



# CUYAHOGA RIVERBANK INSPECTION AND SOIL SAMPLING HARSHAW CHEMICAL COMPANY FUSRAP SITE

**U.S. Army Corps of Engineers  
Buffalo District**

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April 2016

Formerly Utilized Sites Remedial Action Program (FUSRAP)

FUSRAP was initiated in 1974 to identify, investigate, and clean up or control sites throughout the United States that were part of the Nation's early atomic weapons and energy programs during the 1940s, 1950s, and 1960s. When implementing FUSRAP, the Corps of Engineers follows the investigation and response framework of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan.

## Site Description

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 in a low-lying area adjacent to the Cuyahoga River and Big Creek and is surrounded on three sides by industries. It includes several developed and undeveloped land parcels.

## Scope

On November 13, 2014, the Corps of Engineers inspected bank stability of the Cuyahoga River and Big Creek. The inspection focused on eight areas, identified as A through H, shown on Figure 1. The inspection of Area A indicated a large, localized area of sloughing. There is a known area of FUSRAP-related contamination, identified in the RI, near Area A. In the spring of 2015, Corps of Engineers personnel visually inspected Area A and determined additional erosion had occurred and sampling was needed.

On August 24, 2015, Corps of Engineers personnel collected 12 riverbank soil samples from Area A, as shown in Figure 2 and Table 1. The Corps of Engineers obtained samples at different elevations, from river level to the top of the riverbank, with a range of approximately 11 feet. The Corps of Engineers analyzed the samples for FUSRAP-related contaminants: isotopic radium (Ra-226), isotopic thorium (Th-228, Th-230, Th-232), and isotopic uranium (U-234, U-235, U-238.) A representative of the Ohio Environmental Protection Agency was present to observe and assist with the sampling event.

Corps of Engineers personnel scanned the eroded area with 2-inch x 2-inch sodium iodide gamma radiation detectors. The scans indicated no readings above background, so samples were spaced on an unbiased triangular sampling grid. The Corps of Engineers collected the soil samples using stainless steel spoons and bucket augers. Construction debris present in the soil sampling area had to be avoided. The result was an imperfect triangular grid. The Cuyahoga River water level was at its annual average, 3 feet, on the sampling date, based on U.S. Geological Survey's Cuyahoga River hydrographic estimates. Attachment 1 contains photographs of the field activities.

## Results and Interpretation

Tables 2 and 3 present the analytical results. Table 2 presents the individual sample results, and Table 3 presents minimum, maximum, and average values for each of the radionuclides. Both tables include site-specific background values.

The riverbank soils are not releasing FUSRAP-related contamination from the site. The Corps of Engineers did not evaluate non-FUSRAP-related contamination. The riverbank analytical results are well below radiological and chemical screening levels which are protective of human health and the environment, for both aquatic and terrestrial ecosystems.

## References

Sheppard, S.C., M. I. Sheppard, M-O Gallerand, and B. Sanipelli, 2005. *Derivation of ecotoxicity thresholds for uranium. Journal of Environmental Radioactivity* 79(1):55-83.

United States Army Corps of Engineers 2009. *Former Harshaw Chemical Site Remedial Investigation Report, Revision 1.* October.

United States Army Corps of Engineers 2012. *Former Harshaw Chemical Company Site Feasibility Study Report, Revision 0.* September.

United States Department of Energy (U.S. DOE) 2002. DOE Technical Standard, *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota.* (DOE-STD-1153-2002) U.S. Department of Energy, Washington, D.C. 20585 <http://energy.gov/ehss/biota>

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ATTACHMENT 1–CUYAHOGA RIVERBANK SOIL SAMPLING PHOTOS

HARSHAW CHEMICAL COMPANY FUSRAP SITE

AUGUST 24, 2015

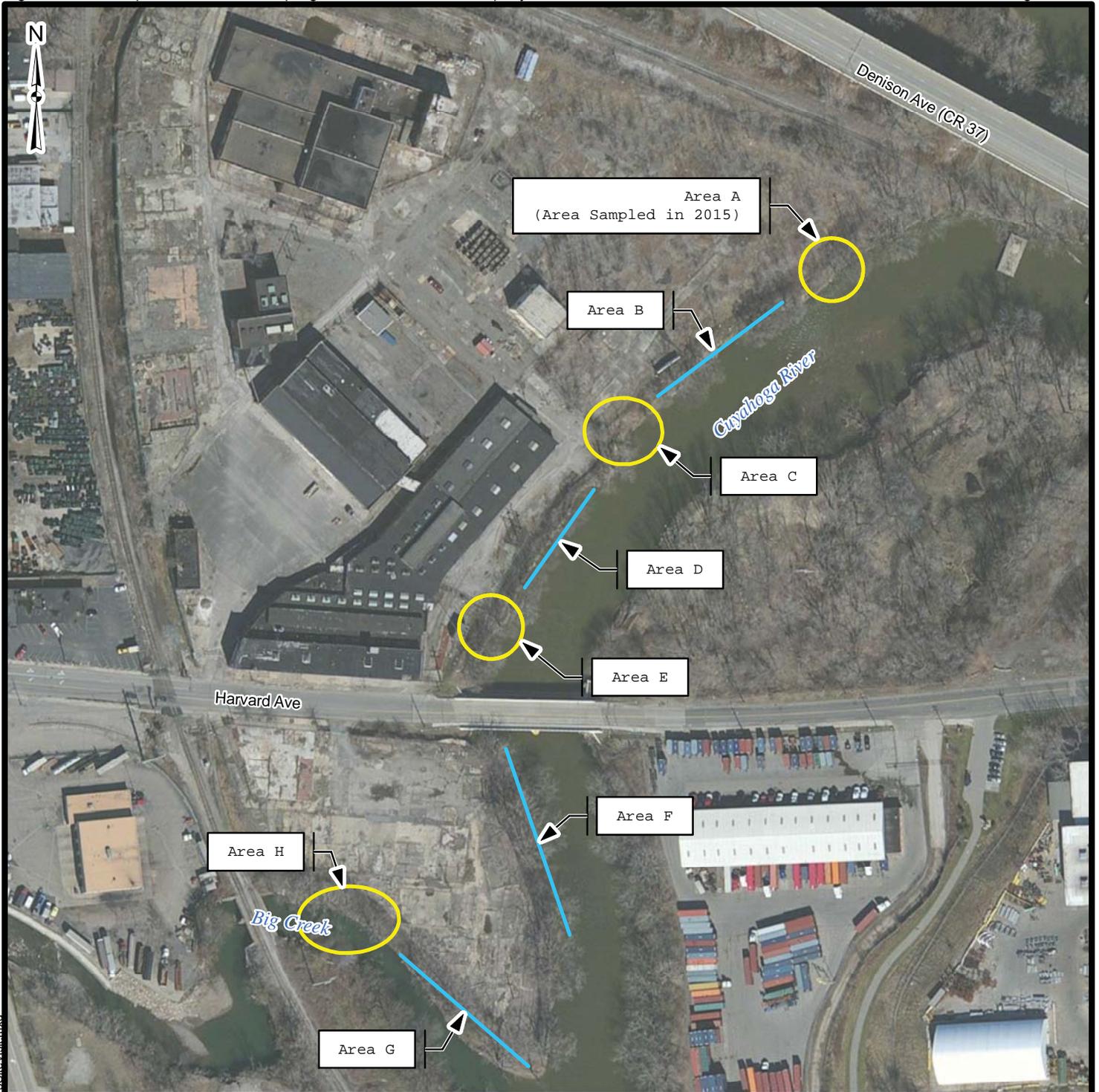


Photo circa 2012. Many buildings on the Harshaw Site have since been removed.



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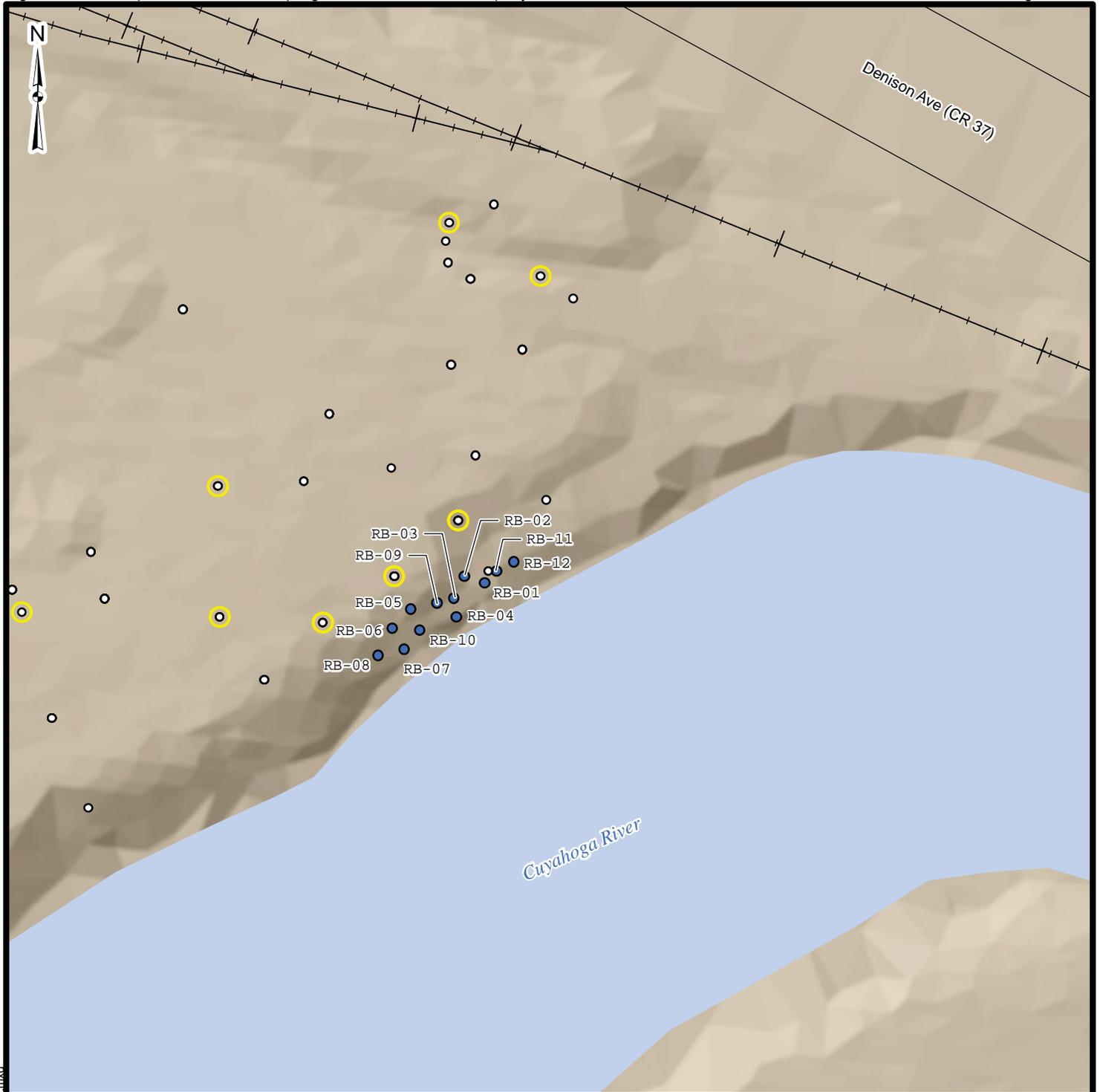
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AREAS IDENTIFIED DURING THE 13 NOVEMBER 2014  
SITE VISIT

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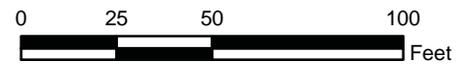
FORMER HARSHAW CHEMICAL COMPANY  
CLEVELAND, OHIO

FIGURE 1



**Legend**

- 2015 Riverbank Soil Sample
- Pre-2015 Soil Sample Location
- Soil Sample Exceeds Feasibility Study Cleanup Goals
- +— Railroad



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**SOIL SAMPLES NEAR ERODED AREA**

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**FORMER HARSHAW CHEMICAL COMPANY  
 CLEVELAND, OHIO**

**FIGURE 2**

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**TABLE 1**  
**SURVEY DATA FOR RIVERBANK SOIL SAMPLE LOCATIONS**  
**HARSHAW CHEMICAL COMPANY FUSRAP SITE**

<b>Location Description</b>	<b>Point Number</b>	<b>Northing *</b>	<b>Easting *</b>	<b>Surface Elevation ** (feet amsl)</b>
RB-1	60928	650,458.0280	2,192,454.7590	575.10
RB-2	60919	650,460.2940	2,192,447.6910	580.89
RB-3	60920	650,452.6400	2,192,443.9930	577.31
RB-4	60927	650,446.0110	2,192,444.8180	572.99
RB-5	60922	650,448.7740	2,192,428.8410	583.36
RB-6	60923	650,442.0550	2,192,422.3270	582.74
RB-7	60925	650,434.6940	2,192,426.5060	573.69
RB-8	60924	650,432.5110	2,192,417.3080	580.38
RB-9	60921	650,451.0520	2,192,437.9630	581.06
RB-10	60926	650,441.3780	2,192,431.9360	575.89
RB-11	60918	650,462.1470	2,192,458.9380	576.53
RB-12	60917	650,465.4110	2,192,465.2010	577.27

**NOTES:**

\* = Coordinate System: NAD 1983, Ohio North 3401 Zone

\*\* = Vertical Datum NGVD 88

amsl = above mean seal level

**TABLE 2**  
**SUMMARY OF DETECTED RADIOISOTOPES IN RIVERBANK SOIL SAMPLES**  
**HARSHAW CHEMICAL COMPANY FUSRAP SITE**

NAME	MATRIX	UNITS	SITE-SPECIFIC SURFACE SOIL BACKGROUND*	LOCATION ID											
				RB-01	RB-02	RB-03	RB-04	RB-05	RB-06	RB-07	RB-08	RB-09	RB-10	RB-11	RB-12
RADIUM-226	SO	pCi/g	1.41	1.656	1.627	1.573	1.182	1.347	1.677	1.184	1.492	1.325	0.862	1.262	1.299
THORIUM-228	SO	pCi/g	1.41	0.901	0.915	1.01	0.953	0.475	0.752	0.947	0.798	1.27	0.763	0.76	0.921
THORIUM-230	SO	pCi/g	1.21	1.21	1.15	1.45	0.904	0.855	1.36	0.905	0.928	1.6	0.917	0.608	0.67
THORIUM-232	SO	pCi/g	1.41	1.06	0.918	0.978	0.708	0.484	0.217	0.93	0.598	1.01	0.754	0.626	0.779
URANIUM-234	SO	pCi/g	2.42	0.935	1.13	1.03	9.14	3.23	3.08	2.08	7.48	4.34	0.902	2.65	0.872
URANIUM-235	SO	pCi/g	0.106	0.084	0.032	0.073	0.448	0.131	0.174	0.131	0.459	0.249	0.089	0.12	0.047
URANIUM-238	SO	pCi/g	2.42	0.953	1.16	0.955	8.79	3.08	3.22	2.01	7.68	4.94	0.688	2.14	0.873

## NOTES:

SO = soil

pCi/g = picocurie per gram

\* = Site-specific background value for surface soil (0 to 2 feet) as presented in Table 5-1 RI (2009)

**TABLE 3**  
**SUMMARY OF RESULTS FOR CUYAHOGA RIVERBANK SOIL SAMPLE LOCATIONS**  
**HARSHAW CHEMICAL COMPANY FUSRAP SITE**

NAME	MATRIX	UNITS	MINIMUM	MAXIMUM	AVERAGE	SITE-SPECIFIC SURFACE SOIL BACKGROUND*
RADIUM-226	SO	pCi/g	0.86	1.68	1.37	1.41
THORIUM-228	SO	pCi/g	0.48	1.27	0.87	1.41
THORIUM-230	SO	pCi/g	0.61	1.60	1.05	1.21
THORIUM-232	SO	pCi/g	0.22	1.06	0.76	1.41
URANIUM-234	SO	pCi/g	0.87	9.14	3.07	2.42
URANIUM-235	SO	pCi/g	0.03	0.46	0.17	0.106
URANIUM-238	SO	pCi/g	0.69	8.79	3.04	2.42

NOTES: SO = soil  
pCi/g = picocurie per gram  
\* = Site-specific background value for surface soil (0 to 2 feet) as presented in Table 5-1 RI (2009)

ATTACHMENT 1-CUYAHOGA RIVERBANK SOIL SAMPLING PHOTOS  
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AUGUST 24, 2015



Photograph 1: Looking south at Area A of Cuyahoga Riverbank. Sloughing and erosion is seen in the middle portion of the photograph.



Photograph 2: Close-up of riverbank erosion. A large piece of debris that has sloughed from the bank is visible in the middle section of the photograph.

ATTACHMENT 1-CUYAHOGA RIVERBANK SOIL SAMPLING PHOTOS  
HARSHAW CHEMICAL COMPANY FUSRAP SITE  
AUGUST 24, 2015



Photograph 3: Survey of riverbank area with 2-inch x 2-inch sodium iodide gamma radiation detectors.



Photograph 4: Looking south at completed sample locations marked with pin flags.