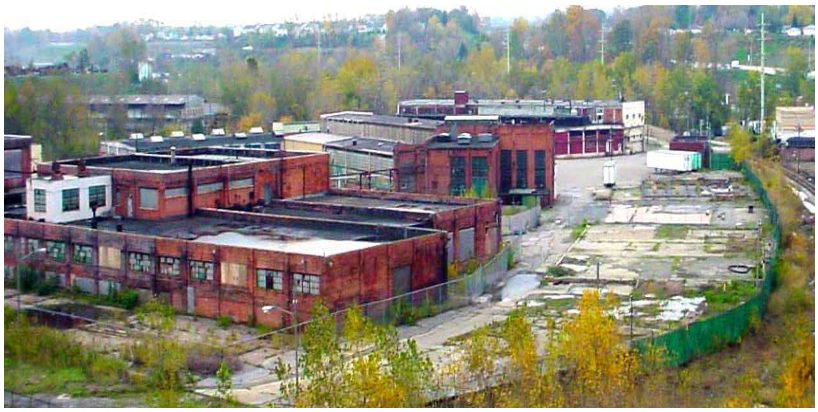
Former Harshaw Chemical Company Site
Cleveland, Ohio

U.S. Army Corps of Engineers
Buffalo District
March 2019

Building Strong ®

Formerly Utilized Sites Remedial Action Program

The Formerly Utilized Sites Remedial Action Program (FUSRAP) was initiated in 1974 to identify, investigate, and, if necessary, clean up or control sites throughout the United States contaminated by activities conducted as part of the nation's early atomic weapons and energy program. Congress transferred the administration and execution of FUSRAP from the U.S. Department of Energy (DOE) to the U.S. Army Corps of Engineers in 1997. The Corps of Engineers implements FUSRAP in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Title 40 of the Code of Federal Regulations (CFR), Part 300.



Former Harshaw Chemical Company Site (Historic Photo)

Site Description and Site History

The 55-acre former Harshaw Chemical Company Site is located at 1000 Harvard Avenue, approximately five miles southwest of downtown Cleveland in Cuyahoga County, Ohio. The site is located in an industrialized area that is bordered by the Cuyahoga River and Big Creek. The main portion of the facility at one time included over 30 buildings on about 16 acres of land.

The former Harshaw Chemical Company was contracted by the Manhattan Engineer District (MED) and later the Atomic Energy Commission (AEC) to support the nation's early atomic weapons program. From 1944 to 1959, various forms of uranium were processed in Building G-1 (formerly known as Plant C) at the Harshaw Site and sent to Oak Ridge, Tennessee, for further processing.

Investigations that addressed residual radiological contamination at the site were conducted by Argonne National Laboratory for the Atomic Energy Commission from 1976 to 1979. The current property owners conducted additional investigations in the 1990s and numerous buildings were demolished. The former Harshaw Chemical Company Site was included in FUSRAP in spring 2001 for further characterization of FUSRAP-related contaminants.

Corps of Engineers Investigations

In accordance with the phased process required in CERCLA, the Corps of Engineers has completed a preliminary assessment, a remedial investigation (RI) report, released in 2009; a feasibility study (FS) released in 2012; a feasibility study addendum (FSA), released in 2018; and proposed plan, released in 2018 for the Harshaw Site.

Remedial Investigation

The Corps of Engineers RI to determine the nature and extent of FUSRAP related materials and assess current and long-term risks was completed in 2009.

Nature and Extent of Contamination: Environmental samples collected during the RI to determine nature and extent of contamination focused on the following: buildings, soil, groundwater, surface water, sediment, sewers, and drains.

FUSRAP-related radioactive contaminants of concern identified at the site were radium, uranium, and thorium. The most significant concentrations of radioactive materials were identified in Building G-1, and soil and groundwater beneath and around Building G-1.

Surface water and sediment in Big Creek and the Cuyahoga River did not show impacts from FUSRAP-related contaminants that would pose a risk exceeding limits established in the NCP to human health or the environment.

Groundwater Model: The groundwater model investigated the fate and transport of groundwater and contaminants at the site. The findings include the following:

- Groundwater is not used as a drinking water source.
- The site groundwater is currently being treated for nickel contamination by another party.
- A plume of uranium impacted groundwater, located under and near Building G-1, is not expected to impact the river with concentrations of uranium above background levels within a 1,000-year period.

Baseline Risk Assessment: The baseline risk assessment included a human health risk assessment and an ecological risk assessment. Risks exceeding the limits established in the NCP were identified for the industrial worker, maintenance worker, resident, and subsistence farmer receptors when exposed to contaminated soil, especially in and around Building G-1. These risks indicated a need for remedial action and a FS to evaluate remedial action alternatives.

Investigative Area IA-06: During the RI, the Corps of Engineers divided the site into Investigative Areas (IAs). IA-06, a six-acre parcel located east of the Cuyahoga River, was found to be the least impacted portion of the site. (See Figure 1 on the next page.) No known process activities were conducted in IA-06 and, results from Corps of Engineers investigations concluded that there was no FUSRAP contamination in IA-06 that would pose a risk to human health or the environment. As a result, a record of decision for IA-06 was released in April 2011, indicating that no remedial action is required under FUSRAP for the current and reasonably anticipated future land use of IA-06, which is recreational.

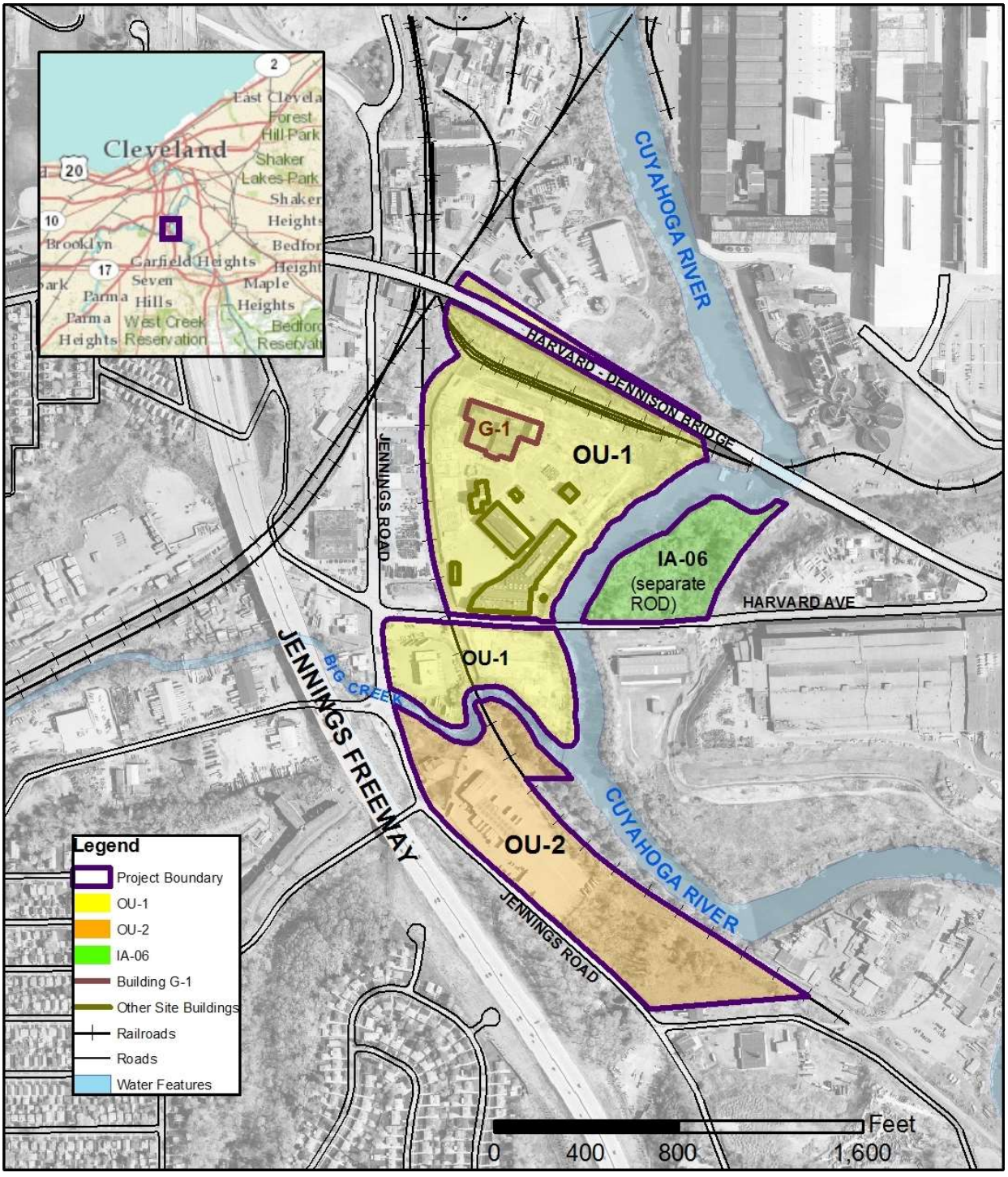


Figure 1. Site Location and Layout

*Note: The buildings outlined in OU-1 have been removed.

Feasibility Study

The Corps of Engineers released the FS during 2012, which identifies and evaluates potential remedial alternatives to eliminate potential risks to human health and the environment that exceed limits established in the NCP due to the presence of FUSRAP-related contamination.

Based on planned land uses for different areas of the site, the Harshaw Site was divided into two separate operable units (OUs). As shown in Figure 1 on the previous page, OU-1 is the portion of the site that is north of Big Creek and west of the Cuyahoga River. The planned future land use for OU-1 is industrial with the construction worker being defined as the group of individuals reasonably expected to receive the greatest exposure to residual radioactivity for any applicable set of circumstances. OU-2 is the portion of the site that is south of Big Creek and to the west of the Cuyahoga River. The planned future land use for OU-2 is residential with the adult resident being defined as the group of individuals reasonably expected to receive the greatest exposure to residual radioactivity for any applicable set of circumstances.

Based on the RI report and baseline risk assessment, constituents of concern (COC) in OU-1 and OU-2 are radium-226, thorium-230, thorium-232, and total uranium (U-234, U-235, U-238) for both soil and buildings.

The following steps were followed in the FS to develop remedial alternatives for the site:

Identification of Applicable or Relevant and Appropriate Requirements (ARARs): ARARs are standards or requirements under federal environmental or state environmental or facility siting laws. These standards are designed to be protective and are used to assess whether a particular alternative can meet those standards.

The Corps of Engineers identified 10 CFR 20 Subpart E, Radiological Criteria for License Termination, as the ARAR for remedial activities for OU-1 and OU-2. Specifically,

- 10 CFR 20.1402, Unrestricted Use: Total effective dose equivalent (TEDE) limited to 25 mrem/yr above background to the average member of the critical exposure group and demonstrated to be as low as reasonably achievable (ALARA). (Applies to Alternative 3 for OU-1 and Alternative 8 for OU-2 in the proposed plan.)

- 10 CFR 20.1403, Restricted Use: 25 mrem/yr above background TEDE to the average member of the critical group and demonstrated to be ALARA relying on durable land use controls and 100 mrem/yr to the average member of the critical exposure group if land use controls fail. (Applies to Alternative 2 for OU-1 and Alternative 6 for OU-2 in the proposed plan.)

Development of Alternatives: Remedial action alternatives for soil and buildings were identified. The development of alternatives was based on expected future land use where industrial use is likely for the OU-1 area and residential redevelopment is a reasonable potential future land use at the OU-2 area. CERCLA requires that alternatives ensure adequate protection of human health and the environment, achieve remedial action objectives, meet ARARs, and permanently and significantly reduce the volume, toxicity, and/or mobility of FUSRAP-related contaminants. The alternatives listed on the next page were identified in the FS to be carried forward for consideration:

- Alternative 1 - No Action (OU-1)
- Alternative 2 - Limited Action and Land Use Controls (OU-1)
- Alternative 3 - Complete Removal with Off-Site Disposal (OU-1)
- Alternative 4 - Complete Removal with *Ex Situ* Treatment and Off-Site Disposal (OU-1)
- Alternative 5 - No Action (OU-2)
- Alternative 6 - Limited Action and Land Use Controls (OU-2)
- Alternative 7 - Complete Removal with Off-Site Disposal (OU-2)
- Alternative 8 - Complete Removal with *Ex Situ* Treatment and Off-Site Disposal (OU-2)

Feasibility Study Addendum

During 2014 the Corps of Engineers removed Building G-1; excavated test pits to locate, assess, and terminate site utilities; and performed a geotechnical inspection and soil sampling to assess bank stability of the Cuyahoga River and Big Creek. In addition to the removal of Building G-1 by the Corps of Engineers, the property owner removed the warehouse, the former foundry, the former boiler house, the garage, and the former hydrogen fluoride plant wastewater treatment system building.

During 2015 the Corps of Engineers took soil borings and excavated test pits to characterize soil along an abandoned rail spur north of and around the former Building G-1, installed and sampled monitoring wells and temporary well points, and sampled groundwater from test pits to characterize contaminants in groundwater near the former Building G-1.

The FSA re-evaluates each alternative from the FS based on the results of the 2014 and 2015 building removals and additional investigations. The contaminated soil volumes and groundwater model were updated to reflect changes in site conditions and integrate new investigation data. The FSA concludes that uranium in groundwater will not pose a risk exceeding the limits established in the NCPto current and future land users or the Cuyahoga River environment.

Since the buildings on-site were removed, the quantity of waste material that their decontamination or demolition would have contributed to the alternative has been removed from the estimated volumes of contaminated material. The potential to use *ex situ* treatment was rolled in as an option in Alternatives 3 and 7. Because this made Alternatives 4 and 8 the same as Alternatives 3 and 7, Alternatives 4 and 8 were removed from consideration.

The table below updates the components of the potential remedial alternatives from the FS to reflect the components of the remaining potential alternatives in the FSA.

Operable Unit	Alternative	2012 Feasibility Study Components	Feasibility Study Addendum Components
OU-1	1 – No Action	None	None
	2 – Limited Action and Land Use Controls	Removal of Building G-1, off-site disposal of Building G-1 debris, bank stabilization, land use controls, and site monitoring	Land use controls and site monitoring
	3 – Complete Removal with Off-Site Disposal	Excavation of impacted soil exceeding the preliminary remediation goals (industrial future land use), off-site disposal, removal of Building G-1 and off-site disposal, decontamination of site buildings	Excavation of impacted soil exceeding the preliminary remediation goals (industrial future land use), and off-site soil disposal
OU-2	5 – No Action	None	None
	6 – Limited Action and Land Use Controls	Land use controls and site monitoring	Land use controls and site monitoring
	7 – Complete Removal with Off-Site Disposal	Excavation of impacted soil exceeding the preliminary remediation goals (residential future land use) and off-site disposal	Excavation of impacted soil exceeding the preliminary remediation goals (residential future land use) and off-site disposal

Comparative Analysis of Alternatives: The FSA presents a detailed comparative analysis between the remaining remedial alternatives. Each alternative is assessed against the following seven of the nine CERCLA evaluation criteria.

1. Overall protection of human health and the environment,
2. Compliance with ARARs,
3. Long-term effectiveness and permanence,
4. Reduction in toxicity, mobility, or volume through treatment,
5. Short-term effectiveness,
6. Implementability, and
7. Cost.

The table below briefly summarizes the comparative analysis for the CERCLA evaluation criteria for OU-1, which uses industrial preliminary remediation goals.

CERCLA Criteria	Alternative 1: No Action	Alternative 2: Limited Action and Land Use Controls	Alternative 3: Complete Removal with Off-Site Disposal
Overall protection of human health and the environment	Not Protective	Protective	Protective
Compliance with ARARs	Not Compliant	Compliant	Compliant
Long-term effectiveness and permanence	Low	Moderate	High
Reduction of contaminant toxicity, mobility, or volume through treatment	None	None	None[a]
Short-term effectiveness	High	High	Moderate
Implementability[b]	Not Applicable	Low	High
Cost Present Worth	$0	$6,186,258	$32,784,001

The table below briefly summarizes the comparative analysis for the CERCLA evaluation criteria for OU-2, which uses residential preliminary remediation goals.

CERCLA Criteria	Alternative 5: No Action	Alternative 6: Limited Action and Land Use Controls	Alternative 7: Complete Removal with Off-Site Disposal
Overall protection of human health and the environment	Not Protective	Protective	Protective
Compliance with ARARs	Not Compliant	Compliant	Compliant
Long-term effectiveness and permanence	Low	Moderate	High
Reduction of contaminant toxicity, mobility, or volume through treatment	None	None	None[a]
Short-term effectiveness	High	High	Moderate
Implementability[b]	Not Applicable	Low	High
Cost Present Worth	$0	$3,650,207	$5,909,693

*The footnotes below apply to both tables above.

[a] Waste minimization practices proposed under this alternative, such as radiological scanning and soil sorting, may reduce the volume of contaminated soil requiring disposal.

[b] The overall implementability is based on the lower of the ratings for technical and administrative implementability.

Alternatives 2, 3, 6, and 7 satisfy the CERCLA threshold criteria (overall protection of human health and the environment and compliance with applicable or relevant and appropriate requirements) and the balancing criteria (long-term effectiveness and permanence; reduction of contaminant toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, and cost).

The eighth and ninth criteria, state acceptance and community acceptance, are addressed after the public comment period following the release of the proposed plan. The proposed plan presents the preferred alternative for public comment.

Proposed Plan

The proposed plan outlines the remedial alternatives remaining from the FSA and identifies the preferred remedial alternatives to address FUSRAP-related soil contamination at the Harshaw Site for OU-1 and OU-2, which are Alternative 3—Complete Excavation and Off-Site Disposal (OU-1) using industrial preliminary remediation goals based on an industrial reasonable future land use and Alternative 7—Complete Excavation and Off-Site Disposal (OU-2) using residential preliminary remediation goals based on a residential reasonable future land use.

These alternatives involve complete excavation of FUSRAP-impacted soils exceeding their respective ARAR-based preliminary remediation goals, transportation and off-site disposal of soils, confirmatory sampling and site restoration. Both alternatives will be protective of human health and the environment, comply with ARARs, are cost effective, use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

What's Next

The FSA, proposed plan, and supporting documents are available in the Reports Section of the Buffalo District website at: http://www.lrb.usace.army.mil/Missions/HTRW/FUSRAP/Harshaw-Site/
and have been placed in the Administrative Record for the Harshaw Site (locations listed on the next page). The public is encouraged to review and comment on all the alternatives presented in the proposed plan. The public comment period for the proposed plan begins March 4, 2019 and ends May 4, 2019.

A public meeting will be conducted April 2, 2019, at the Holiday Inn Cleveland South (6001 Rockside Road, Independence, OH 44131) beginning with a poster session at 6:30 p.m. The presentation will start at 7 p.m.A court recorder will be available to record verbal comments after the presentation portion of the meeting. Written comments may be provided that evening, emailed to fusrap@usace.army.mil, or mailed before the close of the comment period to the address below:

U.S. Army Corps of Engineers, Buffalo District
Attention: Environmental Project Management Team
1776 Niagara Street
Buffalo, NY 14207

The preferred alternative may be modified based on any new information acquired during the designated public comment period. Responses to comments received will be provided in the record of decision, which will identify the selected remedy to be implemented.

Administrative Record

The Administrative Record for the former Harshaw Chemical Company Site contains documents that support the CERCLA process for the site. It is available for review electronically at the following locations:

Cleveland Public Library
Public Administration Library
325 Superior Avenue, N.E.
Cleveland, OH 44114

Cuyahoga County Library
(Brooklyn Branch)
4480 Ridge Road
Brooklyn, OH 44144-3353

U.S. Army Corps of Engineers
(By appointment)
1776 Niagara Street
Buffalo, New York 14207