HRS DOCUMENTATION RECORD COVER SHEET

Name of Site: Acme Steel Coke Plant

EPA Identification Number: ILN000509241 (Ref. 4, p. 1)

Contact Persons

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Pathways, Components, or Threats Not Scored

The ground water[1] and air migration pathways, the drinking water and human food chain threats of the surface water migration pathway, and the soil exposure and subsurface intrusion pathway were not scored as a part of this Hazard Ranking System (HRS) evaluation. These pathways and threats were excluded because a release to these media would not significantly affect the overall score and because the environmental threats of the surface water migration pathway are sufficient to qualify the site for placement on the National Priorities List (NPL). These pathways are of concern to the U.S. Environmental Protection Agency (EPA) and may be considered during future evaluations.

Ground Water Migration Pathway: There are no drinking water wells within a 4-mile radius of the sources on the site. Drinking water supplies for the City of Chicago are obtained from Lake Michigan (Ref. 53, p. 7); therefore, a possible release to ground water does not pose a significant threat to human health through the ground water migration pathway.

Air Migration Pathway: No ambient air samples have been collected; therefore, this pathway does not contribute significantly to the site score. Nevertheless, the potential for wind to carry particulates off the property is possible. In addition, due to sparse vegetation in many areas of the site, any traffic over such areas can raise dust during dry periods. The nearest resident to the site is 800 feet to the north–northeast. There are no employees currently working at the site (Refs. 6, pp. 9, 33).

Drinking Water and Human Food Chain Threats of the Surface Water Migration Pathway: There are no drinking water intakes within the 15-mile downstream target distance limit (TDL). All drinking water for the City

[1] "Ground water" and "groundwater" are synonymous; the spelling is different due to "ground water" being codified as part of the HRS, while "groundwater" is the modern spelling.

of Chicago comes from Lake Michigan (Ref. 53, p. 7); therefore, the drinking water threat of the surface water migration pathway does not pose a significant threat to human health. The Calumet River has been identified as a fishery by the Illinois Department of Natural Resources and is used for recreational purposes; therefore, the human food chain threat of the surface water migration pathway is of concern to EPA (Ref. 6, p. 29).

Soil Exposure and Subsurface Intrusion Pathway: No soil exposure targets are within an area of observed contamination, and no subsurface vapor or soil gas samples have been collected from the site; therefore, this pathway does not contribute significantly to the site score. Nevertheless, there is the potential for the nearby population to enter the site and be exposed to on-site surface contamination. Additionally, subsurface vapor has not been investigated and, therefore, may pose a risk to occupants of any buildings near the site.

HRS DOCUMENTATION RECORD

Name of Site:	Acme Steel Coke Plant
EPA Region:	5
Date Prepared:	September 2023
Street Address of Site:*	11236 South Torrence Avenue
City, County, State, Zip Code:	Chicago, Cook, Illinois 60617-6440 (Ref. 4, p. 2)
General Location in the State:	Far Southeast Side of Chicago (Ref. 3)
Topographic Map:	Lake Calumet, Illinois/Indiana
Latitude:	41°41′18.72″ North
Longitude:	87°33′41.01″ West

The site coordinates were measured from the facility's northern stack (Ref. 5, p. 2).

*The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, disposed, or placed, or has otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

Scores

Air Pathway:	Not Scored (NS)
Ground Water Pathway:	NS
Soil Exposure and Subsurface Intrusion Pathway:	NS
Surface Water Pathway:	60.00
HRS Site Score:	**30.00**

WORKSHEET FOR COMPUTING HRS SITE SCORE

	S Pathway	S^2 Pathway
1. Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)	NS	NS
2a. Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	60	3,600
2b. Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	NS	NS
2c. Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	60	3,600
3a. Soil Exposure Component Score (S_{se}) (from Table 5-1, line 22)	NS	NS
3b. Subsurface Intrusion Component Score (S_{ssi}) (from Table 5-11, line 12)	NS	NS
3c. Soil Exposure and Subsurface Intrusion Pathway Score (S_{sessi}) (from Table 5-11, line 13)	NS	NS
4. Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	NS	NS
5. Total of $S_{gw}^2 + S_{sw}^2 + S_{sessi}^2 + S_a^2$	-	3,600
6. HRS Site Score (Divide the value on line 5 by 4 and take the square root)	30.00	

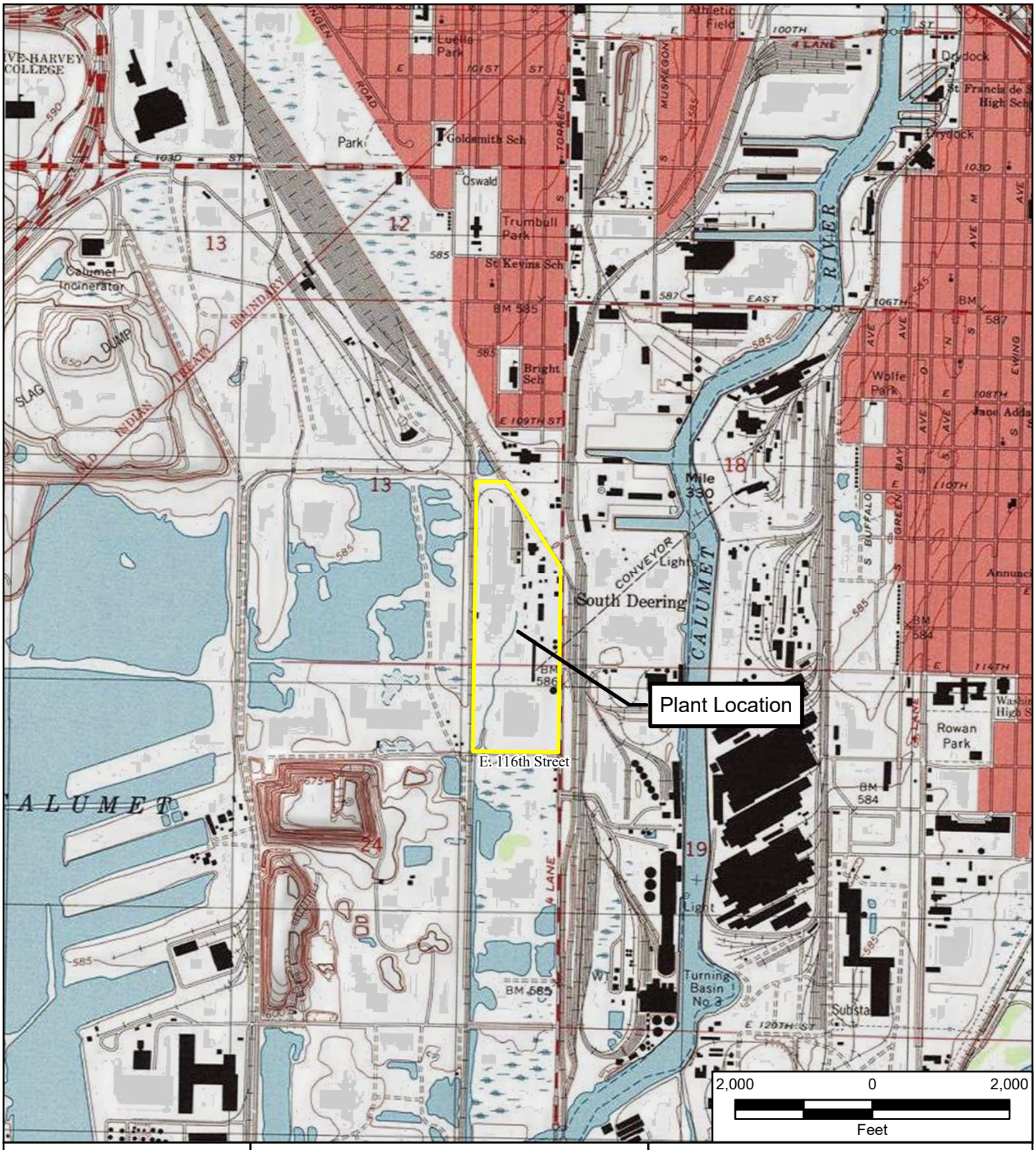
Note: NS = not scored

HRS TABLE 4-1 — Surface Water Overland/Flood Migration Component Scoresheet		
Factor Categories and Factors	**Maximum Value**	**Value Assigned**
Drinking Water Threat		
Likelihood of Release:		
1. Observed Release	550	550
2. Potential to Release by Overland Flow:		
2a. Containment	10	NS
2b. Runoff	25	NS
2c. Distance to Surface Water	25	NS
2d. Potential to Release by Overland Flow (lines 2a x [2b + 2c])	500	NS
3. Potential to Release by Flood:		
3a. Containment (Flood)	10	NS
3b. Flood Frequency	50	NS
3c. Potential to Release by Flood (lines 3a x 3b)	500	NS
4. Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500	NS
5. Likelihood of Release (higher of lines 1 and 4)	550	550
Waste Characteristics:		
6. Toxicity/Persistence	(a)	NS
7. Hazardous Waste Quantity	(a)	NS
8. Waste Characteristics	100	NS
Targets:		
9. Nearest Intake	50	NS
10. Population:		
10a. Level I Concentrations	(b)	NS
10b. Level II Concentrations	(b)	NS
10c. Potential Contamination	(b)	NS
10d. Population (lines 10a + 10b + 10c)	(b)	NS
11. Resources	5	NS
12. Targets (lines 9 + 10d + 11)	(b)	NS
Drinking Water Threat Score:		
13. Drinking Water Threat Score ([lines 5 x 8 x 12]/82,500, subject to a maximum of 100)	100	NS

HRS TABLE 4-1 — Surface Water Overland/Flood Migration Component Scoresheet		
Factor Categories and Factors	**Maximum Value**	**Value Assigned**
Human Food Chain Threat		
Likelihood of Release:		
14. Likelihood of Release (same value as line 5)	550	550
Waste Characteristics:		
15. Toxicity/Persistence/Bioaccumulation	(a)	NS
16. Hazardous Waste Quantity	(a)	NS
17. Waste Characteristics	1,000	NS
Targets:		
18. Food Chain Individual	50	NS
19. Population:		
19a. Level I Concentrations	(b)	NS
19b. Level II Concentrations	(b)	NS
19c. Potential Human Food Chain Contamination	(b)	NS
19d. Population (lines 19a + 19b + 19c)	(b)	NS
20. Targets (lines 18 + 19d)	(b)	NS
Human Food Chain Threat Score:		
21. Human Food Chain Threat Score ([lines 14 x 17 x 20]/82,500, subject to a maximum of 100)	100	NS
Environmental Threat		
Likelihood of Release:		
22. Likelihood of Release (same value as line 5)	550	550
23. Ecosystem Toxicity/Persistence/Bioaccumulation	(a)	5E+8
24. Hazardous Waste Quantity	(a)	10,000
25. Waste Characteristics	1,000	1,000
Targets:		
26. Sensitive Environments:		
26a. Level I Concentrations	(b)	NS
26b. Level II Concentrations	(b)	25
26c. Potential Contamination	(b)	NS
26d. Sensitive Environments (lines 26a + 26b + 26c)	(b)	25
27. Targets (value from 26d)	(b)	25

HRS TABLE 4-1 — Surface Water Overland/Flood Migration Component Scoresheet		
Factor Categories and Factors	**Maximum Value**	**Value Assigned**
Environmental Threat Score:		
28. Environmental Threat Score ([lines 22 x 25 x 27]/82,500, subject to a maximum of 60)	60	60.00
Surface Water Overland/Flood Migration Component Score for a Watershed:		
29. Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum of 100)	100	60.00
Surface Water Overland/Flood Migration Component Score:		
30. Component Score (S_{of})[c] (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100	60.00

Notes:
NS = not scored
[a]Maximum value applies to waste characteristics category.
[b]Maximum value not applicable
[c]Do not round to nearest integer.



Reference Map

Legend

Approximate Plant Boundary

N

Source: Reference 6, p. 39

The source of this map image is ESRI, used by the EPA with ESRI's permission.

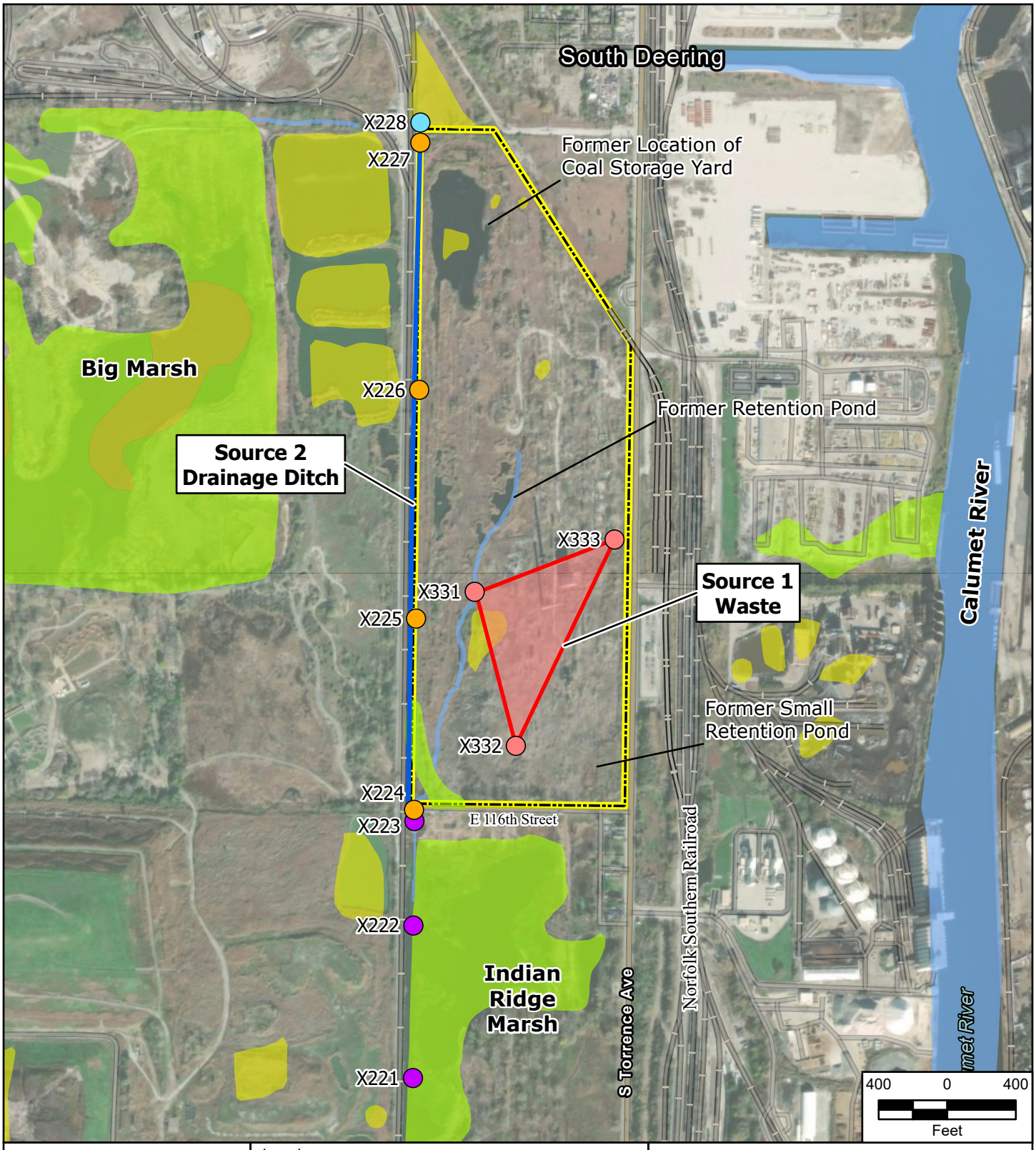
Acme Steel Coke Plant
11236 South Torrence Ave
Chicago, Cook County, Illinois

Figure 1
Plant Location Map

TETRA TECH

Prepared For: EPA	Prepared By: Tetra Tech Inc.

Date Saved: 7/3/2023 EPA Contract No.: 68-HE-0519-D0005 TO-TOLIN No.: F0072-0001DE105



Reference Map

Legend

- Source 2 Soil Sample
- Waste Sample
- Background Sediment Sample
- Contaminated Sediment Sample
- Source 1
- Source 2 overland flow, length 4,238.16 feet
- Approximate Plant Boundary

Wetland Type

- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

N

Source: Ref. 6, Figures 1, 2 and 8; Ref. 10

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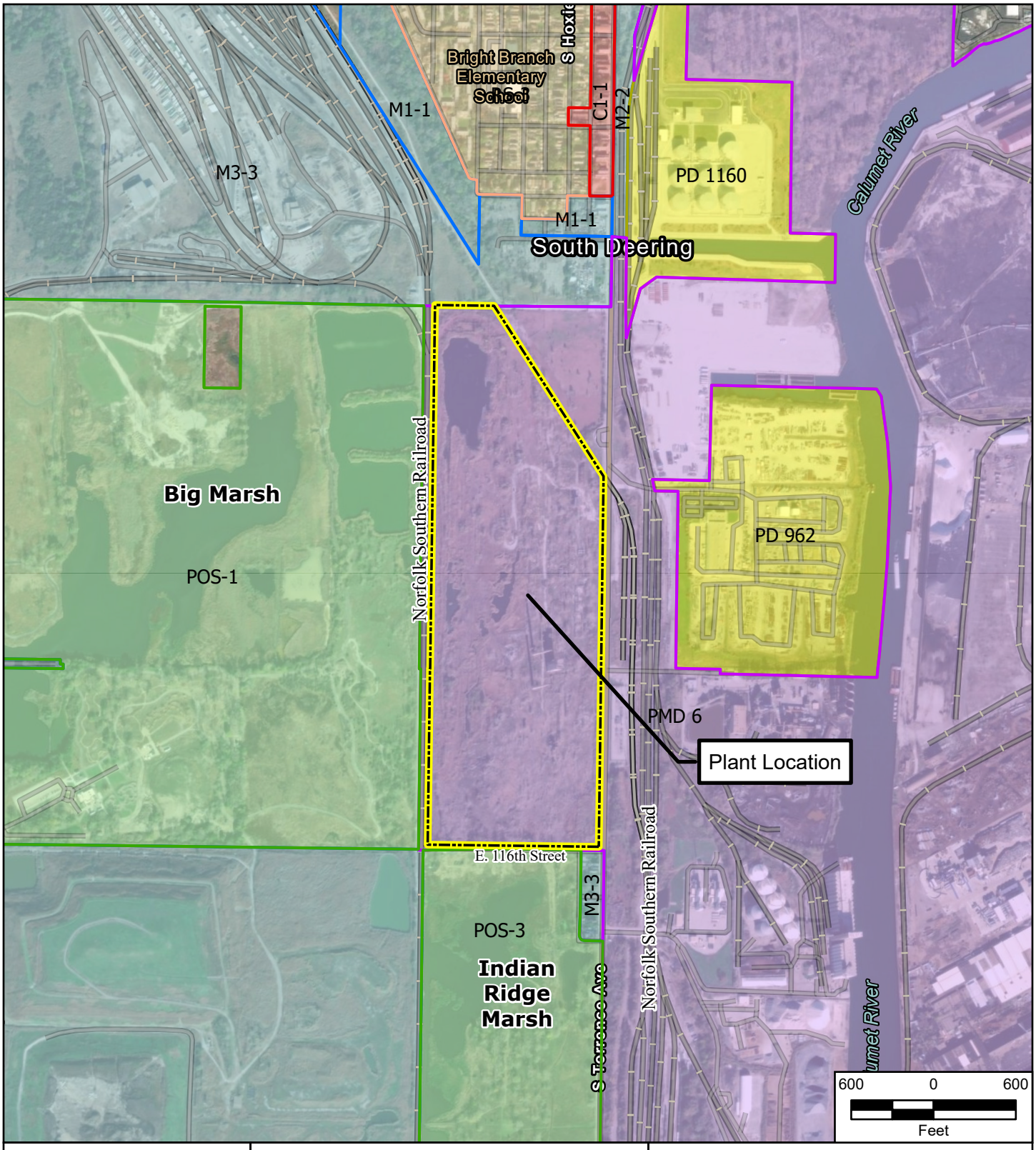
Acme Steel Coke Plant
11236 South Torrence Ave
Chicago, Cook County, Illinois

Figure 2
Source Location Map

TETRA TECH

Prepared For: EPA	Prepared By: Tetra Tech Inc.

Date Saved: 7/13/2023 EPA Contract No.: 68-HE-0519-D0005 TO-TOLIN No.: F0072-0001DE105



Reference Map

Legend

- Commercial
- Manufacturing
- Residential
- Planned Development
- Planned Manufacturing
- Park and Open Space
- Approximate Plant Boundary (Ref. 6, p. 39)

N

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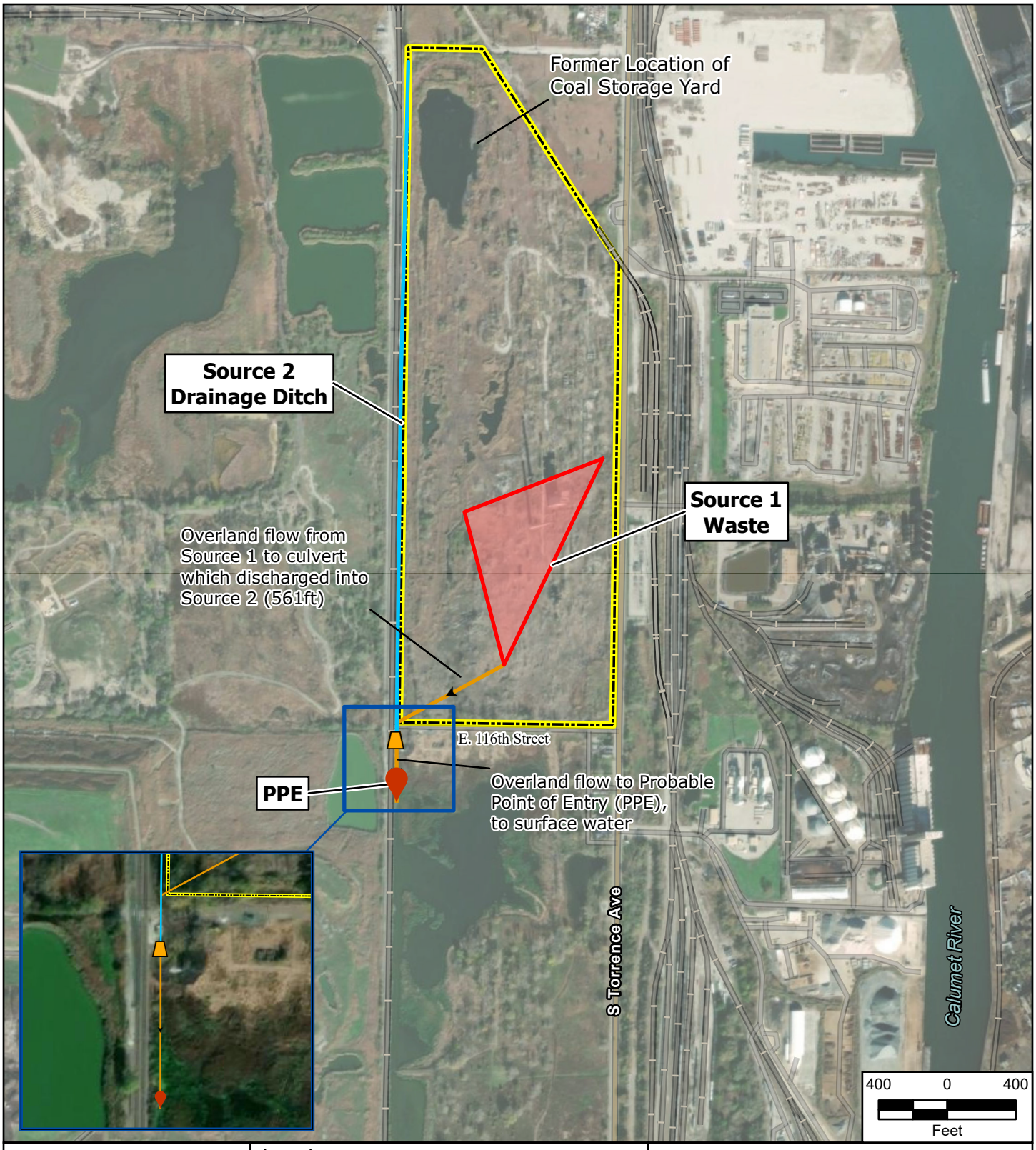
Acme Steel Coke Plant
11236 South Torrence Ave
Chicago, Cook County, Illinois

Figure 3
Plant and Surrounding Features

TETRA TECH

Prepared For: EPA	Prepared By: Tetra Tech Inc.

Date Saved: 7/13/2023 EPA Contract No.: 68-HE-0519-D0005 TO-TOLIN No.: F0072-0001DE105



Reference Map

Legend

- Culvert
- Probable Point of Entry (PPE)
- Source 1 overland flow, length 1,023.69 feet
- Source 2 overland flow, length 4,238.16 feet
- Approximate Plant Boundary

N

Source: Ref. 6, Figures 1, 2 and 8; Ref. 10

Acme Steel Coke Plant
11236 South Torrence Ave
Chicago, Cook County, Illinois

Figure 4
Overland Flow From Sources 1 and 2

TETRA TECH

Prepared For: EPA	Prepared By: Tetra Tech Inc.

Date Saved: 7/11/2023 EPA Contract No.: 68-HE-0519-D0005 TO-TOLIN No.: F0072-0001DE105

Reference Map

Legend

- Mile Markers along Pathways
- Probable Point of Entry (PPE)
- Surface Water Migration Pathways
- Approximate Plant Boundary

N

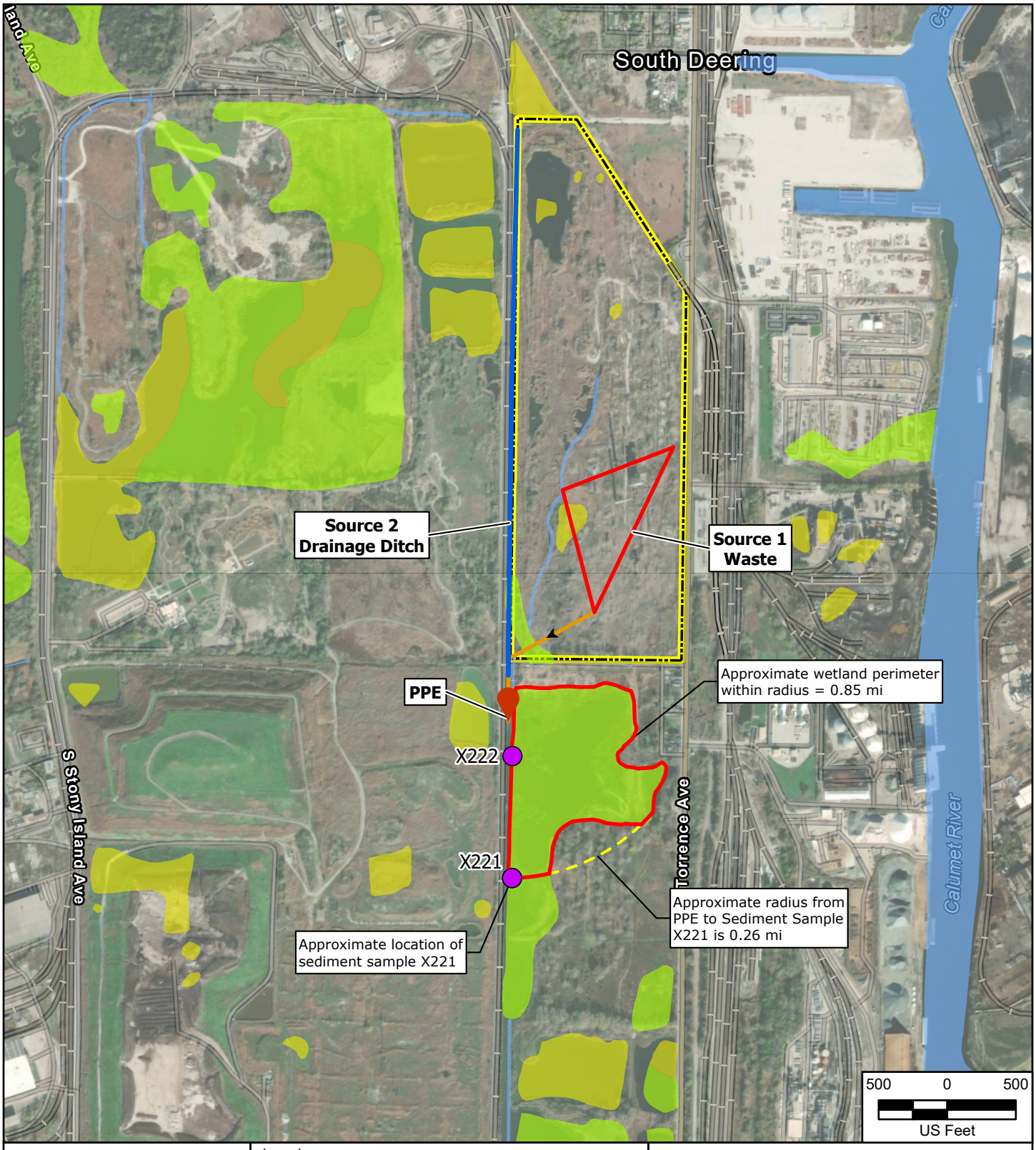
Acme Steel Coke Plant
11236 South Torrence Ave
Chicago, Cook County, Illinois

Figure 5
15-mile Target Distance Limit Map

TETRA TECH

Prepared For: EPA	Prepared By: Tetra Tech Inc.

Date Saved: 3/16/2023 EPA Contract No.: 68-HE-0519-D0005 TO-TOLIN No.: F0072-0001DE105



Reference Map

Legend

- Probable Point of Entry (PPE)
- Contaminated Sediment Sample
- Source 2
- Source 1
- Overland flow
- Approximate Wetland Perimeter (0.85mi)
- Approximate Plant Boundary

Wetland Type

- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

N

Source: Reference Nos. 6, p. 45; 61

Acme Steel Coke Plant
11236 South Torrence Ave
Chicago, Cook County, Illinois

Figure 6
Wetland Perimeter Map

TETRA TECH

Prepared For: EPA	Prepared By: Tetra Tech Inc.

Date Saved: 7/13/2023 EPA Contract No.: 68-HE-0519-D0005 TO-TOLIN No.: F0072-0001DE105

REFERENCES

Ref. No.	Description of the Reference
1.	U.S. Environmental Protection Agency (EPA). Hazard Ranking System, Title 40 *Code of Federal Regulations* (CFR) Part 300, Appendix A (55 *Federal Register* [FR] 51583, Dec. 14, 1990, as amended at 82 FR 2779, Jan. 9, 2017; 83 FR 38037, Aug. 3, 2018), as published in the CFR on July 1, 2019, with two attachments. Attachment A: FR Vol. 55, No. 241. December 14, 1990. Hazard Ranking System Preamble. Attachment B: FR Vol. 82, No. 5, January 9, 2017. Addition of a Subsurface Intrusion Component to the Hazard Ranking System Preamble. 197 pages. https://semspub.epa.gov/src/document/HQ/100002489.
2.	EPA. "Superfund Chemical Data Matrix (SCDM)." Query. July 2022. 215 pages. Accessed February 24, 2023 and August 18, 2023. http://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm.
3.	U.S. Geological Survey (USGS). 7.5 Minute - Topographic Quadrangle. Lake Calumet, Illinois/Indiana. 2015. Map.
4.	EPA. Acme Steel Coke Plant. EPA Identification Number ILN000509241. January 4, 2023. 4 pages. https://enviro.epa.gov/envirofacts/sems/detail-view?id=ILN000509241::0509241.
5.	Tetra Tech, Inc. (Tetra Tech). "Project Note Regarding Latitude and Longitude for the Acme Steel Coke Plant." January 30, 2023. 2 pages.
6.	Illinois Environmental Protection Agency (Illinois EPA). *CERCLA Site Reassessment*. Acme Steel Coke Plant, Chicago, Illinois. Identification Number ILN000509241. April 14, 2023. 366 pages.
7.	Tetra Tech. *Site Reconnaissance Trip Report*. Acme Steel Coke Plant Site. Includes: National Wetlands Inventory (NWI) map (accessed January 4, 2023), the Coke Plant Drainage diagram, and figures from Illinois EPA *Site Reassessment and Indian Ridge Marsh North Channel Reconstruction Chicago Park District* (Revision 0). January 12, 2023. 68 pages.
8.	Illinois EPA. "Memorandum Regarding 0316510001 – Cook County, Acme Steel Coke Plant, Identification Number ILD000810457." Includes attached documents. May 14, 2002. 11 pages.
9.	Illinois EPA. *CERCLA Combined Assessment Report for Acme Steel Coke Plant, Chicago, Illinois*. Identification Number ILN000509241. September 15, 2005. 115 pages.
10.	EPA. "Acme Chicago Coke Site – EPA OSC Response." Undated. 3 pages. Accessed February 27, 2023. https://response.epa.gov/site/site_profile.aspx?site_id=2251.
11.	DeBruler, Dennis. Industrial History. "Lost/Interlake/Acme/Federal Furnace." July 4, 2020. 15 pages. https://industrialscenery.blogspot.com/2020/07/interlakeacmefederal-furnace.html.
12.	DeBruler, Dennis. Industrial History. "Lost/Interlake/Acme/By Products Coke Corp." May 26, 2020. 13 pages. https://industrialscenery.blogspot.com/2020/05/interlakeacmeby-products-coke-corp.html.

13. Environmental Data Resources (EDR). EDR Aerial Photo Decade Package. 11236 South Torrence Avenue. Inquiry 7236662.8. January 30, 2023. 17 pages. (Modified by Tetra Tech to include site features.)

14. EDR. Certified Sanborn Map Report. 11236 South Torrence Avenue. Inquiry 7236662.3. January 31, 2023. 14 pages.

15. EDR. Certified Sanborn Map Report. 11236 South Torrence Avenue. Inquiry 7236662.3. January 31, 2023. 14 pages.

16. EDR. Certified Sanborn Map Report. 11236 South Torrence Avenue. Inquiry 7236662.3. January 31, 2023. 14 pages.

17. Harding Lawson Associates. Coke Plant Drainage Diagram. Acme Steel Company. Plate 3. December 16, 1997. 1 sheet.

18. Harding Lawson Associates. Coke Plant General Plant Layout. Acme Steel Company. Plate 5. December 16, 1997. 1 sheet.

19. Shealy Environmental Services, Inc. Forms lA-OR ("Organic Analysis Data Sheet Target Analyte List"), 1B-OR ("Organic Data Sheet Tentatively Identified Compounds"), 2A-OR ("Deuterated Monitoring Compound Recovery"), 2B-OR ("Deuterated Monitoring Compound Recovery"), 3A-OR ("Matrix Spike/Matrix Spike Duplicate Recovery"), 4-OR ("Method Blank Summary"), and 8-OR ("Internal Standard Area and Retention Time Summary"). October 2018.
98 pages.

20. Illinois EPA. Logbook. October 22, 2018, and October 23, 2018. Excerpt. 4 pages.

21. Illinois EPA. "Chain of Custody Record." ESNP2. Case Number 47927. USEPA CLP Organics (Lab Copy). Shipped October 23, 2018. 2 pages.

22. Tetra Tech. "Project Note Regarding Acme Steel Coke Plant (IL) Site and Contract Laboratory Program Electronic Delivery." Includes attachments: Sample Quantitation Limits. January 12, 2023. 14 pages.

23. Tetra Tech. "Project Note Regarding Acme Steel Coke Plant Area of Source 1." Includes attached figure (Source 1 – Area). January 30, 2023. 2 pages.

24. Illinois EPA. "Chain of Custody Record." Case Number 47927. USEPA CLP Inorganics (Lab Copy). Shipped October 23, 2018. 2 pages.

25. Tetra Tech. "Project Note Regarding Contract Laboratory Program Electronic Delivery." Universal 47927 ESNP2. Includes attachments: Sample Quantitation Limits. January 12, 2023. 53 pages.

26. Tetra Tech. "Project Note Regarding Contract Laboratory Program Electronic Delivery." Universal 47927 MESNP2. Includes attachments: Sample Quantitation Limits. January 12, 2023. 13 pages.

27. Bonner Analytical Testing Company. Forms 1-IN ("Inorganic Analysis Data Sheet"), 3-IN ("Blanks"), 5A-IN ("Matrix Spike Sample Recovery"), 6-IN ("Duplicates"), 9-IN ("Method Detection Limit"), and 12-IN "Analysis Log"). Cyanide. October 24, 2018. 18 pages.

28. Bonner Analytical Testing Company. Form 1-IN ("Inorganic Analysis Data Sheets"). Mercury. October 24, 2018. 12 pages.

29. Illinois EPA. "Site Reassessment Work Plan for Acme Steel Coke Plant." October 11, 2018. 14 pages.

30. Bonner Analytical Testing Company. *Sample Summary*. Acme Steel Coke Plant Project. Metals by ICP-AES. Group Identification Number 47927/EPW14029/MESNP2. February 8, 2019. 51 pages.

31. Illinois EPA. *Quality Assurance Project Plan for CERCLA Site Investigations*. September 6, 2017. 349 pages.

32. Illinois EPA. "Memorandum Regarding Notes from Telephone Conversation with David Holmberg." February 16, 2006. 3 pages.

33. Illinois EPA. "Photographic Notes, Acme Steel Company – Chicago Coke Plant." National Pollutant Discharge Elimination System Number IL0002101. Photographed by Rob Sulski. June 10, 1993. 3 pages.

34. EDR. Historical Topographic Map Report. January 27, 2023. 21 pages.

35. Tetra Tech. *Wetlands Desktop Review*. Acme Steel Coke Plant and Indian Ridge Marsh. Revision 1. July 26, 2023. 66 pages.

36. V3 Companies, Ltd. "Calumet Area Hydrologic Master Plan." Topographic Mapping. August 2006. 4 pages.

37. Kirsch, Tom. "Acme Coke Plant." Opacity. Undated. 3 pages. https://opacity.us/site105_acme_coke_plant.htm.

38. EPA. "Coke Oven Emissions." January 2000. 4 pages. https://www.epa.gov/sites/default/files/2016-09/documents/coke-oven-emissions.pdf.

39. Regenesis. "Dibenzo(a,h)anthracene." Undated. 2 pages.

40. PubChem. *Dibenz[a,h,]anthracene Compound Summary*. Undated. 58 pages.

41. New Jersey Department of Health and Senior Services. "Benzo(b)fluoranthene." Hazardous Substance Fact Sheet. July 2001. 6 pages.

42. PubChem. *Indeno[1,2,3-cd]pyrene Compound Summary*. Undated. 55 pages.

43. Reference Number Reserved.

44. Reference Number Reserved.

45. Farris, Fred F. Abstract. *Encyclopedia of Toxicology.* "Coke Oven Emissions." Elsevier Inc. 2014. 2 pages.

46. EDR. EDR Radius Map Report with GeoCheck. January 27, 2023. 1,443 pages.

47. EPA. *Toxic Release Inventory*. Facility Identification Number 60617CMSTL11236. March 1, 2023. 848 pages.

48. Regenesis. “Benzo(a)anthracene/Benzo(a)perylene.” Undated. Accessed on July 10, 2023. 3 pages. https://regenesis.com/en/glossary/benzoaanthracene-benzoaperylene/.

49. Roadcap, G.S. and others. *An Assessment of the Hydrology and Water Quality of Indian Ridge Marsh and the Potential Effects of Wetland Rehabilitation of the Diversity of Wetland Plant Communities*. December 1999. 104 pages.

50. V3 Companies, Ltd. *Calumet Area Hydrologic Master Plan*. Executive Summary, Vol 1. August 2006. 48 pages.

51. V3 Companies, Ltd. *Calumet Area Hydrologic Master Plan*. Executive Summary, Vol 2. August 2006. 247 pages.

52. EPA. 2008. AP 42, *Compilation of Air Pollutant Emissions Factors.* Volume I, Chapter 12.2, “Coke Production.” Fifth Edition. May. 18 pages. https://www.epa.gov/sites/default/files/2020-11/documents/c12s02_may08.pdf.

53. City of Chicago. “City of Chicago Water Quality Report.” Department of Water Management. 2021. 8 pages.

54. Prendiville, Timothy. “Review of Data for Acme Steel Coke Plant.” EPA. January 30, 2019. 30 pages.

55. EPA. “Using Qualified Data to Document an Observed Release and Observed Contamination.” November 2022. 20 pages.

56. Prendiville, Timothy. “Review of Data for Acme Steel Coke Plant.” EPA. December 20, 2018. 6 pages.

57. EPA. “Lake Calumet Cluster Chicago, Illinois.” Cleanup Activities. Undated. Accessed June 22, 2023. 4 pages. https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0500078.

58. Faust, Rosemarie A. The Risk Assessment Information System. “Toxicity Profiles: Formal Toxicity Summary for Fluoranthene.” Chemical Hazard Evaluation and Communication Program, Biomedical and Environmental Information Analysis Section, Health Sciences Research Division, Oak Ridge, Tennessee. August 1993. 12 pages.

59. Reference Number Reserved.

60. International Agency for Research on Cancer (IARC). “Occupational Exposures During Coal-Tar Distillation.” National Library of Medicine. 2012. 8 pages. https://www.ncbi.nlm.nih.gov/books/NBK304424/.

61. Tetra Tech. “Project Note Regarding U.S. Fish and Wildlife Service (USFWS), Wetland Mapper Program, Wetland at Sampling Location X221.” Includes attachment. Attachments: Wetland Sampling Location Figure and wetland information. June 29, 2023. 9 pages.

62. EPA. Technical Approaches to Characterizing and Cleaning up Brownfields Sites: Railroad Yards. July 15, 2002. 83 pages.

63. Rails-to-Trails Conservancy. “Environmental Contaminants.” Undated. 4 pages.

64. Tetra Tech. “Project Note Regarding Indian Ridge Marsh Drainage.” Includes attachment. Attachment: Google Earth Location of Indian Ridge Marsh and drainage to Marsh Figure. June 27, 2023. 2 pages.

65. EPA. Pollution Report Profile. “Acme Chicago Coke Site.” POLREP #3 – Final POLREP. May 29, 2007. 3 pages.

66. Delaware Health and Social Services. Division of Public Health. “Benzo(a)pyrene.” January 2015. 2 pages.

67. Faust, Rosmarie A. The Risk Assessment Information System. “Toxicity Profiles: Formal Toxicity Summary for Benzo[b]fluoranthene.” Chemical Hazard Evaluation and Communication Program, Biomedical and Environmental Information Analysis Section, Health Sciences Research Division, Oak Ridge, Tennessee. May 1994. 15 pages. https://rais.ornl.gov/tox/profiles/benzob.html.

68. Faust, Rosmarie A. The Risk Assessment Information System. “Toxicity Profiles: Formal Toxicity Summary for Benzo[g,h,i]perylene.” Chemical Hazard Evaluation and Communication Program, Biomedical and Environmental Information Analysis Section, Health Sciences Research Division, Oak Ridge, Tennessee. May 1994. 15 pages. https://rais.ornl.gov/tox/profiles/benzop.html.

69. New Jersey Department of Health and Senior Services. “Benzo(k)fluoranthene.” Hazard Substance Fact Sheet. Chemical Abstracts Services Number 207-08-9. October 2002. 6 pages.

70. Borges, H.T. The Risk Assessment Information System. “Toxicity Profiles: Formal Toxicity Summary for Chrysene.” Chemical Hazard Evaluation Group, Biomedical and Environmental Information Analysis Section, Health Sciences Research Division, Oak Ridge, Tennessee. December 1994. 20 pages. https://rais.ornl.gov/Sugtox/profiles/chrysene.html.

71. Faust, Rosmarie A. The Risk Assessment Information System. “Toxicity Profiles: Formal Toxicity Summary for Fluoranthene.” Chemical Hazard Evaluation and Communication Program, Biomedical and Environmental Information Analysis Section, Health Sciences Research Division, Oak Ridge, Tennessee. August 1993. 19 pages. https://rais.ornl.gov/tox/profiles/fluoran.html.

72. Faust, Rosmarie A. The Risk Assessment Information System. “Toxicity Profiles: Formal Toxicity Summary for Indeno[1,2,3-*cd*]pyrene.” Chemical Hazard Evaluation and Communication Program, Biomedical and Environmental Information Analysis Section, Health Sciences Research Division, Oak Ridge, Tennessee. May 1994. 15 pages. https://rais.ornl.gov/tox/profiles/indeno_1_2_3_cd_pyrene_f_V1.html.

73. Faust, Rosmarie A. The Risk Assessment Information System. “Toxicity Profiles: Formal Toxicity Summary for Phenanthrene.” Chemical Hazard Evaluation and Communication Program, Biomedical and Environmental Information Analysis Section, Health Sciences Research Division, Oak Ridge, Tennessee. August 1993. 13 pages. https://rais.ornl.gov/tox/profiles/phenanthrene_f_V1.html.

74. Faust, Rosmarie A. The Risk Assessment Information System. “Toxicity Profiles: Condensed Toxicity Summary for Pyrene.” Chemical Hazard Evaluation and Communication Program, Biomedical and Environmental Information Analysis Section, Health Sciences Research Division, Oak Ridge, Tennessee. August 1993. 7 pages. https://rais.ornl.gov/tox/profiles/pyrene_c_V1.html.

SITE SUMMARY

For HRS purposes, the Acme Steel Coke Plant Site consists of two sources and a release to the surface water pathway. The release is a result of migration of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene into Indian Ridge Marsh, a Palustrine emergent wetland (Refs. 7, p. 47; 35, p. 15; 61, pp. 2-5), from waste placed on the ground of the Acme coke plant (Source 1, "Waste Pile") as well as a drainage ditch (Source 2, "Drainage Ditch Contaminated Soil") that received overland runoff from Source 1 and the coke plant, as documented in **Sections 2.0** and **4.0** of this HRS documentation record. Waste[2] or slag (Source 1) is in a large pile on the ground throughout a large portion of the coke plant as well as in the drainage features on the plant and the drainage ditch (Source 2) that received drainage from Source 1 and the plant (Refs. 6, pp. 9, 20, 25, 30; 7, pp. 27, 28, 34–39, 41, 43, and Attachment 2). Overland runoff from Source 2 flows south into Indian Ridge Marsh (Ref. 6, Figures 2 [p. 39] and 8 [p. 45]).

This site score reflects releases to Indian Ridge Marsh via overland runoff from Source 1 and Source 2; approximately 0.85 mile of Indian Ridge Marsh wetland perimeter is subject to Level II concentrations as documented in **Section 4.1.4.3.1.2** (**Figure 6** of this document). Previously, surface water overland runoff from the coke plant, Source 1, and Source 2 flowed to the south into the East 116th Street culvert, then into Indian Ridge Marsh until the Municipal Water Reclamation District (MWRD) mandated that the Acme Steel Coke Plant direct water away from the culvert; a former employee of Acme indicated that this change occurred at some point before approximately 1981—runoff was redirected to the east and into a retention pond on the southeast corner of the plant. There, the water in the retention pond was allowed to evaporate (Refs. 8, p. 9; 17; 32, pp. 1–2) (see **Figure 4** of this HRS documentation record).

Overland runoff from Source 1, prior to the MWRD mandate, flowed 561 feet southwest toward a culvert at the southwest corner of the plant. The culvert discharged to Source 2, on the north side of East 116th Street, and Source 2 flowed immediately into the adjacent East 116th Street culvert, which in turn discharged into the south side of East 116th Street at Soil Sampling Location X224. From this location, overland runoff continued approximately 419 feet south into Indian Ridge Marsh, which continues approximately 1.70 miles toward the Calumet River. Lastly, the Calment River flows west to complete the 15-mile target distance limit (TDL) (see **Figures 4 and 5** of this HRS documentation record) (Refs. 6, p. 29; 8, p. 9; 17; 32, p. 2; 35, pp. 6, 7, 11, 12, 20, 37, 39, 41). Similarly, overland runoff from Source 2 flows approximately 4,238 feet from Soil Sampling Location X227 southward into Indian Ridge Marsh, then follows the same path as Source 1 to complete the 15-mile TDL (Refs. 6, pp. 21, 29, 45, 50; 35, pp. 12, 20) (see **Figures 2, 4 and 5** of this HRS documentation record).

The Acme Steel Coke Plant consists of approximately 104 acres. The heart of the plant, once consisting of process buildings and adjacent areas, comprises approximately 11 acres. Historical photographs and maps show railroad spurs throughout the coke plant with trains full of coal, piles of coal, coke storage on the ground surface, coke ovens, conveyors, two stacks, and two retention ponds (Refs. 6, p. 7; 11, p. 3; 12, pp. 1, 2, 5, 6, 11; 13, pp. 8–12, 14–17; 14, p. 6; 15, pp. 9, 10; 16, pp. 6, 12). The plant is bordered: (1) to the north by a mixed residential and manufacturing areas; (2) to the south by Indian Ridge Marsh; (3) to the east by planned development and manufacturing areas; and (4) to the west by Norfolk Southern and Railroad West and Big Marsh (Refs. 6, Figure 2, p. 39; 7, pp. 6, 11, 12) (**Figure 3** of this HRS documentation record). The Calumet River and Lake Michigan are 0.3 miles and 2.83 miles east of the site, respectively (Refs. 3; 6, p. 7). The location of the coke plant property boundary is shown in **Figures 1** and **2** of this HRS documentation record, and the location of Source 1, Source 2, and Indian Ridge Marsh are shown in **Figure 2** of this HRS documentation record. The land use surrounding the Acme plant is shown in **Figure 3** of this HRS documentation record.

[2] Multiple terms including, but not limited to, waste, coal, slag, cinders, coke, coal fines, and coal tar are used in different references to describe waste material on the ground; in general this HRS documentation record uses the same terminology as the references (Ref. 6, pp. 8, 9, 50; 7, pp. 7, 8, 27, 28, 30, 32-39, 41-43; 9, pp. 8, 50, 51, 32, pp. 2, 3). These terms all refer to the materials and process wastes associated with the Acme coke plant operations.

The coke plant began operating around 1905 and ceased operations around 2001 (Refs. 6, pp. 7, 11; 8, pp. 1, 3, 10, p. 1; 11, p. 1; 17; 18); approximately four intact structures remain (Refs. 6, p. 9; 7, pp. 33, 40). Ownership changed often (Refs. 6, pp. 11–13; 10, p. 1; 11, p. 9). The plant received coal by truck and railroad, then converted the coal into coke for use in the blast furnace (Refs. 9, p. 6; 10, p. 1; 12, p. 1). An Acme byproducts plant recovered tar, ammonia, and light oil from coke oven gas and removed gas impurities. An ammonium sulfate solution was produced using ammonia removed from the gas. The cleaned gas served as fuel for the coke batteries as well as for the blast furnace stoves and boilers. The coke was transferred to the blast furnace using an 11,000-foot covered conveyer system (Refs. 9, p. 12; 10, p. 1).

Coke manufacturing includes: (1) preparing, charging, and heating the coal; (2) removing and cooling the coke product; and (3) cooling, cleaning, and recycling the oven gas. Coal is prepared for coking by pulverizing (Ref. 52, p. 1). The primary purpose of coke ovens is the production of quality coke for the iron and steel industry (Ref. 52, p. 4). Coke was produced at the plant through destructive distillation ("coking") of coal in coke ovens in the absence of air. The coking process occurred in a coke oven battery (where multiple ovens are operated together). Gases produced during the coking process, called "foul" gases, were treated at the facility through a multi-step process prior to reintroduction into the coking process as fuel. Tar removed from the foul gas mixed with coal at the facility and reintroduced itself into the coking process as fuel (Refs. 6, p. 12; 52, pp. 1, 4).

Numerous releases to air are known to have occurred from the coke plant and are summarized below:

- Over 50 releases of coke oven gas emissions were reported between 1990 and 2001 for an approximate total of 49,795 pounds of coke oven gas emissions released into the air (Ref. 46, pp. 48, 51, 52, 56, 60, 61, 64–66, 70, 71, 73, 76, 77, 82, 86, 88, 89, 93, 95, 96, 101–106, 115, 117 to 123, 127, 128, 130, 132, 136–162, 166, 170, 174, 175, 178–180, 184, 186–191, 196, 197, 199–203, 208, 209, 213, 217–219, 223, 227, 228, 232–234, 238–240, 243, 246, 247, 252, 253, 263, 264, 266). The largest single event was reported on June 22, 1998, which resulted in a release of 45,500 pounds of coke oven gas (Ref. 46, p. 129).

- Over 20 releases of benzene were reported between 1996 and 1999 for an approximate total of 1,347 pounds of benzene released into the air (Ref. 46, p. 72–74, 82, 94, 100, 105, 107, 116, 119, 121, 161, 187, 189, 191, 201, 227, 258, 262, 278, 297, 323, 345, 347, and 349).

The coke plant was listed as a Toxic Substances Control Act (TSCA) site from 1990 to 2000 (Ref. 46, pp. 103–106). RCRA-regulated waste included K-listed decanter tank sludge from coking operations (K087) (Ref. 46, pp. 5, 138). RCRA violations reported were associated with waste piles, manifests, and records recording (Ref. 46, pp. 137–154).

City inspections reported releases of benzene, dust clouds, odors, and/or excess soot and/or water between 1994 and 2004 (Ref. 46, pp. 278–279). A later city inspection conducted in 2006 indicated that approximately 200 cubic yards of PCB-contaminated soil was stockpiled on the site. The demolition contractor was preparing to dispose the PCB soils off site (Ref. 46, p. 290).

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION – SOURCE 1

Name of source(s): Waste **Number of source:** 1

Source Type: Pile

Description and Location of Source (with reference to a map of the site):

On March 28, 2018, the Illinois Environmental Protection Agency (Illinois EPA) Office of Site Evaluation conducted a site reassessment at the Acme Steel Coke Plant Site in Chicago, Illinois (Ref. 6, p. 6). Illinois EPA collected three waste samples from the process waste pile on the plant property: Samples X331, X332, and X333. Their collection locations, within a more expansive process waste pile, were used to delineate the pile for HRS scoring because the full extent of the waste pile has not been adequately determined (Ref. 6, pp. 21, 25, Figure 7, p. 44), and are shown on **Figure 2** of this HRS documentation record. Sample X331 was collected in the west-central portion of the plant at the beginning of the drainageway that once flowed south and into Indian Ridge Marsh. Sample X332 was collected in the south-central portion of the plant property where high concentrations of semi-volatile organic compounds (SVOCs) were present in previous samples; the area surrounding the sample location was covered with tar spots, slag pieces, and associated fines. Lastly, Sample X333 was collected in the eastern portion of the plant, just south of the area where most of the industrial processes involved in coke production, refining, and storage took place. This sample was collected approximately 15 feet south of a historic aboveground tank location near the eastern edge of the coke plant (Ref. 6, pp. 21, 45, 50).

During the 2018 site reassessment, Illinois EPA observed large amount of fill material made up of cinders and gravel along with some tar and slag adjacent to process buildings is sparse. The surface of the approximately 104-acre site was observed to be almost entirely black due to the presence of waste used as fill material. In many areas the coal fines/cinders placed on the ground had black oil stains with a strong hydrocarbon odor. The Process Waste Pile was placed throughout the facility presumably to fill in low-lying areas, to control surface water run-off, and possibly to control growth of vegetation surrounding the facility (Ref. 6, pp. 9, 25 and 50). Waste Samples X331, X332, and X333 each contained slag (Ref. 6, Table 6, p. 64). Illinois EPA determined the waste sample locations from a portion of a larger area known as the "Process Waste Pile" (Ref. 6, pp. 45, 50). The Process Waste Pile was characterized by coal fines, cinders, and varying percentages of coal tar or other unidentified process wastes along with small percentages of other fill material, such as limestone gravel or brick shards, which covers much of the coke plant property. Illinois EPA determined that the depth of the Process Waste Pile varied throughout the plant. It was measured to extend down to at least 8–11 feet below ground (Refs. 6, p. 25, Figure 7, p. 44; 9, pp. 33, 34, 45, 50, 51).

On December 12, 2022, a site reconnaissance of the plant was conducted and the black material which constitutes Source 1 was present on the ground throughout the property, including the locations of former structures (Ref. 7, pp. 7, 32, 33, 34, 35, 40)—historically, coal was stored across the ground surface of the plant (Refs. 8, p. 9; 14, pp. 6–14; 15, pp. 6–10; 16, p. 9; 17, p. 1). This observation is in line with the 2018 Illinois EPA Site Reassessment field investigation, in which black material consisting of slag, coal, and/or coke several feet deep was observed throughout the entire plant area (Ref. 7, pp. 7, 8, 32–41). The black material is visible in multiple aerial photographs (Refs. 11, p. 8; 13, pp. 7–17). Many areas where slag, coal, and coke were stored now have overgrown vegetation (Ref. 13, pp. 3, 4, 6, 9). Information from site visits and historical documentation indicate that it was common practice for slag, coal, and/or coke to be stored directly on the ground throughout the plant property. In addition, when the plant was owned and operated by Interlake, waste material was also placed west of the coke plant and west of Norfolk and Southern Railroad Tracks (Ref. 29, p. 6).

During an earlier site visit on September 24, 2004, Illinois EPA conducted a CERCLA combined assessment (CA) (referred to as a Combined Preliminary Assessment/Site Inspection Assessment in Reference 6) at the plant (Ref. 9, p. 4) and completed seven subsurface borings. Soil borings were intended to further define subsurface conditions and allow for the collection of soil and waste samples. The borings identified black cinders and coal fines to a depth of up to 11 feet below the ground surface. Two of the boring locations (Geoprobe Sample locations G106 and G104) are located in the near proximity of the edge of the area Source 1 as defined for HRS scoring (Ref. 9, pp. 20, 45, 72, 73).

The Source 1 waste samples consisted of the same black material that was stored throughout the plant (see **Table 1** of this HRS documentation record) (Refs. 6, Table 6, p. 64; 20, p. 3; 29, p. 12); therefore, while Source 1 is characterized using the most recent data, it represents only a conservative portion of the larger waste pile present over much of the coke plant property (and possibly the neighboring property west of the coke plant). Currently, there is insufficient data available to adequately characterize the Process Waste Pile as a whole.

Table 2 of this HRS documentation record summarizes the hazardous substances detected in waste Samples X331, X332, and X333. Many of the same hazardous substances are present in all three waste samples and at similarly elevated concentrations.

Source 1 is conservatively delineated as covering approximately 9.2 acres using only the most recent sample locations; however, based on aerial photographs and on-site investigations, the extent of Source 1 likely covers a much larger area of 50 or more acres, or roughly half of the 104-acre facility property. Source 1 waste pile is a portion of the larger process waste pile that covers a large portion of the former Acme plant property (Refs. 6, pp. 9, 20, 44, 364–366; 7, pp. 7, 32, 33, 34, 35, 40, 49; 9, pp. 33, 34, 46, 88–95; 13, pp. 8–17). The pile began accumulating waste since the early 1900s, when the facility started operations, and waste is still present at the site (Refs. 6, pp. 11, 25, 44; 7, pp. 7, 33–39; 13, pp. 8–17).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE – SOURCE 1

Illinois EPA Site Reassessment – 2018

Illinois EPA collected waste samples during the site reassessment from three locations known to have elevated concentrations of site-related constituents. The samples were intended to confirm that conditions in these locations had not changed significantly since the last Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigation in 2010 (Ref. 6, pp. 19, 21). Waste sample X331 was collected in the west-central portion of coke plant at the beginning of the drainageway that once flowed south and then off the coke plant property into Indian Ridge Marsh. Waste sample X332 was collected in south-central portion of the coke plant where high concentrations of SVOCs were identified in previous sampling events. The area surrounding the sample location was covered with tar spots, slag pieces and associated fines, which is consistent with general descriptions of the Acme coke plant process waste. Waste sample X333 was collected in the eastern portion of the coke plant just south of the area where most of the industrial processes involved in coke production, refining, and storage took place. Waste sample X333 was collected approximately 15 feet south of a historic tank location near the eastern edge of the plant (Refs. 6, p. 21; 8, p. 9).

All waste samples were collected in accordance with the Illinois EPA sampling procedures guidance manual, quality assurance project plan (QAPP) for CERCLA site investigations (2017), and site assessment work plan for the Acme Steel Coke Plant (Refs. 29, p. 11; 31, p. 38).

Samples were analyzed through EPA's Contract Laboratory Program (CLP) (Refs. 29, pp. 11, 13; 54, p. 2; 56, p. 2) for a Target Analyte List (TAL) analysis along with analyses for mercury and cyanide, volatile organic compounds (VOCs), SVOCs, pesticides, and polychlorinated biphenyls (PCBs) (Ref. 29, pp. 12, 14; 54, p. 2; 56, p. 2). The data validation reports for these analyses are noted as References 54 and 56 in this report. The samples were analyzed according to CLP Statement of Work (SOW) SOM02.4 (2016) for the low/medium volatile, SVOCs, pesticide, and Aroclor target analytes (Ref. 54, p. 2) and CLP SOW ISM02.4 analysis procedures; mercury analysis followed a cold vapor Atomic Absorption technique, and cyanide analysis followed the MIDI distillation procedure (Ref. 56, p. 2). The remaining inorganic analyses were performed using an inductively coupled plasma-atomic emission spectroscopy (IPC-AES) procedure (Ref. 56, p. 2).

Table 1 summarizes the waste samples collected by Illinois EPA in 2018:

TABLE 1: Source 1 (Waste) Sample Descriptions

Sample	Type	Sample Description	References
X331	Waste	Collected 0–3 inches below ground surface and contained cinders and possibly slag fines mixed with a low percentage of dark brown/black loam; collected with a stainless-steel trowel	6, Table 6, p. 64; 20, p. 3
X332	Waste	Collected 2–4 inches below ground surface and contained black slag fines and small slag pieces; collected with a stainless-steel trowel	6, Table 6, p. 64; 20, p. 3
X333	Waste	Collected 0–6 inches below ground surface and contained cinders and slag fines; collected with a stainless-steel trowel	6, Table 6, p. 64; 20, p. 3

The laboratory analysis of the waste samples detected the presence of SVOCs, cyanide, and mercury. **Table 2** summarizes these results:

TABLE 2: Analytical Results for Source 1 (Waste) Samples

Sample	EPA Sample Number	Date	Hazardous Substance	Hazardous Substance Concentration (µg/kg, unless otherwise noted)	CRQL (µg/kg, unless otherwise noted)	References
X331	ESNQ1	10/23/2018	Naphthalene	1,200	1,000	19, p. 71; 20, p. 3; 21, p. 2; 22, p. 8
X331	ESNQ1	10/23/2018	Acenaphthylene	1,100	1,000	19, p. 72; 20, p. 3; 21, p. 2; 22, p. 8
X331	ESNQ1	10/23/2018	Dibenzofuran	1,300	1,000	19, p. 72; 20, p. 3; 21, p. 2; 22, p. 9
X331	ESNQ1	10/23/2018	Phenanthrene	13,000	4,100	19, p. 71; 20, p. 3; 21, p. 2; 22, p. 9
X331	ESNQ1	10/23/2018	Anthracene	3,300	1,000	19, p. 72; 20, p. 3; 14, p. 2; 22, p. 9
X331	ESNQ1	10/23/2018	Fluoranthene	15,000	8,000	19, p. 71; 20, p. 3; 21, p. 2; 22, p. 9
X331	ESNQ1	10/23/2018	Pyrene	16,000	1,000	19, p. 73; 20, p. 3; 21, p. 2; 22, p. 9
X331	ESNQ1	10/23/2018	Benzo(a)anthracene	9,500	1,000	19, p. 73; 20, p. 3; 21, p. 2; 22, p. 9
X331	ESNQ1	10/23/2018	Chrysene	9,800	1,000	19, p. 73; 20, p. 3; 21, p. 2; 22, p. 9
X331	ESNQ1	10/23/2018	Benzo(b)fluoranthene	11,000	1,000	19, p. 73; 20, p. 3; 21, p. 2; 22, p. 9
X331	ESNQ1	10/23/2018	Benzo(k)fluoranthene	4,100	1,000	19, p. 73; 20, p. 3; 21, p. 2; 22, p. 9
X331	ESNQ1	10/23/2018	Benzo(a)pyrene	7,900	1,000	19, p. 73; 20, p. 3; 21, p. 2; 22, p. 9
X331	ESNQ1	10/23/2018	Indeno(1,2,3-cd)pyrene	4,500	1,000	19, p. 73; 20, p. 3; 21, p. 2; 22, p. 9
X331	ESNQ1	10/23/2018	Benzo(g,h,i)perylene	3,600	1,000	19, p. 73; 20, p. 3; 21, p. 2; 22, p. 9
X332	ESNQ2	10/23/2018	Naphthalene	12,000	4,100	19, p. 79; 20, p. 3; 21, p. 2; 22, p. 10
X332	ESNQ2	10/23/2018	Acenaphthylene	9,800	4,100	19, p. 80; 20, p. 3; 21, p. 2; 22, p. 10

TABLE 2: Analytical Results for Source 1 (Waste) Samples

Sample	EPA Sample Number	Date	Hazardous Substance	Hazardous Substance Concentration (µg/kg, unless otherwise noted)	CRQL (µg/kg, unless otherwise noted)	References
X332	ESNQ2	10/23/2018	Phenanthrene	40,000	4,100	19, p. 80; 20, p. 3; 21, p. 2; 22, p. 10
X332	ESNQ2	10/23/2018	Anthracene	13,000	4,100	19, p. 80; 20, p. 3; 21, p. 2; 22, p. 10
X332	ESNQ2	10/23/2018	Fluoranthene	120,000	20,000	19, p. 80; 20, p. 3; 21, p. 2; 22, p. 10
X332	ESNQ2	10/23/2018	Pyrene	95,000	10,000	19, p. 81; 20, p. 3; 21, p. 2; 22, p. 10
X332	ESNQ2	10/23/2018	Benzo(a)anthracene	61,000	4,100	19, p. 81; 20, p. 3; 21, p. 2; 22, p. 10
X332	ESNQ2	10/23/2018	Chrysene	61,000	4,100	19, p. 81; 20, p. 3; 21, p. 2; 22, p. 10
X332	ESNQ2	10/23/2018	Benzo(b)fluoranthene	120,000	10,000	19, p. 81; 20, p. 3; 21, p. 2; 22, p. 11
X332	ESNQ2	10/23/2018	Benzo(k)fluoranthene	36,000	4,100	19, p. 81; 20, p. 3; 21, p. 2; 22, p. 11
X332	ESNQ2	10/23/2018	Benzo(a)pyrene	96,000	10,000	19, p. 81; 20, p. 3; 21, p. 2; 22, p. 11
X332	ESNQ2	10/23/2018	Indeno(1,2,3-cd) pyrene	55,000	4,100	19, p. 81; 20, p. 3; 21, p. 2; 22, p. 11
X332	ESNQ2	10/23/2018	Benzo(g,h,i) perylene	53,000	4,100	19, p. 81; 20, p. 3; 21, p. 2; 22, p. 11
X332	MESNQ2	10/23/2018	Mercury	1.2 mg/kg	0.11 mg/kg	20, p. 3; 24, p. 2; 28, p. 11; 30, p. 42
X333	ESNQ3	10/23/2018	Naphthalene	79,000	16,000	19, p. 87; 20, p. 3; 21, p. 2; 22, p. 11
X333	ESNQ3	10/23/2018	Acenaphthylene	130,000	16,000	19, p. 88; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Dibenzofuran	27,000	16,000	19, p. 88; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Fluorene	24,000	16,000	19, p. 88; 20, p. 3; 21, p. 2; 22, p. 12

TABLE 2: Analytical Results for Source 1 (Waste) Samples

Sample	EPA Sample Number	Date	Hazardous Substance	Hazardous Substance Concentration (µg/kg, unless otherwise noted)	CRQL (µg/kg, unless otherwise noted)	References
X333	ESNQ3	10/23/2018	Phenanthrene	420,000	82,000	19, p. 88; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Anthracene	110,000	16,000	19, p. 88; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Fluoranthene	1,100,000	160,000	19, p. 88; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Pyrene	920,000	82,000	19, p. 89; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Benzo(a)anthracene	570,000	82,000	19, p. 89; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Chrysene	560,000	82,000	19, p. 89; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Benzo(b)fluoranthene	810,000	82,000	19, p. 89; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Benzo(k)fluoranthene	240,000	16,000	19, p. 89; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Benzo(a)pyrene	560,000	82,000	19, p. 89; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Indeno(1,2,3-cd)pyrene	420,000	82,000	19, p. 89; 20, p. 3; 21, p. 2; 22, p. 12
X333	ESNQ3	10/23/2018	Benzo(g,h,i)perylene	410,000	82,000	19, p. 89; 20, p. 3; 21, p. 2; 22, p. 12
X333	MESNQ3	10/23/2018	Mercury	5.7 mg/kg	0.56 mg/kg	20, p. 3; 24, p. 3; 26, p. 9; 28, p. 12; 30, p. 45
X333	MESNQ3	10/23/2018	Cyanide	47.1 mg/kg	1.8 mg/kg	20, p. 3; 24, p. 3; 26, p. 9; 27, p. 12; 30, p. 44

Notes:
bgs = below ground surface
CRQL = contract-required quantitation limit; because the samples were analyzed through the CLP, these CRQLs are equivalent to the CRQL as defined by the Hazard Ranking System (Ref. 1, Sections 1.1 and 2.3)
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram

List of Hazardous Substances Associated with Source 1:

Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Chrysene
Cyanide
Dibenzofuran
Fluoranthene
Fluorene
Indeno(1,2,3-cd) pyrene
Mercury
Naphthalene
Phenanthrene
Pyrene

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY – SOURCE 1

The waste samples were collected from the ground surface. The source has no surface water runoff containment features (Refs. 6, pp. 29, 30 and Table 6, p. 64; 8, p. 9; 17, p. 1; 32, pp. 1–2). The containment value for Source 1 was obtained from Reference 1, Table 4-2, and is provided in **Table 3**:

TABLE 3: Containment Value for Source 1

Containment Description	Containment Factor Value	References
Release via overland migration and/or flood; no maintained run-on control system and runoff management system	10	6, pp. 27, 29, 30 and Table 6, p. 64; 8, p. 9; 17, p. 1; 32, pp. 1–2

2.4.2 HAZARDOUS WASTE QUANTITY – SOURCE 1

2.4.2.1.1. Hazardous Constituent Quantity

Total hazardous constituent quantity for Source 1 could not be adequately determined according to HRS requirements—that is, total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1). Sufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) are not available for trustworthy calculations of total or partial mass of all CERCLA hazardous substances in the source and associated releases from the source. Therefore, information is insufficient to calculate a total or partial Hazardous Constituent Quantity estimate for Source 1 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1).

Hazardous Constituent Quantity Assigned Value: Not scored (NS)

2.4.2.1.2. Hazardous Wastestream Quantity

Total hazardous wastestream quantity for Source 1 could not be adequately determined according to HRS requirements; that is, total mass of all hazardous waste streams and CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2). Sufficient historical and current data (manifests, PRP records, State records, permits, waste construction data, annual reports, etc.) are not available for trustworthy calculations of total or partial mass of all hazardous waste streams and all CERCLA pollutants and contaminants in the source and associated releases from the source. Thus, information is insufficient to evaluate the associated releases from the source in order to calculate the hazardous wastestream quantity for Source 1 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, Volume (Ref. 1, Section 2.4.2.1.2).

Hazardous Wastestream Quantity Assigned Value: NS

2.4.2.1.3. Volume

The volume of the waste on the site could not be determined because investigations did not document the information needed to determine the volume of waste on the site.

Volume Assigned Value: 0

2.4.2.1.4. Area

The approximate area of waste pile on site is estimated from the area between the sample locations of Samples X331, X332, and X333. In December 2022, the black material which constitutes Source 1 was present on the ground throughout the property, including where former structures had been (Ref. 7, pp. 7, 32–35).

Sum (square feet [ft^2]): 400,270.58 (Ref. 23)
Equation for Assigning Value (Ref. 1, Table 2-5): 13
400,270.58/13 = 30,790.04 (Ref. 1, Section 2.4.2.1.4)

Area Assigned Value: 30,790.04

2.4.2.1.5. Source Hazardous Waste Quantity Value

Highest Assigned Value Assigned from Ref. 1, Table 2-5: 30,790.04

2.2 SOURCE CHARACTERIZATION – SOURCE 2

2.2.1 SOURCE IDENTIFICATION

Name of source(s): Drainage Ditch **Number of source**: 2

Source Type: Contaminated soil

Description and Location of Source (with reference to a map of the site):

Source 2 includes an intermittent drainage ditch along the western boundary of the plant property, as shown in **Figure 2** of this HRS documentation record (Ref. 6, pp. 20–21). SVOCs were present in Drainage Ditch Soil Samples X227, X226, X225, X224, and X223, as documented in **Table 5** of this HRS documentation record. The locations of the soil samples are shown in **Figure 2** of this HRS documentation record. Runoff and drainage from the plant flows through Source 2 and into the culvert under East 116th Street to Indian Ridge Marsh (Refs. 6, pp. 20, 29–30 and Figure 2; 51, pp. 16, 24, 44) (see **Figure 4** and **Section 4.1.1.1** of this HRS documentation record).

On December 12, 2022, Tetra Tech conducted a site reconnaissance at the Acme Steel Coke Plant Site (Ref. 7, pp. 5, 6) and observed slag, coke, and/or coal throughout the ground surface of the plant and in the eastern sides of the drainage ditch (Source 2) and the railroad tracks that run along the western side of Source 2 (Ref. 7, p. 7, 27, 28, 30, 32–39, 43). Portions of Source 2 have been reworked over time, and the land has been disturbed (Ref. 7, pp. 7, 29).

Contaminated soil in the drainage ditch is adjacent to and downslope of Source 1 and received direct runoff from Source 1 (Refs. 6, pp. 20, 29–30, 44; 7, pp. 27–28, 30, 36, 41; 8, p. 9; 13, pp. 9–17; 32, p. 2; 34, pp. 7–11) (**Figure 2**).

The same contaminants detected in Source 1 were also detected in Source 2 (see **Table 2** and **Table 5** of the HRS documentation record). As documented in the attribution section of this HRS documentation record, the contaminants detected Source 1 and Source 2 are known to be associated with wastes and products generated by the plant operations.

The following contaminants detected in Source 2 samples are not naturally occurring, other than from fires, and are associated with products and contaminants from coke plants:

Benzo(a)anthracene (Ref. 48, p. 1)
Benzo(a)pyrene (Ref. 66, p. 1)
Benzo(b)fluoranthene (Ref. 67, p. 8).
Benzo(g,h,i)perylene (Ref. 68, p. 8)
Benzo(k)fluoranthene (Ref. 69, p. 1)
Chrysene (Ref. 70, p. 9)
Fluoranthene (Ref. 71, p. 8)
Indeno(1,2,3-cd)pyrene (Ref. 72, pp. 8, 9)
Phenanthrene (Ref. 73, pp. 5, 6)
Pyrene (Ref. 74, p. 5)

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE – SOURCE 2

Illinois EPA Site Reassessment – 2018

During the 2018 Site Reassessment, Illinois EPA collected soil samples along the extent of Source 2 (Ref. 6, pp. 19–21 and Figure 8, p. 45) (see **Figure 2** of this HRS documentation record). The most upgradient soil sample collected from Source 2 came from sampling location X227. Four other soil samples were collected downgradient from this location: Samples X226, X225, X224, and X223 (Ref. 6, Figure 8, p. 45).

Soil sample X227 was collected at the northwestern corner of the Acme Steel Coke Plant within the drainage route flowing southward along the property's western edge. This location is also the low-lying area west of the plant fence and approximately 60 feet east of the railroad tracks (Ref. 6, p. 21). The land slopes southward from here, and overland runoff flows southward through the ditch (Source 2) and ultimately off the property, either into Indian Ridge Marsh or Big Marsh (Refs. 6, p. 21; 7, p. 5).

Soil sample X226 was collected at Source 2, downgradient of soil sample X227 from a low-lying area west of the fence running along the western edge of the Acme Steel Coke Plant. No observable ditch was present here, but the elevation of the area indicates that surface water runoff from the facility would collect in this area prior to flowing southward along the north–south ditch (Source 2) (Ref. 6, p. 20).

Soil sample X225 was collected at Source 2, downgradient of soil sample X226, from inside of the culvert draining the ditch immediately west of the Acme Steel Coke Plant (Ref. 6, p. 20 and Table 6, p. 63).

Soil sample X224 was collected at Source 2, from the east side of the ditch, 20 feet north of the culvert flowing under East 116th Street and into Indian Ridge Marsh. Surface water runoff and drainage from the Acme Steel Coke Plant would flow through this ditch and into the culvert (Ref. 6, p. 20 and Table 6, p. 63).

Soil sample X223 was collected at Source 2, approximately 8 feet south of the culvert pipe running southward under East 116th Street and 40 feet east of the railroad tracks (Ref. 6, p. 21 and Table 6, p. 63). The sample indicates impacts from the Acme Steel Coke Plant in the drainageway leading into Indian Ridge Marsh. The sample location is approximately 150 feet north of the freshwater emergent wetland as mapped by the U.S. Department of Fish and Wildlife; however, wetland vegetation was growing within several feet of the sample location (Ref. 6, p. 20).

Also collected during the 2018 site reassessment, was sediment sample X228. This sample was collected upgradient from Source 2 and thus is used as a reference point in this HRS documentation record to show that elevated concentrations of contaminants are associated with Source 2 (Ref. 6, pp. 19–21 and Figure 8, p. 45) (see Figure 2 of this HRS documentation record).

Figure 8 in Reference 6 shows the sampling locations discussed above. Field logbook notes for the October 2018 site reassessment sampling event are provided in Reference 20. Sample chain-of-custody (COC) forms are provided in References 21 and 24. **Table 4** describes the characteristics of Source 2 soil and upgradient reference point samples, and **Table 5** summarizes the Source 2 detected contaminant concentrations. Locations from which the Source 2 soil samples and reference point sample were collected, are depicted on **Figure 2** of this HRS documentation record.

TABLE 4: Source 2 Sample Descriptions

Sample	Type	Sample Description	References
Source 2 Soil Samples			
X223	Soil	Collected 6–12 inches beneath the soil surface and consisted of soft-to-medium black silt with a low percentage of sand; had a strong, natural organic smell; sampled with a stainless-steel auger and trowel. Sparse vegetation in the area; some roots in soil	6, Table 6, p. 63; 20, pp. 2, 3
X224	Soil	Collected 5–10 inches beneath the soil surface and contained black loam with slag fines; sampled with a stainless-steel trowel. A truckload of railroad ballast had been dumped in the area, covering the north opening of the culvert; rudimentary erosion control consisting of telephone poles and used tires had been constructed decades earlier to keep waste material from eroding off the site	6, Table 6, p. 63; 20, pp. 2, 3
X225	Soil	Collected 4 inches beneath the soil surface of soils accumulated inside the opening of the culvert; contained black loam with roots; collected with a stainless-steel trowel	6, Table 6, p. 63; 20, pp. 2, 3
X226	Soil	Collected 12 inches below the ground surface and contained black/dark brown silty loam with a small amount of roots; collected with a stainless-steel trowel	6, Table 6, p. 64; 20, pp. 2, 3
X227	Soil	Collected 3–8 inches below the ground surface with a stainless-steel trowel and contained black/dark brown loam with a low percentage of sand; roots present but no slag or site impacts noted. Wetland species in the immediate vicinity	6, Table 6, p. 64; 20, pp. 2, 3
Upgradient Reference Point			
X228	Sediment	Collected 3 inches below the ground surface with a stainless-steel trowel; material was black/dark brown loam with a low percentage of sand; roots present but no slag or site impacts noted. Phragmites/wetland species to the east in the immediate vicinity, and a railroad ballast, trees, and some slag to the west	6, Table 6, p. 64; 20, pp. 2, 3

TABLE 5: Concentrations of Hazardous Substances in Source 2

Sample	EPA Sample Number	Date	Hazardous Substance	Hazardous Substance Concentration (µg/kg, unless otherwise noted)	CRQL (µg/kg, unless otherwise noted)	References
X223	ESNP4	10/22/2018	Phenanthrene	4,300	2000	19, p. 38; 20, p. 2; 21, p. 1; 25, p. 22
X223	ESNP4	10/22/2018	Fluoranthene	8,600	3800	19, p. 38; 20, p. 2; 21, p. 1; 25, p. 22
X223	ESNP4	10/22/2018	Pyrene	7,700	2000	19, p. 39; 20, p. 2; 21, p. 1; 25, p. 22
X223	ESNP4	10/22/2018	Benzo(a)anthracene	5,400	2000	19, p. 39; 20, p. 2; 21, p. 1; 25, p. 22
X223	ESNP4	10/22/2018	Chrysene	6,600	2000	19, p. 39; 20, p. 2; 21, p. 1; 25, p. 22
X223	ESNP4	10/22/2018	Benzo(b)fluoranthene	9,300	2000	19, p. 39; 20, p. 2; 21, p. 1; 25, p. 22
X223	ESNP4	10/22/2018	Benzo(k)fluoranthene	3,400	2000	19, p. 39; 20, p. 2; 21, p. 1; 25, p. 22
X223	ESNP4	10/22/2018	Benzo(a)pyrene	6,100	2000	19, p. 39; 20, p. 2; 21, p. 1; 25, p. 22
X223	ESNP4	10/22/2018	Indeno(1,2,3-cd)pyrene	4,400	2000	19, p. 39; 20, p. 2; 21, p. 1; 25, p. 22
X223	ESNP4	10/22/2018	Benzo(g,h,i)perylene	4,100	2000	19, p. 39; 20, p. 2; 21, p. 1; 25, p. 22
X223	MESNP4	10/22/2018	Mercury	0.51 mg/kg	0.19 mg/kg	20, p. 2; 24, p. 1; 26, p. 9; 28, p. 3; 30, p. 10
X223	MESNP4	10/22/2018	Cyanide	17.9 mg/kg	0.95 mg/kg	20, p. 2; 24, p. 1; 27, p. 3; 26, p. 9; 30, p. 9
X224	ESNP5	10/22/2018	Phenanthrene	2,600	1,300	19, p. 42; 20, p. 2; 21, p. 1; 25, p. 23
X224	ESNP5	10/22/2018	Fluoranthene	3,800	2,400	19, p. 42; 20, p. 2; 21, p. 1; 25, p. 23
X224	ESNP5	10/22/2018	Pyrene	3,600	1,300	19, p. 43; 20, p. 2; 21, p. 1; 25, p. 23

TABLE 5: Concentrations of Hazardous Substances in Source 2

Sample	EPA Sample Number	Date	Hazardous Substance	Hazardous Substance Concentration (µg/kg, unless otherwise noted)	CRQL (µg/kg, unless otherwise noted)	References
X224	ESNP5	10/22/2018	Benzo(a)anthracene	2,900	1,300	19, p. 43; 20, p. 2; 21, p. 1; 25, p. 24
X224	ESNP5	10/22/2018	Chrysene	3,400	1,300	19, p. 43; 20, p. 2; 21, p. 1; 25, p. 24
X224	ESNP5	10/22/2018	Benzo(b)fluoranthene	4,800	1,300	19, p. 43; 20, p. 2;21, p. 1; 25, p. 24
X224	ESNP5	10/22/2018	Benzo(k)fluoranthene	1,900	1,300	19, p. 43; 20, p. 2; 21, p. 1; 25, p. 24
X224	ESNP5	10/22/2018	Benzo(a)pyrene	3,100	1,300	19, p. 43; 20, p. 2; 21, p. 1; 25, p. 24
X224	ESNP5	10/22/2018	Indeno(1,2,3-cd)pyrene	2,500	1,300	19, p. 43; 20, p. 2; 21, p. 1; 25, p. 24
X224	ESNP5	10/22/2018	Benzo(g,h,i)perylene	2,400	1,300	19, p. 43; 20, p. 2; 21, p. 1; 25, p. 24
X224	MESNP5	10/22/2018	Mercury	0.30 mg/kg	0.14 mg/kg	24, p. 1; 20, p. 2; 26, p. 9; 28, p. 4; 30, p. 13
X224	MESNP5	10/22/2018	Cyanide	7.3 mg/kg	0.69 mg/kg	24, p. 1; 20, p. 2; 26, p. 9; 27, p. 4; 30, p. 12
X225	EXPN6	10/22/2018	Phenanthrene	1,700	820	19, p. 46; 20, p. 2; 21, p. 1; 25, p. 25
X225	EXPN6	10/22/2018	Fluoranthene	9,500	1,600	19, p. 46; 20, p. 2; 21, p. 1; 25, p. 25
X225	EXPN6	10/22/2018	Benzo(a)anthracene	5,900	1,600	19, p. 47; 20, p. 2; 21, p. 1; 25, p. 25
X225	EXPN6	10/22/2018	Chrysene	9,100	1,600	19, p. 47; 20, p. 2; 21, p. 1; 25, p. 25
X225	EXPN6	10/22/2018	Benzo(b)fluoranthene	14,000	1,600	19, p. 47; 20, p. 2; 21, p. 1; 25, p. 25
X225	EXPN6	10/22/2018	Benzo(k)fluoranthene	18,000	1,600	19, p. 47; 20, p. 2; 21, p. 1; 25, p. 25

TABLE 5: Concentrations of Hazardous Substances in Source 2

Sample	EPA Sample Number	Date	Hazardous Substance	Hazardous Substance Concentration (µg/kg, unless otherwise noted)	CRQL (µg/kg, unless otherwise noted)	References
X225	EXPN6	10/22/2018	Benzo(a)pyrene	7,800	1,600	19, p. 47; 20, p. 2; 21, p. 1; 25, p. 25
X225	EXPN6	10/22/2018	Indeno(1,2,3-cd)pyrene	6,400	1,600	19, p. 47; 20, p. 2; 21, p. 1; 25, p. 25
X225	EXPN6	10/22/2018	Dibenzo(a,h)anthracene	2,000	1,600	19, p. 47; 20, p. 2; 21, p. 1; 25, p. 25
X225	EXPN6	10/22/2018	Benzo(g,h,i)perylene	5,700	1,600	19, p. 47; 20, p. 2; 21, p. 1; 25, p. 25
X226	ESNP7	10/22/2018	Phenanthrene	2,700	1,200	19, p. 56; 20, p. 2; 21, p. 1; 25, p. 27
X226	ESNP7	10/22/2018	Fluoranthene	5,000	2,300	19, p. 56; 20, p. 2; 21, p. 1; 25, p. 27
X226	ESNP7	10/22/2018	Pyrene	5,000	1,200	19, p. 57; 20, p. 2; 21, p. 1; 25, p. 27
X226	ESNP7	10/22/2018	Benzo(a)anthracene	4,000	1,200	19, p. 57; 20, p. 2; 21, p. 1; 25, p. 27
X226	ESNP7	10/22/2018	Chrysene	5,500	1,200	19, p. 57; 20, p. 2; 21, p. 1; 25, p. 27
X226	ESNP7	10/22/2018	Benzo(b)fluoranthene	8,700	1,200	19, p. 57; 20, p. 2; 21, p. 1; 25, p. 27
X226	ESNP7	10/22/2018	Benzo(k)fluoranthene	2,800	1,200	19, p. 57; 20, p. 2; 21, p. 1; 25, p. 27
X226	ESNP7	10/22/2018	Benzo(a)pyrene	5,900	1,200	19, p. 57; 20, p. 2; 21, p. 1; 25, p. 27
X226	ESNP7	10/22/2018	Indeno(1,2,3-cd)pyrene	4,400	12,00	19, p. 57; 20, p. 2; 21, p. 1; 25, p. 27
X226	ESNP7	10/22/2018	Benzo(g,h,i)perylene	4,200	1,200	19, p. 57; 20, p. 2; 21, p. 1; 25, p. 27
X226	MESNP7	10/22/2018	Mercury	0.16 mg/kg	0.13 mg/kg	20, p. 2; 24, p. 1; 26, p. 9; 28, p. 6; 30, p. 27
X227	ESNP8	10/23/2018	Phenanthrene	4,500	1,200	19, p. 60; 20, p. 3; 21, p. 1; 25, p. 28

TABLE 5: Concentrations of Hazardous Substances in Source 2

Sample	EPA Sample Number	Date	Hazardous Substance	Hazardous Substance Concentration (µg/kg, unless otherwise noted)	CRQL (µg/kg, unless otherwise noted)	References
X227	ESNP8	10/23/2018	Fluoranthene	4,800	2,300	19, p. 60; 20, p. 3; 21, p. 1; 25, p. 28
X227	ESNP8	10/23/2018	Pyrene	4,300	1,200	19, p. 61; 20, p. 3; 21, p. 1; 25, p. 28
X227	ESNP8	10/23/2018	Benzo(a)anthracene	2,700	1,200	19, p. 61; 20, p. 3; 21, p. 1; 25, p. 28
X227	ESNP8	10/23/2018	Chrysene	3,300	1,200	19, p. 61; 20, p. 3; 21, p. 1; 25, p. 28
X227	ESNP8	10/23/2018	Benzo(b)fluoranthene	3,700	1,200	19, p. 61; 20, p. 3; 21, p. 1; 25, p. 29
X227	ESNP8	10/23/2018	Benzo(a)pyrene	2,700	1,200	19, p. 61; 20, p. 3; 21, p. 1; 25, p. 29
X227	ESNP8	10/23/2018	Indeno(1,2,3-cd)pyrene	1,900	1,200	19, p. 61; 20, p. 3; 21, p. 1; 25, p. 29
X227	ESNP8	10/23/2018	Benzo(g,h,i)perylene	1,900	1,200	19, p. 61; 20, p. 3; 21, p. 1; 25, p. 29
X227	MESNP8	10/23/2018	Mercury	0.25 mg/kg	0.14 mg/kg	20, p. 3; 24, p. 1; 26, p. 9; 28, p. 7; 30, p. 30

Notes:
(#) = Concentration adjusted in accordance with Reference 55, pp. 8, A-4.
mg/kg = milligram per kilogram
µg/kg = micrograms per kilogram
CRQL = contract-required quantitation limit

List of Hazardous Substances Associated with Source 2

Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Chrysene
Cyanide
Dibenzo(a,h)anthracene
Fluoranthene
Indeno(1,2,3-cd)pyrene
Mercury
Phenanthrene
Pyrene

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY – SOURCE 2

The drainage ditch has no containment features. Overland drainage from the ditch flows south into Indian Ridge Marsh (Ref. 6, pp. 20, 21) (see **Section 4.1.1.1** of this HRS documentation record). The containment value for Source 2 was obtained from Reference 1, Table 4-2, and is summarized in **Table 6**:

TABLE 6: Containment Source 2

Containment Description	Containment Factor Value	References
Release via overland migration and/or flood; there is no documentation of a liner, cover, or other containment features where the samples were collected just below ground surface	10	1, Table 4-2; 6, pp. 20–21; 20, pp. 2, 3

2.4.2 HAZARDOUS WASTE QUANTITY – SOURCE 2

2.4.2.1.1. Hazardous Constituent Quantity

Total hazardous constituent quantity for Source 2 could not be adequately determined according to HRS requirements—that is, total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1). Sufficient historical and current data (manifests, potentially responsible party [PRP] records, State records, permits, waste concentration data, etc.) are not available for trustworthy calculations of total or partial mass of all CERCLA hazardous substances in the source and associated releases from the source. Therefore, information is insufficient to calculate a total or partial Hazardous Constituent Quantity estimate for Source 2 with reasonable confidence. Scoring proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1).

Hazardous Constituent Quantity Assigned Value: Not scored (NS)

2.4.2.1.2. Hazardous Wastestream Quantity

Total hazardous wastestream quantity for Source 2 could not be adequately determined according to HRS requirements; that is, total mass of all hazardous waste streams and CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2). Sufficient historical and current data (manifests, PRP records, State records, permits, waste construction data, annual reports, etc.) are not available for trustworthy calculations of total or partial mass of all hazardous waste streams and all CERCLA pollutants and contaminants in the source and associated releases from the source. Thus, information is insufficient to evaluate the associated releases from the source in order to calculate the hazardous wastestream quantity for Source 2 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, Volume (Ref. 1, Section 2.4.2.1.2).

Hazardous Wastestream Quantity Assigned Value: NS

2.4.2.1.3. Volume

The volume of Source 2 cannot be determined.

Volume Assigned Value: 0

2.4.2.1.4. Area

The area of Source 2 cannot be determined from available samples; however, the area of the contaminated soil at the Source 2 drainage ditch is greater than 0.

Area Assigned Value: Greater Than (>) 0

2.4.2.1.5. Source Hazardous Waste Quantity Value

Highest Assigned Value Assigned from Ref. 1, Table 2-5: >0.

The source hazardous waste quantity and containment values are summarized in **Table 7**:

TABLE 7: Summary of Source Descriptions

Source Number	Source Hazardous Waste Quantity Value	Source Hazardous Constituent Quantity Complete? (Yes/No)	Containment Factor Value by Pathway				
			Ground Water (GW) (Ref. 1, Table 3-2)	Surface Water (SW)		Air	
				Overland/flood (Ref. 1, Table 4-2)	GW to SW (Ref. 1, Table 3-2)	Gas (Ref. 1, Table 6-3)	Particulate (Ref. 1, Table 6-9)
1	30,790.04	No	NS	10	NS	NS	NS
2	>0	No	NS	10	NS	NS	NS

Note:
NS = not scored
> = greater than

Description of Other Possible Sources:

The locations of the other possible sources are shown on Figure 7 of Reference 8. In 2005, Illinois EPA conducted a CERCLA combined assessment (identified in Reference 6 as a combined preliminary assessment/site inspection assessment) at the site and collected samples from these possible sources (Ref. 9, pp. 17-20, 22, 31, 44, 50-51). Later, in 2010, Illinois EPA conducted field work for an expanded site inspection (ESI) and collected additional samples from these other possible sources (Ref. 6, pp. 15, 41). Insufficient source information and/or current status information is available at this time, however, to score these other possible sources.

1. Tar Impoundment

The tar impoundment is a surface impoundment that contained what appears to be coal tar and, potentially, other Acme Steel Coke Plant byproducts at the time of the 2005 field operations. It was visible in aerial photographs beginning in 1986, and the size and shape remained the same until the time of the ESI in 2010. It is estimated to be 17,228 square feet (ft^2), or 0.40 acre. Based on global positioning system (GPS) data, it has a perimeter of 303.8 meters (Ref. 6, p. 24).

An analysis of a waste sample collected near the center of the impoundment during the combined preliminary assessment/site inspection assessment found significant quantities of benzene and several organic compounds. The analysis also found benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene at levels greater than EPA removal action levels (RALs). Other hazardous substances associated with the impoundment include benzo(k)fluoranthene, chrysene, dibenzofuran, indeno(1,2,3-cd)pyrene, fluoranthene, and other SVOCs (Ref. 6, p. 24).

2. French Drain and Sump

The French drain and sump consist of the known sections of the buried French drain system that, when the Acme Steel Coke Plant was in operation, collected surface water runoff, shallow groundwater infiltration, and potentially liquid from piping from manholes inside the process building and in the general areas outside the buildings. According to historical information about the facility, the French drain directed liquids into a sump that was periodically pumped. There is no information describing the disposal of the waste from the sump or the exact physical location of the sump (Ref. 6, pp. 24, 25).

During the combined preliminary assessment/site inspection assessment, a sample was obtained from one of the "clean-out" riser pipes from the system. Analysis of this sample showed elevated concentrations of benzo(a)pyrene (Ref. 6, pp. 19–20). The system contains contaminated soil. The size of the French drain and sump is approximately 1,488 ft^2. Other hazardous substances associated with the system include SVOCs (Ref. 6, pp. 24, 25).

3. Facility Trench and Discharge Line

The facility trench and discharge line is a combination of brick and concrete-lined trenches and an underground network of pipes that convey storm water, non-contact cooling water, and other process waters through Outfall #3 and into the Semet-Solvay slip (Ref. 6, p. 26).

The northern portion of the trench system and the discharge line leading to the Semet Solvay Slip was investigated during the combined preliminary assessment/site inspection assessment. A sample was taken from the open trench just west of the Light Oil process building, and a sample was taken from Outfall #3. These samples represent waste material prior to being directed underneath South Torrence Avenue and in a northeast direction towards the Semet-Solvay Slip. At the slip, wastewater is released into the environment through a large-diameter metal pipe. Five additional samples were taken from the bottom of the trench throughout the central portion of the facility (Ref. 6, p. 26).

All the samples were described as black slag, cinders, and organic liquid with a coal tar odor. Additionally, all the samples contained elevated concentrations of many of the same contaminants, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene (Ref. 6, p. 26).

Through field observations and desktop geographic information system (GIS), the facility trench and discharge line source was determined to be 3,026 feet long and approximately 3 feet wide throughout the facility (Ref. 6, p. 26).

4.0 SURFACE WATER MIGRATION PATHWAY

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

4.1.1.1 Definition of Hazardous Substance Migration Path for Overland/Flood Component

The hazardous substance migration pathway includes both the overland segment and the in-water segment that hazardous substances would take as they migrate away from sources. The overland segment begins at the source and proceeds downgradient to the probable point of entry (PPE) to surface water. The in-water segment at the PPE continues in the direction of flow for rivers (Ref. 1, Sections 4.0.2 and 4.1.1.1) (see **Figures 4 and 5** of this HRS documentation record).

The overland segments of the migration pathways from Source 1 and Source 2 have changed over time. Surface water runoff from the coke plant, Source 1, and Source 2 flowed to the south to the East 116th Street culvert to Indian Ridge Marsh until MWRD mandated that the Acme Steel Coke Plant direct water away from the culvert sometime before 1981. Thereafter, runoff was redirected to the east and into a retention pond on the southeast corner of the plant. The water in the retention pond was allowed to evaporate (Refs. 8, p. 9; 17; 32, pp. 1–2) (see **Figure 4** of this HRS documentation record). Historically, surface water runoff from Source 1 followed the topography and entered the intermittent drainage ditch (Source 2) that flows from the north to the south along the western boundary of the coke plant property boundary, shown in **Figures 4** and **5**, where soil samples X224 through X227 were collected (see **Figure 2** of this HRS documentation record). A single 36-inch diameter culvert connected the coke plant to Indian Ridge Marsh through Source 2 (Ref. 51, pp. 23-24). From the southwest corner of the plant property, the drainage ditch discharged into the East 116th Street culvert that drained the southwest corner of the plant southward under East 116th Street into Indian Ridge Marsh and associated wetlands (Refs. 32, p. 2; 35, pp. 6–7, 11; 36, pp. 2, 4; 49, p. 8; 50, p. 15; 51, pp. 37, 44).

Waste materials piled in the southwestern portion of the facility may have blocked what once was a perennial waterway from the central portion of the facility into Indian Ridge Marsh (Refs. 6, pp. 29, 30; 7, pp. 7, 15; 17). However, surface water runoff from portions of the facility, including portions of the area thought to be part of the larger Source 1 process waste pile, continues to drain to the west and into the north-south ditch (i.e., Source 2) (Refs. 6, p. 30; 7, pp. 7, 18; 51, p. 44).

Surface water runoff and overland drainage from the plant and Source 1 flow into Source 2, the drainage ditch, and overland drainage flows from Source 2 into the culvert under East 116th Street to Indian Ridge Marsh (Refs. 6, pp. 20, 29–30 and Figures 2; 7, pp. 16, 20, 21; 8, pp. 39, 45; 51, pp. 16, 24, 44). An additional culvert may also carry some of the drainage from the southwest portion of the coke plant westward beneath the railroad tracks into surface water located at Big Marsh (Ref. 6, p. 29; 51, p. 44).

United States Geological Survey topographic maps from 1991 through 2018 show a perennial waterway originating on the western central portion of plant and flowing south–southwest off the plant and ultimately connecting with Indian Ridge Marsh (Refs. 6, pp. 8, 29; 34, pp. 7–11). Earlier topographic maps identify a wetland on the coke plant extending south to Indian Ridge Marsh (Ref. 34, pp. 12 to 17; 35, p. 37).

The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory shows an unnamed perennial stream originating in the center of the coke plant and flowing into a small wetland in the southwest corner of the property. According to the USFWS National Wetland Inventory, the wetland has a perennial drainage feature that flows south to the East 116th Street culvert to Indian Ridge Marsh (Refs. 7, p. 47; 35, p. 16). On an unknown date, this drainage was redirected. The flow was redirected away from the culvert in the southwest corner of the plant through berms into a retention pond on the southeast corner of the plant. Water in the retention pond was allowed to evaporate (Refs. 32, p. 2; 13, pp. 10, 17; 17).

The topography at the Acme Steel Coke Plant is primarily flat (Ref. 3). The placement of waste material (coal fines/cinders) altered surface water runoff from the plant, creating depressions and elevated areas (Refs. 6, p. 8; 10, pp. 3–17). During the 2018 Illinois EPA Site Reassessment, the western portion of the plant appeared to be the lowest in elevation, as evidenced by hydrophytic vegetation and standing water. Waste materials had created a series of berms and water-filled ditches on the western and southern portions of the plant. Surface water appeared to remain on the plant throughout the year in three areas: the settling basin on the southeast corner of the property, a ponded area on the northwest corner of the property, and at the remains of a perennial waterway that previously flowed through the western central portion of the property (Refs. 6, p. 8 and Figure 2, p. 39; 8, p. 9; 17). The Site Reassessment also found that surface water runoff from the extreme southwestern corner of the facility into the north-south ditch (Source 2) was believed to have remained constant and that surface water runoff from portions of the facility towards the west and into the north-south ditch continued and that runoff from small portions of the plant drain to the east and south (Ref. 6, pp. 8, 25). In addition, on an unidentified date, a French drain system was constructed along portions of the eastern boundary of the plant to collect surface water runoff and shallow groundwater prior to leaving the site on the east side of the property (Ref. 6, p. 8). Historically, during heavy rainfall events, surface water runoff flowed off the plant to the east and onto Torrence Avenue, as did coke from the plant (Ref. 33, p. 1).

Currently, runoff from Source 1 and Source 2 flows south to Indian Ridge Marsh, which drains into the Calumet River (Refs. 7, pp. 7, 15, 17, 18; 35, pp. 11, 12, 16, 20). Runoff from Source 1 historically flowed to the southwest approximately 561 feet, then entered Source 2 at the southwest corner of the plant and continued approximately 462.69 feet south into a perennial tributary or Indian Ridge Marsh; it then continued 1.70 miles to the Calumet River (see **Figures 4 and 5** of this HRS documentation record) (Refs. 32, p. 2; 35, pp. 11, 14, 15, 22, 35, 37, 39, 53, 63).

Surface water runoff flows along Source 2 drainage ditch approximately 4,238.16 feet south, as measured from the most upgradient soil sample X227's collection location, to the perennial tributary or wetland south of the plant. The PPE to surface water is north of the location of sediment sample X222 in Indian Ridge Marsh (see **Figures 2, 4, and 5** of this HRS documentation record).

4.1.1.2 Target Distance Limit

The 15-mile surface water migration pathway TDL is measured from the most downstream PPE (Ref. 1, Section 4.1.1.2).

Current Surface Water Migration In-Water Segment

Currently, drainage from the process waste pile (Source 1) and water in the intermittent drainage ditch (Source 2) flows south through the East 116th Street culvert and an oil water separator, then into Indian Ridge Marsh (Ref. 7, p. 7). The drainage ditch becomes perennial 250 feet north of the location where Sediment Sample X222 was collected; therefore, the PPE is 250 feet north of that sample location. Indian Ridge Marsh continues approximately 1.20 miles from the PPE to the Calumet River, which continues for 0.55 mile to the southwest to the Grand Calumet River and becomes the Little Calumet River (Ref. 3; Ref. 6, pp. 28, 29; Ref. 9, p. 37). The 15-mile TDL, as measured from the PPE, is completed at the intersection of West 127th Street and the Little Calumet River (Refs. 32, p. 125; 50, p. 18). **Figures 4 and 5** of the HRS documentation record illustrate the flow from the plant to Indian Ridge Marsh; flow continues in Indian Ridge Marsh south to the Calumet River. Historical topographic maps of the marsh also show water entering the irregularly shaped ponded area within Indian Ridge Marsh (Ref. 34, pp. 7–11).

Sediment samples X221 and X222, collected from Indian Ridge Marsh downstream of the PPE, contained significant concentrations of numerous SVOCs that meet the HRS criteria for documenting an observed release to surface water for Indian Ridge Marsh (Ref. 1, Section 2.3). The most downstream sample

concentration in the Indian Ridge Marsh (at sample X221) documents 0.85 mile perimeter of the wetland subject to Level II contamination (see **Figure 6** of this HRS documentation record). The perimeter of Indian Ridge Marsh was measured because there was no discernable flow through the wetland, as documented below (Ref. 1, Section 4.1.4.3.1.2).

A 2023 aerial photograph of Indian Ridge Marsh shows water entering the marsh from the north into an irregularly shaped ponded area on the south side of East 116th Street. The ponded area is bordered to the north by East 116th Street, to the south by East 122nd Street, to the west by railroad tracks, and to the east by South Torrence Avenue (Ref. 64, p. 2). The ponded area is identified by the USFWS as a "Freshwater Emergent Wetland" (Ref. 35, p. 16). At East 122nd Street, water from the ponded area flows into the 122nd Street culvert and south to Indian Ridge Marsh South, an extended portion of the marsh that lies south of 122nd St (Refs. 50, pp. 15, 46, 48; 51, pp. 16, 44). Investigations or aerial photographs of Indian Ridge Marsh do not describe or show discernable flow through the wetland. The wetland appears to be a settling area (pond) that flows to a culvert under 122nd Street (Refs. 13, pp. 3-7; 49, pp. 7–8).

Historical Surface Water Migration In-Water Segment

Indian Ridge Marsh is a remnant of a once larger wetland complex that has been severely affected by the surrounding infilling and land-use activities (Ref. 49, p. iii). Steel mill slag and other wastes were used to fill in wetland areas (Ref. 49, p. 1). The extensive wetlands that comprised the Indian Ridge Marsh and the Calumet region of Chicago have been reduced to smaller pockets isolated from each other by industrial, commercial, and residential areas and by transportation routes. Hydrologic flow patterns have been altered by damming and reversing the flow of the Calumet River (Ref. 49, p. 1). Currently, Indian Ridge Marsh consists of several interconnected wetland pools connected to the Calumet River (Refs. 49, p. 2; 35, p. 16; 51, p. 44).

Topographic maps from 1973 and 1977 only show a small, ponded area on the north side of what was identified as 120th Street on historical topographic maps in Indian Ridge Marsh. Indian Ridge Marsh is shown mostly as a wetland with no ponded water (Ref. 34, pp. 12, 13). Topographic maps from 1929 to 1965 show no ponded water in this same area, only wetland (Ref. 34, pp. 14–17).

A 1999 hydrology study of Indian Ridge Marsh describes the marsh as several wetland pools connected to the Calumet River (Ref. 49, p. 2). East 122nd Street sits on a causeway that divides the marsh into north and south pools connected by a culvert at the west end of the causeway. One prominent topographic feature in the marsh is a main channel that runs along the western edge of the marsh adjacent to the railroad causeway. This channel averages roughly 50 feet wide and extends the length of the marsh between 116th Street and the Calumet River (Ref. 49, pp. 2, 5). The north pool has a deep spot at which the bottom elevation is 575 feet. The north pool has a narrow connection to the main channel that can become cluttered with debris when the water level drops below 582 feet (Ref. 49, p. 2).

The 1999 hydrology study describes flow through Indian Ridge Marsh as generally occurring from north to south. Water enters the wetland system at the north pool, with flow from both the east and the west. Smaller flows enter from the north. Three culverts are beneath the railroad tracks that carry runoff from a drainage area estimated to be approximately 13 acres on the Lake Calumet Cluster Site. Water from the North Pool flows through culverts under 122nd Street (Ref. 49, p. 8). The 1999 hydrology study describes drainage similar to general current drainage; however, subsequent modifications to drainage in the Indian Ridge Marsh may have occurred (Refs. 7, p. 7; 35, p. 7; 51, p. 4).

4.1.2.1 LIKELIHOOD OF RELEASE

4.1.2.1.1 OBSERVED RELEASE

Direct Observation

An observed release by direct observation is established when: (1) a material that contains one or more hazardous substances has been seen entering surface water through migration or is known to have entered surface water through direct deposition; (2) a source area has been flooded at a time that hazardous substances were present and one or more hazardous substances were in contact with the flood waters; or (3) when evidence supports the inference of a release of a material that contains one or more hazardous substances by the site to surface water—demonstrated adverse effects associated with that release may also be used to establish an observed release (Ref. 1, Section 4.1.2.1.1). As documented in **Section 2.2** and **Section 4.1.1.1** of this HRS documentation record, waste from the coke plant has been observed along the overland migration pathway in Source 2, and Source 1 has been in contact with a perennial tributary or waterway flowing from the center of the plant, but this has not been confirmed.

Chemical Analysis

An observed release by chemical analysis is established by showing that the hazardous substances in release samples are significantly greater in concentration than the background level and by documenting that at least part of the significant increase is the result of a release from the site under evaluation. The significant increase can be documented in one of two ways for HRS purposes: If the background sample concentration is not detected (or is less than the detection limit), an observed release is established when the sample measurement equals or exceeds the sample-specific background sample quantitation limits (SQLs). Alternatively, if the background sample concentration equals or exceeds the detection limit, an observed release is established when the sample measurement is three times or more above the background concentration and above the sample-specific SQL (Ref. 1, Table 2-3).

Observed releases of SVOCs are documented in the following sections by comparing the hazardous substances in similar background and contaminated sediment samples (see **Tables 8 and 10** in this section and **Section 4.1.2.1.1** of this HRS documentation record) and by attributing the significant increase to the site, at least in part. The samples documenting this release were collected by Illinois EPA during the 2018 Site Reassessment (Ref. 6) (see **Figure 2** of this HRS documentation record).

No removal actions have been conducted at the site to remove or contain contamination associated with Source 1 and Source 2 and the release to surface water (Ref. 65, pp. 1–3). EPA identified actions at the site as inactive (Ref. 65, p. 1). A 2022 site reconnaissance of the plant identified slag, coke, and/or coal throughout the ground surface of the plant. The black material was also on the eastern sides of the drainage ditch and the railroad tracks (Ref. 7, p. 7).

Illinois EPA 2018 Site Reassessment Sampling Event

During the 2018 Site Reassessment, Illinois EPA collected sediment samples from Indian Ridge Marsh and a background sediment sample (Ref. 6, pp. 19–20, 45) (see **Figure 2** of this HRS documentation record). All samples were collected in accordance with the Illinois EPA's sampling procedures guidance manual, the QAPP for CERCLA site investigations (2017), and the site assessment work plan for the Acme Steel Coke Plant using the same sampling procedures (Refs. 29; 31). Samples were analyzed through the CLP (Ref. 29, pp. 11, 13). The sediment samples were analyzed for TAL analysis plus mercury and cyanide, VOCs, SVOCs, pesticides, and PCBs (Ref. 29, pp. 12, 14). The data validation reports are provided in References 54 and 56. Figure 8 in Reference 6 shows the location of the sediment samples. Field logbook notes for the October 2018 Site Reassessment sampling event are provided in Reference 20. COC forms are in References 21 and 24.

Table 8 describes the background sediment sample, and **Table 9** summarizes the concentrations of hazardous substances detected in the background sediment sample. **Table 10** describes the release sediment samples, and **Table 11** summarizes the concentrations detected in the release sediment samples that meet the criteria for observed contamination. Locations of the samples are depicted on **Figure 2** of this HRS documentation record.

Background Sediment Sample

The location of background sediment sample X228 is shown in **Figure 2** of this HRS documentation record. The location is upstream, upgradient of the drainage from Sources 1 and 2 (Ref. 6, pp. 21, 45). Sediment sample X228 was collected from a low-lying area north of the Acme Steel Coke Plant's northern boundary within the overland drainage route flowing southward along the western edge of the wetland north of the plant property (Ref. 6, p. 21). The sample was collected in a wetland with classification code "PUBHx" (Refs. 35, p. 16; 61, pp. 69). The specifications for this classification code are presented below:

- **System Palustrine (P):** This includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity from ocean-derived salts is below 0.5 parts per trillion (ppt). It also includes wetlands lacking such vegetation but with the following four characteristics: (1) an area less than 8 hectares (ha) (20 acres); (2) a lack of active wave-formed or bedrock shoreline features; (3) a water depth in the deepest part of basin of less than 2.5 meters (8.2 feet) at low water; and (4) a salinity from ocean-derived salts of less than 0.5 ppt.
- **Class Unconsolidated Bottom (UB):** This includes all wetlands and deepwater habitats with at least 25 percent cover of particles smaller than stones (less than 6–7 centimeters) and a vegetative cover of less than 30 percent.
- **Water Regime Permanently Flooded (H):** In this circumstance, water covers the substrate throughout the year in all years.
- **Special Modifier Excavated (x):** This modifier is used to identify wetland basins or channels that were excavated by humans (Ref. 61, pp. 6-9) (see **Figure 6** of this HRS documentation record).

Logbook notes pertaining to the collection of sediment ample X228 are provided in Reference 20. The COC records are provided in References 21 and 24.

The background and contaminated samples were collected from similar sediment types: black/dark brown loam (Ref. 6, Table 6, pp. 63–64). The background and contaminated samples, as documented in **Tables 8** and **10** of this HRS documentation record, have similar physical characteristics, sample collection methods, timeframes, and depths.

TABLE 8: Sediment Background Sample Description

Sample	Type	Sample Description	Reference
X228	Sediment	Collected from 3 inches below ground surface with a stainless-steel trowel; material was black/dark brown loam with low percentage sand; roots were present in sampled material, but no slag or site impacts were noted. Phragmites/wetland species to east were noted in the immediate vicinity; a railroad ballast, trees and some slag were to the west of sampling location	6, Table 6, p. 64; 20 p. 3

TABLE 9: Sediment Background Concentrations

Sample	EPA Sample Number	Date	Hazardous Substance	Hazardous Substance Concentration (µg/kg)	CRQL (µg/kg)	References
X228	ESNP9	10/23/2018	Pyrene	74 J	220	19, p. 65; 20, p. 3; 21, p. 1; 25, p. 30
X228	ESNP9	10/23/2018	Benzo(a)anthracene	36 J	220	19, p. 65; 20, p. 3; 21, p. 1; 25, p. 30
X228	ESNP9	10/23/2018	Chrysene	59 J	220	19, p. 65; 20, p. 3; 21, p. 1; 25, p. 30
X228	ESNP9	10/23/2018	Benzo(b)fluoranthene	83 J	220	19, p. 65; 20, p. 3; 21, p. 1; 25, p. 30
X228	ESNP9	10/23/2018	Benzo(a)pyrene	56 J	220	19, p. 65; 20, p. 3; 21, p. 1; 25, p. 30
X228	ESNP9	10/23/2018	Benzo(g,h,i)perylene	220 U	220	19, p. 65; 20, p. 3; 21, p. 1; 25, p. 30
X228	ESNP9	10/23/2018	Indeno(1,2,3-cd) pyrene	41 J	220	19, p. 65; 20, p. 3; 21, p. 1; 25, p. 30
X228	ESNP9	10/23/2018	Fluoranthene	82 J	220	19, p. 64; 20, p. 3; 21, p. 1; 25, p. 30

Notes:
Adjustment factors only apply to biased "J" qualified data, not to other "J" qualified data such as results qualified "J" solely due to detection between the detection limit and quantitation limit (Ref. 54, p. 4; 55, p. 3).
µg/kg = micrograms per kilogram
CRQL = contract-required quantitation limit
J = result is an estimated quantity; the associated numerical value is the approximate concentration of the analyte in the sample (Ref. 54, p. 29).
U = compound was not detected above the reported sample quantitation limit (Ref. 54, p. 29).

TABLE 10: Contaminated Sediment Sample Descriptions

Sample	Type	Sample Description	Reference
X221	Sediment	Collected from a wetland in Indian Ridge Marsh approximately 1,400 feet south of the East 116th Street culvert draining the southwest corner of the coke plant, approximately 35 feet east of railroad tracks; contains soft black silt with gray hue resting atop a stiff layer assumed to be more clayey; no chemical odor noted; collected with stainless steel auger and trowel Water at the location is approximately 18–24 inches deep; sample collected 12–18 inches beneath the sediment surface	6, Table 6, p. 63; 20, p. 16
X222	Sediment	Collected from a wetland in Indian Ridge Marsh approximately 630 feet south of the culvert draining the southwest corner of the coke plant, approximately 40 feet east of railroad tracks; contains soft-to-medium black silt with a low percentage of sand resting atop a stiff layer assumed to be more clayey; no chemical odor noted; sampled with stainless steel auger and trowel Water at the location is approximately 18 inches deep; sample collected 6–12 inches beneath the sediment surface	6, Table 6, p. 63; 20, p. 1

TABLE 11: Concentrations of Hazardous Substances in Contaminated Sediment Samples Meeting Observed Release Criteria

Sample	EPA Sample Number	Date	Hazardous Substance	Hazardous Substance Concentration (µg/kg)	CRQL (µg/kg)	References
X221	ESNP2	10/22/2018	Fluoranthene	1,600	1300	19, p. 30; 20, p. 1; 21, p. 1; 25, p. 18
X221	ESNP2	10/22/2018	Pyrene	1,200	660	19, p. 31; 20, p. 1; 21, p. 1; 25, p. 18
X221	ESNP2	10/22/2018	Benzo(a)anthracene	740	660	19, p. 31; 20, p. 1; 21, p. 1; 25, p. 19
X221	ESNP2	10/22/2018	Chrysene	970	660	19, p. 31; 20, p. 1; 21, p. 1; 25, p. 19
X221	ESNP2	10/22/2018	Benzo(b)fluoranthene	1,300	660	19, p. 31; 20, p. 1; 21, p. 1; 25, p. 19
X221	ESNP2	10/22/2018	Benzo(a)pyrene	820	660	19, p. 31; 20, p. 1; 21, p. 1; 25, p. 19
X222	ESNP3	10/22/2018	Fluoranthene	970	860	19, p. 34; 21, p. 1; 25, p. 20
X222	ESNP3	10/22/2018	Pyrene	760	440	19, p. 35; 21, p. 1; 25, p. 20
X222	ESNP3	10/22/2018	Benzo(a)anthracene	490	440	19, p. 35; 21, p. 1; 25, p. 20
X222	ESNP3	10/22/2018	Chrysene	640	440	19, p. 35; 21, p. 1; 25, p. 20
X222	ESNP3	10/22/2018	Benzo(b)fluoranthene	900	440	19, p. 35; 21, p. 1; 25, p. 20
X222	ESNP3	10/22/2018	Benzo(a)pyrene	620	440	19, p. 35; 21, p. 1; 25, p. 20
X222	ESNP3	10/22/2018	Indeno(1,2,3-cd)pyrene	510	440	19, p. 35; 21, p. 1; 25, p. 20
X222	ESNP3	10/22/2018	Benzo(g,h,i)perylene	530	440	19, p. 35; 21, p. 1; 25, p. 20

Notes:
µg/kg = micrograms per kilogram
CRQL = contract-required quantitation limit; because the samples were analyzed through the CLP, the CRQLs presented above are equivalent to the CRQL as defined by the Hazard Ranking System (Ref. 1, Sections 1.1 and 2.3)

Attribution

The hazardous substances detected at observed release concentrations (i.e., concentrations significantly above background levels) in sediment samples collected from Indian Ridge Marsh immediately downstream of the Acme Steel Coke Plant and Sources 1 and 2 include: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene. These hazardous substances were also detected in both Source 1 and Source 2 samples (see **Section 2.2** of this HRS documentation record for Sources 1 and 2).

Source 1, the process waste pile, is conservatively delineated for purposes of this HRS documentation record as covering approximately 9.2 acres using the most recent sample locations; however, based on aerial photographs and on-site investigations, the extent of the process waste pile likely covers 50 or more acres (Refs. 6, pp. 9, 20, 25, 44, 364–366; 7, pp. 7, 32, 33, 34, 35, 40, 49; 9, pp. 33, 34, 46, 88–95; 13, pp. 8–17). The pile began accumulating waste in the early 1900s, and process waste, part of which was delineated as Source 1, still remains at the plant property (Refs. 6, pp. 25, 44; 7, pp. 7, 33–39; 13, pp. 8–17). Although drainage from Source 1 has been altered somewhat at certain points throughout its history, during the length of facility operation it largely has drained into Source 2, the drainage ditch, and then drainage from both Source 1 and Source 2 flowed into the culvert under East 116th Street and then into Indian Ridge Marsh (Refs. 6, pp. 20, 29–30 and Figure 2; 51, pp. 16, 24, 44) where the observed release samples were collected (see **Figures 2 and 6** of this HRS documentation record).

The Acme Steel Coke Plant operated for most of the 20th century, from about 1905 until operations ceased in 2001 (Refs. 6, pp. 7, 11; 8, pp. 3, 9; 10, p. 1; 11, p. 1; 17). Approximately four intact structures remain on the property (Refs. 6, p. 9; 7, pp. 33, 40), along with process waste materials spread across a large portion of the property and contaminated soil resulting from drainage from the process waste materials and facility operations (see **Section 2.2** of this HRS documentation record for Sources 1 and 2). At coke oven batteries, such as those that operated at the Acme Steel Coke Plant, coal is processed to produce coke (pure carbon), which is a component in the manufacture of iron and steel. Chemicals recovered from coke oven emissions are used as raw materials for plastics, solvents, dyes, drugs, waterproofing, paints, pipe coating, roads, roofing, insulation, and as pesticides and sealants (Ref. 38, p. 1).

Coal tar, coal tar pitch, volatiles, creosote, polycyclic aromatic hydrocarbons (PAHs), and metals are found in coke oven emissions. PAHs are SVOCs, and those that have been found in coke oven emissions include benzo(a)anthracene, benzo(a)pyrene, chrysene, and phenanthrene (Ref. 38, pp. 1-2). Benzo(b)fluoranthene can also be present in coal and coke oven emissions (Ref. 41, pp. 1, 3). Additionally, coal tar and coal tar pitch, such as that found in coke oven emissions, are known to contain indeno(1,2,3-cd)pyrene (Ref. 42, pp. 1, 15, 16, 26, 31, 33, 39). Coke-oven tar, which is released in ovens, is also known to contain fluoranthene (Ref. 58, p. 2; 60, p. 1).

Information from site visits and historical documentation indicate that it was common practice for slag, coal, and/or coke (i.e., coke plant process waste) to be stored directly on the ground throughout the plant property (Ref. 29, p. 6). In addition, during the time that the plant was owned and operated by Interlake, waste material was also placed on the property owned by Interlake west of the coke plant and west of Norfolk and Southern Railroad Tracks (Ref. 29, p. 6).

Samples from the process waste pile—which is primarily comprised of coal fines, cinders, and varying percentages of coal tar and other unidentified process wastes—have been found to contain benzo(a)anthracene and benzo(b)fluoranthene (Ref. 6, pp. 25, 26). Analysis of downgradient soil and sediment samples found elevated concentrations of many of the same contaminants, including benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene (Ref. 6, p. 26). As is discussed above, all these chemicals are known to be present in coke oven emissions.

Photos of the Acme Steel Coke Plant Site, taken on December 13, 2022, show black soil that appears to contain coal tar, coal fines, coal, coke, and slag. These materials are visible in the drainage feature of the retention pond that was formerly used to hold runoff for evaporation and in soil throughout the plant (Refs. 7, Appendix C, p. 41; 17). The photos show water in the drainage feature and, therefore, at least intermittently in contact with this material. Several mounds of this material are visible, with some mounds more than five feet high. The black solids range in size from sand sized particles to fist-sized lumps. In some areas, there is no vegetation or soil covering this black material (Ref. 7, Appendix C, pp. 19-45).

The EPA Toxics Release Inventory (TRI) is a resource for toxic chemical releases reported by industrial and federal facilities. The EPA TRI for the Acme plant from 1996 to 2001 identify releases of SVOCs, mercury, and cyanide to the environment (Ref. 47, pp. 1–17). Source 1 Waste Sample X331, collected during the 2018 Illinois EPA Site Reassessment from the western central portion of the site (near the beginning of the surface water drainage route to the south), contained high concentrations of SVOCs (Ref. 6, p. 23).

Other Possible Contributors

Indian Ridge Marsh is a disturbed marshland that is part of a series of open spaces in the Lake Calumet area, including Big Marsh, Heron Pond, and Dead Stick Pond. Historically, prior to development of the Calumet Area, these wetland areas were much more extensive and directly connected to Lake Calumet; however, during the initial development of the wetland areas in the late 19th century, large amounts of municipal/industrial waste fill raised the low-lying areas for development. Several studies have characterized the nature of the fill deposits in the Calumet Area and determined that it consists of slag containing metals from nearby steel mills, dredge spoils from the channelization of the Calumet River, demolition debris, and municipal and industrial wastes. As a result of the historical fill activities, hydrologic flow patterns in the Calumet Area were altered, and the previous extensive wetland areas were reduced to smaller pools, such as Indian Ridge Marsh, that are interspersed within the primarily industrial and commercial development in the area (Ref. 49, pp. 9, 10).

Indian Ridge Marsh and Source 2 receive surface water runoff from other sources of possible contamination in addition to the Acme facility, including the Lake Calumet Cluster Site (LCCS) (Ref. 51, pp. 20, 24, 44). Historically, culverts connected flow from the LCCS to the Indian Ridge Marsh; however, since 2006, the LCCS discharges directly to Lake Calumet (Ref. 51, p. 24). Although not located hydrologically upgradient of the Indian Ridge Marsh, the LCCS is adjacent to the west and consists of approximately 87 acres of historical disposal and waste facilities (Refs. 51, p. 44; 57, p. 2). The LCCS formerly operated as a landfill, hazardous waste incinerator, and location for unauthorized waste dumping; it was placed on the National Priorities List (NPL) in 2010 (Ref. 57, pp. 2, 3). The LCCS is a known source of PCBs, VOCs, SVOCs, and metals (Ref. 57, p. 3). Between 2015 and 2017, EPA collected soil and groundwater samples from the LCCS and adjacent Indian Ridge Marsh; however, sample results are unavailable at this time (Ref. 57, p. 3).

Additionally, Source 2 may receive surface water runoff from the Norfolk Southern Railroad, its associated railyard, a dense residential area, and industrial and commercial development in the area (Ref. 51, p. 44). The railyard and surrounding industrial area are adjacent to the north and northwest of the Acme facility. Common contaminants found in railyards include hydrocarbons, coolants, metals, solvents, and asbestos-containing materials. Based on proximity to Source 2 and hydrologic flow patterns, it is possible that contaminants potentially present at the railyard contribute to contamination at Source 2 and the Indian Ridge Marsh (Refs. 62, p. 5; 63, pp. 1, 2).

The southeast side of Chicago at the location of the site and surrounding area, including the background sample location, is a remnant of a once larger wetland complex affected by infilling and land-use activities (Refs. 13, pp. 3-17; 34, pp. 7-21; 49, p. iii) (**Figure 2** of this HRS documentation record). The extensive

wetlands that comprised the area have been reduced to smaller pockets from damming and reversing the flow of the Calumet River. Steel mill slag, dredged material from the Calumet River system, demolition debris, municipal wastes, industrial wastes, and other wastes were used to fill in wetland areas (Ref. 49, pp. 1, 58).

There was no drainage from the sources to the west in the northwest portion of the plant. Coal was stored in the northwest portion in "windrows" oriented east to west and surficial water would accumulate between the piles and would flow from one location to another based on the addition or removal of coal (Refs. 13, pp. 9-17; 32, p. 2).

Although the aforementioned facilities may have contributed, in part, to contaminant levels detected in Indian Ridge Marsh, the coke plant, including Sources 1 and 2, has been a primary, long-time contributor to the contamination due to the plant's history, its proximity and location hydrologically upgradient from the Indian Ridge Marsh, as well as the contaminants documented from sample results of the Acme facility and Indian Ridge Marsh as documented herein. The material characteristic of the plant can be traced from Sources 1 and 2 to the probable point of entry to Indian Ridge Marsh, across the plant property where coke process wastes can be observed in drainage areas from the plant to the marsh, and the material is known to contain the same hazardous substances detected in the release surface water samples as documented in **Sections 2.2 and 4.1.2.1.1** of this HRS documentation record. The plant consisted of approximately 104 acres (Ref. 6, p. 7). A large pile of coal was stored across the ground surface of the plant near Indian Ridge Marsh (Refs. 8, p. 9; 13, p. 17; 14, pp. 6–14; 15, pp. 6–10; 16, p. 9; 17, p. 1). On December 12, 2022, EPA conducted a site reconnaissance of the plant and, as in the 2018 Illinois EPA Site Reassessment field investigation, observed black material consisting of slag, coal, and/or coke several feet deep that was present throughout the entire plant area (Ref. 7, pp. 7, 8, 32–41). The black material was present on the ground and is seen in multiple aerial photographs (Refs. 11, p. 8; 13, pp. 7–17). Some areas where slag, coal, and coke were stored now have overgrown vegetation (Ref. 13, pp. 3, 4, 6, 9); however, overland drainage from these areas still flows to the Indian Ridge Marsh as is documented in **Section 4.1.1.1** of this HRS documentation record.

Hazardous Substances in the Release:

Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Chrysene
Fluoranthene
Indeno(1,2,3-cd) pyrene
Pyrene

Surface Water Observed Release Factor: 550

4.1.4.2 ENVIRONMENTAL THREAT WASTE CHARACTERISTICS

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

Table 12 summarizes the ecosystem toxicity, persistence, and bioaccumulation factor values for the hazardous substances detected in Sources 1 and 2 with a containment factor value exceeding 0. The combined ecosystem toxicity, persistence, and bioaccumulation factor values are assigned in accordance with Reference 1, Section 4.1.4.2.1.

TABLE 12: Ecosystem Toxicity/Persistence/Bioaccumulation

Hazardous Substances	Source Number	Ecosystem Toxicity Factor Value[1]	Persistence Factor Value[2]	Ecosystem Bioaccumulation Value[3]	Ecosystem Toxicity/ Bioaccumulation Factor Value (Ref. 1, Table 4-21)	Reference
Acenaphthylene	1	0	0.4	500	0	2, p. 2
Anthracene	1	10,000	0.4	50,000	2E+8	2, pp. 14, 15
Benzo(a)anthracene	1, 2	10,000	1 (OR)	50,000	5E+8	2, p. 28
Benzo(a)pyrene	1, 2	10,000	1 (OR)	50,000	5E+8	2, p. 39
Benzo(b)fluoranthene	1, 2	NL	NL (OR)	NL	NL	–
Benzo(g,h,i)perylene	1, 2	0	1 (OR)	50,000	0	2, p. 50
Benzo(k)fluoranthene	1, 2	0	1	50,000	0	2, p. 72
Chrysene	1, 2	1,000	1 (OR)	5,000	5E+6	2, p. 94
Cyanide	1, 2	1,000	0.07	0.5	3.5	2, p. 105
Dibenzo(a,h)anthracene	2	0	1	50,000	0	2, p. 208
Dibenzofuran	1	1,000	0.4	500	2E+5	2, p. 116
Fluorene	1	1,000	0.4	5,000	2E+6	2, p. 197
Fluoranthene	1, 2	10,000	1 (OR)	5,000	5E+7	2, p. 61
Indeno(1,2,3-cd) pyrene	1, 2	0	1 (OR)	50,000	0	2, p. 127
Mercury	1, 2	10,000	1	50,000	5E+8	2, p. 138
Naphthalene	1	1,000	0.4	50,000	2E+7	2, p. 160
Phenanthrene	1, 2	10,000	0.4	50,000	2E+8	2, p. 171
Pyrene	1, 2	10,000	1 (OR)	50,000	5E+8	2, p. 182

Notes:
[1] Ecotoxicity for fresh water
[2] Persistence value for lakes
[3] Bioaccumulation factor value for fresh water; environmental threat
NL = not listed
OR = observed release

Regarding the environmental threat, benzo(a)anthracene, benzo(a)pyrene, mercury, and pyrene have the highest toxicity/persistence/ecosystem bioaccumulation factor value of 500,000,000.

Ecosystem Toxicity/Persistence/Bioaccumulation Factor: 5E+8
(Reference 1, Section 4.1.4.2.1.4)

4.1.4.2.2 HAZARDOUS WASTE QUANTITY

Table 13 summarizes the hazardous waste quantity for the sources on the site:

TABLE 13: Hazardous Waste Quantity

Source Number	Source Type	Source Hazardous Waste Quantity
1	Pile	30,790.04
2	Contaminated Soil	greater than 0

See **Section 2.4.2.1.5** of this HRS documentation record for more information.

The sum of the source hazardous waste quantity values, rounded to the nearest integer, is used to assign the hazardous waste quantity factor value (Ref. 1, Section 2.4.2.2 and Table 2-6).

Total Source Hazardous Waste Quantity: 30,790
Hazardous Waste Quantity Factor: 10,000 (Ref. 1, Table 2-6)

4.1.4.2.3 CALCULATION OF ENVIRONMENTAL CHAIN THREAT - WASTE CHARACTERISTICS FACTOR CATEGORY VALUE

For the environmental threat, benzo(a)anthracene, benzo(a)pyrene, mercury, and pyrene yield the highest values for waste characteristics. The waste characteristics factor category is obtained by multiplying the ecosystem toxicity, persistence, and hazardous waste quantity (HWQ) factor values, subject to a maximum product of 1×10^8. This product was then multiplied by the ecosystem bioaccumulation potential factor value, subject to a maximum product of 1×10^{12}. Based on this product, a value was assigned in accordance with Reference 1, Table 2-7.

Ecosystem Toxicity/Persistence Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 10,000

Ecosystem Toxicity/Persistence Factor Value × Hazardous Waste Quantity Factor Value: 1×10^8

Ecosystem Toxicity/Persistence Factor Value ×
Hazardous Waste Quantity Factor Value × Bioaccumulation Factor Value (50,000): 5×10^{12} (subject to a maximum of 1×10^{12})

Waste Characteristics Factor Category Value: 1,000
(Ref. 1, Table 2-7)

4.1.4.3 Environmental Threat Targets

Level I Concentrations

No Level I concentrations have been documented.

Level II Concentrations

Actual contamination by chemical analysis has been documented in **Section 4.1.2.1.1** of this HRS documentation record. The sampling locations are depicted in **Figure 2** of this HRS documentation record. An observed release of SVOCs into a 0.85-mile perimeter wetland is documented (Ref. 1, Table 4-24 and Section 4.1.4.3.1).

The zone of actual contamination begins in Indian Ridge Marsh at the PPE until it reaches wetland sediment sampling location X221 (see **Figure 6** of this HRS documentation record). Because surface water flows from the PPE into a wetland, the perimeter of the wetland is measured and includes the zone of actual contamination; it ends at wetland sediment sample location X221 (see **Table 11** and **Figure 6** of this HRS documentation record; Ref. 1, Section 4.1.4.3.1.1). The perimeter is estimated at 0.85 mile.

Most Distant Level II Sample

Sample ID:	X221 (approximately 993 feet south of the PPE) (see Figure 2 of this HRS documentation record)
Sample Medium:	Sediment
Hazardous Substance:	SVOCs
Location:	Indian Ridge Marsh
References:	7, p. 47; 35, p. 11 (see **Figure 2** and **Table 11** of this HRS documentation record)

4.1.4.3.1 Sensitive Environments

4.1.4.3.1.1 Level I Concentrations

Sensitive Environments

Level I sensitive environments were not scored in this HRS documentation record.

Wetlands

Level I wetlands were not scored in this HRS documentation record.

4.1.4.3.1.2 Level II Concentrations

Sensitive Environments

Level II sensitive environments were not scored in this HRS documentation record.

Wetlands

Contaminated wetland sediment sample X221 was collected from Indian Ridge Marsh, which includes a freshwater emergent wetland with classification code "PEM1F" (Ref. 61, p. 1) (see **Figures 2** and **6** and **Table 11** of this HRS documentation record). The specifications for classification code PEM1F are presented below:

- **System Palustrine (P):** This includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation but with all the following characteristics: (1) an area less than 8 ha (20 acres); (2) a lack of active wave-formed or bedrock shoreline features; (3) a water depth in the deepest part of basin less than 2.5 meters (8.2 feet) at low water; and (4) a salinity from ocean-derived salts less than 0.5 ppt.
- **Class Emergent (EM):** This is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.
- **Subclass Persistent (1):** This is dominated by species that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems.
- **Water Regime Semi-Permanently Flooded (F):** Here, surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface (Ref. 61, pp. 2–4).

The zone of actual contamination begins at the PPE and ends at the location of wetland sediment sample X221 (see **Table 11** and **Figure 6** of this HRS documentation record). Because surface water migrates from the PPE into a wetland with no discernable or channelized flow, the perimeter of the wetland is measured to obtain the wetland length. The perimeter is estimated at 0.85 mile. The zone of actual contamination ends at the location of wetland sediment sample X221 (see **Table 11** and **Figure 6** of this HRS documentation record; Ref. 1, Sections 4.1.4.3.1.1 and 4.1.4.3.1.2).

TABLE 14: Level II Wetland Frontage

Wetland	Water Body	Wetland Frontage	References
Palustrine emergent	Indian Ridge Marsh	0.85 mile	Refs. 7, p. 47; 35, p. 16; **Figure 6** of this document

Total Wetland Frontage: 0.85 mile

The wetland ratings value for 0.85 mile is obtained from Reference 1, Table 4-24 and is 25.

Wetland Value: 25 (Ref. 1, Table 4-24)

For wetlands subject to Level II concentrations, the wetland value (25) is assigned (Ref. 1, Section 4.1.4.3.1.2).

Wetland Value: 25
Level II Concentrations Factor Value: 25 (Ref. 1, Section 4.1.4.3.1.2)

4.1.4.3.1.3 Potential Contamination

Because targets subject to Level II concentrations achieve the maximum score for the environmental threat, potential contamination is not evaluated in this HRS documentation record.