

Department of Energy

Formerly Utilized Sites Remedial Action Program (FUSRAP) – Northeast Ohio

Harshaw Chemical Company

Cleveland, Ohio

The former Harshaw Chemical Company is located at 1000 Harvard Avenue in Cleveland, Ohio, three miles south of downtown Cleveland. The site is located adjacent to the Cuyahoga River and Big Creek in an industrialized area in Cuyahoga County. The 55 acres include several developed and undeveloped land parcels near the intersection of Harvard Avenue and Jennings Road. Developed site parcels include former production areas with remaining facility buildings, former production area foundations, and parking areas associated with previously demolished buildings, and re-developed commercial properties. The Harshaw Chemical Company (HCC) conducted chemical and radiological research and production under contract to the Manhattan Engineer District (MED) and the Atomic Energy Commission (AEC) from 1942 through 1959. Numerous materials were produced by refining uranium oxide feed material.

The United States Army Corps of Engineers (USACE) - Buffalo District completed a preliminary assessment for the former Harshaw Chemical site in April 2001. The assessment concluded that although there was no imminent threat to human health or the environment, the site should undergo further investigation. The USACE is the lead agency for the investigation of the nature and extent of the contamination and the site cleanup. The state of Ohio (Ohio EPA and Ohio Department of Health) provides technical feedback and regulatory oversight of the investigation and cleanup.

SITE HISTORY

The site was initially purchased by the Harshaw, Fuller & Goodwin Company in 1905 and commercially manufactured chemical solvents, metal salts, fluorides, hydrofluoric acids, and other chemical products at the Harvard Avenue location. The HCC began production of chemical and radiological compounds for the MED in late 1942. Under the Atomic Energy Act of 1946, the AEC was created to oversee the United States' nuclear energy program. The AEC effectively assumed control of all MED operations on January 1, 1947. The HCC conducted numerous additional chemical and radiological research and production activities for the MED and later for the AEC through the end of government-contracted operations in 1959. The HCC continued to conduct commercial chemical production throughout the period of MED/AEC contracted operations.

Operational History

Harshaw's primary radiological process involved refining uranium oxide to produce several uranium-bearing materials including uranium hexafluoride (UF₆), uranium tetrafluoride (UF₄), and uranium tetrachloride (UCl₄). Generally, two types of uranium refining processes were employed during the 1940s and 1950s: "dry" and "wet". The dry process included the conversion of uranium oxide (U₃O₈) feed material to UF₆. The product, UF₆, was further purified using fractional distillation. The wet process used chemical solvent extraction to produce purified uranium compounds earlier in overall

production when compared to the dry process. The wet process became the preferred method of uranium refining. Historic documents indicate that both the dry and wet processes were used by the HCC at the Harvard Avenue location.

Harshaw's primary uranium production contract was Letter Contract W-7405-ENG-276, dated January 5, 1944. This contract authorized the construction and operation of a UF₆ production facility (later known as Plant C or Building G-1). MED Contract W-7405-ENG-276 was finalized and signed on May 27, 1944. This contract served as the primary vehicle for the production of UF₄, UF₆, and uranium dioxide (UO₂) by the HCC until production ceased in the early 1950s. The HCC received the final release and assignment of MED Contract W-7405-ENG-276 on December 23, 1959.

Regulatory History

During the period of government-contracted operations at Harshaw, the facility was not subject to regulatory requirements other than those required by specific contracts or security procedures (as typical with other government-contracted facilities of the period). The HCC was not subject to environmental, radiological, or hazardous waste regulatory requirements although operation-specific material, equipment, radiological, and health and safety requirements were administered by both MED and AEC.

Additional regulatory items associated with the site include:

- Historic documents indicate the HCC held numerous AEC licenses authorizing the use and possession of specific radioactive materials between 1957 and 1973.
- Records acquired from Ohio Environmental Protection Agency (Ohio EPA) indicate one or more National Pollutant Discharge Elimination System (NPDES) permits or City of Cleveland permits may have been held by the HCC. These permits are related to process-related waste discharges occurring after 1960.
- A Resource Conservation and Recovery Act (RCRA) Part B Permit Application was filed for the facility when due in November 1988 and was later closed prior to actual permit issuance. Several historic documents identified possible solid or hazardous waste landfill operations on HCC property (apparently related to disposal areas located southwest of main site), but none of these documents referenced any landfill or disposal permits or licenses.

Previous Investigations

Several previous investigations conducted primarily addressed radiological contamination associated with government-contracted production operations:

- Argonne National Laboratory performed a study for the AEC to determine the condition of sites formerly used by the MED and AEC. This study was performed from 1976 to 1979 and concluded that "significant" levels of contamination were still present in 17 buildings and at 32 exterior locations.
- Chemical Waste Management performed a radiological assessment of Building C (Building G-1) in 1992. This study was performed to determine the extent of contamination within the building.
- Foster Wheeler Environmental Corporation (FWEC) performed decontamination and decommissioning on Building G-1 in 1995. As a first phase of this effort,

additional characterization was performed to determine the accuracy of previous characterization work and to quantify the extent of contamination within the building. Subsequent to characterization, FWEC removed piping and asbestos containing material and performed limited decontamination of selected floor areas. The radioactive waste and asbestos generated during this effort were stored in Building G-1 under the mezzanine on the north side of the building and have not been removed to date.

- Numerous radiation surveys of existing buildings and structures were conducted by B. Koh & Associates, Inc. for the current property owners. Survey results were submitted to the Nuclear Regulatory Commission (NRC) along with requests for free release determinations. Many of the released buildings and structures were demolished and disposed accordingly.
- B. Koh & Associates, Inc. also conducted environmental investigations for most of the site. The investigations included soil, sediment, surface water, and ground water sampling conducted primarily to characterize radiological conditions associated with past operations.
- Blasland, Bouck & Lee also conducted chemical soil sampling for former Parcels A, B, and C (currently defined as portions of IA03 and IA04, IA06, and the southern portion of IA07, respectively).

The facility was designated under DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP) on June 3, 1999. The DOE began the FUSRAP in 1974 to study sites involved in World War II and Manhattan Project activities, as well as peacetime activities under the Atomic Energy Commission. In October 1997, Congress, through the Energy and Water Development Appropriations Act, transferred responsibility for the administration and execution of FUSRAP to the USACE.

Current Harshaw Site Status

The Remedial Investigation is scheduled for completion in 2009. The cleanup of the contamination may not begin until 2012 or later.

Related Link: [US Army Corps of Engineers](#)

For environmental questions relating to this site contact:

[Kurt Kollar](#)
Ohio EPA
(330) 963-1200