HAZARD RANKING SYSTEM (HRS)
DOCUMENTATION RECORD - COVER SHEET

Name of Site:	Henryetta Iron and Metal	
SEMS ID No.:	OKN000607147	

Contact Persons

Site Investigation:	Brenda Nixon Cook, NPL Coordinator, EPA Reg.6 (Name)	(214) 665-7436 (Telephone)
Documentation Record:	Brenda Nixon Cook, NPL Coordinator, EPA Reg.6 (Name)	(214) 665-7436 (Telephone)

Pathways, Components, or Threats Not Scored

1) **Ground Water Pathway:** The ground water migration pathway has not been scored. Temporary monitoring wells located on Henryetta Iron and Metal (HIM) property have shown elevated levels of metals and polychlorinated biphenyls (PCBs) (Ref. 4, pp. 45-48). Based on information available at this time, further evaluation of the ground water migration pathway would not significantly affect the listing decision (Ref. 1, Sec. 2.2.3).

2) **Surface Water Pathway: Ground Water to Surface Water Migration Component:** The overland/flood migration component of the Surface Water Migration Pathway has been scored for the Human Food Chain Threat and Environmental Threat. The Ground Water to Surface Water Migration component has not been scored. Based on information available at this time, evaluation of this component would not significantly affect the listing decision (Ref. 1, Sec. 2.2.3).

3) **Soil Exposure and Subsurface Intrusion Pathway:** Based on information available at this time, further evaluation of the Soil Exposure and Subsurface Intrusion pathway would not significantly affect the listing decision (Ref. 1, Sec. 2.2.3; Ref. 1a, Sec. 2.2.3).

4) **Air Migration Pathway**: Based on information available at this time, evaluation of the air migration pathway would not significantly affect the listing decision (Ref. 1, Sec. 2.2.3).

These pathways and components are of concern to the U.S. Environmental Protection Agency (EPA) and may be considered during a future evaluation.

HRS DOCUMENTATION RECORD

Name of Site:	Henryetta Iron and Metal
Site Spill Identifier No.:	A6AA
EPA Site ID No.:	OKN000607147
EPA Region:	6
Date Prepared:	November 2019
Street Address of Site*:	1420 West Main Street
City, County, and State:	Henryetta, Okmulgee County, Oklahoma 74437*

General Location within the State:

Henryetta Iron and Metal is located in southern Okmulgee County, on the west side of Henryetta, Oklahoma (See HRS documentation record Figure 1).

Topographic Map(s): The following U.S. Geological Survey (USGS) 7.5-minute series topographic maps were used in locating the Site: Pharoah Quadrangle, Oklahoma (2018), and Henryetta Quadrangle, Oklahoma (2018) (Ref. 3, pp. 1, 2).

Latitude/Longitude*: 35.439996 N, -95.999803 W

Latitude and Longitude coordinates were measured from the office of the former facility (Ref. 3, pp. 1-2; Ref. 7, p. 1).

Scores

Air Pathway	Not Scored
Ground Water Pathway	Not Scored
Soil Exposure and Subsurface Intrusion Pathway	Not Scored
Surface Water Pathway	98.66

HRS SITE SCORE 49.33

*The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area where 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.

“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.

WORKSHEET FOR COMPUTING HRS SITE SCORE

		S	S^2
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)	98.66	9,733.7956
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)	NS	NS
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}) Enter the sum of lines 3a and 3b as the pathway score.	NS	NS
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	NS	NS
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_{sessi}^2 + S_a^2$	----	9,733.795
6.	HRS Site Score: Divide the value on line 5 by 4 and take the square root.		**49.33**

Notes:

S Score
S^2 Score squared
NS Not scored

TABLE 4-1. SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

DRINKING WATER THREAT – Not Scored (NS)

Factor Categories and Factors		Maximum Value	Value Assigned
	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[2b + 2c])	500	NS
3.	Potential to Release by Flood:		
	3a. Containment (Flood)	10	NS
	3b. Flood Frequency	50	NS
	3c. Potential to Release 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 (Toxicity/Persistence x Hazardous Waste Quantity, then assign a value from Table 2-7)	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

TABLE 4-1. SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET (CONTNUED)

HUMAN FOOD CHAIN THREAT

Factor Categories and Factors		Maximum Value	Value Assigned
	Likelihood of Release		
14.	Likelihood of Release (Same value of line 5)	550	550
	Waste Characteristics		
15.	Toxicity/Persistence/ Bioaccumulation	a	$5x10^8$
16.	Hazardous Waste Quantity	a	100
17.	Waste Characteristics (Toxicity/Persistence/Bioaccumulation x Hazardous Waste Quantity, then assign a value from Table 2-7)	1,000	320
	Targets		
18.	Food Chain Individual	50	20
19.	Population		
	19a. Level I Concentrations	b	0
	19b. Level II Concentrations	b	0
	19c. Potential Human Food Chain Contamination	b	0.0003
	19d. Population (lines 19a + 19b + 19c)	b	0.0003
20.	Targets (lines 18 + 19d)	b	20.0003
	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	42.66

TABLE 4-1. SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET (CONTNUED)

ENVIRONMENTAL THREAT

Factor Categories and Factors		Maximum Value	Value Assigned
	Likelihood of Release		
22.	Likelihood of Release (Same value of line 5)	550	550
	Waste Characteristics		
23.	Ecosystem Toxicity/Persistence Bioaccumulation	a	$5x10^8$
24.	Hazardous Waste Quantity	a	100
25.	Waste Characteristics (Ecosystem Tox./Persistence x Bioaccumulation x Hazardous Waste Quantity, then assign a value from Table 2-7)	1,000	320
	Targets		
26.	Sensitive Environments		
	26a. Level I Concentrations	b	0
	26b. Level II Concentrations	b	25
26c.	Potential Contamination		
	26c. Potential Contamination	b	1.25
26d.	Sensitive Environments (lines 26a + 26b + 26c)	b	26.25
27.	Targets (value from line 26d)	b	26.25
	Environmental Threat Score		
28.	Environmental Threat Score [(lines 22 x 25 x 27)/82,500 subject to a maximum of 60]	60	56

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED

29.	Watershed Score [(Lines 13 + 21+ 28), subject to a maximum of 100]	100	98.66

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE

30.	Component Score (Highest score from Line 29 for all watersheds evaluated, subject to a maximum of 100)	100	98.66

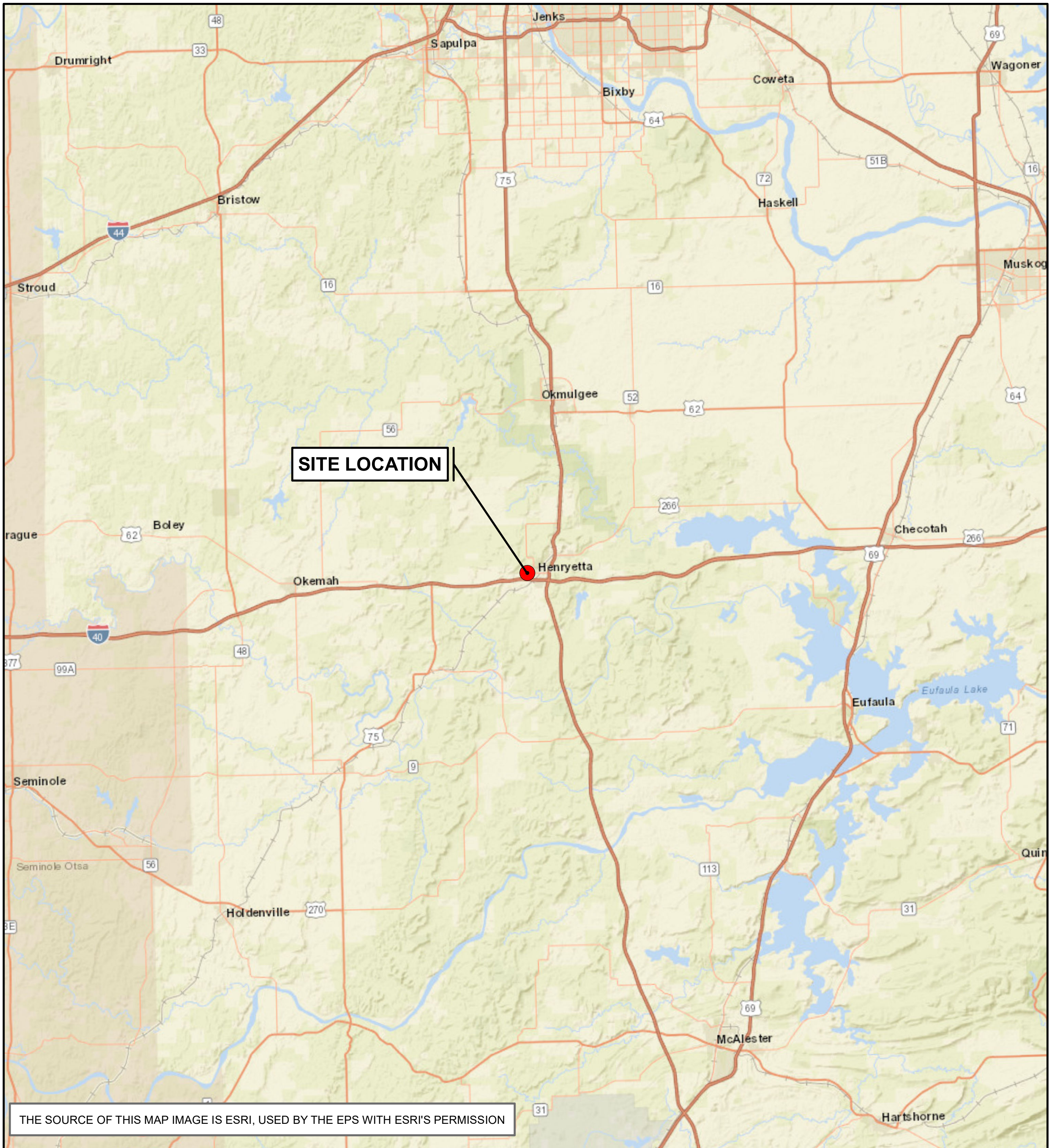
NOTES TO THE READER

1. The following rules were applied when citing references in this documentation record:

   Tracking numbers are assigned by the region to every page of every reference. The tracking number consists of the reference number followed by the page number within that reference (e.g., Reference 4, Page 1 is expressed as 4.001 in Reference 4).

2. Hazardous substances are often listed by the names used in the Superfund Chemical Data Matrix (SCDM) (Ref. 2).

FIGURES



LEGEND

- Site Location
  35.439996 N, -95.999803 W

N

0 10 20

SCALE IN MILES

SOURCE: WORLD STREET MAPS; ESRI
TDD: 0001/19-223
SEMS: OKN000607147
SSID: A6AA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

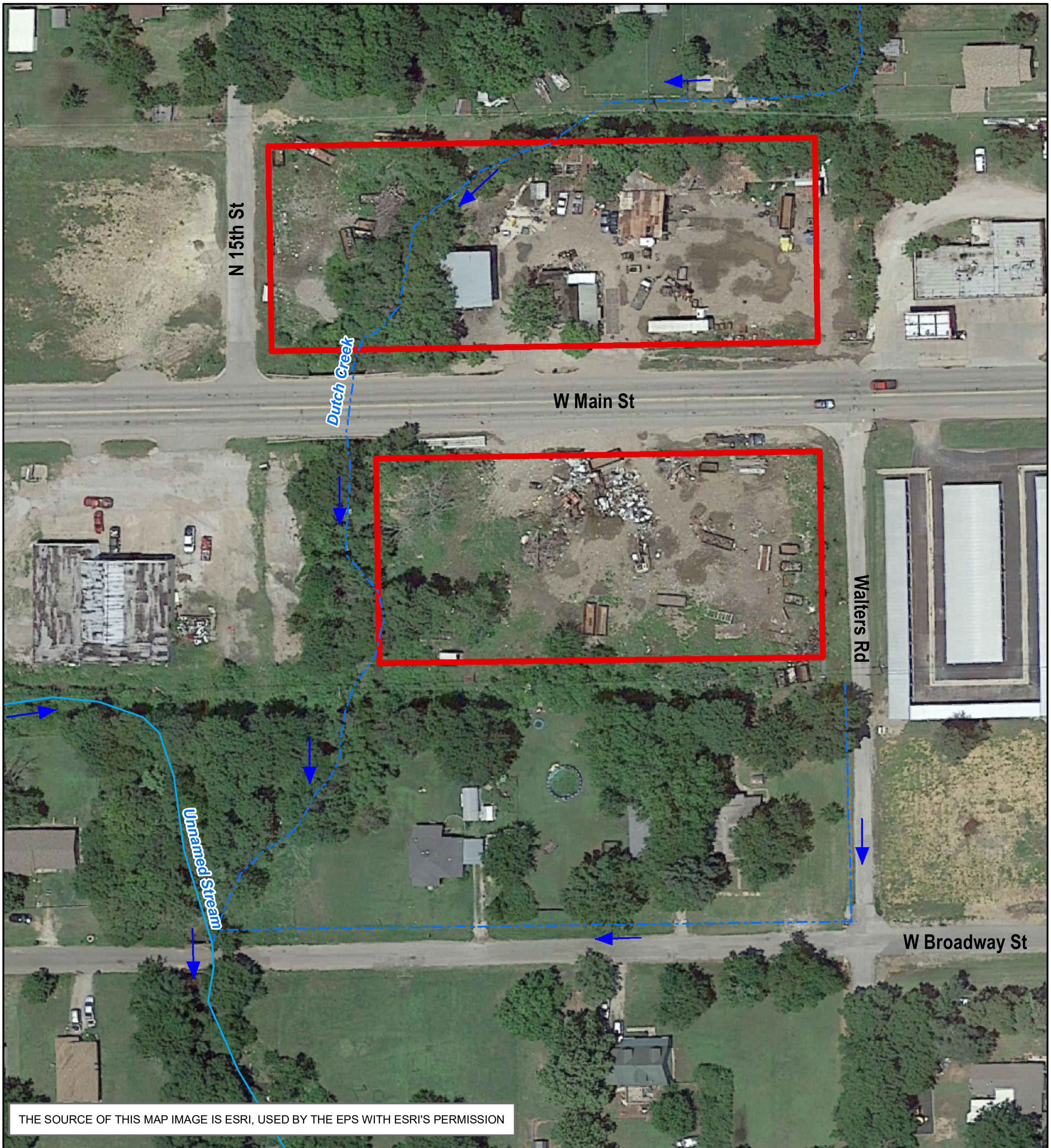
USEPA REGION 6

FIGURE 1

SITE LOCATION MAP
HENRYETTA IRON & METAL
1420 WEST MAIN STREET
HENRYETTA, OKMULGEE COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
AUGUST 2019	20600.012.001.1223	AS SHOWN

FILE: G:\EPA\Region 6 START IV\Superfund\Henryetta Iron and Metal\mxd\HRS\Figure 1 Site Location Map.mxd 9:51:22 AM 8/21/2019 brownm



LEGEND

- PROPERTY BOUNDARY
- INTERMITTENT SURFACE WATER DRAINAGE
- UNNAMED STREAM
- SURFACE WATER DRAINAGE FLOW

N

0 100 200

Feet

SOURCE:
ESRIi, BASEMAP-DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.
PROPERTY BOUNDARY - CORELOGIC PARCELPOINT TECHNOLOGY
TDD: 0001/19-223
SEMS: OKN000607147
SSID: A6AA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

USEPA REGION 6

FIGURE 2

AERIAL SITE SKETCH
HENRYETTA IRON & METAL
1420 WEST MAIN STREET
HENRYETTA, OKMULGEE COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
JULY 2019	20600.012.001.1223	AS SHOWN

FILE: G:\EPA\Region 6 START IV\Superfund\Henryetta Iron and Metal\mxd\HRS\Figure 2 Aerial Site Sketch.mxd 12:56:12 PM 7/5/2019 BROWNM

LEGEND

- SOURCE 1 AREA
- 2010 PHASE II SOIL SAMPLES
- 2016 SI SOIL SAMPLES
- 2017 ESI SOIL SAMPLES
- DUTCH CREEK
- INTERMITTENT SURFACE WATER DRAINAGE
- SURFACE WATER DRAINAGE FLOW DIRECTION

N

0 40 80 160

SCALE IN FEET

SOURCE: USDA-FSA AERIAL PHOTOGRAPHY FIELD OFFICE, NATIONAL AGRICULTURE IMAGERY PROGRAM(NAIP), OKLAHOMA, AUGUST 2010.
TDD: 0001/17-007
SEMS: OKN000607147
SSID: A6AA

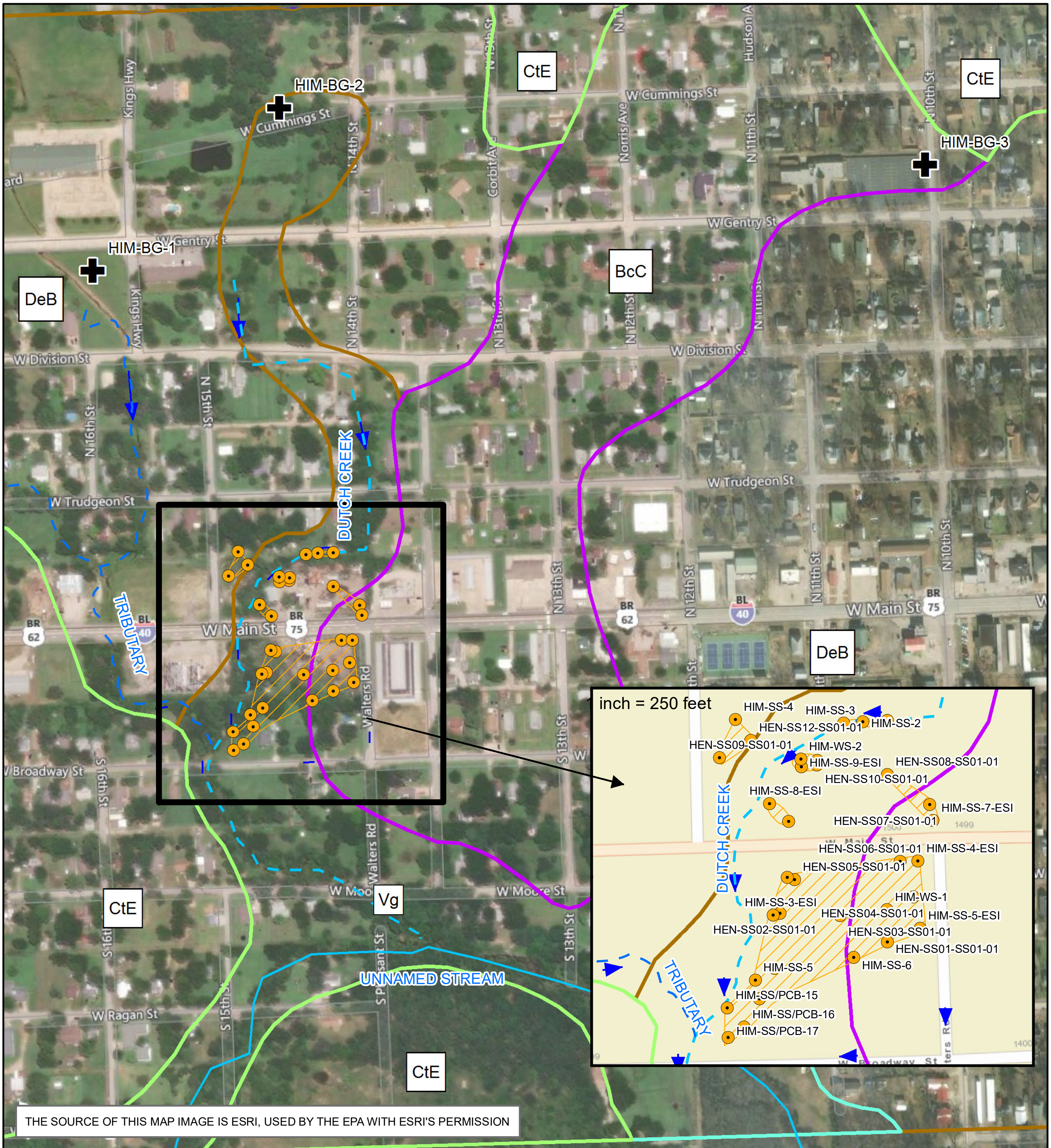
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

USEPA REGION 6

FIGURE 3
SOURCE 1 WITH SAMPLING LOCATIONS
HENRYETTA IRON & METAL
1420 WEST MAIN STREET
HENRYETTA, OKMULGEE COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
AUGUST 2019	20600.012.001.1223	AS SHOWN

FILE: G:\EPA\Region 6 START IV\Superfund\Henryetta Iron and Metal\mxd\HRS\Figure 3 Source 1 with Sampling Locations.mxd 9:48:18 AM 8/27/2019 brownm



BACKGROUND SOIL SAMPLE LOCATION

DUTCH CREEK

TRIBUTARY

UNNAMED STREAM

SURFACE WATER DRAINAGE FLOW DIRECTION

SOURCE 1 AREA

SOURCE 1 SAMPLE LOCATIONS

SOIL UNIT

BcC

CtE

DeB

Vg

N

0 200 400 800

SCALE IN FEET

SOURCE: SIO, U.S. Navy, NGA, GEBCO, Image Landsat/Copernicus Image IBCAO; USGS National Hydrography Dataset, USGS NRCS National Cooperative Soil Survey
TDD: 0001/17-007
SEMS: OKN000607147
SSID: A6AA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

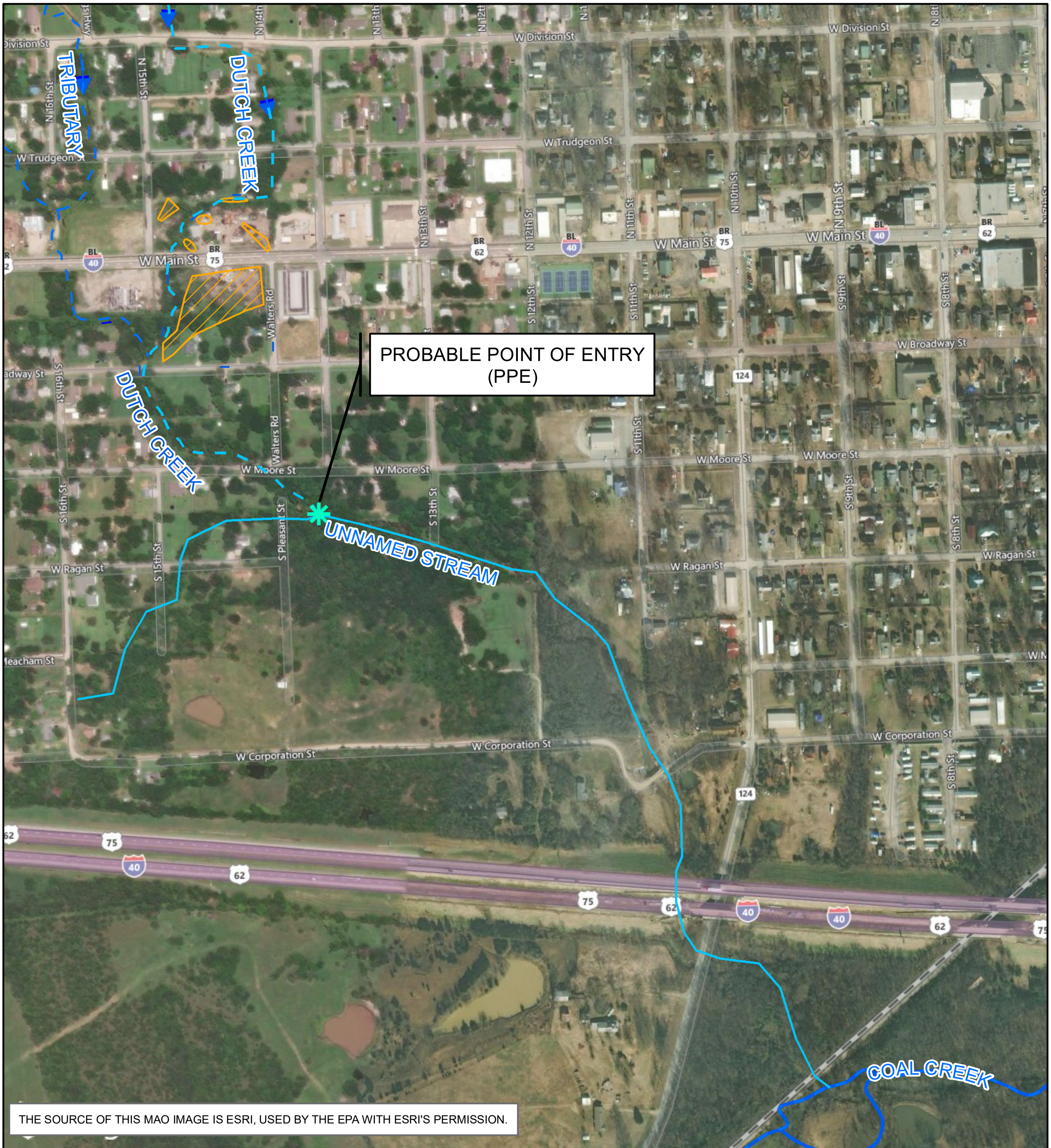
USEPA REGION 6

FIGURE 3A

SOURCE 1 SOIL TYPES AND BACKGROUND LOCATIONS
HENRYETTA IRON & METAL
1420 WEST MAIN STREET
HENRYETTA, OKMULGEE COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
JULY 2019	20600.012.001.1223	AS SHOWN

FILE: G:\EPA\Region 6 START IV\Superfund\Henryetta Iron and Metal\mxd\HRS\Figure 3A Source 1 Soil Types and Background Locations.mxd 2:55:04 PM 7/23/2019 BROWNM



SOURCE 1
SURFACE WATER DRAINAGE FLOW DIRECTION
TRIBUTARY
DUTCH CREEK
UNNAMED STREAM
COAL CREEK
PROBABLE POINT OF ENTRY (PPE)

SOURCE: WORLD STREET MAPS; ESRI
u.s. geological survey, national hydrography dataset, oklahoma, 2016
TDD: 0001/19-223
SEMS: OKN000607147
SSID: A6AA

0 250 500 1,000
SCALE IN FEET

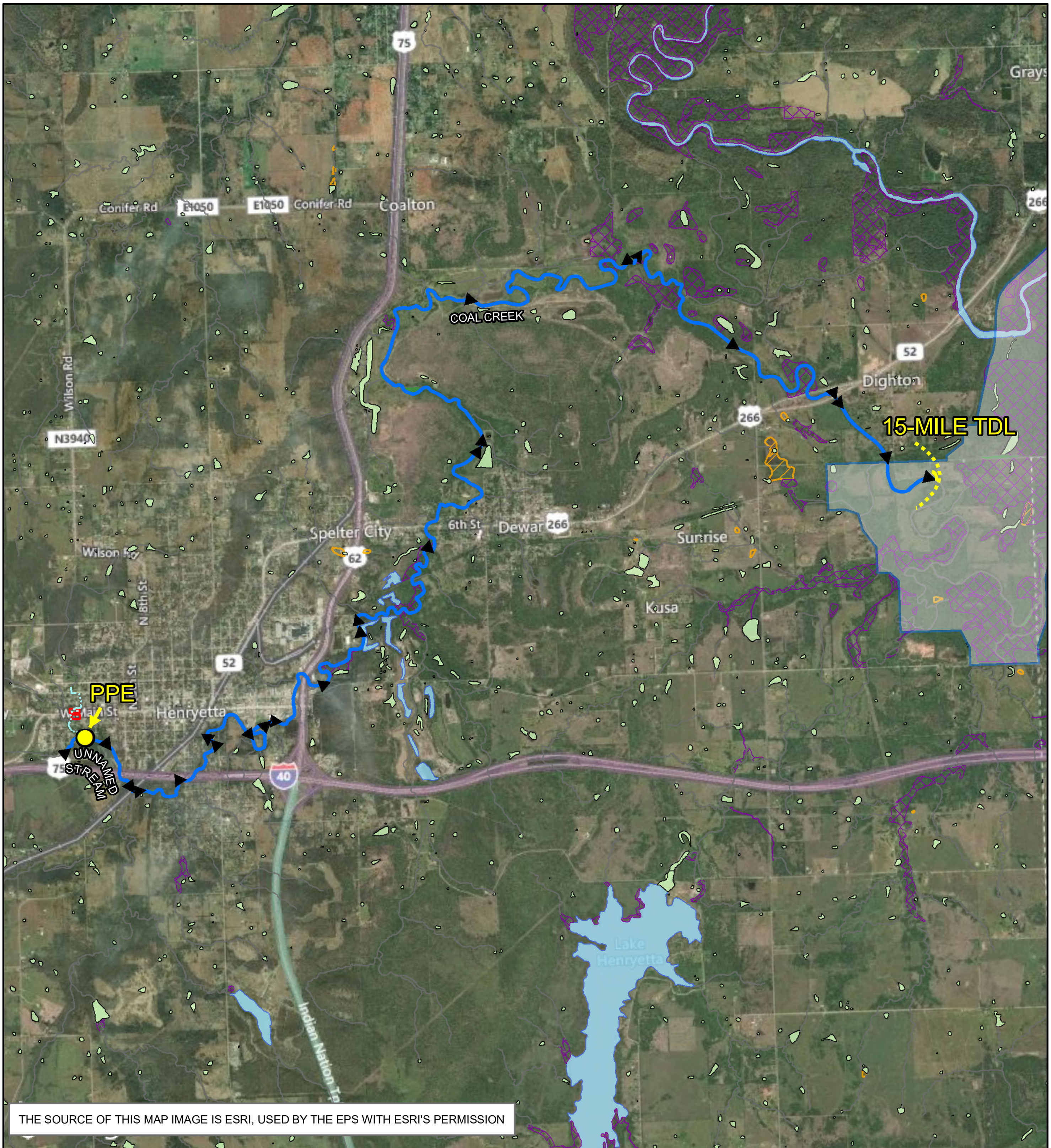
N

USEPA REGION 6

FIGURE 4
PPE LOCATION AND
OVERLAND FLOW PATHWAYS
HENRYETTA IRON & METAL
1420 WEST MAIN STREET
HENRYETTA, OKMULGEE COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
JULY 2019	20600.012.001.1223	AS SHOWN

FILE: G:\EPA\Region 6 START IV\Superfund\Henryetta Iron and Metal\mxd\HRS\Figure 4 PPE Location and Overland Flow Pathways.mxd 3:04:11 PM 7/23/2019 BROWNM



LEGEND

- PROBABLE POINT OF ENTRY (PPE)
- SURFACE WATER PATHWAY
- TARGET DISTANCE LIMIT (TDL)
- FRESHWATER EMERGENT WETLAND
- FRESHWATER FORESTED/SHRUB WETLAND
- FRESHWATER POND
- LAKE
- FACILITY BOUNDARY
- DUTCH CREEK

EUFALA WILDLIFE MANAGEMENT AREA - DEEP FORK

N

0 1 2

Miles

SOURCE: WORLD STREET MAPS; ESRI
U.S. FISH AND WILDLIFE, NATIONAL WETLANDS INVENTORY
TDD: 0001/19-223
SEMS: OKN000607147
SSID: A6AA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

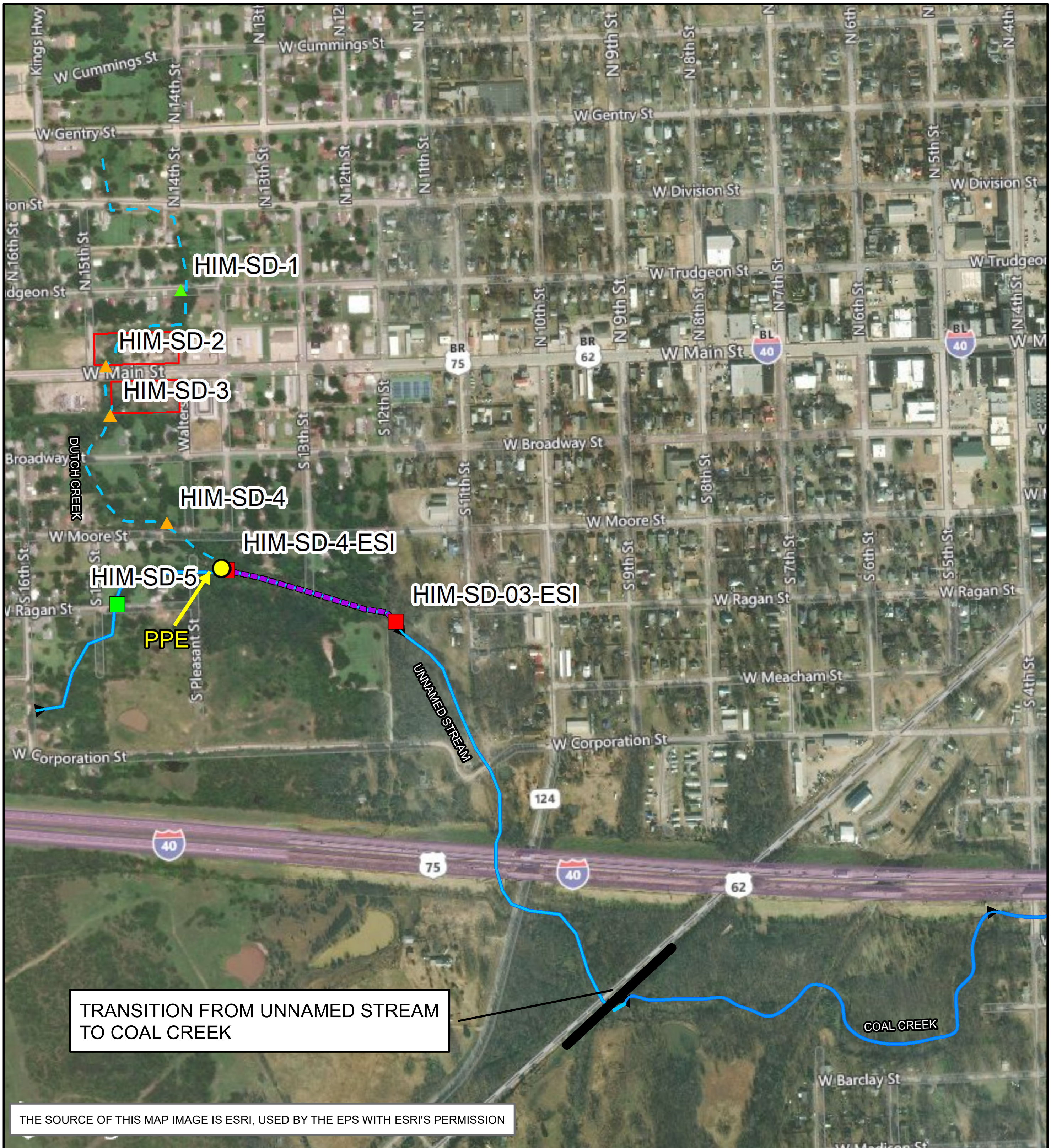
USEPA REGION 6

FIGURE 5

SURFACE WATER MIGRATION PATHWAY
HENRYETTA IRON & METAL
1420 WEST MAIN STREET
HENRYETTA, OKMULGEE COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
JULY 2019	20600.012.001.1223	AS SHOWN

FILE: G:\EPA\Region 6 START IV\Superfund\Henryetta Iron and Metal\mxd\HRS\Figure 5 Surface Water Migration Pathway.mxd 2:03:46 PM 7/18/2019 BROWNM



LEGEND

- FACILITY BOUNDARY
- PROBABLE POINT OF ENTRY (PPE)
- LEVEL II CONTAMINATION SEGMENT
- SURFACE WATER PATHWAY
- DUTCH CREEK
- UNNAMED STREAM
- COAL CREEK
- OBSERVED RELEASE BACKGROUND SAMPLE
- OBSERVED RELEASE SAMPLE
- OVERLAND FLOW BACKGROUND SAMPLE
- OVERLAND FLOW SAMPLE

SOURCE: WORLD STREET MAPS; ESRI
U.S. FISH AND WILDLIFE, NATIONAL WETLANDS INVENTORY
TDD: 0001/19-223
SEMS: OKN000607147
SSID: A6AA

0 325 650 1,300
Feet

N

USEPA REGION 6

FIGURE 6
LEVEL II CONTAMINATION SEGMENT
HENRYETTA IRON & METAL
1420 WEST MAIN STREET
HENRYETTA, OKMULGEE COUNTY, OKLAHOMA

DATE	PROJECT NO	SCALE
AUGUST 2019	20600.012.001.1223	AS SHOWN

FILE: G:\EPA\Region 6 START IV\Superfund\Henryetta Iron and Metal\mxd\HRS\Figure 6 Level II Contamination Segment.mxd 9:51:21 AM 8/27/2019 brownm

FIGURE REFERENCE SHEET

Figure 1: Facility Location Map

Base Map Source*, Esri**, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, OpenStreetMap contributors, and the GIS User Community

*Map annotated by EPA START on 23 July 2019 and 22 August 2019 to depict site location (Ref. 3, pp. 1-2; Ref. 12, p. 4; Ref. 7, p.1).

** Source map image is Esri, and is used by EPA with Esri's permission

Figure 2: Aerial Site Sketch

Base Map Source*, Esri**- DigitalGlobe, GeoEye, EarthStar Geographics, CNES/Airbus DS, USDA, USGS, AeroGrid, IGN, and GIS user community

Property Boundary Source – CoreLogic ParcelPoint Technology

*Map annotated by EPA START on 2 July 2019, to depict property boundary and surface water drainage flow (Ref. 10, pp. 11, 51; Ref. 11, pp. 9, 41; Ref. 12, pp. 4, 12).

** Source map image is Esri, and is used by EPA with Esri's permission

Figure 3: Source 1 [with Phase II ESA, Site Inspection, and Expanded Site Inspection] Sampling Locations Map

Base Map Source*, Esri**- USDA-FSA Aerial Photography Field Office, National Agriculture Imagery Program (*NAIP*), Oklahoma, August 2010; USGS National Hydrography Dataset

*Map annotated by EPA START on 23 July 2019, to depict source locations and sample locations, site drainage, and overland flow (Ref. 4, p. 72; Ref. 5, p. 16; Ref. 6, p. 15; Ref. 10, pp. 11, 51; Ref. 11, pp. 9, 41; Ref. 12, pp. 4, 12; Ref, 14, pp. 1-2; Ref. 16, pp. 1-2).

** Source map image is Esri, and is used by EPA with Esri's permission

Figure 3A: Source 1 Soil Types and Background Locations

Base Map Source*, Esri**- USDA-FSA Aerial Photography Field Office, National Agriculture Imagery Program (NAIP), Oklahoma, August 2010.with Google Earth Imagery Metadata from: SIO, U.S. Navy, NGA, GEBCO, Image Landsat/Copernicus Image IBCAO; USGS National Hydrography Dataset, USGS NRCS National Cooperative Soil Survey

*Map annotated by EPA START on 23 July 2019, to depict source locations and sample locations, site drainage, and overland flow (Ref. 4, p. 72; Ref. 5, p. 16; Ref. 6, p. 15; Ref. 10, pp. 11, 51; Ref. 11, pp. 9, 41; Ref. 12, pp. 4, 12; Ref, 14, pp. 1-2; Ref. 16, pp. 1-2).

** Source map image is Esri, and is used by EPA with Esri's permission

Figure 4: PPE Location and Overland Flow Pathways

Base Map Source* , Esri**- with World Imagery Metadata From: DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community; USGS National Hydrography Dataset

*Map annotated by EPA START on 23 July 2019, to depict the PPE, site drainage, overland flow, and sources (Ref. 3, pp. 1-2; Ref. 12, p. 14; Ref. 14, pp. 1-2; Ref. 16, pp. 1-2).

** Source map image is Esri, and is used by EPA with Esri's permission

Figure 5: Surface Water Migration Pathway

Base Map Source*, Esri**- with World Imagery Metadata From: DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community; USGS National Hydrography Dataset; Oklahoma WMA; and National Wetlands Inventory

*Map annotated by EPA START on 18 July 2019, for surface water flow, common drainage, facility boundary, wetland delineation maps, wildlife management areas, and national wetland inventory (Ref. 3, pp .1-2; Ref. 16, pp. 1-2; Ref. 25, pp. 6, 15).

** Source map image is Esri, and is used by EPA with Esri's permission

Figure 6: Level II Contamination Segment

Base Map Source*, Esri**- with World Imagery Metadata From: DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community; USGS National Hydrography Dataset

*Map annotated by EPA START on 7 August 2019, for surface water flow, common drainage, facility boundary, and sediment sample locations (Ref. 4, p. 72; Ref. 6, pp. 15, 19, 23, 25; Ref. 11, pp. 9, 41; Ref. 12, pp. 4, 14; Ref. 21, pp. 1-2).

** Source map image is Esri, and is used by EPA with Esri's permission

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1a. U.S. EPA. Addition of a Subsurface Intrusion Component to the Hazard Ranking System, 40 Code of Federal Regulations Part 300, 82 Federal Register 2760. January 9, 2017. Total Pages: 48. Available on-line at https://www.regulations.gov/document?D=EPA-HQ-SFUND-2010-1086-0104.

2. EPA. Superfund Chemical Data Matrix (SCDM) Query. Last Update: December 2018. SCDM Query by Substance and HRS Factor Values. Available from Uniform Resource Locator (URL): https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm Accessed 18 April 2019 and 27 August 2019. Total Pages: 235.

3. U.S. Geological Survey (USGS). 2018, Pharoah, Oklahoma; 2018, Henryetta, Oklahoma (7.5-minute topographic series maps). Total Pages: 2.

4. ALL Consulting. Phase II Environmental Site Assessment. Targeted Brownfields Assessment. Henryetta Iron and Metal, Henryetta, Oklahoma. June 2010. Total Pages: 124.

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7. Google Earth. Henryetta Iron and Metal Site Location. 35.439996 N, -95.999803 W. https://www.google.com/earth/. August 22, 2019. Total Pages: 1.

8. ODEQ. State Environmental Laboratory (SEL) Services Division. Report of Analysis. Project LE-001_0005-LPD-Henryetta Iron and Metal. December 16, 2016. Total Pages: 91.

9. ODEQ. SEL Services Division. Report of Analysis. Project LE-001_0010-LPD-Henryetta Iron and Metal. March 20, 2018. Total Pages: 65.

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13. Test America. Analytical Report. Job Number 280-1886-1. Henryetta Iron Works. April 29, 2010. Total Pages: 557.

14. WESTON. Project Note to File with Attachment. Subject: Henryetta Iron and Metal. Henryetta, Muskogee County, Oklahoma. Source 1 Overland Flow Distances. Attachment: Figure of Source 1 Overland Flow. July 17, 2019. Total Pages: 2.

15. Test America. Analytical Report. Job Number 280-1845-1. Henryetta Iron Works and Metal. April 20, 2010. Total Pages: 227.

16. WESTON. Project Note to File with Attachment. Subject: Henryetta Iron and Metal. Henryetta, Muskogee County, Oklahoma. Source 1 Area Measurements. Attachment: Figure of Source 1 Areas. July 15, 2019. Total Pages: 2.

17. EPA. Using Qualified Data to Document an Observed Release and Observed Contamination. EPA 540-F-94-028. November 1996. Pages 18.

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SITE SUMMARY

Henryetta Iron and Metal was a scrap-metal yard located west of downtown Henryetta. The physical address is 1420 West Main Street, Henryetta, Okmulgee County, Oklahoma. The property is approximately 2.5 acres in size and consists of two parcels of land bisected by West Main Street. The north and south parcels of land each encompass approximately 1.3 acres and 1.2 acres, respectively. Both parcels were part of the same operation, with the same property owner (Ref. 11, pp. 9, 11; Ref. 35, pp. 1, 2).

Henryetta Iron and Metal (HIM) operations consisted of acquiring various metal-containing objects from various sources for recycling (Ref. 12, p. 4). The HIM Site, for HRS purposes, includes several scrap metal and junk waste piles that have resulted in contaminated soil as a result of facility operations (Ref. 6, p. 14). The geographic coordinates of the Site are Latitude 35.439996° North and Longitude -95.999803° West, which pinpoints the location of the facility's main office (Ref. 3, pp. 1, 2; Ref. 10, p. 11; Ref. 7, p. 1; Figure 1).

The property had been used as a metal salvage yard since the 1930s. Other businesses that have occupied the property include a blacksmith, motor freight lines, a welding facility, and a pipe and supply company (Ref. 11. p. 23).

The site was discovered in August 2003 when a citizen complaint was filed on HIM. The complaint claimed that compressor oil, motor oil, and vehicular fluid saturated the site. Oklahoma Department of Environmental Quality (ODEQ) investigated the site and found contaminated soil, engine blocks, and piles of ash and wire (Ref. 12, pp. 5, 25). Sampling conducted found high concentrations of total petroleum hydrocarbons (TPH), and polychlorinated bi-phenyl (PCB) above EPA's action level. On 9 September 2003, a consent order was signed and a fine was issued to the facility owner (Ref. 5, pp. 5, 41-54).

In October 2008, a Phase I Environmental Site Assessment (ESA) was conducted for Mehlburger Brawley by Graham Engineering. P.C. to identify, to the extent feasible, recognized environmental conditions in connection with the HIM property (Ref. 11, p. 6). Based on this assessment a soil and groundwater sampling program was recommended to determine whether any environmental conditions associated with past usage of the property existed (Ref. 11, p. 31). Interviews conducted during a 2008 site assessment, indicated that for many years, the junkyard (HIM) received PCB-containing transformers from the Public Service Company of Oklahoma (PSO). Reportedly, PCB oil was dumped on the property and also buried in steel drums in the northern portion of the property (Ref. 11, p. 23).

In March 2010, U.S. Army Corps of Engineers (USACE), Tulsa District, contractors ALL Consulting (ALL) conducted a Phase II ESA based on the recommendations of the 2008 Phase I ESA. The purpose of the Phase II ESA was to sample potential sources of contamination identified in the Phase I ESA (Ref. 4, p. 10). The Phase II ESA found surface soil, sediment, groundwater, and subsurface soil samples exceeded regulatory limits (EPA and/or ODEQ) for semi-volatile organic compounds (SVOC), metals, and PCBs (Ref. 4, pp. 57-59).

In October 2016 and October 2017, ODEQ conducted Site Inspection (SI) and Expanded Site Inspection (ESI) sampling events. These sampling events found sediment contamination of metals, SVOCs and

PCBs within Dutch Creek and Coal Creek, as well as soil contamination of metals, SVOCs and PCBs at the facility and at residential properties to the south (Ref. 5, pp. 10, 13, 14-15; Ref. 6, pp. 12-14).

Due to the contamination found at the residential properties during the SI and ESI, a Removal Assessment was conducted by the EPA and EPA contractors in March 2018 (Ref. 10, p. 2). Soil sampling was conducted and results compared to EPA Removal Management Levels (RMLs). Contaminated soil containing metals, SVOCs, and PCBs were found exceeding RMLs and at concentrations that dictate the removal of the contamination to protect human health and the environment (Ref. 10, pp. 2-3).

In October through November 2018, EPA and EPA contractors conducted removal activities. The removal action included the excavation of contaminated soils from three residential properties located south of HIM, a City of Henryetta easement, and a drainage area west and southwest of the residential properties (Ref. 28, p. 2). A total of 1,294.75 tons of excavated soil and discarded material were transported and disposed of off-site (Ref. 28, p. 3).

The HIM property contains several scrap metal and junk waste piles that have resulted in contaminated soil. These waste piles and the contaminated soil are sources at this site. The contaminated soil scored source at the property contain hazardous substances that have released into the surface waters of an Unnamed Stream and Coal Creek via Dutch Creek through the surface water pathway (described below). These releases of hazardous substances have caused Level II contamination of wetlands, and fisheries identified within the Unnamed Stream and Coal Creek are subject to potential contamination (Ref. 6, pp. 12-14, 19).

The HIM facility is located within an area of residential and commercial development. The facility consists of an office, scales, several storage sheds, and the outdoor storage of scrap metal located on the north parcel, while the south parcel is used for additional outdoor storage of scrap metal (Ref. 4, p. 13).

The HIM facility is bordered by residential properties to the north and south and commercial properties to the east (storage units) and west (auto body shop). The facility is not fenced and accessible to the public. An intermittent creek, Dutch Creek, flows through the western portion of the facility. Dutch Creek is a tributary to an Unnamed Stream and Coal Creek, approximately 0.26 mile south of the facility (Ref. 3. pp. 1, 2; Figure 2). The HIM site, as scored, consists of 1 source and releases of hazardous substances to the Unnamed Stream and Coal Creek. The source is part of the same operation and part of one site. Dutch Creek flows through and adjacent to both properties, and under the main road, which separates the properties, further connecting the contaminated soil areas scored as a source at the Site.

2.2 SOURCE CHARACTERIZATION:

The source evaluated at the Henryetta Iron and Metal Site, for HRS scoring purposes, is:

- Source 1: Areas of Soil Contamination (Contaminated Soil).

SOURCE 1: SOURCE DESCRIPTION

2.2.1 SOURCE IDENTIFICATION

Source Description: Source 1 – Contaminated Soil

Source Type: Contaminated Soil

Description and Location of Source:

As a result of metal scrap piles being placed directly on the ground wherever a clear area was located, soil became contaminated (Ref. 4, pp. 13-14; Ref. 5, p. 5). Interviews conducted during a 2008 site assessment, indicated that for many years, the metal scrapyard (HIM) received PCB-containing transformers from the PSO. Reportedly PCB oil was dumped on the property, and also buried in steel drums in the northern portion of the property (Ref. 11, p. 23). ODEQ testing has indicated that PCBs, metals, and total petroleum hydrocarbons (TPH) exist in the soil at concentrations exceeding Federal and/or State guidelines (Ref. 11, p. 31). The location of this source is depicted on Figure 3.

Source Type

Soil samples have elevated concentrations of various metals and SVOC compounds as a result HIM activities, and as such, the source type for Source 1 is "Contaminated Soil" (Ref. 1, Table 2-5; Ref. 5, p. 13; Ref. 6, pp. 13-14; Ref. 11, p. 23).

Source Location

The contaminated soil is found throughout the facility and the source is delineated using surface soil samples collected during the 2010 Phase II ESA, the 2016 SI, and the 2017 ESI (Ref. 6, pp. 13-14). There are six areas identified as containing contaminated soil. Although these areas have structures, a road, or a creek which separate them, they have been aggregated into one source since they are all the same source type, and contain the same hazardous substances which migrate using the same overland path (Dutch Creek), to the same surface water pathway (Unnamed Stream and Coal Creek), as shown in this HRS documentation record. These six contaminated soil areas identified are located on:

- the north side of the northern property parcel (identified by samples HIM-SS-1, HIM-SS-2, and HIM-SS-3), Area 1;
- the northwest side of the northern property parcel (identified by HIM-SS-4, HEN-SS12-SS01-01, and HEN-SS09-SS01-01), Area 2;
- the center of the northern property parcel (identified by samples HIM-WS-2, HIM-SS-9-ESI, and HEN-SS10-SS01-01), Area 3;
- the southeast side of the northern parcel (identified by HEN-SS08-SS01-01, HEN-SS07-SS01-01, and HIM-SS-7-ESI), Area 4;
- the southwest side of the northern parcel (identified by HIM-SS-8-ESI and HEN-SS11-SS01-01), Area 5; and
- the southern parcel(identified by samples HIM-SS-1/2-ESI, HEN-SS05-SS01-01, HIM-SS-3-ESI, HEN-SS02-SS01-01, HEN-SS06-SS01-01, HIM-SS-4-ESI, HIM-SS-5, HIM-SS-6, HEN-

SS04-SS01-01, HIM-WS-1, HIM-SS-5-ESI, HEN-SS01-SS01-01, HIM-SS-13/PCB-13, HIM-SS-14/PCB-14, HIM-SS-15/PCB-15, HIM-SS-16/PCB-16, and HIM-SS-17/PCB-17), Area 6 (Ref. 4, pp. 18, 24; Ref. 6, pp. 21, 216; Ref. 16, p. 2; Figure 3 of this HRS documentation record).

Source Containment

Release To Surface Water

Contents of the contaminated soil are exposed to the elements and can release to the surface water through run off. An intermittent creek, Dutch Creek, runs through the facility and the source areas where it is exposed to Source 1, flows south, and to the east for approximately 0.26 miles until connecting to the Unnamed Stream, the first perennial water body (Ref. 3, p. 1-2; Ref. 12, pp. 8, 19; Figure 4 of this HRS documentation record). There is no maintained engineered cover, liner, or a run-on control system and runoff management system (Ref. 4, pp. 115-117; Ref. 12, p. 19).

A containment value of 10 was selected for Source 1 because there is no maintained engineered cover, liner, or a run-on control system and runoff management system (Ref. 1, Section 4.1.2.1.2.1.1).

Containment Value: 10

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

In August 2003, based on a citizen complaint filed with the ODEQ, the ODEQ collected source samples from a pile of ash and wire (which could have resulted from burning wire to remove the insulation), and from a pile of electronic components and open drums (Ref. 12, p. 28). PCBs were found above EPA's action level of 50 parts per million (Ref. 12, pp. 5, 28, 29, 30).

In March 2010, USACE, Tulsa District, contractors ALL Consulting (herein referred to as ALL) conducted a Phase II ESA based on the recommendations of the 2008 Phase I ESA. The purpose of the Phase II ESA was to sample potential sources of contamination identified in the Phase I ESA (Ref. 4, p. 10). ALL collected twelve soil source samples from the following locations:

- stained area in southeast portion of the Site (HEN-SS01);
- suspected former underground storage tank (UST) location (HEN-SS06);
- former metal piles on the southern portion of the Site (HEN-SS03, HEN-SS04);
- former metal pile in the northwest corner of the southern portion of the Site (HEN-SS05);
- oilfield pipe piled in the northern portion of the Site (HEN-SS07);
- former metal pile in the northeast portion of the northern portion of the Site (HEN-SS08);
- scrap heap and slag pile in the center of the northern portion of the Site (HEN-SS10);
- south end of the northern portion of the Site near the office (HEN-SS11-SS01-01);
- west side of the southern portion of the Site, adjacent to where former drums were located (HEN-SS02-SS02-01); and
- pile of oilfield equipment and metal storage in the northwest corner of the northern portion of the Site (HEN-SS09, HEN-SS12) (Ref. 4, pp. 10, 18-24).

In October 2016, ODEQ conducted a SI sampling event. As part of the SI sampling, four soil samples were collected north of the HIM property boundary (HIM-SS-1, HIM-SS-2, HIM-SS-3, and HIM-SS-4), two soil samples were collected to the south of the HIM property boundary (HIM-SS-5, and HIM-SS-6), and three background samples were taken upstream and away from the influence of the site (HIM-BG-1[BG-DeB], HIM-BG-2 [BG-Vg], and HIM-BG-3 [BG-BcC]) (Figure 3A; Ref. 5, pp. 11, 16, 20, 22). In addition, five soil samples were collected at a later date, 23 January 2017, from the residential property where HIM-SS-5 was taken (HIM-SS/PCB-13, HIM-SS/PCB-14, HIM-SS/PCB-15, HIM-SS/PCB-16, HIM-SS/PCB-17, and duplicate HIM-SS/PCB-18) (Ref. 5, pp. 11, 16, 20, 355-357). During the SI, no soil samples were collected from the HIM site property due to an EPA Removal investigation being conducted at the time (Ref. 5, p. 6).

In October 2017, ODEQ conducted an ESI based on findings of a SI, conducted in October 2016, which found residential soil and sediment samples contained metals, SVOC, and PCB contamination (Ref. 6, p. 12). During the ESI, ODEQ was able to collect samples on the property and collected two soil waste source samples (HIM-WS-1, HIM-WS-2). One soil sample was taken near what appeared to be an UST (HIM-WS-2), and one soil sample was where visible staining was present on the south property (HIM-WS-1) (Ref. 6, pp. 5, 15, 21, 29, 30; Ref. 16, p. 2). In addition, six soil samples were collected from the 2010 footprint of the former piles, which were no longer present in 2017, and three soil samples were collected between former pile footprints and Dutch Creek (Ref. 6, pp. 5, 21; Ref. 16, p. 2; Figure 3 of this HRS documentation record). These locations include the following:

- northwest corner of former southern pile (HIM-SS-1-ESI);
- northeast corner of former southern pile (HIM-SS-4-ESI);
- southeast side of former southern pile (HIM-SS-5-ESI);
- southeast corner of former northeastern pile (HIM-SS-7-ESI);
- southwest corner of former north central pile (HIM-SS-9-ESI);
- northeast corner of former north central pile (HIM-SS-10-ESI);
- northern portion of the property from a southeast area of contaminated soil (HIM-SS-8-ESI);
- southern portion of the property, just west of a scrap metal/junk pile (HIM-SS-1-ESI); and
- southern portion of the property further south of HIM-SS-3-ESI but also along the western edge of a scrap metal/junk pile (Ref. 6, pp. 9, 15, 21; Ref. 16, p. 2).

As mentioned above, during the October 2016 SI, to establish soil background concentrations, three soil background samples representing the different soil types found on the Site, were collected. The samples were collected upstream and away from the influence of former site operations (Figure 3A; Ref. 5, pp. 11, 22). HIM-BG-1 is the background for soil type Dennis silt loam (DeB) which encompasses the northwest side of the Site, HIM-BG-2 is the background for soil type Verdigris silt loam (Vg), which encompasses the central portion of the Site, and HIM-BG-3 is the background for soil type Bates-Collinsville complex (BcC) which encompasses the southeast side of the Site (Figure 3A; Ref. 5, pp. 11, 20, 22, 201-203). The soil types were determined by utilizing the United States Department of Agriculture (USGS), National Resources Conservation Service (NRCS) Soil Survey data (Ref. 29, pp. 1-3). As shown below, although the source samples were collected at different times (2010, 2016, and 2017), established sampling protocols and methodology was used for all soil sample collection.

For the 2010 sampling event, the soil samples were collected using stainless steel trowels and transferred to the appropriate number and type of sample container. The samples were packaged daily, and placed on ice in a sample cooler. A Chain of Custody was completed for each cooler, and shipped overnight via

Federal Express to the laboratory (Ref. 4, pp. 25, 63-70). The samples were submitted to Test America Laboratories of Denver, Colorado, and analyzed with the following EPA SW-846 Analytical Methods: RCRA list metals by method 6020/7471; VOCs by method 5035/8260; SVOCs by method 8270; PCBs by method 8082; NORM by method 9310; and GRO/DRO by method 8015B/C (Ref. 4, p. 18). Once final analytical results were received, the data underwent data validation and the analytical data produced from the collected samples were found to be useful for their intended purpose as stated by the data quality objectives (Ref. 4, pp. 33, 106).

For the 2016 and 2017 sampling events, the soil samples, including the background samples, were collected following ODEQ's SI and ESI Sampling and Analysis Plan (Ref. 5, pp. 4, 346-357; Ref. 6, p. 3; Ref. 6, pp. 423-426; Ref. 30; Ref. 31). The samples were all collected from the surface (0-6 inches deep). Sampling team members used disposable gloves to ensure no cross contamination occurred, with new gloves used for each sample. The surface material was cleared away using a dedicated stainless steel spoon or trowel in order to obtain a representative sample. The sample was mixed thoroughly with a dedicated stainless steel spoon and bowl to obtain a homogeneous sample before being placed in two 4-oz jars. The background samples were collected, outside the influence of the site. The samples were collected using the same sampling techniques as the other soil samples (Ref. 30, pp. 8, 9; Ref. 31, p. 8). The collected samples were analyzed for total metals, SVOCs, and PCBs using Oklahoma State Environmental Laboratory (SEL) methods and procedures (Ref. 5, p. 11; Ref. 6, p. 8).

Table 1

Source 1 – Soil Background Concentrations

Hazardous Substance	Station Location No.	Conc.	Units	RL[1]	Reference
Soil Type DeB					
Arsenic	HIM-BG-1	<10.0	mg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 76; Ref. 32, p. 5; Ref. 36, p. 11
Cadmium	HIM-BG-1	<2.0	mg/kg	2.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 76; Ref. 32, p. 5; Ref. 36, p. 11
Chromium	HIM-BG-1	19.7	mg/kg	5.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 76; Ref. 32, p. 5; Ref. 36, p. 11
Lead	HIM-BG-1	19.2	mg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 76; Ref. 32, p. 5; Ref. 36, p. 11
Zinc	HIM-BG-1	117	mg/kg	5.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 76; Ref. 32, p. 5; Ref. 36, p. 11
Mercury	HIM-BG-1	<0.25	mg/kg	0.25	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 76; Ref. 32, p. 5; Ref. 36, p. 16

Table 1
Source 1 – Soil Background Concentrations

Hazardous Substance	Station Location No.	Conc.	Units	RL[1]	Reference
Aroclor-1254	HIM-BG-1	<12.3	µg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 73; Ref. 32, p. 5; Ref. 36, p. 22
Aroclor-1260	HIM-BG-1	<12.3	µg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 73; Ref. 32, p. 5; Ref. 36, p. 22
Benz(a)anthracene	HIM-BG-1	<810	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 74; Ref. 32, p. 5; Ref. 36, p. 29
Benzo(a)pyrene	HIM-BG-1	<810	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 74; Ref. 32, p. 5 Ref. 36, p. 29
Benzo(g,h,i)perylene	HIM-BG-1	<810	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 74; Ref. 32, p. 5 Ref. 36, p. 29
Chrysene	HIM-BG-1	<810	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 74; Ref. 32, p. 5 Ref. 36, p. 29
Fluoranthene	HIM-BG-1	<810	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 74; Ref. 32, p. 5 Ref. 36, p. 29
Indeno(1,2,3-c,d)pyrene	HIM-BG-1	<810	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 74; Ref. 32, p. 5 Ref. 36, p. 29
Phenanthrene	HIM-BG-1	<810	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 75; Ref. 32, p. 5 Ref. 36, p. 29
Pyrene	HIM-BG-1	<810	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 75; Ref. 32, p. 5 Ref. 36, p. 29
Soil Type Vg					
Arsenic	HIM-BG-2	<10.0	mg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 80; Ref. 32, p. 5; Ref. 36, p. 11
Cadmium	HIM-BG-2	<2.0	mg/kg	2.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 80; Ref. 32, p. 5; Ref. 36, p. 11
Chromium	HIM-BG-2	24.3	mg/kg	5.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 80; Ref. 32, p. 5; Ref. 36, p. 11
Lead	HIM-BG-2	48.8	mg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 80; Ref. 32, p. 5; Ref. 36, p. 11
Selenium	HIM-BG-2	<10	mg/kg	10	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 80; Ref. 32, p. 5; Ref. 36, p. 11
Silver	HIM-BG-2	<10	mg/kg	10	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 80; Ref. 32, p. 5; Ref. 36, p. 11
Zinc	HIM-BG-2	217	mg/kg	5.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 80; Ref. 32, p. 5; Ref. 36, p. 11
Mercury	HIM-BG-2	<0.25	mg/kg	0.25	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 80; Ref. 32, p. 5; Ref. 36, p. 16
Aroclor-1248	HIM-BG-2	<11.7	µg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 77; Ref. 32, p. 5; Ref. 36, p. 22

Table 1

Source 1 – Soil Background Concentrations

Hazardous Substance	Station Location No.	Conc.	Units	RL[1]	Reference
Aroclor-1254	HIM-BG-2	<11.7	µg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 77; Ref. 32, p. 5; Ref. 36, p. 22
Aroclor-1260	HIM-BG-2	<11.7	µg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 77; Ref. 32, p. 5; Ref. 36, p. 22
Benz(a)anthracene	HIM-BG-2	<771	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 78; Ref. 32, p. 5; Ref. 36, p. 29
Benzo(a)pyrene	HIM-BG-2	<771	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 78; Ref. 32, p. 5; Ref. 36, p. 29
Benzo(g,h,i)perylene	HIM-BG-2	<771	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 78; Ref. 32, p. 5; Ref. 36, p. 29
Benzo(k)fluoranthene	HIM-BG-2	<771	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 78; Ref. 32, p. 5; Ref. 36, p. 29
Bis(2-ethylhexyl)phthalate	HIM-BG-2	<771	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 78; Ref. 32, p. 5; Ref. 36, p. 29
Chrysene	HIM-BG-2	<771	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 78; Ref. 32, p. 5; Ref. 36, p. 29
Dibenz(a,h)anthracene	HIM-BG-2	<771	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 78; Ref. 32, p. 5; Ref. 36, p. 29
Fluoranthene	HIM-BG-2	<771	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 78; Ref. 32, p. 5; Ref. 36, p. 29
Indeno(1,2,3-c,d)pyrene	HIM-BG-2	<771	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 78; Ref. 32, p. 5; Ref. 36, p. 29
Phenanthrene	HIM-BG-2	<771	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 79; Ref. 32, p. 5; Ref. 36, p. 29
Pyrene	HIM-BG-2	<771	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 79; Ref. 32, p. 5; Ref. 36, p. 29
Soil Type BcC					
Arsenic	HIM-BG-3	28.6	mg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 84; Ref. 32, p. 5; Ref. 36, p. 11
Cadmium	HIM-BG-3	<2.0	mg/kg	2.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 84; Ref. 32, p. 5; Ref. 36, p. 11
Chromium	HIM-BG-3	25.5	mg/kg	5.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 84; Ref. 32, p. 5; Ref. 36, p. 11
Lead	HIM-BG-3	138	mg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 84; Ref. 32, p. 5; Ref. 36, p. 11
Silver	HIM-BG-3	<10.0	mg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 84; Ref. 32, p. 5; Ref. 36, p. 11
Zinc	HIM-BG-3	482	mg/kg	5.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 84; Ref. 32, p. 5; Ref. 36, p. 11

Table 1

Source 1 – Soil Background Concentrations

Hazardous Substance	Station Location No.	Conc.	Units	RL[1]	Reference
Mercury	HIM-BG-3	2.32	mg/kg	0.25	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 84; Ref. 32, p. 5; Ref. 36, p. 16
Aroclor-1248	HIM-BG-3	<11.5	µg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 81; Ref. 32, p. 5; Ref. 36, p. 22
Aroclor-1254	HIM-BG-3	<11.5	µg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 81; Ref. 32, p. 5; Ref. 36, p. 22
Aroclor-1260	HIM-BG-3	<11.5	µg/kg	10.0	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 81; Ref. 32, p. 5; Ref. 36, p. 22
Benzo(a)pyrene	HIM-BG-3	1630	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 82; Ref. 32, p. 5;Ref. 36, p. 29
Benzo(g,h,i)perylene	HIM-BG-3	1010	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 82; Ref. 32, p. 5;Ref. 36, p. 29
Benzo(k)fluoranthene	HIM-BG-3	698 J[2]	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 1, 82; Ref. 32, p. 5;Ref. 36, p. 29
Bis(2-ethylhexyl)phthalate	HIM-BG-3	<758	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 1, 82; Ref. 32, p. 5; Ref. 36, p. 29
Chrysene	HIM-BG-3	1900	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 82; Ref. 32, p. 5;Ref. 36, p. 29
Dibenz(a,h)anthracene	HIM-BG-3	232 J[2]	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 82; Ref. 32, p. 5;Ref. 36, p. 29
Fluoranthene	HIM-BG-3	4320	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 82; Ref. 32, p. 5;Ref. 36, p. 29
Indeno(1,2,3-c,d)pyrene	HIM-BG-3	1180	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 82; Ref. 32, p. 5;Ref. 36, p. 29
Phenanthrene	HIM-BG-3	2430	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 83; Ref. 32, p. 5;Ref. 36, p. 29
Pyrene	HIM-BG-3	3410	µg/kg	667	Ref. 5, pp. 11, 22; Ref. 8, pp. 2, 83; Ref. 32, p. 5;Ref. 36, p. 29

Notes:
µg/kg –microgram per kilogram for SVOCs and PCBs
mg/kg – milligram per kilogram for metals
< - less than

1 Reporting Limit (RL) is the same as the HRS definition of Detection Limit (DL) and is the lowest level that can be distinguished from the random "noise" of an analytical instrument (Ref. 1, Sec. 1.1; Ref. 36, pp. 11, 16, 22, 28, 29).

2 "J" qualified results are due to detection between the reporting limit (RL) and the corrected Instrument Data Reduction (Ref. 36, p. 32). This flag is not associated with a quality control failure or a bias, therefore no adjustment was required (Ref. 17, pp. 1, 2).

All Source 1 soil samples are being compared to the background samples collected during the 2016 SI. The source samples are compared to the background samples collected within the same soil type (Figure 3A; Ref. 29, p.1). It was noted in the SI that the background sample for soil type BcC (HIM-BG-3) was potentially influenced by a nearby parking lot that was recently paved (Ref. 6, p. 11). Therefore, elevated

SVOC concentrations for samples taken from BcC soil types were included in Table 3 below although they were below biased background concentrations. The Source 1 samples are being compared to the following background samples:

Table 2
Source Samples and Comparative Soil Background Samples

Source Sample	Soil Type	Background Sample
HIM-SS-8-ESI	Vg	HIM-BG-2
HEN-SS11-SS01-01	Vg	HIM-BG-2
HIM-SS-1	Vg	HIM-BG-2
HIM-SS-2	Vg	HIM-BG-2
HIM-SS-3	Vg	HIM-BG-2
HIM-WS-2	Vg	HIM-BG-2
HIM-SS-9-ESI	Vg	HIM-BG-2
HIM-SS-10-ESI	Vg	HIM-BG-2
HEN-SS10-SS01-01	Vg	HIM-BG-2
HEN-SS08-SS01-01	Vg	HIM-BG-2
HIM-SS-4	DeB	HIM-BG-1
HEN-SS12-SS01-01	DeB	HIM-BG-1
HEN-SS09-SS01-01	DeB	HIM-BG-1
HIM-SS-5	Vg	HIM-BG-2
HIM-SS-6	Vg	HIM-BG-2
HEN-SS07-SS01-01	BcC	HIM-BG-3
HIM-SS-7-ESI	BcC	HIM-BG-3
HEN-SS06-SS01-01	BcC	HIM-BG-3
HIM-SS-4-ESI	BcC	HIM-BG-3
HIM-WS-1	BcC	HIM-BG-3
HEN-SS04-SS01-01	BcC	HIM-BG-3
HIM-SS-5-ESI	BcC	HIM-BG-3
HEN-SS01-SS01-01	BcC	HIM-BG-3
HIM-SS/PCB-13	Vg	HIM-BG-2
HIM-SS/PCB-14	Vg	HIM-BG-2
HIM-SS/PCB-15	Vg	HIM-BG-2
HIM-SS/PCB-16	Vg	HIM-BG-2
HIM-SS/PCB-17	Vg	HIM-BG-2
HIM-SS/PCB-18	Vg	HIM-BG-2
HIM-SS-1-ESI	Vg	HIM-BG-2
HIM-SS-2-ESI	Vg	HIM-BG-2
HIM-SS-3-ESI	Vg	HIM-BG-2
HEN-SS02-SS01-01	Vg	HIM-BG-2
HEN-SS03-SS01-01	Vg	HIM-BG-2
HEN-SS05-SS01-01	Vg	HIM-BG-2

Note – the Source 1 soil type is determined based on its location relative to the USDA NRCS Soil Survey Data (Figure 3; Ref. 29, pp. 1-3).

Analytical evidence of the contamination in the soil samples associated with Source 1 at the HIM Site are summarized as follows:

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
Soil Type Vg						
2010 PHASE II ESA						
Arsenic	HEN-SS02	62000	µg/kg	770	10000	Ref. 4, pp. 18, 74, 97, 106; Ref. 13, pp. 67, 308, 549; Ref. 36, p. 11
Cadmium	HEN-SS02	230000 Q	µg/kg	130	2000	Ref. 4, pp. 18, 74, 94, 97, 106; Ref. 13, pp. 67, 308, 549; Ref. 36, p. 11
Chromium	HEN-SS02	240000	µg/kg	770	24300	Ref. 4, pp. 18, 74, 97, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 308, 549
Lead	HEN-SS02	2700000	µg/kg	5100	48800	Ref. 4, pp. 18, 74, 97, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 308, 549
Mercury	HEN-SS02	2800	µg/kg	110	250	Ref. 4, pp. 18, 74, 97, 106; Ref. 13, pp. 67, 308, 549; Ref. 36, p. 16
Fluoranthene	HEN-SS02	1700	µg/kg	1700	667	Ref. 4, pp. 18, 74, 97, 106; Ref. 13, pp. 67, 147, 549; Ref. 36, p. 29
PCB-1260*	HEN-SS02	2800	µg/kg	880	10.0	Ref. 4, pp. 18, 74, 97, 106; Ref. 13, pp. 67, 268, 549; Ref. 36, p. 22
Arsenic	HEN-SS11	9400	µg/kg	690	10000	Ref. 4, pp. 18, 78, 97, 106; Ref. 13, pp. 67, 315, 550 Ref. 36, p. 11
Cadmium	HEN-SS11	4400 Q	µg/kg	110	2000	Ref. 4, pp. 18, 78, 94, 97, 106; Ref. 13, pp. 67, 315, 550 Ref. 36, p. 11
Chromium	HEN-SS11	28000	µg/kg	690	24300	Ref. 4, pp. 18, 78, 97, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 315, 550
Lead	HEN-SS11	160000	µg/kg	460	48800	Ref. 4, pp. 18, 78, 97, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 315, 550
Mercury	HEN-SS11	1600	µg/kg	98	250	Ref. 4, pp. 18, 78, 97, 106; Ref. 13, pp. 67, 315, 550 Ref. 36, p. 16
PCB-1254*	HEN-SS11	560	µg/kg	200	10.0	Ref. 4, pp. 18, 78 96, 106; Ref. 13, pp. 67, 273, 550; Ref. 36, p. 22
Arsenic	HEN-SS03	100000	µg/kg	690	10000	Ref. 4, pp. 75, 97, 106; Ref. 13, pp. 67, 304, 549; Ref. 36, p. 11
Cadmium	HEN-SS03	250000 Q	µg/kg	110	2000	Ref. 4, pp. 75, 94, 97, 106; Ref. 13, pp. 67, 304, 549; Ref. 36, p. 11
Chromium	HEN-SS03	87000	µg/kg	690	24300	Ref. 4, pp. 75, 97, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 304, 549
Lead	HEN-SS03	1700000	µg/kg	460	48800	Ref. 4, pp. 75, 97, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 304, 549

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
Mercury	HEN-SS03	2100	µg/kg	180	250	Ref. 4, pp. 75, 97, 106; Ref. 13, pp. 67, 304, 549; Ref. 36, p. 16
Selenium	HEN-SS03	710	µg/kg	570	10000	Ref. 4, pp. 75, 97, 106; Ref. 13, pp. 67, 304, 549; Ref. 36, p. 11
Silver	HEN-SS03	4600	µg/kg	110	5000	Ref. 4, pp. 75, 97, 106; Ref. 13, pp. 67, 304, 549; Ref. 36, p. 11
Fluoranthene	HEN-SS03	600	µg/kg	380	667	Ref. 4, pp. 75, 97, 106; Ref. 13, pp. 67, 139, 549; Ref. 36, p. 11
Phenanthrene	HEN-SS03	420	µg/kg	380	667	Ref. 4, pp. 75, 97, 106; Ref. 13, pp. 67, 140, 549; Ref. 36, p. 11
Pyrene	HEN-SS03	540	µg/kg	460	667	Ref. 4, pp. 75, 97, 106; Ref. 13, pp. 67, 140, 549; Ref. 36, p. 11
PCB-1260	HEN-SS03	180	µg/kg	39	10.0	Ref. 4, pp. 75, 97, 106; Ref. 13, pp. 37, 265, 549; Ref. 36, p. 11
Arsenic	HEN-SS05	22000	µg/kg	690	10000	Ref. 4, pp. 76, 96, 106; Ref. 13, pp. 67, 303, 549; Ref. 36, p. 11
Cadmium	HEN-SS05	7500 Q	µg/kg	120	2000	Ref. 4, pp. 76, 94, 96, 106; Ref. 13, pp. 67, 303, 549; Ref. 36, p. 11
Chromium	HEN-SS05	140000	µg/kg	690	24300	Ref. 4, pp. 76, 96, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 303, 549; Ref. 36, p. 11
Lead	HEN-SS05	840000	µg/kg	460	48800	Ref. 4, pp. 76, 96, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 303, 549
Mercury	HEN-SS05	21000	µg/kg	1000	250	Ref. 4, pp. 76, 96, 106; Ref. 13, pp. 67, 303, 549; Ref. 36, p. 16
Bis(2-ethylhexyl)phthalate	HEN-SS05	4800	µg/kg	3900	667	Ref. 4, pp. 76, 96, 106; Ref. 13, pp. 67, 138, 549; Ref. 36, p. 29
PCB-1254	HEN-SS05	3700	µg/kg	780	10.0	Ref. 4, pp. 76, 96, 106; Ref. 13, pp. 67, 264, 549; Ref. 36, p. 22
Arsenic	HEN-SS08	25000	µg/kg	640	10000	Ref. 4, pp. 77, 96, 106; Ref. 13, pp. 67, 319, 550; Ref. 36, p. 11
Cadmium	HEN-SS08	9300 Q	µg/kg	110	2000	Ref. 4, pp. 77, 94, 96, 106; Ref. 13, pp. 67, 319, 550; Ref. 36, p. 11
Chromium	HEN-SS08	78000	µg/kg	640	24300	Ref. 4, pp. 77, 96, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 319, 550
Lead	HEN-SS08	490000	µg/kg	430	10000	Ref. 4, pp. 77, 96, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 319, 550
Mercury	HEN-SS08	1400	µg/kg	180	250	Ref. 4, pp. 77, 96, 106; Ref. 13, pp. 67, 319, 550; Ref. 36, p. 11
PCB-1254	HEN-SS08	6600	µg/kg	1700	10.0	Ref. 4, pp. 78, 96, 106; Ref. 13, pp. 67, 277, 550; Ref. 36, p. 22

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
Arsenic	HEN-SS10	17000	µg/kg	790	10000	Ref. 4, pp. 18, 78, 96, 106; Ref. 13, pp. 67, 314, 550; Ref. 36, p. 11
Cadmium	HEN-SS10	77000 Q	µg/kg	130	2000	Ref. 4, pp. 18, 78, 94, 96, 106; Ref. 13, pp. 67, 314, 550; Ref. 36, p. 11
Chromium	HEN-SS10	170000	µg/kg	790	24300	Ref. 4, pp. 18, 78, 96, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 314, 550
Lead	HEN-SS10	14000000	µg/kg	13000	48800	Ref. 4, pp. 18, 78, 96, 106; Ref. 8, p. 80; Ref. 13, pp. 67, 314, 550
Mercury	HEN-SS10	2900	µg/kg	430	250	Ref. 4, pp. 18, 78, 96, 106; Ref. 13, pp. 67, 314, 550; Ref. 36, p. 16
Silver	HEN-SS10	35000	µg/kg	130	10000	Ref. 4, pp. 18, 78, 96, 106; Ref. 13, pp. 67, 314, 550; Ref. 36, p.11
PCB-1248	HEN-SS10	400000	µg/kg	85000	10.0	Ref. 4, pp. 18, 78, 96, 106; Ref. 13, pp. 67, 272, 550 Ref. 36, p. 22
OCTOBER 2016 SI						
Benz(a)anthracene	HIM-SS-1	901	µg/kg	667	667	Ref. 5, pp. 16, 20; Ref. 8, pp. 1, 8; Ref. 32, p. 1; Ref.36, p. 29
Chrysene	HIM-SS-1	983	µg/kg	667	667	Ref. 5, pp. 16, 20; Ref. 8, pp. 1, 8; Ref. 32, p. 1; Ref.36, p. 29
Fluoranthene	HIM-SS-1	1440	µg/kg	667	667	Ref. 5, pp. 16, 20; Ref. 8, pp. 1, 8; Ref. 32, p. 1; Ref.36, p. 29
Pyrene	HIM-SS-1	1340	µg/kg	667	667	Ref. 5, pp. 16, 20; Ref. 8, pp. 1, 9; Ref. 32, p. 1; Ref.36, p. 29
Arsenic	HIM-SS-2	14.7	mg/kg	10	10.0	Ref. 5, pp. 12, 16, 20; Ref. 8, pp. 1, 10; Ref. 32, p. 1; Ref. 36, p. 11
Arsenic	HIM-SS-3	11.2	mg/kg	10	10.0	Ref. 5, pp. 12, 16, 20; Ref. 8, pp. 1, 14; Ref. 32, p. 1; Ref. 36, p. 11
Aroclor-1254	HIM-SS-5	2070	µg/kg	10	10.0	Ref. 5, pp. 12, 16, 20; Ref. 8, pp. 1, 19; Ref. 32, p. 2 ; Ref. 36, p. 22
Aroclor-1260	HIM-SS-5	673	µg/kg	10	10.0	Ref. 5, pp. 12, 16, 20; Ref. 8, pp. 1, 19; Ref. 32, p. 2; Ref. 36, p. 22
Arsenic	HIM-SS-5	12.3	mg/kg	10	10.0	Ref. 5, pp. 12, 16, 20; Ref. 8, pp. 1, 22; Ref. 32, p. 2; Ref. 36, p. 11
Cadmium	HIM-SS-5	3.5	mg/kg	2	2.0	Ref. 5, pp. 12, 16, 20; Ref. 8, pp. 1, 22, 80; Ref. 32, p. 2; Ref. 36, p. 11
Lead	HIM-SS-5	110	mg/kg	10	48.8	Ref. 5, pp. 12, 16, 20; Ref. 8, pp. 1, 22, 80; Ref. 32, p. 2; Ref. 36, p. 11
Zinc	HIM-SS-5	556	mg/kg	5	217	Ref. 5, pp. 12, 16, 20; Ref. 8, pp. 1, 22, 80; Ref. 32, p. 2; Ref. 36, p. 11
Cadmium	HIM-SS-6	2.7	mg/kg	2	2.0	Ref. 5, pp. 16, 20; Ref. 8, pp. 1, 26; Ref. 32, p. 2; Ref. 36, p. 11

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
Zinc	HIM-SS-6	487	mg/kg	5	217	Ref. 5, pp. 16, 20; Ref. 8, pp. 1, 26, 80; Ref. 32, p. 2; Ref. 36, p. 11
Aroclor-1248	HIM-SS/ PCB-13	59.3	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1254	HIM-SS/ PCB-13	149	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1260	HIM-SS/ PCB-13	115	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1248	HIM-SS/ PCB-14	27.6	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1254	HIM-SS/ PCB-14	270	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1260	HIM-SS/ PCB-14	133	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1248	HIM-SS/ PCB-15	370	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1254	HIM-SS/ PCB-15	2060	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1260	HIM-SS/ PCB-15	892	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1248	HIM-SS/ PCB-16	20.0	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1254	HIM-SS/ PCB-16	149	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1260	HIM-SS/ PCB-16	97.5	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1248	HIM-SS/ PCB-17	29.5	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1254	HIM-SS/ PCB-17	188	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1260	HIM-SS/ PCB-17	122	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1248	HIM-SS/ PCB-18 (DUP of PCB-17)	31.2	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1254	HIM-SS/ PCB-18 (DUP of PCB-17)	291	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22
Aroclor-1260	HIM-SS/ PCB-18 (DUP of PCB-17)	137	µg/kg	10	10.0	Ref. 5, pp. 12-13, 16, 20; Ref. 32, p. 6; Ref. 36, p, 22

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
OCTOBER 2017 ESI						
Arsenic	HIM-WS-2	10.4	mg/kg	10	10.0	Ref. 6, p. 5; Ref. 9, pp. 1, 62; Ref. 32, p. 7; Ref. 36, p. 11; Ref. 43, pp. 2, 9
Cadmium	HIM-WS-2	31.1	mg/kg	2	2.0	Ref. 6, p. 5; Ref. 9, pp. 1, 62; Ref. 32, p. 7; Ref. 36, p. 11; Ref. 43, pp. 2, 9
Chromium	HIM-WS-2	70.5	mg/kg	5	24.3	Ref. 6, p. 5; Ref. 8, p. 80; Ref. 9, pp. 1, 62; Ref. 32, p. 7; Ref. 43, pp. 2, 9
Lead	HIM-WS-2	3780	mg/kg	10	48.8	Ref. 6, p. 5; Ref. 8, p. 80; Ref. 9, pp. 1, 62; Ref. 32, p. 7; Ref. 43, pp. 2, 9
Zinc	HIM-WS-2	3340	mg/kg	5	217	Ref. 6, p. 5; Ref. 8, p. 80; Ref. 9, pp. 1, 62; Ref. 32, p. 7; Ref. 43, pp. 2, 10
Mercury	HIM-WS-2	1.84	mg/kg	0.25	0.25	Ref. 6, p. 5; Ref. 9, pp. 1, 63; Ref. 32, p. 7; Ref. 36, p. 16; Ref. 43, pp. 2, 16
PCB-1248	HIM-WS-2	30000	µg/kg	10	10.0	Ref. 6, p. 6; Ref. 9, pp. 1, 63; Ref. 32, p. 7; Ref. 36, p. 22; Ref. 43, pp. 2, 22
PCB-1254	HIM-WS-2	11600	µg/kg	10	10.0	Ref. 6, p. 6; Ref. 9, pp. 1, 63; Ref. 32, p. 7; Ref. 36, p. 22; Ref. 43, pp. 2, 22
PCB-1260	HIM-WS-2	12500	µg/kg	10	10.0	Ref. 6, p. 6; Ref. 9, pp. 1, 63; Ref. 32, p. 7; Ref. 36, p. 22; Ref. 43, pp. 2, 22
Bis(2-ethylhexyl)phthalate	HIM-WS-2	2790	µg/kg	804	667	Ref. 9, pp. 1, 64; Ref. 32, p. 7; Ref. 36, p. 29; Ref. 43, pp. 2, 30
Arsenic	HIM-SS-1	22.8	mg/kg	10	10.0	Ref. 6, p. 9; Ref. 9, pp. 1, 2; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 1, 9
Cadmium	HIM-SS-1	22.2	mg/kg	2	2.0	Ref. 6, p. 9; Ref. 9, pp. 1, 2; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 1, 9
Chromium	HIM-SS-1	128	mg/kg	5	24.3	Ref. 6, p. 9; Ref. 8, p. 80; Ref. 9, pp. 1, 2; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Lead	HIM-SS-1	1190	mg/kg	10	48.8	Ref. 6, p. 9; Ref. 8, p. 80; Ref. 9, pp. 1, 2; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Zinc	HIM-SS-1	2890	mg/kg	5	217	Ref. 6, p. 9; Ref. 8, p. 80; Ref. 9, pp. 1, 2; Ref. 32, p.8; Ref. 43, pp. 1, 10
Mercury	HIM-SS-1	17.5	mg/kg	0.25	0.25	Ref. 6, p. 9; Ref. 9, pp. 1, 3; Ref. 32, p. 8; Ref. 36, p. 16; Ref. 43, pp. 2, 16
Aroclor-1248	HIM-SS-1	1520	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 3; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
Aroclor-1254	HIM-SS-1	548	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 3; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
Aroclor-1260	HIM-SS-1	683	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 3; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
Benz(a)anthracene	HIM-SS-1	837	µg/kg	750	667	Ref. 6, p. 10; Ref. 9, pp. 1, 4; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 29

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
Benzo(a)pyrene	HIM-SS-1	1120	µg/kg	750	667	Ref. 6, p. 10; Ref. 9, pp. 1, 4; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 29
Chrysene	HIM-SS-1	880	µg/kg	750	667	Ref. 6, p. 10; Ref. 9, pp. 1, 4; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 30
Fluoranthene	HIM-SS-1	1550	µg/kg	750	667	Ref. 6, p. 10; Ref. 9, pp. 1, 4; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 31
Indeno(1,2,3-c,d)pyrene	HIM-SS-1	1010	µg/kg	750	667	Ref. 6, p. 10; Ref. 9, pp. 1, 4; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 31
Pyrene	HIM-SS-1	1290	µg/kg	750	667	Ref. 6, p. 10; Ref. 9, pp. 1, 4; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 29
Arsenic	HIM-SS-2 (DUP of SS1)	22.7	mg/kg	10	10.0	Ref. 6, p. 9; Ref. 9, pp. 1, 6; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 1, 9
Cadmium	HIM-SS-2 (DUP of SS1)	19.8	mg/kg	2	2.0	Ref. 6, p. 9; Ref. 9, pp. 1, 6; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 1, 9
Chromium	HIM-SS-2 (DUP of SS1)	112	mg/kg	5	24.3	Ref. 6, p. 9; Ref. 8, p. 80; Ref. 9, pp. 1, 6; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Lead	HIM-SS-2 (DUP of SS1)	847	mg/kg	10	48.8	Ref. 6, p. 9; Ref. 8, p. 80; Ref. 9, pp. 1, 6; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Zinc	HIM-SS-2 (DUP of SS1)	3380	mg/kg	5	217	Ref. 6, p. 9; Ref. 8, p. 80; Ref. 9, pp. 1, 6; Ref. 32, p. 8; Ref. 43, pp. 1, 10
Mercury	HIM-SS-2 (DUP of SS1)	23.7	mg/kg	0.25	0.25	Ref. 6, p. 9; Ref. 9, pp. 1, 7; Ref. 32, p. 8; Ref. 36, p. 16; Ref. 43, pp. 2, 8
Aroclor-1248	HIM-SS-2 (DUP of SS1)	1220	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 7; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 2, 14
Aroclor-1254	HIM-SS-2 (DUP of SS1)	472	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 7; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 2, 14
Aroclor-1260	HIM-SS-2 (DUP of SS1)	660	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 8; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 2, 14
Benz(a)anthracene	HIM-SS-2 (DUP of SS1)	8870	µg/kg	778	667	Ref. 6, p. 10; Ref. 9, pp. 1, 8; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 29
Benzo(a)pyrene	HIM-SS-2 (DUP of SS1)	9370	µg/kg	778	667	Ref. 6, p. 10; Ref. 9, pp. 1, 8; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 29
Benzo(k)fluoranthene	HIM-SS-2 (DUP of SS1)	3930	µg/kg	778	667	Ref. 6, p. 10; Ref. 9, pp. 1, 8; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 30
Chrysene	HIM-SS-2 (DUP of SS1)	8820	µg/kg	778	667	Ref. 6, p. 10; Ref. 9, pp. 1, 8; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 30
Dibenz(a,h)anthracene	HIM-SS-2 (DUP of SS1)	1430	µg/kg	778	667	Ref. 6, p. 10; Ref. 9, pp. 1, 8; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 30
Fluoranthene	HIM-SS-2 (DUP of SS1)	20300	µg/kg	778	667	Ref. 6, p. 10; Ref. 9, pp. 1, 8; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 31

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
Indeno(1,2,3-c,d)pyrene	HIM-SS-2 (DUP of SS1)	7000	µg/kg	778	667	Ref. 6, p. 10; Ref. 9, pp. 1, 8; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 31
Phenanthrene	HIM-SS-2 (DUP of SS1)	10700	µg/kg	778	667	Ref. 6, p. 10; Ref. 9, pp. 1, 8; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 32
Pyrene	HIM-SS-2 (DUP of SS1)	17900	µg/kg	778	667	Ref. 6, p. 10; Ref. 9, pp. 1, 8; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 32
Arsenic	HIM-SS-3	46.7	mg/kg	10	10.0	Ref. 6, p. 9; Ref. 9, pp. 1, 10; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 1, 9
Cadmium	HIM-SS-3	134	mg/kg	2	2.0	Ref. 6, p. 9; Ref. 9, pp. 1, 10; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 1, 9
Chromium	HIM-SS-3	560	mg/kg	5	24.3	Ref. 6, p. 9; Ref. 8, p. 80; Ref. 9, pp. 1, 10; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Lead	HIM-SS-3	2110	mg/kg	10	48.8	Ref. 6, p. 9; Ref. 8, p. 80; Ref. 9, pp. 1, 10; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Zinc	HIM-SS-3	10100	mg/kg	5	217	Ref. 6, p. 9; Ref. 8, p. 80; Ref. 9, pp. 1, 10; Ref. 32, p. 8; Ref. 43, pp. 1, 10
Mercury	HIM-SS-3	12.3	mg/kg	0.25	0.25	Ref. 6, p. 9; Ref. 9, pp. 1, 11; Ref. 32, p. 8; Ref. 36, p. 16; Ref. 43, pp. 1, 16
Aroclor-1248	HIM-SS-3	3400	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 11; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
Aroclor-1254	HIM-SS-3	9560	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 11; Ref. 32, p. 8; Ref. 36, p. 22 Ref. 43, pp. 1, 22
Aroclor-1260	HIM-SS-3	1560	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 11; Ref. 32, p. 8; Ref. 36, p. 22 Ref. 43, pp. 1, 22
Benz(a)anthracene	HIM-SS-3	26100	µg/kg	1240	667	Ref. 6, p. 10; Ref. 9, pp. 1, 12; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 29
Benzo(a)pyrene	HIM-SS-3	14700	µg/kg	1240	667	Ref. 6, p. 10; Ref. 9, pp. 1, 12; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 29
Benzo(g,h,i)perylene	HIM-SS-3	7440	µg/kg	1240	667	Ref. 6, p. 10; Ref. 9, pp. 1, 12; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 29
Benzo(k)fluoranthene	HIM-SS-3	8250	µg/kg	1240	667	Ref. 6, p. 10; Ref. 9, pp. 1, 12; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 30
Chrysene	HIM-SS-3	22600	µg/kg	1240	667	Ref. 6, p. 10; Ref. 9, pp. 1, 12; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 30
Fluoranthene	HIM-SS-3	42200	µg/kg	1240	667	Ref. 6, p. 10; Ref. 9, pp. 1, 12; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 31
Indeno(1,2,3-c,d)pyrene	HIM-SS-3	9320	µg/kg	1240	667	Ref. 6, p. 10; Ref. 9, pp. 1, 12; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 31
Pyrene	HIM-SS-3	40600	µg/kg	1240	667	Ref. 6, p. 10; Ref. 9, pp. 1, 12; Ref. 32, p.8; Ref. 36, p. 29; Ref. 43, pp. 1, 32

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
Arsenic	HIM-SS-8	45.3	mg/kg	10	10.0	Ref. 6, p. 10; Ref. 9, pp. 1, 30; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 1, 9
Zinc	HIM-SS-8	975	mg/kg	5	217	Ref. 6, p. 10; Ref. 8, p. 80; Ref. 9, pp. 1, 30; Ref. 32, p. 8; Ref. 43, pp. 1, 10
Mercury	HIM-SS-8	1.25	mg/kg	0.25	0.25	Ref. 6, p. 10; Ref. 9, pp. 1, 31; Ref. 32, p. 8; Ref. 36, p. 16; Ref. 43, pp. 1, 16
Aroclor-1248	HIM-SS-8	21500	µg/kg	10	10.0	Ref. 6, p. 12; Ref. 9, pp. 1, 31; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
Aroclor-1254	HIM-SS-8	10200	µg/kg	10	10.0	Ref. 6, p. 12; Ref. 9, pp. 1, 31; Ref. 32, p.8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
Aroclor-1260	HIM-SS-8	5980	µg/kg	10	10.0	Ref. 6, p. 12; Ref. 9, pp. 1, 31; Ref. 32, p.8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
Cadmium	HIM-SS-9	12.9	mg/kg	2	2.0	Ref. 6, p. 10; Ref. 9, pp. 1, 34; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 1, 9
Chromium	HIM-SS-9	36.3	mg/kg	5	24.3	Ref. 6, p. 10; Ref. 8, p. 80; Ref. 9, pp. 1, 34; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Lead	HIM-SS-9	3350	mg/kg	10	48.8	Ref. 6, p. 10; Ref. 8, p. 80; Ref. 9, pp. 1, 34; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Zinc	HIM-SS-9	2930	mg/kg	5	217	Ref. 6, p. 10; Ref. 8, p. 80; Ref. 9, pp. 1, 34; Ref. 32, p. 8; Ref. 43, pp. 1, 10
Mercury	HIM-SS-9	1.27	mg/kg	0.25	0.25	Ref. 6, p. 10; Ref. 9, pp. 1, 35; Ref. 32, p. 8; Ref. 36, p. 16; Ref. 43, pp. 1, 16
PCB-1248	HIM-SS-9	4920	µg/kg	10	10.0	Ref. 6, p. 12; Ref. 9, pp. 1, 35; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
PCB-1254	HIM-SS-9	5370	µg/kg	10	10.0	Ref. 6, p. 12; Ref. 9, pp. 1, 35; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
PCB-1260	HIM-SS-9	7720	µg/kg	10	10.0	Ref. 6, p. 12; Ref. 9, pp. 1, 35; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
Arsenic	HIM-SS-10	14.6	mg/kg	10	10.0	Ref. 6, p. 10; Ref. 9, pp. 1, 38; Ref. 32, p. 7; Ref. 36, p. 11; ; Ref. 43, pp. 1, 9
Cadmium	HIM-SS-10	42.1	mg/kg	2	2.0	Ref. 6, p. 10; Ref. 9, pp. 1, 38; Ref. 32, p. 7; Ref. 36, p. 11; ; Ref. 43, pp. 1, 9
Chromium	HIM-SS-10	33.3	mg/kg	5	24.3	Ref. 6, p. 10; Ref. 8, p. 80; Ref. 9, pp. 1, 38; Ref. 32, p. 7; ; Ref. 43, pp. 1, 9
Lead	HIM-SS-10	2140	mg/kg	10	48.8	Ref. 6, p. 10; Ref. 8, p. 80; Ref. 9, pp. 1, 38; Ref. 32, p. 7; ; Ref. 43, pp. 1, 9
Zinc	HIM-SS-10	2340	mg/kg	5	217	Ref. 6, p. 10; Ref. 8, p. 80; Ref. 9, pp. 1, 38; Ref. 32, p. 7; ; Ref. 43, pp. 1, 10
Mercury	HIM-SS-10	4.89	mg/kg	0.25	0.25	Ref. 6, p. 10; Ref. 9, pp. 1, 39; Ref. 32, p. 7; Ref. 36, p. 16; Ref. 43, pp. 1, 16

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
PCB-1248	HIM-SS-10	147	µg/kg	10	10.0	Ref. 6, p. 12; Ref. 9, pp. 1, 39; Ref. 32, p. 7; Ref. 36, p. 22; Ref. 43, pp. 1, 22
PCB-1254	HIM-SS-10	1160	µg/kg	10	10.0	Ref. 6, p. 12; Ref. 9, pp. 1, 39; Ref. 32, p. 7; Ref. 36, p. 22; Ref. 43, pp. 1, 22
PCB-1260	HIM-SS-10	4490	µg/kg	10	10.0	Ref. 6, p. 12; Ref. 9, pp. 1, 39; Ref. 32, p. 7; Ref. 36, p. 22; Ref. 43, pp. 1, 22
Soil Type BcC						
2010 PHASE II ESA						
Arsenic	HEN-SS06	77000	µg/kg	720	28600	Ref. 4, pp. 76, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 302, 549
Cadmium	HEN-SS06	27000 Q	µg/kg	120	2000	Ref. 4, pp. 76, 94, 96, 106; Ref. 13, pp. 67, 302, 549; Ref. 36, p. 11
Chromium	HEN-SS06	110000	µg/kg	720	25500	Ref. 4, pp. 76, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 302, 549
Lead	HEN-SS06	2100000	µg/kg	480	138000	Ref. 4, pp. 76, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 302, 549
Mercury	HEN-SS06	270000	µg/kg	85	2320	Ref. 4, pp. 76, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 302, 549
PCB-1254	HEN-SS06	200	µg/kg	41	10	Ref. 4, pp. 76, 96, 106; Ref. 13, pp. 49, 263, 549; Ref. 36, p. 22
Benzo(a)pyrene	HEN-SS06	740	µg/kg	420	1630[5]	Ref. 4, pp. 76, 96, 106; Ref. 13, pp. 49, 135, 549; Ref. 36, p. 22
Benzo(g,h,i)perylene	HEN-SS06	710	µg/kg	420	1010[5]	Ref. 4, pp. 76, 96, 106; Ref. 13, pp. 49, 135, 549; Ref. 36, p. 22
Fluoranthene	HEN-SS06	1200	µg/kg	420	4320[5]	Ref. 4, pp. 76, 96, 106; Ref. 13, pp. 49, 135, 549; Ref. 36, p. 22
Pyrene	HEN-SS06	1000	µg/kg	15	3410[5]	Ref. 4, pp. 76, 96, 106; Ref. 13, pp. 49, 136, 550; Ref. 36, p. 29
Arsenic	HEN-SS07	19000	µg/kg	650	28600	Ref. 4, pp. 77, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 317, 550
Cadmium	HEN-SS07	8500 Q	µg/kg	110	2.0	Ref. 4, pp. 77, 94, 96, 106; Ref. 13, pp. 67, 317, 550; Ref. 36, p. 11
Chromium	HEN-SS07	270000	µg/kg	650	25500	Ref. 4, pp. 77, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 317, 550
Lead	HEN-SS07	590000	µg/kg	430	138000	Ref. 4, pp. 77, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 317, 550
Mercury	HEN-SS07	1300	µg/kg	85	2320	Ref. 4, pp. 77, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 317, 550
Bis(2-ethylhexyl)phthalate	HEN-SS07	3100	µg/kg	1400	667	Ref. 4, pp. 77, 96, 106; Ref. 13, pp. 67, 168, 550; Ref. 36, p. 29

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
PCB-1260	HEN-SS07	240	µg/kg	37	10.0	Ref. 4, pp. 77, 96, 106; Ref. 13, pp. 67, 275, 550; Ref. 36, p. 22
Arsenic	HEN-SS04	150000 J[3] (86206)	µg/kg	690	28600	Ref. 4, pp. 75, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 301, 549
Cadmium	HEN-SS04	21000 Q	µg/kg	110	2000	Ref. 4, pp. 75, 94, 96, 106; Ref. 13, pp. 67, 301, 549; Ref. 36, p. 11
Chromium	HEN-SS04	190000 J[3] (147286)	µg/kg	690	25500	Ref. 4, pp. 75, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 301, 549
Lead	HEN-SS04	16000000 QJ[3] (11111111)	µg/kg	9100	138000	Ref. 4, pp. 6, 42, 75, 94, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 301, 549; Ref, 17, pp. 8, 18
Mercury	HEN-SS04	12000 J[3] (6557)	µg/kg	940	2320	Ref. 4, pp. 75, 96, 106; Ref. 8, p. 84; Ref. 13, pp. 67, 301, 549
Benzo(a)pyrene	HEN-SS04	1700	µg/kg	1500	1630[5]	Ref. 4, pp. 75, 96, 106; Ref. 8, p. 82; Ref. 13, pp. 67, 133, 549
Benzo(g,h,i)perylene	HEN-SS04	1500	µg/kg	1500	1010[5]	Ref. 4, pp. 75, 96, 106; Ref. 8, p. 82; Ref. 13, pp. 67, 133, 549
Bis(2-ethylhexyl)phthalate	HEN-SS04	3200 J[4]	µg/kg	1500	667	Ref. 4, pp. 75, 96, 106; Ref. 13, pp. 67, 134, 549; Ref. 36, p. 29
PCB-1254	HEN-SS04	3100	µg/kg	380	10.0	Ref. 4, pp. 75, 96, 106; Ref. 13, pp. 67, 262, 549; Ref. 36, p. 22
Arsenic	HEN-SS01	67000	µg/kg	670	28600	Ref. 4, pp. 75, 97, 106; Ref. 8, p. 84; Ref. 15, pp. 20, 97, 225
Cadmium	HEN-SS01	31000 Q	µg/kg	110	2000	Ref. 4, pp. 75, 94, 97, 106; Ref. 15, pp. 6, 20, 97, 225; Ref. 36, p. 11
Chromium	HEN-SS01	58000	µg/kg	670	25500	Ref. 4, pp. 75, 97, 106; Ref. 8, p. 84; Ref. 15, pp. 20, 97, 225
Lead	HEN-SS01	1800000	µg/kg	450	138000	Ref. 4, pp. 75, 97, 106; Ref. 8, p. 84; Ref. 15, pp. 20, 97, 225
Mercury	HEN-SS01	2900	µg/kg	190	2320	Ref. 4, pp. 75, 97, 106; Ref. 8, p. 84; Ref. 15, pp. 20, 97, 225
PCB-1254	HEN-SS01	61000	µg/kg	9700	10.0	Ref. 4, pp. 75, 97, 106; Ref. 15, pp. 20, 90, 225; Ref. 36, p. 22
OCTOBER 2017 ESI						
Arsenic	HIM-WS-1	64.3	mg/kg	10	28.6	Ref. 6, p. 5; Ref. 8, p. 84; Ref. 9, pp. 1, 42; Ref. 32, p. 7; Ref. 43, pp. 1, 9
Cadmium	HIM-WS-1	41.0	mg/kg	2	2.0	Ref. 6, p. 5; Ref. 9, pp. 1, 42; Ref. 32, p. 7; Ref. 43, pp. 1, 9
Chromium	HIM-WS-1	187	mg/kg	5	25.5	Ref. 6, p. 5; Ref. 8, p. 84; Ref. 9, pp. 1, 42; Ref. 32, p. 7; Ref. 43, pp. 1, 9

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
Lead	HIM-WS-1	2810	mg/kg	10	138	Ref. 6, p. 5; Ref. 8, p. 84;Ref. 9, pp. 1, 42; Ref. 32, p. 7; Ref. 43, pp. 1, 9
Mercury	HIM-WS-1	7.54	mg/kg	0.25	2.32	Ref. 6, p. 5; Ref. 8, p. 84;Ref. 9, pp. 1, 43; Ref. 32, p. 7; Ref. 43, pp. 1, 16
Zinc	HIM-WS-1	5080	mg/kg	5	482	Ref. 6, p. 5; Ref. 8, p. 84; Ref. 9, pp. 1, 42; Ref. 32, p. 7; Ref. 43, pp. 1, 10
PCB-1248	HIM-WS-1	6850	µg/kg	10	10.0	Ref. 6, p. 6; Ref. 9, pp. 1, 43; Ref. 32, p. 7; Ref. 36, p. 22; Ref. 43, pp. 1, 22
PCB-1254	HIM-WS-1	18700	µg/kg	10	10.0	Ref. 6, p. 6; Ref. 9, pp. 1, 43; Ref. 32, p. 7; Ref. 36, p. 22; Ref. 43, pp. 1, 22
PCB-1260	HIM-WS-1	5100	µg/kg	10	10.0	Ref. 6, p. 6; Ref. 9, pp. 1, 43; Ref. 32, p. 7; Ref. 36, p. 22; Ref. 43, pp. 1, 22
Arsenic	HIM-SS-4	66.2	mg/kg	10	28.6	Ref. 6, p. 9; Ref. 8, p. 84; Ref. 9, pp. 1, 14; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Cadmium	HIM-SS-4	18.4	mg/kg	2	2.0	Ref. 6, p. 9; Ref. 9, pp. 1, 14; Ref. 32, p. 8;
Chromium	HIM-SS-4	177	mg/kg	5	25.5	Ref. 6, p. 9; Ref. 8, p. 84; Ref. 9, pp. 1, 14; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Lead	HIM-SS-4	2230	mg/kg	10	138	Ref. 6, p. 9; Ref. 8, p. 84; Ref. 9, pp. 1, 14; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Zinc	HIM-SS-4	3660	mg/kg	5	482	Ref. 6, p. 9; Ref. 8, p. 84; Ref. 9, pp. 1, 14; Ref. 32, p. 8; Ref. 43, pp. 1, 10
Mercury	HIM-SS-4	44.2	mg/kg	0.25	2.32	Ref. 6, p. 9; Ref. 8, p. 84; Ref. 9, pp. 1, 15; Ref. 32, p. 8; Ref. 43, pp. 1, 16
PCB-1248	HIM-SS-4	801	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 15; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
PCB-1254	HIM-SS-4	578	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 15; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 1, 22
PCB-1260	HIM-SS-4	957	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 15; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 2, 14
Arsenic	HIM-SS-5	60.3	mg/kg	10	28.6	Ref. 6, p. 9; Ref. 8, p. 84; Ref. 9, pp. 1, 18; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Cadmium	HIM-SS-5	125	mg/kg	2	2.0	Ref. 6, p. 9; Ref. 9, pp. 1, 18; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 1, 9
Chromium	HIM-SS-5	131	mg/kg	5	25.5	Ref. 6, p. 9; Ref. 8, p. 84; Ref. 9, pp. 1, 18; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Lead	HIM-SS-5	2660	mg/kg	10	138	Ref. 6, p. 9; Ref. 8, p. 84; Ref. 9, pp. 1, 18; Ref. 32, p. 8; Ref. 43, pp. 1, 9
Silver	HIM-SS-5	10.9	mg/kg	10	10	Ref. 6, p. 9; Ref. 9, pp. 1, 18; Ref. 32, p. 8; Ref. 36, p. 22; Ref. 43, pp. 1, 9
Zinc	HIM-SS-5	8170	mg/kg	5	482	Ref. 6, p. 9; Ref. 8, p. 84; Ref. 9, pp. 1, 18; Ref. 32, p. 8; Ref. 43, pp. 1, 10

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
Mercury	HIM-SS-5	4.26	mg/kg	0.25	2.32	Ref. 6, p. 9; Ref. 8, p. 84; Ref. 9, pp. 1, 19; Ref. 32, p. 8; Ref. 43, pp. 1, 16
PCB-1248	HIM-SS-5	1210	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 19; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 2, 14
PCB-1254	HIM-SS-5	1160	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 19; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 1, 22
PCB-1260	HIM-SS-5	614	µg/kg	10	10.0	Ref. 6, p. 11; Ref. 9, pp. 1, 19; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 43, pp. 1, 22
Benzo(a)pyrene	HIM-SS-5	10100	µg/kg	1260	1630[5]	Ref. 6, p. 10; Ref. 8, p. 82; Ref. 9, pp. 1, 20; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 29
Benzo(g,h,i)perylene	HIM-SS-5	7620	µg/kg	1260	1010[5]	Ref. 6, p. 10; Ref. 8, p. 82; Ref. 9, pp. 1, 20; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 29
Benzo(k)fluoranthene	HIM-SS-5	4740	µg/kg	1260	698	Ref. 6, p. 10; Ref. 8, p. 82; Ref. 9, pp. 1, 20; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 30
Bis(2-ethylhexyl)phthalate	HIM-SS-5	1490	µg/kg	1260	667	Ref. 6, p. 10; Ref. 9, pp. 1, 20; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 30
Chrysene	HIM-SS-5	10800	µg/kg	1260	1900[5]	Ref. 6, p. 10; Ref. 8, p. 82; Ref. 9, pp. 1, 20; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 30
Dibenz(a,h)anthracene	HIM-SS-5	2370	µg/kg	1260	667	Ref. 6, p. 10; Ref. 9, pp. 1, 20; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 36, p. 29; Ref. 43, pp. 1, 31
Fluoranthene	HIM-SS-5	19800	µg/kg	1260	4320[5]	Ref. 6, p. 10; Ref. 8, p. 82;Ref. 9, pp. 1, 20; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 31
Indeno(1,2,3-cd)perylene	HIM-SS-5	10300	µg/kg	1260	1180[5]	Ref. 6, p. 10; Ref. 8, p. 82;Ref. 9, pp. 1, 20; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 31
Phenanthrene	HIM-SS-5	6560	µg/kg	1260	2430[5]	Ref. 6, p. 10; Ref. 8, p. 82;Ref. 9, pp. 1, 20; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 32
Pyrene	HIM-SS-5	15500	µg/kg	1260	3410[5]	Ref. 6, p. 10; Ref. 8, p. 82;Ref. 9, pp. 1, 20; Ref. 32, p. 8; Ref. 36, p. 29; Ref. 43, pp. 1, 32
Cadmium	HIM-SS-7	2.4	mg/kg	2	2.0	Ref. 6, p. 10; Ref. 9, pp. 1, 26; Ref. 32, p. 8; Ref. 36, p. 11; Ref. 36, p. 29; Ref. 43, pp. 1, 9
Zinc	HIM-SS-7	803	mg/kg	5	482	Ref. 6, p. 10; Ref. 8, p. 84; Ref. 9, pp. 1, 26; Ref. 32, p. 8; Ref. 43, pp. 1, 10
Soil Type DeB						
2010 PHASE II ESA						
Arsenic	HEN-SS09	25000	µg/kg	670	10000	Ref. 4, pp. 18,,78, 96, 106; Ref. 13, pp. 67, 318, 550; Ref. 36, p. 11
Cadmium	HEN-SS09	47000 Q	µg/kg	110	2000	Ref. 4, pp. 18, 78, 94, 96, 106; Ref. 13, pp. 67, 318, 550; Ref. 36, p. 11
Chromium	HEN-SS09	93000	µg/kg	670	19700	Ref. 4, pp. 18, 78, 96, 106; Ref. 8, p. 76; Ref. 13, pp. 67, 318, 550

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
Lead	HEN-SS09	1300000	µg/kg	450	19200	Ref. 4, pp. 18, 78, 96, 106; Ref. 8, p. 76; Ref. 13, pp. 67, 318, 550
Mercury	HEN-SS09	1900	µg/kg	180	250	Ref. 4, pp. 18, 78, 96, 106; Ref. 13, pp. 67, 318, 550; Ref. 36, p. 16
Fluoranthene	HEN-SS09	480	µg/kg	410	667	Ref. 4, pp. 18, 78, 96, 106; Ref. 13, pp. 67, 169, 550; Ref. 36, p. 29
PCB-1254	HEN-SS09	200	µg/kg	82	10.0	Ref. 4, pp. 18, 78, 96, 106; Ref. 13, pp. 67, 276, 550; Ref. 36, p. 22
Arsenic	HEN-SS12	52000	µg/kg	740	10000	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 316, 550; Ref. 36, p. 11
Cadmium	HEN-SS12	22000 Q	µg/kg	120	2000	Ref. 4, pp. 18, 79, 94, 96, 106; Ref. 13, pp. 67, 316, 550; Ref. 36, p. 11
Chromium	HEN-SS12	37000	µg/kg	740	5000	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 316, 550; Ref. 36, p. 11
Lead	HEN-SS12	590000	µg/kg	490	19200	Ref. 4, pp. 18, 79, 96, 106; Ref. 8, p. 76; Ref. 13, pp. 67, 316, 550
Mercury	HEN-SS12	1700	µg/kg	190	250	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 316, 550; Ref. 36, p. 16
Benz(a)anthracene	HEN-SS12	4400	µg/kg	1600	667	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 165, 550; Ref. 36, p. 29
Benzo(a)pyrene	HEN-SS12	3900	µg/kg	1600	667	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 165, 550; Ref. 36, p. 29
Benzo(g,h,i)perylene	HEN-SS12	2600	µg/kg	1600	667	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 165, 550; Ref. 36, p. 29
Chrysene	HEN-SS12	4500	µg/kg	1600	667	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 165, 550; Ref. 36, p. 29
Fluoranthene	HEN-SS12	9400	µg/kg	1600	667	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 165, 550; Ref. 36, p. 29
Indeno(1,2,3-cd)perylene	HEN-SS12	2100	µg/kg	1600	667	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 165, 550; Ref. 36, p. 29
Phenanthrene	HEN-SS12	2600	µg/kg	1600	667	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 166, 550; Ref. 36, p. 29
Pyrene	HEN-SS12	8000	µg/kg	2000	667	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 166, 550; Ref. 36, p. 29
PCB-1260	HEN-SS12	190	µg/kg	41	10.0	Ref. 4, pp. 18, 79, 96, 106; Ref. 13, pp. 67, 274, 550; Ref. 36, p. 22
OCTOBER 2016 SI						
Cadmium	HIM-SS-4	3.7	mg/kg	2	2.0	Ref. 5, pp. 12, 16, 20; Ref. 8, pp. 1, 18; Ref. 32, p. 1; Ref. 36, p. 11
Lead	HIM-SS-4	767	mg/kg	10	19.2	Ref. 5, pp. 12, 16, 20; Ref. 8, pp. 1, 18, 76; Ref. 32, p. 1

Table 3
Source 1 Hazardous Substance

Hazardous Substance	Evidence					Reference
	Station Location No.	Conc.	Units	RL[1]	BKG[2]	
Zinc	HIM-SS-4	1240	mg/kg	5	117	Ref. 5, pp. 12, 16, 20; Ref. 8, pp. 1, 18, 76; Ref. 32, p. 1

Notes:
* The names PCB and Aroclor are used interchangeably and both refer to the same organic compounds.
µg/kg –microgram per kilogram
mg/kg – milligram per kilogram
Q – One or more quality control criteria failed (Ref. 4, p. 94). The Q validation flag does not indicate the value is estimated, or that there is an associated bias (Ref. 4, pp. 100, 103). Therefore, the value requires no adjustment per the procedure described in the EPA fact sheet (Ref. 17, pp. 1, 2).
J – Indicated estimated value (Ref. 4, p. 94).
1 For the Test America Data presented in References 13 and 15, the Reporting Limit (RL) is the Method Detection Limit (MDL) adjusted based on percent moisture and any dilution/extraction factors (Ref. 13, p. 3; Ref. 15, p. 3; Ref. 34, pp. 1-2). The HRS defines the SQL as the quantity of a substance that can reasonably quantified given the limits of detection for the methods of analysis and sample characteristics that may affect quantitation (for example dilution, concentration) (Ref. 1, Sec. 1.1). For the Department of Environmental Quality data (References 8 and 9), the RL is the same as the HRS definition of Detection Limit (DL) and is the lowest level that can be distinguished from the random "noise" of an analytical instrument for all analyses except 8270. 8270 RLs were corrected for percent moisture (Ref. 1, Sec. 1.1; Ref. 36, pp. 11, 16, 22, 28, 29; Ref. 43, p. 28).
2 Background concentrations determined by the HIM-BG-1, HIM-BG-2, and HIM-BG-3 reporting limits or results as shown in Table 2 above, demonstrate that soil source concentrations are elevated above background.
3 The "J" bias for this result is unknown, therefore the concentration is adjusted per the procedure described in the EPA fact sheet (Ref. 17, pp. 8, 18).
4 The "J" qualified results are due to detection between the reporting limit (RL) and the corrected Instrument Data Reduction (Ref. 36, p. 32). This flag is not associated with a quality control failure or a bias, therefore no adjustment was required (Ref. 17, pp. 1, 2, 4)
5 Elevated concentrations of SVOCs in soil type BcC (HIM-BG-3) were potentially influenced by a nearby parking lot that was recently paved (Ref. 6, p. 11).

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment

Gas release to air: The air migration pathway was not scored; therefore, gas release to air containment was not evaluated.

Particulate release to air: The air migration pathway was not scored; therefore, particulate containment was not evaluated.

Subsurface Intrusion release: The soil exposure and subsurface intrusion pathway was not scored; therefore, the subsurface intrusion containment was not evaluated.

Release to groundwater: The ground water pathway was not scored; therefore, groundwater containment was no evaluated.

Release via overland migration: Contents of the contaminated soil are exposed to the elements and can release to the surface water through run off. An intermittent creek, Dutch Creek, runs through the facility and the source areas where it is exposed to Source 1, flows south, and to the east for approximately 0.26 miles until connecting to the Unnamed Stream, the first perennial water body (Ref. 3, p. 1-2; Ref. 12, pp. 8, 19; Figure 4 of this HRS documentation record). There is no maintained engineered cover, liner, or a run-on control system and runoff management system (Ref. 4, pp. 115-117; Ref. 12, p. 19). As discussed above, a surface water pathway (overland migration) containment factor value of 10 has been assigned based on no maintained engineered cover, liner or a run-on control system and runoff management system(Ref. 1, Table 4-2).

Containment Value: 10

Because the surface water migration pathway containment factor value for this source is greater than zero, the following substances associated with the source can migrate via the Surface Water Migration Pathway (Ref. 1, Sec. 3.1.2.1):

- Arsenic
- Cadmium
- Chromium
- Lead
- Selenium
- Silver
- Zinc
- Mercury
- PCB-1248
- PCB-1254
- PCB-1260
- Benzo(a)pyrene
- Benzo(a)anthracene
- Benzo(g,h,i)perylene
- Benzo(k)fluoranthene
- Bis(2-ethylhexyl)phthlate
- Chrysene
- Dibenz(a,h)anthracene
- Fluoranthene
- Indeno(1,2,3-c,d)pyrene
- Phenanthrene
- Pyrene

2.4.2 HAZARDOUS WASTE QUANTITY

2.4.2.1 Source Hazardous Waste Quantity

2.4.2.1.1 Tier A: Hazardous Constituent Quantity - Not Calculated (NC)

The total Hazardous Constituent Quantity for Source 1 could not be adequately determined according to the HRS requirements; that is, the total mass of all Comprehensive Environmental Response, Compensation and Liability Act (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). There are insufficient historical and current data [manifests, potentially responsible party (PRP) records, State records, permits, waste concentration data, etc.] available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information 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 Value (S): Not Calculated
Are the data complete for hazardous constituent quantity for this area? No

2.4.2.1.2 Tier B: Hazardous Wastestream Quantity - Not Calculated (NC)

The total Hazardous Wastestream Quantity for Source 1 could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous waste streams and CERCLA pollutants and contaminants for the source and releases from the source are not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2). Insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, annual reports, etc.) are available to adequately calculate the total or partial mass of all hazardous waste streams and CERCLA pollutants and contaminants for the source and the associated releases from the source. Therefore, there is insufficient information to adequately calculate or extrapolate a total or partial Hazardous Wastestream Quantity estimate 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 Value (W): Not Calculated
Are the data complete for hazardous constituent quantity for this area? No

2.4.2.1.3 Tier C: Volume

The depth of the soil contamination could not be accurately determined based on the information available. Therefore, information is not sufficient to evaluate Tier C and it is not possible to adequately determine a volume for Source 1 (Ref. 1, Section 2.4.2.1.2). Therefore the total volume assigned for Tier C is 0 (Ref. 1. Sec. 2.4.2.1.3).

Hazardous Waste Volume Quantity Value (V): 0
(Ref. 1, HRS Table 2-5)

2.4.2.1.4 Tier D: Area

The area of Source 1, contaminated soil, was an approximate calculation performed using GIS software. The GIS software calculated the area of the polygons drawn over each of the areas of contaminated soil confirmed by samples collected from investigations conducted in 2010, 2016 and 2017 (Ref. 16, pp. 1-2). The GIS software calculated the total area of the Source 1 contaminated soil areas to be 67,191 ft^2 (Ref. 16, pp. 1-2). The Tier D equation for assigning a value for area of contaminated soil is A/34,000 (Ref. 1, Table 2-5).

Area of Source 1 (ft^2): 67,191
Area Assigned Value = 67,191 ft^2 /34,000
Area Assigned Value = 1.976

2.4.2.1.5 Source Hazardous Waste Quantity Value

Per the HRS, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) should be assigned as the source hazardous waste quantity value (Ref. 1, Section 2.4.2.1.5).

Table 4
Source 1 – Hazardous Waste Quantity Value

Tier Evaluated	Source 2 Values
A	Not Calculated
B	Not Calculated
C	0
D	1.976

Source 1 Hazardous Waste Quantity Value: 1.976

SITE SUMMARY OF SOURCE DESCRIPTION

Source No.	Source Hazardous Waste Quantity Value	Containment			
		Ground Water	Surface Water	Gas	Air Particulate
1	1.976	NE	10	NE	NE
TOTAL	1.976				

NE = Not Evaluate

4.0 SURFACE WATER MIGRATION PATHWAY

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

4.1.1 GENERAL CONSIDERATIONS

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

The hazardous substance migration path includes the in-water segment that hazardous substances would take as they migrate away from sources at the facility (Ref. 1, Section 4.1.1.1). The hazardous substance migration path for in-water segments for the sources are described below. The complete (overland and in-water segment) surface water pathway is presented on Figures 4, and 5.

Overland and In-Water Segments

The overland flow migration route and distance for each area of Source 1 is as follows (Ref. 14, pp. 1, 2):

- Area 1 – 0 feet to Dutch Creek, and 1,648 feet along Dutch Creek to the Unnamed Stream;
- Area 2 – 65 feet to Dutch Creek and 1,518 feet along Dutch Creek to the Unnamed Stream;
- Area 3 – 20 feet to Dutch Creek and 1,518 feet along Dutch Creek to Unnamed Stream;
- Area 4 - 360 feet to Dutch Creek and 1,382 feet along Dutch Creek to Unnamed Stream;
- Area 5 – 20 feet to Dutch Creek and 1,418 feet along Dutch Creek to Unnamed Stream;
- Area 6 – from northeast corner 810 feet to Dutch Creek and 905 long Dutch Creek to Unnamed Stream, from northwest corner 88 feet to Dutch Creek and 1,280 long Dutch Creek to Unnamed Stream, from southwest corner 50 feet to Dutch Creek and 905 long Dutch Creek to Unnamed Stream.

The main overland migration route for all source areas begins at Dutch Creek. Dutch Creek is an intermittent tributary of Coal Creek, it flows through the Site, and under West Main Street in a southerly direction through the west part of Henryetta, has a stream length of 1.5 miles, and a drainage area of 2.9 square miles (Ref. 3, pp. 1-2; Ref. 12, pp. 14, 19; Ref. 18, p. 7). Dutch Creek flows south and east between 0.31 mile (most upstream source area) to 0.171 mile (most downstream source area), until connecting to a perennial unnamed stream (Ref. 6, p. 430; Ref. 14, pp. 1-2). This perennial unnamed stream begins the in-water segment, and has been identified as the most upstream Probable Point of Entry (PPE) to an eligible surface water body as defined in the HRS (Ref. 1, Sec. 4.0.2; Ref. 33, p. 1). The unnamed stream continues for 3,076 feet (0.58 mile) before converging with Coal Creek (Figure 4; Ref. 21, pp. 1, 2). Coal Creek begins about 2 miles west of Henryetta and flows first in a southerly direction, and then in a northeasterly direction through the south and east sides of the city to its confluence with the Deep Fork, a tributary of the North Canadian River which is a tributary of the Arkansas River. The total drainage area of Coal Creek is 74 square miles (Ref. 18, p. 7). Coal Creek continues for the remaining 14.42 miles that make up the 15-mile Target Distance Limit (TDL) (Figure 5; Ref. 1, Section 4.1.1.2). Flooding along Coal and Dutch Creeks occurs on the average of about once every 5 years (Ref. 18, p. 3).

4.1.2.1 Likelihood of Release

4.1.2.1.1 Observed Release

<u>**Chemical Analyses**</u>

Background Concentrations:

A background sediment sample was collected by the ODEQ during the October 2016 SI to assess the migration and observed release by chemical analysis of contamination in the surface water pathway. The background sample (HIM-SD-5) was collected upstream of the Unnamed Stream, prior to its confluence with Dutch Creek as shown on Figure 6 (Ref. 5, pp. 16, 21). The Unnamed Stream is incorrectly identified as Coal Creek in the PA, SI, and ESI reports. Please see Reference 33 on correct identification information.

The sediment was collected following ODEQ's SI and ESI Sampling and Analysis Plan (Ref. 5, p. 4; Ref. 6, p. 3; Ref. 30; Ref. 31). The samples were grab samples all collected from the surface (0-6 inches deep) using a long stainless steel spoon. Sampling team members used disposable gloves to ensure no cross contamination occurred, with new gloves used for each sample. Sediment samples were mixed thoroughly with a dedicated stainless steel spoon and bowl to obtain a homogeneous sample before being placed in two 4-oz jars. The background samples were collected, outside the influence of the site. The samples were collected using the same sampling techniques as the other soil samples (Ref. 30, pp. 8, 9; Ref. 31, p. 8). The collected samples were analyzed for total metals, SVOCs, and PCBs using Oklahoma State Environmental Laboratory (SEL) methods and procedures (Ref. 5, p. 11; Ref. 6, p. 7).

The background samples and the samples collected to demonstrate an observed release were all collected during similar time frames and similar sampling events (Ref. 5, p. 4; Ref. 6, p. 4). The samples were collected by the ODEQ during the 2016 SI and 2017 ESI sampling events, following the same sample collection protocols and methodologies (Ref. 5, p. 4; Ref. 6, p. 4; Ref. 30, p. 9; Ref. 31, p. 8). Background samples were collected from similar locations, were from similar media, same depth, under the same hydrological conditions and flow, used the same sampling methods, preservation, and handling and were all collected during the same weather conditions as the observed release samples (Ref. 5, p. 4; Ref. 6, p. 4; Ref. 30, pp. 8, 9; Ref. 31, p. 7).

Table 5
Background Sediment Sample

Station Location	Sampling Location	Sample Date (Military Time)	Reference
Unnamed Stream			
HIM-SD-5	Unnamed Stream before confluence with Dutch Creek*	10/13/16 (1507)	Ref. 5, pp. 9, 16, 21; Ref. 8, p. 57; Ref. 32, p. 4; Figure 6

*Note – The Unnamed Stream is incorrectly identified as Coal Creek in the PA, SI, and ESI reports. Please see Reference 33 on correct identification information.

Table 6
Background Sediment Sample Concentrations

Station Location	Hazardous Substance	Concentration	Reporting Limit[1]	Units	Reference
Unnamed Stream					
HIM-SD-5	Aroclor-1248	<12.7	10.0	µg/kg	Ref. 8, p. 57; Ref. 36, p. 22
	Aroclor-1254	<12.7	10.0	µg/kg	Ref. 8, p. 57; Ref. 36, p. 22
	Aroclor-1260	<12.7	10.0	µg/kg	Ref. 8, p. 57; Ref. 36, p. 22
	Arsenic	26.3	10.0	mg/kg	Ref. 8, p. 60; Ref. 36, p. 11
	Cadmium	<2.0	2.0	mg/kg	Ref. 8, p. 60; Ref. 36, p. 11
	Chromium	27.8	5.0	mg/kg	Ref. 8, p. 60; Ref. 36, p. 11
	Lead	33.7	10.0	mg/kg	Ref. 8, p. 60; Ref. 36, p. 11
	Zinc	220	5.0	mg/kg	Ref. 8, p. 60; Ref. 36, p. 11
	Mercury	<0.25	0.25	mg/kg	Ref. 8, p. 60; Ref. 36, p. 16

Notes:
* The names PCB and Aroclor are used interchangeably and both refer to the same organic compounds.
mg/kg - milligram per kilogram (mg/kg) used for metal analytes
µg/L – microgram per kilogram (µg/kg) used for SVOC and PCB analytes
< - less than
[1] For the Department of Environmental Quality data (References 8 and 9), the Reporting Limit (RL) is the same as the HRS definition of Detection Limit (DL) and is the lowest level that can be distinguished from the random "noise" of an analytical instrument for all analyses except 8270. 8270 RLs were corrected for percent moisture (Ref. 1, Sec. 1.1; Ref. 36, pp. 11, 16, 22, 28, 29; Ref. 43, p.28).

Observed Release samples will be compared to the designated background level as shown below:

Table 7
Significant Background Concentrations

Matrix	Hazardous Substance	Background Concentration	RL or 3 x Background	Units
Sediment	Aroclor-1248	<12.7	12.7	µg/kg
	Aroclor-1254	<12.7	12.7	µg/kg
	Aroclor-1260	<12.7	12.7	µg/kg
	Arsenic	26.3	78.9	mg/kg
	Cadmium	<2.0	2.0	mg/kg
	Chromium	27.8	83.4	mg/kg
	Lead	33.7	101.1	mg/kg
	Zinc	220	660	mg/kg
	Mercury	<0.25	0.25	mg/kg

Notes:
mg/kg - milligram per kilogram (mg/kg) used for metal analytes
µg/kg – microgram per kilogram (µg/kg) used for SVOC and PCB analytes

Observed Release Samples:

Sediment samples identified as "contaminated" are those that meet observed release criteria as defined by the HRS (Ref. 1, Table 2-3). Observed release criteria is met when the hazardous substance is attributable to a release from the Site, its concentration exceeds the Sample Quantitation Limit (SQL; including the background SQL), and is at least three times greater than the background concentration when the background concentration equals or exceeds its SQL (Ref. 1, Table 2-3).

Sediment sampling locations with concentrations meeting observed release criteria were collected by the ODEQ during the October 2017 ESI sampling event. These samples were collected following ODEQ's ESI Sampling and Analysis Plan (Ref. 6, p. 3; Ref. 31; Figure 6 of this HRS documentation record). Sampling team members used disposable gloves to ensure no cross contamination occurred, with new gloves used for each sample. The surface material was cleared away using a dedicated stainless steel spoon or trowel in order to obtain a representative sample. The sample was mixed thoroughly with a dedicated stainless steel spoon and bowl to obtain a homogeneous sample before being placed in two 4-oz jars. The background sample was collected, outside the influence of the site, upstream within the Unnamed Stream prior to its confluence with Dutch Creek. The samples were collected using the same sampling techniques as the other soil samples (Ref. 31, p. 8). The collected samples were analyzed for total metals, SVOCs, and PCBs using Oklahoma State Environmental Laboratory (SEL) methods and procedures (Ref. 6, p. 11).

Table 8
Observed Release Sampling Locations

Station Location	Sampling Location	Sample Date (Military Time)	Reference
ODEQ ESI Sediment Sampling – October 2017			
HIM-SD-03	Downstream in the Unnamed Stream*	10/11/17 (1135)	Ref. 6, pp. 15, 23; Ref. 9, p. 54; Ref. 32, p. 7
HIM-SD-04	Downstream in the Unnamed Stream*	10/11/17 (1213)	Ref. 6, pp. 15, 23; Ref. 9, p. 58; Ref. 32, p. 7

*Note – The Unnamed Stream is incorrectly identified as Coal Creek in the PA, SI, and ESI reports. Please see Reference 33 on correct identification information.

Table 9
Sediment Sample Concentrations

Station Location	Hazardous Substance	Concentration	RL[1]	Bkgd – RL or 3x Result	Units	Reference
ODEQ ESI Sediment Sampling – October 2017						
Unnamed Stream						
HIM-SD-03	Cadmium	2.1	2.0	2.0	mg/kg	Ref. 6, pp. 15, 23; Ref. 9, p. 54; Ref. 43, pp. 2, 9
HIM-SD-03	Zinc	1410	10.0	660	mg/kg	Ref. 6, pp. 15, 23; Ref. 9, p. 54; Ref. 43, pp. 2, 10
HIM-SD-04	Zinc	990	10.0	660	mg/kg	Ref. 6, pp. 15, 23; Ref. 9, p.

Table 9
Sediment Sample Concentrations

Station Location	Hazardous Substance	Concentration	RL[1]	Bkgd – RL or 3x Result	Units	Reference
						58; Ref. 43, pp. 2, 10
HIM-SD-04	Mercury	0.38	0.25	0.25	mg/kg	Ref. 6, pp. 15, 23; Ref. 9, p. 59; Ref. 43, pp. 2, 16
HIM-SD-04	Aroclor-1248	32.7	10	12.7	µg/kg	Ref. 6, pp. 15, 23; Ref. 9, p. 59; Ref. 43, pp. 2, 22
HIM-SD-04	Aroclor-1254	61.9	10	12.7	µg/kg	Ref. 6, pp. 15, 23; Ref. 9, p. 59; Ref. 43, pp. 2, 22
HIM-SD-04	Aroclor-1260	29.2	10	12.7	µg/kg	Ref. 6, pp. 15, 23; Ref. 9, p. 59; ; Ref. 43, pp. 2, 22

Notes:
* The names PCB and Aroclor are used interchangeably and both refer to the same organic compounds.
mg/kg - milligram per kilogram (mg/kg) used for metal analytes
µg/L – microgram per kilogram (µg/kg) used for SVOC and PCB analytes
Bkgd – Background
RL – Reporting Limit

1 For the Department of Environmental Quality data (References 8 and 9), the Reporting Limit (RL) is the same as the HRS definition of Detection Limit (DL) and is the lowest level that can be distinguished from the random "noise" of an analytical instrument for all analyses except 8270. 8270 RLs were corrected for percent moisture (Ref. 1, Sec. 1.1; Ref. 36, pp. 11, 16, 22, 28, 29; Ref. 43, p. 28).

The background samples and observed release samples were both collected from the same medium on October 2016 and October 2017, by the same ODEQ teams operating under the same QASPs and sampling procedures. Background and observed release samples were collected from similar locations, were from similar media, same depth, used the same sampling methods, preservation, and handling and were all collected during the same time of year (Ref. 5, p. 4; Ref. 6, p. 3; Ref. 30; Ref. 31).

Attribution

HIM operations consisted of acquiring various metal-containing objects from various sources for recycling (Ref. 12, p. 4). The property had been used as a metal salvage yard since the 1930s. Other businesses that have occupied the property include a blacksmith, motor freight lines, a welding facility, and a pipe and supply company (Ref. 11. p. 23). Interviews conducted during a 2008 site assessment, indicated that for many years, the junkyard (HIM) received PCB-containing transformers from the PSO. Reportedly PCB oil was dumped on the property, and also buried in steel drums in the northern portion of the property (Ref. 11, p. 23). ODEQ testing has indicated that PCBs, metals, and TPH exist in the soil at concentrations exceeding Federal and/or State guidelines (Ref. 11, p. 31).

The sources at the facility are uncontained, and in places abut to an intermittent creek (Dutch Creek). Dutch Creek transports the contaminants of concern (COCs) to the perennial Unnamed Stream and Coal Creek. Several sediment samples within Dutch Creek demonstrate that the chemicals found within the contaminated soil source on the Site are also present within the creek. Samples HIM-SD-2, HIM-SD-3, and HIM-SD-4 contain detections of cadmium, zinc, mercury, Aroclor-1248, Aroclor-1254, and Aroclor-1260 contamination, the same chemicals found in Source 1 (Tables 1, 3, 9, and 10). In addition, several of these same COCs are detected in sediment samples associated with the Unnamed Stream (HIM-SD-03 and HIM-SD-04) (Table 9).

A background sediment sample was collected within the Unnamed Stream prior to confluence with Dutch Creek (HIM-SD-5). No PCBs (Aroclors) were detected in this sample (Tables 6 and 7).

Although not used to demonstrate observed release for this HRS documentation record, additional sediment and surface water samples in Dutch Creek were collected in March 2010 during Phase II ESA sampling. These samples further demonstrate attribution and the ongoing release of COCs from the site. A total of six sediment samples were collected from various locations within the stream bed. One sediment sample was collected upstream from the Site (HEN-SD01), and four sediment samples were collected at points in the stream bed within the property boundaries (HEN-SD-02, HEN-SD03, HEN-SD04, and HEN-SD05), and one sediment sample was collected in the stream bed downstream from the southern property line (HEN-SD06) (Ref. 4, pp. 20, 24). In addition, a total of three surface/stream water grab samples were collected from various locations within the stream. One surface/stream water grab was collected upstream from the Site where the stream crossed the property (HEN-SW01), one surface/stream water grab sample was collected in the middle portion of the Site (HEN-SW02) and one surface/stream water grab sample was collected at the southern property line (HEN-SW03) (Ref. 4, pp. 20, 24, 55). Each of the sediment, surface/stream water samples were analyzed using the following SW-846 Analytical Methods: Method 6020/7471 (RCRA Metals); Method 8020 (PCBs); and Method 8015B/C (GRO/DRO) (Ref. 4, pp. 20-21).

The same constituents identified in the observed release samples presented in Table 9 were also detected in the samples collected during the March 2010 Phase II ESA. PCB-1254 was not detected in the up-gradient sediment samples but was detected in all of the downstream sediment samples (HEN-SD02 through HEN-SD06) and one of the surface water samples (HEN-SW03) (Ref. 4, pp. 49, 51, 54, 89-91; Ref. 13, pp. 256-261, 280). Cadmium was elevated in four of the sediment samples (HEN-SD02, HEN-SD03, HEN-SD04, and HEN-SD05), and two surface water samples (HEN-SW02, HEN-SW03). Mercury was detected above background concentrations in all the downstream sediment samples (HEN-SD02 through HEN-SD06) (Ref. 4, pp. 49, 55, 89-91; Ref. 13, pp. 295-299, 320, 322). Zinc was not analyzed for in these samples (Ref. 13, pp. 295-299, 320, 322).

Additional samples were also collected in Dutch Creek in October 2016. These samples demonstrate that the same COCs found in Source 1 migrated via Dutch Creek to the Unnamed Stream. In addition, a sample upstream of the facility boundaries was also collected which demonstrates that the observed release would still be eligible if the up-gradient levels in Dutch Creek were used as the background levels as shown below.

Table 10
Samples Collected in Dutch Creek

Station Location	Hazardous Substance	Concentration	Reporting Limit[1]	Units	Reference
Dutch Creek - Upstream of Property Boundaries					
HIM-SD-1	Aroclor-1248	<11.6	10.0	µg/kg	Ref. 8, p. 41; Ref. 36, p. 22
	Aroclor-1254	<11.6	10.0	µg/kg	Ref. 8, p. 41 Ref. 36, p. 22
	Aroclor-1260	<11.6	10.0	µg/kg	Ref. 8, p. 41 Ref. 36, p. 22
	Arsenic	44.3	10.0	mg/kg	Ref. 8, p. 44; Ref. 36, p. 11
	Cadmium	<2.0	2.0	mg/kg	Ref. 8, p. 44 Ref. 36, p. 11
	Chromium	49.7	5.0	mg/kg	Ref. 8, p. 44 Ref. 36, p. 11
	Lead	67.4	10.0	mg/kg	Ref. 8, p. 44 Ref. 36, p. 11
	Zinc	304	5.0	mg/kg	Ref. 8, p. 44 Ref. 36, p. 11
	Mercury	<0.25	0.25	mg/kg	Ref. 8, p. 44; Ref. 36, p. 16

Dutch Creek - Within and Downstream of Property Boundaries

Station Location	Hazardous Substance	Concentration	RL[1]	Bkgd – Result	Units	Reference
HIM-SD-2	Aroclor-1248	973	15.9	10.0	µg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 45; Ref. 36, p. 22
HIM-SD-2	Aroclor-1254	1200	15.9	10.0	µg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 45; Ref. 36, p. 22
HIM-SD-2	Aroclor-1260	365	15.9	10.0	µg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 45; Ref. 36, p. 22
HIM-SD-2	Cadmium	4.3	2.0	2.0	mg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 48; Ref. 36, p. 11
HIM-SD-3	Aroclor-1248	1140	20.2	10.0	µg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 49; Ref. 36, p. 22
HIM-SD-3	Aroclor-1254	1900	20.2	10.0	µg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 49; Ref. 36, p. 22
HIM-SD-3	Aroclor-1260	381	20.2	10.0	µg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 49; Ref. 36, p. 22
HIM-SD-3	Cadmium	9.1	2.0	2.0	mg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 52; Ref. 36, p. 11
HIM-SD-3	Zinc	969	10.0	304	mg/kg	Ref. 5, pp. 9, 21; Ref. 8, pp. 44, 52; Ref. 36, p. 11
HIM-SD-3	Mercury	0.48	0.25	0.25	mg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 52; Ref. 36, p. 11
HIM-SD-4	Aroclor-1248	133	12.3	10.0	µg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 53; Ref. 36, p. 22
HIM-SD-4	Aroclor-1254	203	12.3	10.0	µg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 53; Ref. 36, p. 22
HIM-SD-4	Aroclor-1260	43.3	12.3	10.0	µg/kg	Ref. 5, pp. 9, 21; Ref. 8, p. 53; Ref. 36, p. 22

Notes:
* The names PCB and Aroclor are used interchangeably and both refer to the same organic compounds.
  mg/kg - milligram per kilogram (mg/kg) used for metal analytes
  µg/kg – microgram per kilogram (µg/kg) used for SVOC and PCB analytes
  RL – Reporting Limit

[1] For the Department of Environmental Quality data (References 8 and 9), the Reporting Limit (RL) is the same as the HRS definition of Detection Limit (DL) and is the lowest level that can be distinguished from the random "noise" of an analytical instrument for all analyses except 8270. 8270 RLs were corrected for percent moisture (Ref. 1, Sec. 1.1; Ref. 36, pp. 11, 16, 22, 28, 29; Ref. 43, p.28).

Facilities within 1 mile radius of the HIM Site were identified. Four facilities were found within a database search (Ref. 19, pp. 14, 15). None of these facilities have compliance violations, nor were found to deal with the COCs associated with the HIM Site (Ref. 20, pp. 1-23). In addition, there are other facilities located in the vicinity of HIM that are not identified in environmental databases, but were found within a general search around the property. The facilities identified within close proximity to HIM include a gas station, auto body shop, tire shop, funeral home, and car wash (Ref. 37, p. 3). None of these facilities are listed in the environmental databases searched and the COCs detected in the observed release samples are not known to be used in conjunction with the activities commonly performed as part of these facility activities (Ref. 38, p. 1; Ref. 39, pp. 1-2; Ref. 40, p. 1; Ref. 41, p. 1; Ref. 42, pp. 1-3).

Historical operations at HIM have shown to cause cadmium, zinc, mercury, Aroclor-1248, Aroclor-1254, and Aroclor-1260 contamination in soil (Section 2.2.2 of this HRS Documentation Record). This contamination, combined with the overall lack of containment of the source at the facility, has led to cadmium, zinc, mercury, Aroclor-1248, Aroclor-1254, and Aroclor-1260 contamination migration from the contaminated soil source at the facility into the surface water pathway (Section 4.1.2.1.1 of this HRS Documentation Record). Surface water pathway sediment samples meeting observed release criteria are present that support the cadmium, zinc, mercury, Aroclor-1248, Aroclor-1254, and Aroclor-1260 contamination in the surface water pathway that can be attributed (wholly or, at least, in part) to the HIM Site.

Likelihood of Release Factor:

Based on the analytical data and attribution components listed above, cadmium, zinc, mercury, Aroclor-1248, Aroclor-1254, and Aroclor-1260 have been documented as the hazardous substances in the observed release to the Unnamed Stream. Therefore, the observed release factor value of 550 was assigned to the surface water migration pathway (Ref. 1, Section 4.1.2.1.1).

Likelihood of Release Factor Value: 550

4.1.2.1.2 POTENTIAL TO RELEASE

4.1.2.1.2.1 Potential to Release by Overland Flow

Potential to release was not evaluated because an observed release to surface water was established by chemical analysis (see Section 4.1.2.1.1 of this HRS documentation record).

4.1.3.2 HUMAN FOOD CHAIN THREAT - WASTE CHARACTERISTICS

Evidence of contamination associated with the Source has been established based on chemical analyses of samples collected from the sources (refer to the Attribution Section and Section 2.2). Cadmium, zinc, mercury, Aroclor-1248, Aroclor-1254, and Aroclor-1260, were detected in sediment samples collected in the Unnamed Stream establishing an observed release (see Section 4.1.2.1.1).

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

Table 11
Human Food Chain Threat- Toxicity/Persistence/ Bioaccumulation Summary

Hazardous Substance	Source Number	Toxicity Factor Value	Persistence[1] Factor Value	Bioaccumulation [2] Value	Toxicity/ Persistence/ Bioaccumulation Factor Value	Reference
Arsenic	1	10,000	1	5	5×10^4	Ref. 2, p. 3
Cadmium	1, OR	10,000	1	50,000	5×10^8	Ref. 2, p. 80
Chromium	1	10,000	1	5	5×10^4	Ref. 2, p. 91
Lead	1	10,000	1	5,000	5×10^7	Ref. 2, p. 135
Selenium	1	100	1	50	5×10^3	Ref. 2, p. 190
Silver	1	100	1	50	5×10^3	Ref. 2, p. 201
Zinc	1, OR	10	1	500	5×10^3	Ref. 2, p. 212
Mercury	1, OR	10,000	1	50,000	5×10^8	Ref. 2, p. 146
Aroclor-1248*	1, OR	10,000	1	50,000	5×10^8	Ref. 2, p. 168
Aroclor-1254*	1, OR	10,000	1	50,000	5×10^8	Ref. 2, p. 168
Aroclor-1260*	1, OR	10,000	1	50,000	5×10^8	Ref. 2, p. 168
Benz(a)anthracene	1	100	1	50,000	5×10^6	Ref. 2, p. 225
Benzo(a)pyrene	1	10,000	1	50,000	5×10^8	Ref. 2, p. 25
Benzo(g,h,i)perylene	1	0	1	50,000	0	Ref. 2, p. 36
Benzo(k)fluoranthene	1	10	1	50,000	5×10^5	Ref. 2, p. 58
Bis(2-ethylhexyl) phthalate	1	100	1	50,000	5×10^6	Ref. 2, p. 69
Chrysene	1	10	1	5	5×10^1	Ref. 2, p. 102
Dibenz(a,h)anthracene	1	10,000	1	50,000	5×10^8	Ref. 2, p. 113
Fluoranthene[3]	1	100	1	5,000	5×10^5	Ref. 2, p. 47
Indeno(1,2,3-cd) pyrene	1	100	1	50,000	5×10^6	Ref. 2, p. 124
Phenanthrene	1	1	0.4	5,000	2×10^3	Ref. 2, p. 157
Pyrene	1	100	1	50,000	5×10^6	Ref. 2, p. 179

Notes:
* As PCBs
[1] Persistence values assigned based on the Unnamed Stream and Coal Creek which have perennially flowing water, and thus classification as a River (Ref 1, Table 4-10).

[2] Bioaccumulation factor values are assigned from the SCDM (Ref. 2), for the type of water body "Fresh Water", in which the fisheries are located (Ref. 1, Sect. 4.1.3.2.1.3).
[3] Fluoranthene is listed as benzo(j,k)fluoranthene in the SCDM (Ref. 2, p. 46).
OR – Observed Release

The hazardous substances with the highest Toxicity/Persistence/Bioaccumulation Factor Values are cadmium, mercury, aroclor-1248 (as PCBs), aroclor-1254 (as PCBs), aroclor-1260 (as PCBs), benzo(a)pyrene, and dibenz(a,h)anthracene (Ref. 1, Table 4-16; Ref. 2, pp. 25, 80, 113, 146, 168).

Toxicity/Persistence/Bioaccumulation Factor Value: 5 x 10^8

4.1.3.2.2 Hazardous Waste Quantity

Source No.	Source Hazardous Waste Quantity Value	Containment			
		Ground Water	Surface Water	Gas	Air Particulate
1	1.976	NE	10	NE	NE
TOTAL	1.976				

NE= not evaluated

The sum of the hazardous waste quantity values is assigned as the Hazardous Waste Quantity Factor Value (Ref. 1, Sec. 2.4.2.2 and Table 2-6). The sum of the source hazardous waste quantity values for Surface Water pathway, rounded to the nearest integer is 1.976.

As documented in Sections 4.1.4.3.2.2 of this HRS documentation record, and according to Section 2.4.2.2 of the HRS, a surface water pathway hazardous waste quantity factor of 100 can be assigned because targets for the surface water pathway are subject to Level II concentrations; therefore, a minimum value of 100 was assigned for the hazardous waste quantity factor value (Ref. 1, Section 2.4.2.2).

Sum of Values: 1.976
Hazardous Waste Quantity Factor Value (Ref. 1, Sec. 4.2.2.2, Table 2-6): 100

4.1.3.2.3 Waste Characteristics Factor Category Value

Toxicity/Persistence Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 100
Bioaccumulation Potential Factor Value: 50,000

(Toxicity/Persistence Factor Value) x (Hazardous Waste Quantity Factor Value) = 1 x 10^6 (maximum of 1 x 10^8 according to HRS Section 4.1.3.2.3)

(Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value) x (Bioaccumulation Potential Factor Value) = 5 x 10^{10} (maximum of 1 x 10^{12} according to HRS Section 4.1.3.2.3)

A hazardous waste quantity factor of 100 is assigned according to HRS Section 2.4.2.2. From Reference 2 and Table 4-12 of the HRS, cadmium, mercury, aroclor-1248 (as PCBs), aroclor-1254 (as PCBs), aroclor-1260 (as PCBs), benzo(a)pyrene, and dibenz(a,h)anthracene have a toxicity/persistence value of 10,000 and a bioaccumulation potential factor of 50,000. The waste characteristics factor category value from Reference 1, Table 2-7 for a waste characteristics product of 5×10^{10} is 320.

Waste Characteristics Factor Category Value: 320

4.1.3.3 HUMAN FOOD CHAIN THREAT – TARGETS

Coal Creek's designated uses include secondary body contact recreation, where boating or wading can occur and as a warm water aquatic community that supports intolerant climax fish communities (Ref. 22, p. 2; Ref. 23 pp. 11-12, 17). A total of 16 different fish species are found within these waterways, these include: red shiner, blackspotted topminnow, longear sunfish, mosquito fish, bluegill, redear sunfish, redfinned darter, green sunfish, largemouth bass, gizzard shad, golden shiner, bluntnose minnow, stoneroller, carp, channel catfish, and white crappie (Ref. 18, p. 21). According to the Oklahoma Department of Wildlife Conservation (ODWC), Coal Creek is fished and the fish are caught for human consumption. At the Lake Road bridge over Coal Creek, ODWC has observed fishing of crappie for human consumption (Figure 6; Ref. 27, p. 1). The TDL extends from the PPE to Coal Creek, south of Highway 266 near Dighton, Oklahoma (refer to Figure 5). Fishing is documented within the 15-mile TDL (Ref. 3, pp. 1-2; Ref. 27, p. 1)

4.1.3.3.1 Food Chain Individual

A food chain individual factor of 20 is assigned based on an observed release (from chemical analysis) of cadmium, zinc, mercury, aroclor-1248 (as PCBs), aroclor-1254 (as PCBs), and aroclor-1260 (as PCBs) with a Bioaccumulation Factor Value of 500 or greater in sediments in the watershed, and also based on a fishery being present within the 15-mile TDL of the in water segment (Ref. 1, Sec. 4.1.3.3.1; Ref. 2, pp. 80, 146, 168; Figure 5; Tables 8, 9, 10).

Food Chain Individual Factor Value: 20

4.1.3.3.2 Population

4.1.3.3.2.1 <u>Level I Concentrations</u>

Level I concentrations have not been established as fish tissue samples have not been collected; therefore, the Level I concentrations factor value receives an assigned value of 0.

Level I Concentrations Factor Value: 0

4.1.3.3.2.2 <u>Level II Concentrations</u>

No Level II concentrations have been established for fisheries or portions of fisheries, within the watershed (Ref. 1, Sec. 4.1.3.3.2.2). Recreation fishing has been observed within the Unnamed Stream where an observed release by chemical analysis has been established (see Sec. 4.2.1.1 of this HRS documentation record), but no evidence of consumption has been found (Ref. 33, pp. 1, 4, 5; Ref. 44, pp. 2, 3, 19).

Level II Concentrations Factor Value: 0

4.1.3.3.2.3 Potential Human Food Chain Contamination

Coal Creek is fished for crappie and according to the Oklahoma Department of Wildlife Management; these fish are caught for human consumption (Ref. 27, p. 1). Data to estimate pounds of fish caught annually for Coal Creek is not available; however, because this water body is fished, the annual production is known to be greater than zero. As such, a human food chain population value of 0.03 is assigned from Table 4-18 of the HRS Rule (Ref. 1, Table 4-18).

For Coal Creek, the dilution weight was based on the average annual flow data collected by the USGS at a gauging station located in Coal Creek near Henryetta (Ref. 5, p. 225). Based on the stream flow, Coal Creek, according to Table 4-13 of the HRS Rule, is classified as a small to moderate stream and receives an assigned dilution weight of 0.1 (Ref. 1, Table 4-13).

Table 12
Potential Fishery Identification Study

Identity of Fishery	Annual Production (pounds)	Type of Surface Water Body	Average Annual Flow	Reference	Population Value (P_i)	Dilution Weight (D_i)	P_i x D_i
Coal Creek	>0, but unknown	Small to Moderate Stream	10 - 100 cfs	Ref. 1, Tables 4-13, 4-18; Ref. 5, pp. 8, 225	0.03	0.1	0.003

Notes:
cfs = cubic feet per second.

Coal Creek - Product of P_i x D_i = 0.03 x 0.1
Product of P_i x D_i: 0.003
(Sum of Products of P_i x D_i)/10: 0.0003

Potential Human Food Chain Contamination Factor Value: 0.0003

4.1.3.3.2.4 Calculation of Population Factor Value

The population factor value is equal to:

Level I Concentrations (0) + Level II Concentrations (0) + Potential Human Food Chain Contamination (0.0003) = 0.0003

A value of 0.0003 is assigned as the Population Factor Value.

Population Factor Value: 0.0003

4.1.3.3.3 Calculation of Human Food Chain Threat – Target Factor Category Value

The Human Food Chain Threat – Targets Threat Category value is calculated by summing the food chain individual and population factor values for the watershed:

Food Chain Individual Factor Value (20) + Population Factor Value (0.0003) = 0.0003

Target Factor Category Value: 20.0003

4.1.3.4 Calculation of Human Food Chain Threat Score for a Watershed

The Human Food Chain Threat Score is calculated by multiplying the human food chain threat factor category values for the likelihood of release, waste characteristics, and targets for the watershed (Ref. 1, Sec. 4.1.3.4).

Likelihood of Release (550) x Waste Characteristics (320) x Targets (20.0003) =3,520,053
(rounded to the nearest integer)

This product is then divided by 82,500:

3,520,053/ 82,500 = 42.66730

The resulting value, subject to a maximum of 100, is assigned as the Human Food Chain Threat Score.

Human Food Chain Threat Score: 42.66

4.1.4.2 ENVIRONMENTAL THREAT – WASTE CHARACTERISTICS

The environmental threat waste characteristics section provides the ecosystem toxicity, persistence, and bioaccumulation factor values for hazardous substances that are available to migrate from sources at the site to surface water in the watershed via the overland/flood hazardous substances migration path for the watershed (Ref. 1, Sec. 4.1.4.2.1), the hazardous waste quantity value for the watershed (Ref. 1, Sec. 4.1.4.2.2), and the calculation of the environmental threat – waste characteristics factor category value. The highest combined ecosystem toxicity, persistence, and bioaccumulation factor used to determine the waste characteristics factor value for the environmental threat of the surface water migration pathway (Ref. 1, Sec. 4.1.4.2.3).

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

Table 13
Ecosystem Toxicity/Persistence/Bioaccumulation Factor Summary

Hazardous Substance	Source Number	Ecosystem Toxicity Factor Value	Persistence[1] Factor Value	Ecosystem Bioaccumulation [2] Value	Ecosystem Toxicity/ Persistence/ Bioaccumulation Factor Value	Reference
Arsenic	1	10	1	50,000	5×10^5	Ref. 2, p. 3
Cadmium	1, OR	10,000	1	50,000	5×10^8	Ref. 2, p. 80
Chromium	1	10,000	1	500	5×10^6	Ref. 2, p. 91
Lead	1	1,000	1	50,000	5×10^7	Ref. 2, p. 135
Selenium	1	1,000	1	500	5×10^5	Ref. 2, p. 190
Silver	1	10,000	1	50	5×10^5	Ref. 2, p. 201
Zinc	1, OR	10	1	50,000	5×10^5	Ref. 2, p. 212
Mercury	1, OR	10,000	1	50,000	5×10^8	Ref. 2, p. 146
Aroclor-1248*	1 OR	10,000	1	50,000	5×10^8	Ref. 2, p. 168
Aroclor-1254*	1, OR	10,000	1	50,000	5×10^8	Ref. 2, p. 168
Aroclor-1260*	1, OR	10,000	1	50,000	5×10^8	Ref. 2, p. 168
Benz(a)anthracene	1	10,000	1	50,000	5×10^8	Ref. 2, p. 225
Benzo(a)pyrene	1	10,000	1	50,000	5×10^8	Ref. 2, p. 25
Benzo(g,h,i)perylene	1	0	1	50,000	0	Ref. 2, p. 36
Benzo(k)fluoranthene	1	0	1	50,000	0	Ref. 2, p. 58
Bis(2-ethylhexyl) phthalate	1	1,000	1	50,000	5×10^7	Ref. 2, p. 69
Chrysene	1	1,000	1	5,000	5×10^6	Ref. 2, p. 102
Dibenz(a,h)anthracene	1	0	1	50,000	0	Ref. 2, p. 113
Fluoranthene	1	10,000	1	5,000	5×10^7	Ref. 2, p. 47
Indeno(1,2,3-cd) pyrene	1	0	50,000	0	0	Ref. 2, p. 124

Table 13
Ecosystem Toxicity/Persistence/Bioaccumulation Factor Summary

Hazardous Substance	Source Number	Ecosystem Toxicity Factor Value	Persistence[1] Factor Value	Ecosystem Bioaccumulation [2] Value	Ecosystem Toxicity/ Persistence/ Bioaccumulation Factor Value	Reference
Phenanthrene	1	10,000	0.4	50,000	2×10^8	Ref. 2, p. 157
Pyrene	1,	10,000	1	50,000	5×10^8	Ref. 2, p. 179

Notes:
* As PCBs
[1] Persistence values assigned based on the Unnamed Stream and Coal Creek which have perennially flowing water, and thus classification as a River (Ref 1, Table 4-10).
[2] Ecosystem Bioaccumulation factor values are assigned from the SCDM (Ref. 2), for the type of water body "Fresh Water" (Ref. 1, Sect. 4.1.3.2.1.3).
[3] Fluoranthene is listed as benzo(j,k)fluoranthene in the SCDM (Ref. 2, p. 46).
OR – Observed Release

The hazardous substances with the highest Ecosystem Toxicity/Persistence/Bioaccumulation Factor Values are cadmium, mercury, aroclor-1248 (as PCBs), aroclor-1254 (as PCBs), aroclor-1260 (as PCBs), benz(a)anthracene, benzo(a)pyrene, and pyrene (Ref. 1, Table 4-16; Ref. 2, pp. 25, 80, 146, 168).

Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

4.1.4.2.2 Hazardous Waste Quantity

Source No.	Source Hazardous Waste Quantity Value	Containment			
		Ground Water	Surface Water	Gas	Air Particulate
1	1.976	NE	10	NE	NE
TOTAL	1.976				

NE= not evaluated

The sum of the hazardous waste quantity values is assigned as the Hazardous Waste Quantity Factor Value (Ref. 1, Sec. 2.4.2.2 and Table 2-6). The sum of the source hazardous waste quantity values for Surface Water pathway, rounded to the nearest integer is 1.976. As documented in Section 4.1.4.3.2.2 of this HRS documentation record, wetlands are subject to Level II concentrations; therefore, a minimum value of 100 can be assigned for the hazardous waste quantity factor value (Ref. 1, Section 2.4.2.2).

Sum of Values: 1.976
Hazardous Waste Quantity Factor Value (Ref. 1, Sec. 4.2.2.2, Table 2-6): 100

4.1.4.2.3 Waste Characteristics Factor Category Value

Ecosystem Toxicity/Persistence Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 100
Bioaccumulation Potential Factor Value: 50,000

(Ecosystem Toxicity/Persistence Factor Value) x (Hazardous Waste Quantity Factor Value) = 1×10^6 (maximum of 1×10^8 according to HRS Section 4.1.3.2.3)

(Ecosystem Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value) x (Bioaccumulation Potential Factor Value) = 5×10^{10} (maximum of 1×10^{12} according to HRS Section 4.1.4.2.3)

A hazardous waste quantity factor of 100 is assigned according to HRS Section 2.4.2.2. From Reference 2 and Table 4-12 of the HRS, cadmium, mercury, aroclor-1248 (as PCBs), aroclor-1254 (as PCBs), aroclor-1260 (as PCBs), and benzo(a)pyrene, have an ecosystem toxicity/persistence value of 10,000 and an ecosystem bioaccumulation potential factor of 50,000. The waste characteristics factor category value from Reference 1, Table 2-7 for a waste characteristics product of 5×10^{10} is 320.

Waste Characteristics Factor Category Value: 320

4.1.4.3 ENVIRONMENTAL THREAT – TARGETS

4.1.4.3.1 Sensitive Environments

4.1.4.3.1.1 Level I Concentrations

Level I concentrations cannot be established in the contiguous wetlands along the Unnamed Stream or Coal Creek.

Level I Concentration Factor Value: 0

4.1.4.3.1.2 Level II Concentrations

Wetlands were identified by ODEQ personnel within the Level II segment of the Unnamed Stream. ODEQ identified wetland vegetation including the Justicia Americana (American Water Willow), Ludwigia spp., Carex spp., and Chasmanthium Latifolium, as well as other herbaceous plants associated with wetland vegetation within the Level II contamination along the Unnamed Stream (Ref. 44, pp. 1, 4-18, 20-27; Ref. 45, pp. 1-2; Figure 6).

The total frontage of wetlands subject to Level II contamination when measured using mapping software, came to a total of 1,700 feet for frontage on both banks of the Unnamed Stream or approximately 0.32 miles (Ref. 44, pp. 1, 27; Ref. 45, pp. 1-2). A value of 25 is assigned from Table 4-24 of the HRS for a length of wetlands from 0.1 to 1 mile (Ref. 1, Sec. 4.1.4.3.1.2).

Threatened and endangered species have been reported within the general area, however, it is not known if their habitats overlap the zone of Level II contamination. Therefore, these other sensitive environments will not be evaluated (Ref. 5, pp. 232-237).

To obtain the Level II concentration factor, the sum of the sensitive wetlands value and sensitive environments value are added to obtain the Level II Concentration Factor Value (Ref. 1, Sec. 4.1.4.3.1.3).

Sensitive Wetlands Value (25) + Sensitive Environments Value (0) = 25

Level II Concentration Factor Value (Ref. 1, Sec. 4.1.4.3.1.2 and Table 4-24): 25

4.1.4.3.1.3 Potential Contamination

Within Coal Creek’s 15-mile TDL, there is an Oklahoma Department of Wildlife Conservation Wildlife Management Area. The Eufaula Wildlife Management Area lies within the last 0.5 mile of the TDL (Figure 5; Ref. 24, pp. 1, 10). This is state land designated for wildlife or game management and therefore has a sensitive environments rating of 25 (Ref. 1, Table 4-23).

Wetlands identified by the National Wetland Inventory are along the surface water pathway and front Coal Creek within the 15-mile TDL. These wetlands are classified as freshwater forested/shrub wetlands which meet the 40 CFR 230.3 definition of a wetland and are HRS eligible (Ref. 25, pp. 6, 16; Ref. 26, pp. 1-2). The wetland frontage along Coal Creek was calculated as a sum of the length of wetlands contiguous to the creek (Ref. 26, pp. 1-2).

Table 14
Wetland Frontage along Coal Creek

Type of Surface Water Body	Wetland Frontage (miles)	Wetland Value (Ref. 1, Table 4-24)	Reference
Coal Creek	3.436	100	Ref. 26, pp. 1-2

To obtain Potential Contamination Factor Value, the sum of the sensitive environments is added to the wetland value, which is then multiplied by the assigned surface water dilution weight for each water segment. This value is then divided by 10 to obtain the Potential Contamination Factor Value (Ref. 1, Sec. 4.1.4.3.1.3).

Table 15
Wetland Potential Contamination in Coal Creek

Type of Surface Water Body	Sum of Sensitive Environment Values (Sj)	Wetland Frontage Value (Wj)	Adjusted Dilution Weight (Dj)	(Wj + Sj)Dj
Coal Creek	25	100	0.1	12.5

Potential Contamination Factor Value
12.5 / 10 = 1.25

Potential Contamination Factor Value: 1.25

4.1.4.3.1.4 Environmental Threat – Targets Factor Category Value

The environmental threat target factor category value for the watershed is the sum of the values for the Level I Concentrations Factor Value, Level II Concentrations Factor Value, and Potential Contamination Factors Value (Ref. 1, Sec. 4.1.4.3.1.4).

Level I (0) + Level II (25) + Potential Contamination (1.25) = 1.25

Target Factor Category Value: 26.25

4.1.4.4 Calculation of Environmental Threat Score

The Environmental Threat Score is calculated by multiplying the environmental threat factor category values for the likelihood of release, waste characteristics, and targets for the watershed (Ref. 1, Sec. 4.1.4.4 and 4.1.4.3.1.4).
Likelihood of Release (550) x Waste Characteristics (320) x Targets (26.25) = 4,620,000
(rounded to the nearest integer).

This product is then divided by 82,500:

4,620,000 ÷ 82,500 = 56

The resulting value, subject to a maximum of 60, is assigned as the Environmental Threat Score.

Environmental Threat Score: 56

4.1.5 Calculation of Overland/Flood Migration Component Score for a Watershed

The overland/flood migration component score for the watershed is calculated by summing the scores for the Drinking Water Threat Score, Human Food Chain Threat Score, and Environmental Threat Score assigned as the Surface Water Overland/Flood Migration Component Score for a Watershed (Ref. 1, Sec. 4.1.5).

Drinking Water (0) + Human Food Chain (42.66) + Environmental (56) = 98.66

The resulting value, subject to a maximum of 100, is assigned as the Watershed Score.

Watershed Score: 98.66

4.1.6 Calculation of Overland/Flood Migration Component Score

The highest Surface Water Overland/Flood Migration Component Score for the Watershed evaluated (in this case, only one watershed was evaluated) is selected and assigned as the Surface Water Overland/Flood Migration Component Score for the site, subject to a maximum of 100 (Ref. 1, Sec. 4.1.6).

Component Score: 98.66

4.2 GROUND WATER TO SURFACE WATER MIGRATION COMPONENT

This component was not scored because an observed release was documented for the overland flow/flood component.

Ground Water to Surface Water Factor Value: NS

NS= Not scored

4.3 CALCULATION OF SURFACE WATER MIGRATION PATHWAY SCORE

The overland/flood migration component was scored and this value is assigned to the surface water migration pathway score.

Surface Water Migration Pathway Score: 98.66