

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** AC Spark Plug  
Flint, Michigan

**TIME PERIOD:** 1946- 1947

**DESCRIPTION OF ACTIVITIES:**

AC Spark Plug was principally engaged in beryllium work. However, records indicate that 2.19 lbs of thorium metal was procured by the AC Spark Plug Company in December 1946, for research purposes.

Documentation reviewed was not specific as to the origination or production of this material. It is non-discernable as to whether AC Spark Plug was involved in refining thorium ores, metal production and/or metal workings.

While the quantity of material (2.19 lbs) is identified, the form of the material is not. It is not clear if the material was 5-7% ThO<sub>2</sub> ore, powder, or metal. Additionally, specific activities conducted with this material, final accountability or disposition and/or decontamination efforts are not contained within the reviewed documentation.

The start date 1946 appears to be supported however, a definitive determination cannot be reached with respect to the end date, without more descriptive documentation related to the disposition of the 2.19 lbs. of thorium.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE, and an internal DOE FUSRAP evaluation document.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Aeroprojects, Inc.  
West Chester, Pennsylvania

**ALSO KNOWN AS:** Sonabond Ultrasonics

**TIME PERIOD:** 1951-1973

**DESCRIPTION OF ACTIVITIES:**

Aeroprojects, Inc. performed research and development in areas of instrumentation, welding, filling of tubes with powders, extrusion, solidification and cleaning, under contract with the AEC from 1951 through 1973. While the exact quantities of materials used are not known, the alloys involved included compounds of thorium and uranium among other non-radioactive elements.

There is reason to believe that during the period of operation from 1951 through 1973, Aeroproject, Inc. did, on occasion, utilize site property for burial of uranium/thorium waste. However, radiological surveys of the property performed in 1988 do not indicate exposure levels/rates above natural background. However, there is documentation that during facility cleaning in 1975 and 1976 (outside the period in which weapons-related production occurred), some uranium shavings and slugs were discovered and buried on the site as well. These items, as described, are deemed significant enough to expand the listed dates through 1976.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques discussing radiological surveys performed for the DOE, written information provided by the present site owner (as of 1990), along with internal DOE FUSRAP and Office of Environmental Restoration documents.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1951-1976

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Ajax Magnathermic Corp.  
Youngstown, Ohio

**TIME PERIOD:** 1958-1962

**DESCRIPTION OF ACTIVITIES:**

From 1959 through 1961, Ajax Magnathermic Corp. conducted feasibility tests on various sizes and shapes of uranium rods and tubes under contract to NLO (Fernald). In 1961, Ajax Magnathermic was developing and testing a newly designed induction coil for NLO (Fernald), to heat treat uranium cores. The new design was not fully successful and the old coil configuration was retained.

Multiple documents and radiological surveys were available demonstrating implementation of radiological contamination controls and representative monitoring during operations, along with descriptions of post-operational decontamination and area monitoring. These actions and documentation demonstrate elimination of the potential for residual radiological contamination.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website, documentation provided by the DOE Worker Advocacy Group consisting of an internal DOE FUSRAP evaluation document, and multiple NLO (Fernald) documents describing visits, inspections and/or radiological surveys of the Ajax Magnathermic facility.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Alba Craft Shop  
Oxford, Ohio

**TIME PERIOD:** 1952-1957; DOE 1994-1995 (Decontamination)

**DESCRIPTION OF ACTIVITIES:**

Alba Craft Shop performed a variety of machine shop services on uranium metals for the National Lead Company of Ohio (Fernald) during the period of 1952 through 1957. Production scale operations consisted of hollow drilling and turning of uranium slugs for the Savannah River and Hanford plutonium production reactors.

Survey results from 1992 confirm the presence of residual contamination, thirty-five years after operations ceased. While the conditions discovered in 1992 are well defined, there is no method to determine the actual conditions left at the end of operations in 1957.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included, the Department of Energy (DOE) Worker Advocacy Website, documentation provided by the DOE Worker Advocacy group consisting of an internal DOE FUSRAP evaluation document, DOE-EM publication "Linking Legacies", and Army Core of Engineers Formerly Utilized Sites Remedial Action Program (FUSRAP).

Reviewed ORNL Report (ORNL/RASA-92/14); Results of the Radiological Survey at the Former Alba Craft Laboratory Site Properties, Oxford Ohio; Issued March 1993.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1952 - 1995

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Albany Research Center  
Albany, Oregon

**ALSO KNOWN AS:** ARC  
U.S. Bureau of Mines  
Albany Metallurgical Research Center  
Oregon Metallurgical Corp.

**TIME PERIOD:** 1948-1978 and 1987-1993 (Remediation)

**DESCRIPTION OF ACTIVITIES:**

From 1948-1978, the Bureau of Mines conducted metallurgical research at the Albany Research Center for the AEC and ERDA. Beginning in 1955, the site performed research on alloys of uranium and thorium under an AEC contract. Metallurgical operations also included melting, machining and welding. Documentation indicates that the Oregon Metallurgical Corp. possessed production quantities of radioactive materials for work requested by NLO (Fernald) in November 1958.

Contracted services involving radioactive materials at this facility appear to have ended in 1978. However, a radiological survey of the site and facilities, performed in 1982 by a DOE subcontractor, identified significant levels of contamination, both fixed and removable. Documentation available for this review did not contain activity levels of the identified radioactive contamination but, based on the description of conditions in the documentation, the potential for significant residual contamination existed between 1978 and the beginning of cleanup activities (1987).

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group, consisting of contracting information from the period in which weapons-related production occurred, DOE FUSRAP documentation, and internal/external communiques.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1948 - 1993

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Aliquippa Forge  
Aliquippa, Pennsylvania

**ALSO KNOWN AS:** Vulcan Crucible Steel Co.  
Universal Cyclops, Inc.

**TIME PERIOD:** 1947-1950 and 1983-1994

**DESCRIPTION OF ACTIVITIES:**

In the late 1940s, Aliquippa Forge (previously Vulcan Crucible) was a supplier of rolled uranium rods used in Hanford's reactors. The AEC operated a rolling mill, two furnaces and cutting and extrusion equipment at Vulcan. Work at the site ended after decontamination efforts were finalized by the operator in 1950.

Operations ceased in 1950. However, a subsequent radiological survey of the facility performed in May 1978, identified uranium contamination throughout several areas of the facility. From 1986 through 1988, phase one of a FUSRAP cleanup was begun and the area was isolated from access until 1993 when phase two was begun and completed in 1994.

Documentation reviewed indicates the potential for significant residual contamination outside of the period in which weapons-related production occurred (between 1950 and 1983).

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE, as well as information contained on the Army Corps of Engineers Formerly Utilized Site Remedial Action Program (FUSRAP) website.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1947 - 1994

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Allegheny-Ludlum Steel  
Watervliet, New York

**TIME PERIOD:** 1950-1952

**DESCRIPTION OF ACTIVITIES:**

Allegheny-Ludlum Steel rolled uranium billets into rods for the AEC as part of the multi-site process overseen by the New York Operations Office for the production of uranium metal for fabrication into slugs for fueling the Hanford production reactors.

While full records were not immediately available to review, processes, material forms, objectives, oversight by AEC during operations, and contractual requirements to recover and return all uranium-bearing materials, are documented well enough to determine it unlikely that significant residual radioactive contamination existed after operations. This determination is further supported by radiological survey results from 1976 and 1980, finding no radiation above background levels.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and historical documentation from written publications.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Allied Chemical and Dye Corp.  
North Claymont, Delaware

**ALSO KNOWN AS:** General Chemical Div., Allied Chemical and Dye Corp.  
Allied Chemical Corp.  
Union Texas Petroleum Div.

**TIME PERIOD:** Early 1950s - Late 1960s

**DESCRIPTION OF ACTIVITIES:**

Allied Chemical and Dye Corp. was involved in research and development and small pilot-scale operations on uranium recovery from a phosphoric acid plant. Former AEC employees estimated that, at most, only a few pounds of uranium concentrate were produced.

Documentation does not specifically identify the periods of operation or quantify the media or uranium concentrations introduced to the processes. Documentation does, however, indicate that when operations ceased, there was a low potential for residual contamination based on the fact that only a few pounds of uranium concentrate were reportedly separated and recovered through filtration methods. Additionally, no radiological survey data or documentation that decontamination efforts were ever implemented were available for review.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE, and historical documentation.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Allied Chemical Corp. Plant  
Metropolis, Illinois

**ALSO KNOWN AS:** General Chemical Division

**TIME PERIOD:** 1959-1976

**DESCRIPTION OF ACTIVITIES:**

After World War II, many companies working for the United States Government produced  $UF_6$  feed for uranium enrichment and diffusion plants. The Allied Plant in Metropolis, Illinois was completed and initial deliveries began sometime in 1959. In 1962, several feed plants were shut down and the privately-owned Allied Chemical Corp. Plant in Metropolis, IL, took over the conversion of  $U_3O_8$  to  $UF_6$ . This plant produced approximately five thousand tons of uranium hexafluoride feed for the Paducah Gaseous Diffusion Plant per year. It was shut down in 1964. Though it later reopened, it is not clear that any material after this date was used in the atomic weapons production process.

Documentation available for review supports the start date of 1959. There is no available documentation to clearly define the radiological status of the facility at the end of weapons related work in 1976 but based on the nature of the work, there is a high degree of probability that residual contamination exists beyond the period in which weapons-related production occurred and is indistinguishable from contamination resulting from commercial operations.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE, and historical documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information required

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Allis-Chalmers Company  
West Allis, Milwaukee, Wisconsin

**TIME PERIOD:** 1943-1944

**DESCRIPTION OF ACTIVITIES:**

Allis-Chalmers Company constructed a new facility in 1943, near Milwaukee, under a contract negotiated with Army engineers. The purpose of this facility was to manufacture pumps necessary to transport process gas through cascade barriers of the K-25 plant. This facility was also used to wind silver strips around magnet coils for use in the Y-12 project.

In December of 1943, the Y-12 project sent back to Allis-Chalmers all of the coils, which were found to have internal shorts due to rust or other sediment in the cooling oil. The objective was to clean the internal windings without complete dismantlement.

It should be noted that the documentation reviewed does not firmly establish that the coils returned to Allis-Chalmers were contaminated internally or externally with uranium. Failure of these components was discovered in late October 1943 during the first testing of the magnet coils during system shakedowns, and prior to startup of the process and/or plant.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE, and historical publication text.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Aluminum Company of America (ALCOA) (New Jersey)  
Garwood, New Jersey

**TIME PERIOD:** 1944

**DESCRIPTION OF ACTIVITIES:**

Under subcontract to the Metallurgical Laboratory (University of Chicago), the Garwood facility manufactured casting dies and used them to cast uranium slugs. This work was conducted intermittently between July and October of 1944.

The potential for residual contamination, post-operations, is low.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of contracting information from the period in which weapons-related production occurred, DOE FUSRAP documentation, and/or internal/external communiques.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Aluminum Co. of America (ALCOA)  
New Kensington, Pennsylvania

**ALSO KNOWN AS:** Aluminum Research Companies  
New Kensington Workers of ALCOA on Pine and 9<sup>th</sup> Streets

**TIME PERIOD:** 1944-1945

**DESCRIPTION OF ACTIVITIES:**

The Aluminum Co. of America (ALCOA) site in New Kensington, Pennsylvania was one of 14 facilities in the early 1940s that produced nuclear fuel for the X-10 pilot plant reactor in Oak Ridge, Tennessee and the production reactors at Hanford, Washington. ALCOA used a unique welding process to "can" and seal uranium slugs produced by these other facilities.

Documentation indicates that operations began in the spring of 1943 at the Pine and Ninth Street location within Buildings #29 and #44. There was no radiological survey data provided for Building #44. Documentation of radiological surveys was provided from the early 1990's confirming the absence of residual contamination at Building #29 (600 Freeport Road), and a Building #18 (Pine and Ninth Street).

It is unclear if Building #44 has been surveyed, and without such data a definitive determination cannot be made with respect to the potential for residual contamination.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE, and historical documentation. Pertinent documentation reviewed included:

1. Aerospace Corporation Letter from Charles Young to Andrew Wallo, dated 18 November 1987, "Recommendation For Site Visit Aluminum Company of America Site New Kensington, Pennsylvania."
2. ORNL Survey Report (ORNL/RASA-92/4); Results of the Radiological Survey at the Alcoa Research Laboratory, 600 Freeport Road, New Kensington Pennsylvania (ANK001); October 1992.
3. ORNL Survey Report (ORNL/RASA-92/5) Results of the Radiological Survey at the Former ALCOA New Kensington Works, Pine and Ninth Streets, New Kensington Pennsylvania; October 1992

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

## **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** AMCOT  
Fort Worth, Texas

**TIME PERIOD:** 1961-1962

### **DESCRIPTION OF ACTIVITIES:**

The American Manufacturing Company of Texas (AMCOT) conducted specialized tube elongation and billet piercing tests on uranium metal for NLO (Fernald). Tube elongation tests were conducted from July to September, 1961 and involved approximately 7 tons of uranium. The billet piercing tests were conducted from June to September, 1962 and involved approximately 23 tons of uranium. Both NLO (Fernald) and AMCOT employees participated in the tests.

There is detailed documentation describing the processes, material handled, radiological controls and monitoring, multiple equipment and area decontamination activities, as well as removal of materials and wastes generated during the processes which ended in 1962. However, additional documentation verifies that a final facility decontamination was not conducted until 1963. The presence of residual contamination cannot be ruled out prior to completion of this final task.

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1961 - 1963

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** American Bearing Corp  
Indianapolis, Indiana

**TIME PERIOD:** 1954 - 1959

**DESCRIPTION OF ACTIVITIES:**

In 1954, American Bearing Corp. was selected to participate in the machining of a sample lot of four hollow extrusion uranium billets from ingots for National Lead of Ohio (Fernald). Subsequently, National Lead used the Special Products Area of American Bearing to process uranium materials in the late 1950s. In May 1959, National Lead Industries (NLI), Nuclear Division was formed in Albany (Colonie), NY, and this work was moved to this NLI facility. It is not evident in the available documentation as to how the facility was used after 1959.

An Oak Ridge Associated Universities (ORAU) report dated Nov. 1983, titled, Radiological Survey of the American Bearings Corporation Indianapolis, Indiana, confirms that a facility survey was performed by Radiation Management Corporation (RMC) in 1981/1982 identifying residual contamination in excess of unrestricted release criteria. This survey prompted decontamination and partial dismantlement of the facility, approximately twenty-two years after cessation of AWE operational activities. Subsequent to that effort, ORAU was requested to and performed a survey as detailed in the referenced report.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE, and historical documentation. Pertinent document: Oak Ridge Associated University (ORAU) report dated Nov. 1983 titled, Radiological Survey of the American Bearings Corporation Indianapolis Indiana

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1954 - 1983

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** American Chain and Cable Co.  
Bridgeport, Connecticut

**TIME PERIOD:** 1944

### **DESCRIPTION OF ACTIVITIES:**

In 1944, American Chain and Cable Co. was contracted by the DuPont Company to evaluate the potential for reclamation of 6,231 uranium rods through swaging (diameter reduction). American Chain and Cable Co. received and swaged eight uranium rods which subsequently failed metallurgical evaluation, and the process was abandoned.

It is not likely or reasonable to suspect that significant levels of residual radioactive material were present after this operation. Documentation exists supporting that a limited quantity of material was processed (eight uranium rods 1.39 to 1.46 inches in diameter), and that the operation was of a short duration (which contractually included delivery and removal of all material). Additionally, the nature of the activity, swaging (cold-working), would most likely not lead to a high probability of dispersion of radioactive material, and apparent personnel exposure controls were reviewed and/or implemented which would lend to further reduction in the probability of dispersion of radioactive material.

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of contracting information from the period in which weapons-related production occurred, MED historical documentation and internal DOE FUSRAP documentation.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** American Machine & Foundry  
Brooklyn, New York

**ALSO KNOWN AS:** AMF  
Lutheran Medical Center  
Bus Terminal

**TIME PERIOD:** 1951-1954

**DESCRIPTION OF ACTIVITIES:**

During the early 1950s, this location designed and produced industrial equipment for the AEC. American Machine & Foundry also performed a large volume of uranium, thorium and possibly zirconium metal machining work from 1951-1954.

Documentation available for review supports the start date of 1951. Available documentation also demonstrates that investigations have been conducted and no radiological survey data is known to exist, identifying radiological conditions after cessation of operations. Considering the absence of data, coupled with the fact that 200 tons U and Th metal were machined at this facility there is a high degree of probability that residual contamination existed after the period in which weapons-related production occurred. FUSRAP investigative surveys conducted in the early 1990s identified no contamination in excess of background however, several of the small buildings presumably used in these operations had been removed by that time, and the existing main building had at some point in time been "guttled" internally for renovation.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP file documents.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** American Machine and Metals, Inc.  
E. Moline, Illinois

**ALSO KNOWN AS:** Vapofier Corp.

**TIME PERIOD:** 1960

**DESCRIPTION OF ACTIVITIES:**

In 1960, American Machine and Metals demonstrated a process for NLO (Fernald) that involved dehydration of green salt using a centrifuge process.

Documentation demonstrates that a limited quantity of material was processed, controls and monitoring were in place during the tests, and the materials and wastes were returned to NLO (Fernald).

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of contracting information from the period in which weapons-related production occurred, DOE FUSRAP documentation, and internal/external communiques.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** American Peddinghaus Corp.  
Moonachie, New Jersey

**TIME PERIOD:** 1978

**DESCRIPTION OF ACTIVITIES:**

The facility conducted a one-day shear (cutting) test on uranium metal for NLO (Fernald) in 1978.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of contracting information from the period in which weapons-related production occurred, DOE FUSRAP documentation, and internal/external communiques.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** American Potash & Chemical  
West Hanover, Massachusetts

**ALSO KNOWN AS:** National Fireworks Ordnance Corp.  
National Northern Div.

**TIME PERIOD:** Unknown - 1961

**DESCRIPTION OF ACTIVITIES:**

American Potash & Chemical conducted uranium metal shaping and uranium-magnesium explosive forming studies for Union Carbide Nuclear Corporation, Oak Ridge, Tennessee. The tests done up to May, 1961 were performed with 430 stainless steel and uranium metal pieces. Work was also done with green and sintered uranium-based powders. The powders were formed in a die into discs approximately 4 ½ inches in diameter and 1 inch thick.

Documentation reviewed does not specify the time period activities began, nor is there documentation of the radiological conditions post-operation. While it is reasonable to believe that residual contamination after 1961 is a low probability, based on documentation that only test quantities of radioactive materials were handled, and that safety oversight was involved, this conclusion is not fully supported by available documentation.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of contracting information from the period in which weapons-related production occurred, DOE FUSRAP documentation, and internal/external communiques.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Anaconda Co.  
Waterbury, Connecticut

**ALSO KNOWN AS:** American Brass Co.  
Fabric Metal Goods and West Tube Mill  
Anamet, Inc.

**TIME PERIOD:** 1942; 1956-1959

### **DESCRIPTION OF ACTIVITIES:**

In 1942, the American Brass Co. produced the barriers used in the gaseous diffusion process. In the late 1950s, under contract to Nuclear Metals, Inc., the company extruded copper-clad uranium billets into tubes at least two separate times for the Savannah River Site. While the original plans called for work on 500 billets, only around 50 were actually processed. The operations involved plating, heating, extruding, sawing, drilling, de-burring, cleaning, testing, crating, and shipping. Work was conducted at the West Tube Mill. AEC Health and Safety Laboratory personnel visited the site in 1956 and 1959, and obtained air quality and surface radiation measurements during the later visit.

Although the period in which weapons-related production occurred is determined to be appropriate, it is questionable as to whether radioactive materials were ever handled during the 1942 operations. Documented activities from the 1956-1959 period includes descriptions of the limited quantity of material handled, the physical form of the material as being copper-clad uranium metals, and radiological surveys of general area ambient dose rates and airborne radioactive material concentrations during operations. Based on an evaluation of this documentation, it is concluded that there was little, if any, potential for residual contamination after completion of the activities.

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE as well as FUSRAP facility evaluation documents.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Armco-Rustless Iron and Steel  
Baltimore, Maryland

**ALSO KNOWN AS:** Armco Steel

**TIME PERIOD:** 1948

**DESCRIPTION OF ACTIVITIES:**

Armco-Rustless Iron and Steel Co. rolled eight billets of uranium for the AEC. It was a one-time test of rolling.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of contracting information from the period in which weapons-related production occurred, DOE FUSRAP documentation, and internal/external communiques.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Armour Fertilizer Works  
Bartow, Florida

**ALSO KNOWN AS:** U.S. Agri-Chemicals Pilot Facility  
U.S. Steel Corp.

**TIME PERIOD:** 1951-1955

**DESCRIPTION OF ACTIVITIES:**

Under contract with the AEC, Armour operated a pilot plant which produced uranium from phosphoric acid. No more than gram quantities of  $U_3O_8$  were believed to have been produced during the time period.

Documentation describes the processes employed and a 1977 radiological survey of the facility which identified conditions consistent with background, or no greater than expected from normal industrial processing of similar materials.

Given the limited production of material and the results of the 1977 survey, the period for this site appears to be appropriate.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Armour Research Foundation  
Chicago, Illinois

**ALSO KNOWN AS:** ARF  
Illinois Institute of Technology  
IIT

**TIME PERIOD:** 1957

**DESCRIPTION OF ACTIVITIES:**

Records indicate that Armour Research Foundation may have tested radioactive materials for NLO (Fernald), specifically test quantities of materials other than metal (UF<sub>4</sub> or ThO<sub>2</sub>).

Documentation does not fully support that radioactive materials related to weapons development were ever handled at this facility. This lack of operations confirmation, coupled with the fact that this facility operated an AEC licensed reactor for non-AWE related research, indicates there would be a low probability for significant residual contamination when considered against that resulting from non-AWE related work.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of contracting information from the period in which weapons-related production occurred, DOE FUSRAP documentation, and/or internal/external communiques.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Arthur D. Little Co.  
San Francisco, California

**ALSO KNOWN AS:** Merrill Co.  
A.D. Little Co.

**TIME PERIOD:** 1948-1956

**DESCRIPTION OF ACTIVITIES:**

Under contract to the AEC from 1948-1956, initially as the Merrill Company, Arthur D. Little Co. researched the separation and recovery of uranium from various ores. Specific work included the recovery of uranium and vanadium from alkaline carbonate leach solutions from domestic ores.

Documentation confirms that this facility, owned by Arthur D. Little Co., performed the specified work from 1948 through 1956. There is no known data available demonstrating that residual contamination did not exist after operations ceased. Additionally, documentation describes the facility as having been demolished and removed at some time prior to 1979. The exact date of the facility demolition and/or use of the facility from 1956 through the time of demolition has not been determined. Based on the nature of the work performed from 1948 through 1956, there is a potential for significant residual contamination after operations ceased, up until the time of demolition.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred..

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information required, specifically the date of demolition.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Ashland Oil  
Tonawanda, New York

**ALSO KNOWN AS:** Ashland #1, Ashland #2  
Ashland Oil Company  
Haist Property

**TIME PERIOD:** 1944-1960; 1974-1982; DOE uncertain to 1998

**DESCRIPTION OF ACTIVITIES:**

In August 1944, the MED purchased the Ashland #1 property, formerly known as the Haist Property, for use as a disposal site for approximately 7,250 metric tons (8,000 tons) of uranium ore tailings and concentrate refining residues generated at the nearby Linde site. When the uranium residues were transported to the Ashland #1 site, they were spread over two-thirds of the property to estimated depths of 0.3 to 1.5 meters (one to five feet). In 1960, the AEC determined that the levels of residual radioactivity at Ashland #1 site were below then-current criteria and released the land as surplus. The Ashland Oil Company eventually acquired the property. From 1957 to 1982, Ashland Oil used a portion of the Ashland #2 site as a landfill for disposal of general plant refuse and industrial and chemical wastes and materials. Between 1974 and 1982, Ashland Oil transported from the Ashland #1 site an unknown quantity of soil mixed with radioactive residues to the Ashland #2 landfill.

Based on the conditions disclosed in the documentation reviewed, it appears that significant quantities of uranium-contaminated residues and wastes were deposited on the property referred to as the Ashland #1 site, which at the time was owned by the AEC. The property was subsequently sold to a private enterprise in 1960. Radiological surveys performed for the government in 1958, 1976 and later, all confirmed the presence of uranium contamination and corresponding ambient dose rates well in excess of natural background. Documentation reviewed indicates that the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically in the gaps from 1960-1974 and after 1982.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1944 - 1998

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Associated Aircraft Tool and Manufacturing Co.  
Fairfield, Ohio

**ALSO KNOWN AS:** Force Control Industries  
Fairfield  
Former Dixie Machinery Ownership

**TIME PERIOD:** 1956 and 1990s (Remediation)

**DESCRIPTION OF ACTIVITIES:**

From February to September, 1956, Associated Aircraft Tool and Manufacturing Co. machined hollow uranium slugs for the Hanford and Savannah River plutonium-production reactors under a subcontract from NLO (Fernald). Associated Aircraft machined approximately 96,000 slugs during the eight-month contract period.

The presence of radiological contamination was confirmed during a radiological survey performed in 1992, 36 years after cessation of operations. There is no reliable method to determine the actual radiological contamination levels during the period after cessation of operations and the beginning of remediation.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of contracting information from the period in which weapons-related production occurred, DOE FUSRAP documentation, and/or internal/external communiques.

Pertinent document: ORNL Report (ORNL/RASA-93-2); Results of the Radiological Survey at the Former Associate Aircraft Tool and Manufacturing Company Site, Fairfield, Ohio.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1956 - 1992+ (Contamination was identified in 1992 but the end date cannot be determined due to insufficient information)

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** B & T Metals  
Columbus, Ohio

**TIME PERIOD:** 1943

**DESCRIPTION OF ACTIVITIES:**

During the early stages of nuclear weapons production, uranium reactor fuel was produced by a variety of metallurgical techniques including extrusion, casting, and machining. In February 1943, DuPont, acting as an agent of the MED, contracted B&T Metals to extrude rods from uranium metal billets for the Hanford reactor in Washington State. B&T Metals extruded an estimated 50 tons of uranium between March 1943 and August 1943.

While MED/AEC contracted operations ceased in 1943, the presence of radiological contamination was confirmed during a preliminary survey performed in 1988-89, 46 years after cessation of operations. There is no reliable method to determine the actual radiological contamination levels immediately after cessation of operations.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of contracting information from the period in which weapons-related production occurred, DOE FUSRAP documentation, and/or internal/external communiques.

Pertinent document: ORNL Report (ORNL/RASA-89/1), Results of the Preliminary Radiological Survey at B&T Metals, 425 West Town Street, Columbus Ohio (CO001); October 1990.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1943 - 1989+ (Contamination was identified in 1989 but the end date cannot be determined due to insufficient information)

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Babcock & Wilcox Company (Virginia)  
Lynchburg, Virginia

**TIME PERIOD:** 1959 and 1968-1972, 1985 - 2001

**DESCRIPTION OF ACTIVITIES:**

Babcock & Wilcox Company reportedly performed work for the AEC involving the Oxide Pellet Fabrication program. Records indicate that during the period of 1968 through 1972 shipments of enriched uranium were made to and from the NLO (Fernald) facility.

The documentation available for this evaluation is insufficient to rule out the period between 1959 through 1968, or the period after 1972. It is not discernable from the available documentation what activities occurred in 1959, other than reference to a radiological survey having been performed. Additionally, there was no available documentation describing the materials, processes and/or objectives of the enriched uranium shipments between Babcock & Wilcox and NLO (Fernald) during the 1968 through 1972 period.

No documentation has been provided or reviewed establishing that this facility ever handled radioactive materials related to AWE work.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Baker and Williams Co.  
Newark, New Jersey

**ALSO KNOWN AS:** Englehard Industries  
Platinum (or Baker) Div. of Englehard Industries  
Baker and Co., Inc.

**TIME PERIOD:** 1957-1962

**DESCRIPTION OF ACTIVITIES:**

Baker and Williams Co. processed unirradiated uranium scrap for the AEC to recover enriched uranium for use in the weapons complex.

Available documentation does not fully describe the processes or amount and forms of radioactive materials handled. Considering this absence of detail, in conjunction with no documentation of radiological survey data subsequent to the operations, the presence of residual contamination after completion of the activities cannot be ruled out.

Additionally, documentation indicates that this facility was used from as early as 1943 through the early 1950s for the recovery of platinum from contaminated spent catalyst (platinized granular carbon). Neither the exact nature nor the extent of the contamination are clear but there are indications that it may have involved polonium and/or plutonium.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

## **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Baker and Williams Warehouses  
New York, New York

**ALSO KNOWN AS:** Pier 39  
Ralph Ferrara Co. Warehouse  
Ralph Ferrara Inc.

**TIME PERIOD:** 1940s and 1992 (DOE Remediation)

### **DESCRIPTION OF ACTIVITIES:**

During the early 1940s, the MED and the AEC used the Baker and Williams site warehouses for short-term storage of uranium concentrates. This material was generated in Port Hope, Canada by milling African ores.

The presence of radiological contamination was confirmed during a preliminary survey performed in 1990-91, approximately 50 years after use by the MED for storage of material. There is no reliable method to determine the actual radiological contamination levels immediately after cessation of operations.

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and the Army Corp of Engineers FUSRAP website.

Pertinent documents:

1. ORAU Report (ORAU 91/L-36); Radiological Survey of the Baker and Williams Warehouses buildings 513-519 New York, New York; December 1991
2. ORAU Report (ORAU 89/L-33); Radiological Survey of the Baker and Williams Warehouses New York, New York; June 1990
3. DOE (OR-FSRD) Report; Certification Docket for the Remedial Action at the Baker and Williams Site in New York, New York, 1991-1993; November 1995.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1940 - 1992

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Baker Brothers  
Toledo, Ohio

**ALSO KNOWN AS:** Rems, Inc.

**TIME PERIOD:** 1943-1944 and 1990-1996 (DOE Remediation)

**DESCRIPTION OF ACTIVITIES:**

Between June 1943 and July 1944, DuPont and the University of Chicago subcontracted the Baker Brothers to machine roll metal rods into uranium slugs that were used for fuel in the world's first production reactors located in Oak Ridge, Tennessee and Hanford, Washington.

There is no evidence of a radiological survey having been performed after completion of operations in 1944. However, radiological surveys performed for the DOE in 1989 and 1990, identified several indoor and outdoor areas with radiation in excess of DOE guidelines, which led to a subsequent FUSRAP cleanup. Radiological survey data from the 1989 and 1990 surveys indicate that residual contamination, concentrations of which are not determinable, was left after cessation of AEC activities ending in 1944.

The documentation reviewed indicates that the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically between 1944 and 1990.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and the Army Corp of Engineers FUSRAP website.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1943 - 1996

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Baker-Perkins Co.  
Saginaw, Michigan

**ALSO KNOWN AS:** APV Chemical Company

**TIME PERIOD:** 1956

**DESCRIPTION OF ACTIVITIES:**

In May 1956, Baker-Perkins performed a test of their mixing equipment for NLO (Fernald). The tests involved mixing uranium trioxide (orange oxide) with water and kneading the mixture with the Baker-Perkins “P” and “K” Ko-Kneader machines.

Documentation demonstrates that a limited quantity of radioactive material was used in the process, controls were in place during the process and post-operational decontamination was implemented with radiological release surveys having been performed.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Battelle Laboratories-King Avenue  
Columbus, Ohio

**ALSO KNOWN AS:** Battelle Columbus Laboratories (BCL)  
Battelle Memorial Institute (BMI)

**TIME PERIOD:** 1943-1986; BE 1947-1961; DOE 1986-present (remediation)

**DESCRIPTION OF ACTIVITIES:**

From 1943 to 1986, Battelle Memorial Institute performed atomic energy research and development as well as beryllium work for the DOE and its predecessor agencies. The Battelle Laboratories have two separate locations in Columbus: King Avenue and West Jefferson. Battelle's research supported the government's fuel and target fabrication program, including fabrication of uranium and fuel elements, reactor development, submarine propulsion, fuel reprocessing, and the safe use of reactor vessels and piping.

The following activities were performed at the King Avenue location: processing and machining enriched, natural, and depleted uranium and thorium; fabricating fuel elements; analyzing radiochemicals; and studying power metallurgy. Beryllium work was conducted from 1947 until at least, 1961.

Documentation discloses initiation of activities for the AEC in or around 1943. It also demonstrates that residual radioactive material was present up until decommissioning activities were started in 1986.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Battelle Laboratories-West Jefferson  
Columbus, Ohio

**ALSO KNOWN AS:** Battelle Memorial Institute (BMI)  
Battelle Columbus Laboratories (BCL)  
West Jefferson Plutonium Facilities

**TIME PERIOD:** 1956-1975; DOE 1986-present (remediation)

**DESCRIPTION OF ACTIVITIES:**

From 1943 to 1986, Battelle Memorial Institute performed atomic energy research and development for the DOE and its predecessor agencies. The Battelle Laboratories have two separate locations in Columbus: King Avenue and West Jefferson. Battelle participated in research on fabrication of uranium and fuel elements, reactor development, submarine propulsion, fuel reprocessing, and the safe use of reactor vessels and piping.

At the West Jefferson location, Battelle operated a large hot cell facility and a research reactor. Reactor operations began in October 1956, and ended in December 1974. The reactor was de-fueled and partially dismantled in 1975 and Battelle's license was changed to possession-only status.

Documentation discloses initiation of activities for the AEC in or around 1956. However, documentation also demonstrates that residual radioactive material was present up until decommissioning activities were started in 1986.

Documentation reviewed indicates that the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically, between 1975 and 1986.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1956 - 2003

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Bell Telephone Laboratories  
Murray Hill, New Jersey

**ALSO KNOWN AS:** Western Electric

**TIME PERIOD:** 1943-1944

**DESCRIPTION OF ACTIVITIES:**

This facility handled a quantity of uranium during World War II, probably in support of its work to develop effective barrier material for the K-25 facility in Oak Ridge, Tennessee. The barrier materials were not contaminated.

Documentation identifies the facility as having and/or using X-metals (uranium) during work being performed in 1943. There is no documentation available to identify the quantities or forms of the uranium, and while it is believed to be small quantities handled under laboratory conditions the presence of residual contamination after operations ceased cannot be ruled out.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE as well as FUSRAP facility evaluation documents.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Bendix Aviation (Pioneer Division)  
Davenport, Iowa

**TIME PERIOD:** 1960

**DESCRIPTION OF ACTIVITIES:**

On three separate occasions, NLO (Fernald) personnel conducted tests to see how well a Bendix sonic energy cleaning system could clean uranium-contaminated 55 gallon drums. At least 18 contaminated drums were test-cleaned.

Documentation of the processes employed during the surface-contaminated drum cleaning tests, contamination controls, reclamation of contaminated materials and wastes, as well as post-operational decontamination efforts and radiological release surveys, is sufficient to demonstrate no residual contamination existed after the operation.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE as well as radiological surveys and FUSRAP facility evaluation documents.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Besley-Wells  
South Beloit, Wisconsin

**ALSO KNOWN AS:** Besley Products Co.

**TIME PERIOD:** 1953

**DESCRIPTION OF ACTIVITIES:**

Besley was a cutting tool manufacturer. An NLO (Fernald) proposal indicates Besley was to machine a trial lot of 500 uranium slugs at its Beloit, Wisconsin plant to evaluate whether the use of the Besley facing and radiusing machine could increase production. An NLO (Fernald) document lists Besley-Wells as the recipient of test quantities of radioactive materials.

There is no available documentation to confirm that this work was ever actually performed.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE as well as FUSRAP facility evaluation documents.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

### **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Bethlehem Steel  
Lackawanna, New York

**TIME PERIOD:** 1949-1952

**DESCRIPTION OF ACTIVITIES:**

In 1949, Bethlehem Steel of Lackawanna, New York developed improved rolling mill pass schedules for uranium billets into 1½ inch rods to be used for reactor fuel rods to later be used at NLO (Fernald) plant. Bethlehem also performed uranium rolling experiments to help design the NLO (Fernald) rolling mill.

Documentation reviewed describes the activities as being limited in scope, principally being performed on weekends, which involved uranium metals being rolled into rods. Based on the nature of the activity, accompanied with documented discussion of cropping and residue collection and removal for material accountability purposes, it is reasonable to assume that there was a low potential for widespread or significant contamination. While there was no radiological survey data available for review from the operational period, radiological surveys of the original facility and equipment, which still existed, were performed in 1976 and 1980, both of which identified no residual contamination above natural background levels.

**UPDATE FROM PRIOR REPORT**

One record has become available confirming that uranium billets were being rolled as late as August 31, 1952, outside the period in which weapons-related production occurred as listed in the progress report..

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE as well as FUSRAP facility evaluation documents.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1949 - 1952+ (Contamination was identified in 2001 but the end date cannot be determined due to insufficient information)

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
--

**FACILITY NAME:** Birdsboro Steel and Foundry  
Birdsboro, Pennsylvania

**TIME PERIOD:** 1951-1952 and 1962

**DESCRIPTION OF ACTIVITIES:**

In the early 1950s, Birdsboro was involved in the design and construction of the FMPC in NLO (Fernald), specifically in the rolling mill plant. The documentation is unclear as to whether any uranium was actually handled at the Birdsboro Steel facility, but does indicate that 11½ pounds of “wafers” were shipped to the facility and that eight assorted pieces of billets weighing 346 pounds were shipped from Birdsboro to the Lake Ontario Ordnance Warehouse. A 1962 document indicates that Birdsboro also supplied rotary piercing equipment for the fabrication of uranium tubes at the FMPC and that an acceptance test took place at Birdsboro, but it is unclear whether any uranium was actually handled at the site.

Documentation is fairly descriptive with respect to material types handled. There is no expectation that significant residual contamination existed after cessation of any handling and/or activities. This is also supported by the limited quantities suspected and/or referenced as having been handled.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE as well as FUSRAP facility evaluation documents.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Bliss and Laughlin Steel  
Buffalo, New York

**ALSO KNOWN AS:** B & L Steel  
Niagara Cold Drawn

**TIME PERIOD:** 1948-1952 and DOE uncertain-1998 (remediation)

**DESCRIPTION OF ACTIVITIES:**

Under contract to the NLO (Fernald), Bliss and Laughlin Steel rolled uranium rods for the AEC and also provided uranium slug machining services. Bliss and Laughlin was part of a complex called the Buffalo Works that fashioned components for the early weapons program. The functions were transferred to the Albuquerque South Valley Site in 1952.

While activities with radioactive material ended in 1952, a radiological survey performed in 1992 for FUSRAP purposes, identified residual radioactive materials affixed to overhead and floor surfaces. While conditions described in the 1992 survey present a low potential for worker exposure, it is reasonable to assume that the described conditions are not representative of the actual physical conditions of residual radioactive materials for the prior 40-year uncovered period. Without historical radiological survey data to demonstrate otherwise, residual contamination must be considered to have been of higher activity levels and transferable for the period between 1952 and 1992.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE as well as FUSRAP facility evaluation documents.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1948 - 1998

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
--

**FACILITY NAME:** Blockson Chemical Co.  
Joliet, Illinois

**ALSO KNOWN AS:** Blockson Chemical Group  
Olin Mathieson  
Olin

**TIME PERIOD:** 1952-1962

**DESCRIPTION OF ACTIVITIES:**

Blockson Chemical Co. operated a plant which produced uranium from phosphoric acid. The AEC contracted with Blockson for the recovery of the uranium, which was ultimately used in weapons production.

Documentation available for review identifies that large quantities, up to 50,000 pounds per year, of uranium intended for AEC purposes were handled and/or processed at this facility between 1952 and 1962.

A radiological survey performed for or by the DOE in 1978 identifies significant, widespread uranium contamination within the facilities used for extraction. Documentation also states that this uranium contamination cannot be conclusively distinguished from what might otherwise be unrelated natural sources. While there are complications associated with identifying the exact nature or origin of the uranium contamination, this facility has never been used for commercial uranium extraction purposes.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE. Pertinent documents includes, DOE Report (DOE/EV-0005/35 & ANL-OHS/HP-83-103); Radiological Survey of Chemicals Group, Olin Corporation (Formerly Blockson Chemical Company) Joliet, Illinois, March27-November28, 1978; May 1983.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**POTENTIAL PERIOD OF RESIDUAL CONTAMINATION**

### **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Bloomfield Tool Co.  
Bloomfield, New Jersey

**TIME PERIOD:** 1947; 1951

**DESCRIPTION OF ACTIVITIES:**

The facility had a small research contract with the AEC in 1947. In 1951, it did some experimental machining of uranium slugs for the AEC. The results were not satisfactory and the work was not expanded.

Documentation reviewed during this evaluation does not fully substantiate that radioactive materials were handled or processed in 1947. However, the 1951 date is supported. Documentation for the 1951 time period is fairly descriptive with respect to material types and quantities handled. Based on the process and material descriptions and documented oversight, there is a low probability of residual contamination after cessation of activities in 1951.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE as well as FUSRAP facility evaluation documents.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Bowen Laboratory  
North Branch, New Jersey

**TIME PERIOD:** 1951

**DESCRIPTION OF ACTIVITIES:**

The Bowen Laboratory conducted some experimental work on uranium compounds during a two-day period in 1951. The tests were to develop a process calcining pitchblende raffinate (transforming liquid-like wastes into a more solid form).

Documentation contains descriptions of the process and objectives, equipment decontamination and radiological release survey results, with no residual contamination existing post-operation.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE as well as FUSRAP facility evaluation documents.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Bridgeport Brass Co.  
Adrian, Michigan

**ALSO KNOWN AS:** Uranium Metals Extrusion Plant  
General Motors, Chevrolet Mfg. Div.  
National Distillers and Chemical Corp.  
Martin  
A.C. Spark Plug

**TIME PERIOD:** 1954-1961; DOE 1988-1995 (remediation)

### **DESCRIPTION OF ACTIVITIES:**

From 1954-1961, Bridgeport Brass performed contract work for the AEC. Operations included production of uranium fuel elements for the Hanford and Savannah River Plant reactors and developmental extrusion work on thorium and depleted natural and slightly enriched uranium. After termination of AEC activities in 1961, most of this plant's functions were transferred to Reactive Metals, Inc. (RMI) in Astabula, Ohio. Bridgeport shipped one large extrusion press to RMI and all other equipment was dismantled and scrapped. This location is now owned by General Motors and cleanup was completed at this site in 1995.

Available documentation demonstrates that AEC operations ceased in 1961-1962, including facility decontamination along with equipment dismantlement and removal from the site. However, a radiological survey of the facility, performed for the DOE in 1976, identified uranium-contaminated dust and dirt throughout the facility requiring an additional cleanup action. A subsequent radiological survey of the facility in 1979, only identified residual contamination in sub-floor and sump areas, with limited potential for personnel exposure. Note: Reference AKA to A.C. Spark Plug on the Worker Advocacy Facility List varies from documentation and might actually be Air Force Plant #60.

Documentation reviewed indicates the potential for significant residual radioactivity existed outside of the period in which weapons-related production occurred, specifically between 1961 and 1988.

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

### **EVALUATION FINDINGS:**

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1954 - 1995

**FACILITY NAME:** Bridgeport Brass Co., Havens Laboratory

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

Bridgeport, Connecticut

**ALSO KNOWN AS:** Reactive Metals, Inc.  
Piedmont Manufacturing

**TIME PERIOD:** 1952-1962

**DESCRIPTION OF ACTIVITIES:**

Bridgeport Brass, at the Havens Laboratory in Connecticut and in Adrian, Michigan, worked to improve the process for extruding uranium. Eventually this work was taken over by Reactive Metals, which operated the AEC/DOE extrusion facility in Ashtabula, Ohio. Bridgeport cut and stored uranium, and may have been involved in the rolling of uranium. Some work of the Havens Laboratory was moved to Seymour, Connecticut, in 1962, to a facility that is now owned by Seymour Specialty Wire.

The work performed at the Havens laboratory was mostly metallurgy work done on a laboratory scale.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE as well as FUSRAP facility evaluation documents.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Brush Beryllium Co. (Detroit)  
Detroit, Michigan

**TIME PERIOD:** 1940s-1950s

**DESCRIPTION OF ACTIVITIES:**

The Brush Beryllium Co. in Detroit, Michigan, was one of several companies that rolled or extruded uranium rods for Hanford reactor fuel in the late 1940s and early 1950s. In 1950, Hanford began making rolled uranium rods onsite, but the AEC shifted the rolling work to the NLO(Fernald), FMPC and its supporting contractors in 1952. A number of private companies, including Brush Beryllium Co., contracted with NLO (Fernald) to provide Hanford with these rolled rods.

There is a reasonable expectation, based the described activities, that residual contamination existed after operations ceased. However no additional documentation has been acquired, therefore a recommendation can not be made for this facility.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Brush Beryllium Co. (Cleveland)  
Cleveland, Ohio

**ALSO KNOWN AS:** Brush Wellman Co.  
Motor Wheel Corp.  
Magnesium Reduction

**TIME PERIOD:** 1942-1943; 1949-1953

**DESCRIPTION OF ACTIVITIES:**

The Brush Beryllium Co., Cleveland facility, conducted research on a process for producing uranium metal (1942-1943) through magnesium reduction of molten green salt (uranium tetra fluoride). The facility later conducted research and development with uranium (1949-1953) and extruded thorium billets into slugs which were placed in Hanford production reactors (1952-1953).

The Brush Cleveland facility also produced beryllium metal and beryllium oxide for the MED (1943-1946) and later for the AEC (1947-1965?).

This facility involved two buildings, one at Chester Street the other at Perkins Avenue. Based on the nature of the work, there is reasonable expectation that significant residual contamination existed after operations ceased. However, this determination is somewhat limited by the fact that both locations no longer exist. The Chester Street building was demolished in 1946 and since that time has been either a vacant field or a parking lot, it is not clear when the Perkins Avenue building was demolished and replaced. There is no indication that either facility was decontaminated between 1943 and 1949.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

Pertinent document: DOE Report; FUSRAP Elimination Report for the Former Brush Beryllium Company, Cleveland, Ohio; November 14, 1985.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1942 - 1953

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** C. G. Sargent & Sons  
Graniteville, Massachusetts

**TIME PERIOD:** 1968

**DESCRIPTION OF ACTIVITIES:**

C.G. Sargents & Sons performed extruder and drying oven tests with thorium for NLO (Fernald). It also conducted a uranium sump cake drying test for NLO (Fernald). These were apparently one-time tests.

Documentation indicates that limited quantities of materials were processed and radiological monitoring was implemented during the activities. These operations were conducted in 1968 under an NRC source material license. In 1970, at license expiration, the NRC concluded there was little likelihood of residual contamination above current guidelines.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE as well as FUSRAP facility evaluation documents.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** C.H. Schnoor  
Springdale, Pennsylvania

**ALSO KNOWN AS:** Conviber  
Premier Manufacturing

**TIME PERIOD:** 1943-1951; DOE 1992-1995 (Remediation)

**DESCRIPTION OF ACTIVITIES:**

In 1943, C.H. Schnoor began providing metal fabrication services in support of MED operations. C.H. Schnoor machine extruded uranium for the Hanford Pile Project. Operations may have continued until 1951 when the building was sold.

Documentation from DOE/EM indicates that radiological surveys performed by the DOE in 1987, 1989 and 1990 confirmed uranium contamination under flooring up to 20,000 picocuries per gram. It is also stated that these surveys did not identify contamination outside the building, whereas FUSRAP website information states that there was contamination identified in outside areas. Aside from these conflicting statements, it is unclear as to whether the identified contamination was fixed and/or removable in nature. Additionally, the location of the contamination is stated as being under flooring which, in and of itself, does not identify if this was original or replaced flooring and there are no present means by which to assess periods of accessibility or potential personnel exposure.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE, information from the FUSRAP website and the DOE/EM website.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** C. I. Hayes, Inc.  
Cranston, Rhode Island

**TIME PERIOD:** 1964

**DESCRIPTION OF ACTIVITIES:**

In 1964, C.I. Hayes Inc., handled uranium metal under subcontract to the National Lead Company. The work involved heat-treating uranium in a vacuum furnace in order to test the decontamination and health and safety aspects of this work.

Documentation describing the process, material handled, radiological controls and monitoring, equipment and area decontamination, as well as removal of materials and wastes generated during the process, demonstrates no residual contamination existed post-operation.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** California Research Corp.  
Richmond, California

**TIME PERIOD:** 1948-1949

**DESCRIPTION OF ACTIVITIES:**

Using small amounts of plutonium and uranium, the California Research Corp. performed experiments to investigate the use of continuous chelation as a means of separating plutonium and zirconium from uranium. The California Research Corp. performed the work as a subcontractor to the Kellex Corporation which was under contract to the AEC to investigate waste recovery methods.

Documentation demonstrates that limited quantities of material were handled under laboratory conditions and controls, implementing personnel and area monitoring, material accountability and equipment decontamination.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Callite Tungsten Co.  
Union City, New Jersey

**TIME PERIOD:** 1944

**DESCRIPTION OF ACTIVITIES:**

According to a 1944 document, the Callite Tungsten Co., used its machines to cold roll uranium metal rods for the MED.

No new documentation has been acquired for this facility. Existing documentation is limited but has been re-reviewed. One single document originating in 1944 describes activities existing at the Callite Tungsten Co. in New Jersey involving the “cold rolling of uranium”. If these activities did in fact occur, there is no documentation available to describe the radiological conditions during or post operations. At this time a definitive determination is not possible without documentation more fully describing the activities, radiological conditions and/or the amount of materials involved.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Carboloy Co.  
Detroit, Michigan

**ALSO KNOWN AS:** General Electric Metallurgical Products

**TIME PERIOD:** 1956

**DESCRIPTION OF ACTIVITIES:**

In 1956, the Carboloy Co. conducted operations to turn down the outer diameter of uranium slugs.

Activities conducted related to weapons development, specifically the downsizing of uranium slugs, was performed in 1956. Later in the same year, General Electric applied for a Special Nuclear Material License from the AEC, so as to receive and process uranium dioxide for conversion into solid fuel pellets associated with commercial boiling water reactor development. General Electric subsequently notified the AEC that commercial applications associated with the license had ceased and requested termination of the license in 1958. Detailed documentation was available for review demonstrating existence of a comprehensive site radiological control program which would have ensured that the weapons development work did not lead to residual contamination dispersed amongst commercial-purpose contamination. This is further evidenced by a radiological survey performed in 1982 by the NRC, verifying the decontamination and removal of equipment, whereupon all radiological conditions were at background levels and no residual contamination was identified.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation available indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Carborundum Company  
Niagra Falls, New York

**ALSO KNOWN AS:** N/A

**TIME PERIOD:** 1944; 1960-1962

**DESCRIPTION OF ACTIVITIES:**

The Carborundum Company engaged in various phases of a Manhattan Engineering District program in 1944 designed to determine suitable methods for shaping and engineering uranium rods. This work involved the forming, coating, and canning of uranium rods for the pile process. Between 1960 and 1962, the company fabricated plutonium carbide pellets for the AEC from materials supplied by Hanford. Carborundum also performed work during the 1950s not related to DOE activities, including: fabricating nuclear fuel elements for commercial purposes and producing zirconium, hafnium, and titanium for the AEC's special reactor materials program.

This is a newly incorporated facility reviewed during this evaluation. Available documentation is limited and neither the operational period dates nor the radiological conditions can be ascertained from available information.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Carnegie Institute of Technology  
Pittsburgh, Pennsylvania

**ALSO KNOWN AS:** Carnegie-Mellon Cyclotron Facility

**TIME PERIOD:** Early 1940s

**DESCRIPTION OF ACTIVITIES:**

During the Manhattan Project (1944), Carnegie Institute of Technology was a key participant in research on the phases of special metals and their alloys. It also worked on the development of methods for testing materials of construction and the construction of “necessary equipment.”

This facility may have performed limited research activities during the time frame of 1941 through 1944, under laboratory controlled conditions. There is no documentation indicating that radioactive materials handled for the MED/AEC would have led to residual contamination.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Carpenter Steel Co.  
Reading, Pennsylvania

**TIME PERIOD:** 1943-1944

**DESCRIPTION OF ACTIVITIES:**

Beginning in 1943, Carpenter Steel Co. was one of the 14 private contractors and vendors that produced fuel for the Oak Ridge X-10 pilot plant reactor and the full-scale Hanford production reactors. As an alternative to extrusion, the Carpenter Steel Co. of Reading, Pennsylvania experimented with rolled uranium rods in July 1944, but these proved to be inferior to the extruded product. The metal tended to form laps and seams on the surfaces of the rolled bars. Carpenter Steel has since changed its name to Carpenter Technology Corporation.

The processes are believed to have had a low potential for resultant, wide-spread contamination. In 1981, a radiological survey conducted by Argonne National Lab identified several discrete areas of elevated contamination which upon review of additional documentation were in inaccessible areas. This initial survey prompted a comprehensive radiological survey in 1988 performed by ORNL. A review of this survey demonstrates that no residual contamination above background was identified.

The site was eliminated from the FUSRAP system in 1991, based on the survey results.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE. Pertinent documentation included, Report (ORNL/RASA-89/3); Results of the Radiological Survey of the Carpenter Steel Facility, Reading Pennsylvania; Date of issue - July 1990.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** C-B Tool Products Co.  
Chicago, Illinois

**TIME PERIOD:** 1944

**DESCRIPTION OF ACTIVITIES:**

For a six month period in 1944, C-B Tool Products Co. had a subcontract with the University of Chicago to provide personnel, facilities, and equipment to produce special machining of parts for special equipment, tools, jigs, and fixtures to the Met Lab from materials provided by the University of Chicago. It is unclear whether the company handled radioactive materials.

There is no available documentation to support or substantiate that radioactive materials were handled or involved at any time. Additionally, the building that may have served as the location for machining or tool development was demolished in the 1940s. Based on the available documentation there is little potential for residual contamination outside of the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE. Pertinent documentation included a FUSRAP Elimination report dated January 31, 1990.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Chambersburg Engineering Co.  
Chambersburg, Pennsylvania

**TIME PERIOD:** 1957

**DESCRIPTION OF ACTIVITIES:**

In March 1957, a series of hot uranium forging tests were conducted at the Chambersburg Engineering Co. by the Metallurgical Department of NLO (Fernald). Approximately 150 hot uranium slugs were forged into washers on two Chambersburg air compressor impactors.

Documentation reviewed describes the processes, materials handled, equipment and area decontamination, recovery of materials as well as safety and health air sampling, all of which demonstrates that no residual contamination existed after the operation.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation available indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Chapman Valve  
Indian Orchard, Massachusetts

**ALSO KNOWN AS:** Chapman Valve Manufacturing Co.  
Crane Co.

**TIME PERIOD:** 1948-1949; DOE 1991-1995 (Remediation)

**DESCRIPTION OF ACTIVITIES:**

Chapman Valve supplied valves to the MED and the AEC. In 1948, Chapman Valve machined uranium rods into slugs for the Brookhaven National Laboratory. Uranium slugs were used as reactor fuel. Chapman may also have conducted rolling operations on uranium metal in 1949.

Documentation indicates that a radiological survey was performed at this site in 1991 with uranium contamination identified on floors, walls and overhead beams. Specific radiological survey data was not available but the written description of the 1991 survey verifies that residual contamination was present after cessation of the activities which ended in 1949.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and information obtained from the FUSRAP website.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1948 - 1995

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Chemical Construction Co.  
Linden, New Jersey

**ALSO KNOWN AS:** Chemico

**TIME PERIOD:** 1953-1955

**DESCRIPTION OF ACTIVITIES:**

The Chemical Construction Co. conducted research and development activities to recover uranium and other metals from low-grade waste materials. The wastes were generated by uranium processing operations at the Mallinckrodt facility in St. Louis, Missouri.

Available documentation briefly describes the process being researched and developed and it would appear that considerable quantities of residues were evaluated for processing but there is no documented evidence that these processes were ever employed. In a DOE Memorandum/Checklist; Young to File dated 12/4/87; the following quote is extracted “Absence of any record of radiological characterization of the property and the volume of material processed suggest that there may be potential for residual contamination. However insufficient info has been found to justify further consideration under FUSRAP.” Subsequently, in 1995, it appears that this site was removed from FUSRAP as DOE found they had no authority to perform remediation.

Based on the uncertainties associated with this site, coupled with determinations documented by DOE through internal reviews it is determined that this site has a potential for significant residual contamination outside the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE. Pertinent documentation included, DOE Letter; Wagoner to Gregorio; No Authority to Perform Remedial Action at the Former Linden Pilot Plant of the Chemical Construction Company; February 17, 1995.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Cincinnati Milling Machine Co.  
Cincinnati, Ohio

**ALSO KNOWN AS:** Cincinnati Milacron, Inc.

**TIME PERIOD:** 1963

**DESCRIPTION OF ACTIVITIES:**

The Cincinnati Milling Machine Co. built electro-chemical machining units. In September 1963, the company tested the feasibility of electro-chemical machining of uranium. Eight normal uranium solid cylinders 1-inch in diameter and 1-inch long (approximately 14 pounds) were used in the test.

Documentation reviewed describes the processes, material handled, radiological controls, monitoring, equipment decontamination and removal of materials and waste. This activity was limited in scope and a post-operation survey identified no residual radioactivity above background levels.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation available indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Colonie Site (National Lead)  
Colonie (Albany), New York

**ALSO KNOWN AS:** Colonie Interim Storage Site  
National Lead Co., Albany, NY  
National Lead Co.-Nuclear Division  
NL Industries-Nuclear Division

**TIME PERIOD:** 1958-1984; DOE 1984-1998

**DESCRIPTION OF ACTIVITIES:**

From 1937 to 1984, National Lead Industries owned and operated the Colonie site. The site was first used as a foundry. During the years from 1958 to 1984, National Lead manufactured thorium and depleted uranium components at this site under license from the AEC.

Activities involving radioactive materials began in 1958 and were conducted through 1984, at which time the property was transferred to the federal government and cleanup under FUSRAP was initiated.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and information obtained from the FUSRAP website.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Columbia University  
New York City, New York

**ALSO KNOWN AS:** Pupin Hall  
Havemeyer Hall  
Nash Building  
Prentiss Hall  
Schermerlimon Hall

**TIME PERIOD:** 1940-1947

**DESCRIPTION OF ACTIVITIES:**

Columbia University began its nuclear research in 1939 by studying nuclear chain reactions. In 1940, the university was contracted by the National Research Defense Committee for additional research in areas including isotope separation, gas centrifuge for uranium separation work, and the nuclear chain reaction. Four of the university's buildings including Pupin, Schermerhorn, Havemeyer, and Nash, were known to have housed the research experiments.

Available documentation is not fully descriptive of quantities of materials handled. However, the nature of research work conducted under laboratory conditions, in and of itself, is sufficient to preclude the potential for significant residual contamination. A subsequent physical inspection and radiological survey of the involved buildings was conducted in 1976 for the DOE. Results of this inspection/survey identified no significant contamination and documented a determination of a low probability for residual contamination from MED/AEC activities.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

## **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Combustion Engineering  
Windsor, Connecticut

**ALSO KNOWN AS:** Asea Brown Boveri

**TIME PERIOD:** 1955-1972; DOE 1993-1998 (remediation)

### **DESCRIPTION OF ACTIVITIES**

Combustion Engineering (CE) supported the AEC beginning in the 1940s. Initial work at the site involved non-nuclear components. In 1955, CE began to use highly-enriched uranium. In the 1960s, CE obtained a license to fabricate fuel elements for power reactors. CE received uranium from NLO(Fernald) through 1972.

Radiological surveys conducted for DOE confirmed the presence of residual contamination and led to subsequent FUSRAP cleanup activities in 1986. Radioactive material contamination was identified in three buildings, related drainpipes and sewer lines, a waste storage pad area, a waste drum burial site, and a brook on the property.

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and information obtained from the FUSRAP website.

Pertinent documents;

1. DOE Report (ORAU 89/E-93); Follow-up Confirmatory Radiological Survey of the Drum Storage Area Combustion Engineering Property Windsor Connecticut; May 1989.
2. DOE Report (ORISE 94/D63); Designation Survey Combustion Engineering Site Windsor, Connecticut; April 1994.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1955 - 1998

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Copperweld Steel  
Warren, Ohio

**TIME PERIOD:** 1943-1946

**DESCRIPTION OF ACTIVITIES:**

Copperweld Steel of Warren, Ohio, straightened and outgassed a large number of uranium rods for the Hanford and Oak Ridge reactors between May and August of 1943.

Documentation reviewed includes process and material descriptions which when coupled with the radiological characterization survey results gathered by ORNL in 1990, there is no evidence or indication that residual contamination existed post-operations.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE. Pertinent documentation included;

1. DOE Letter; A. Williams to F. Iannizzara; Subject: Summary of Radiological Survey Results and Site Elimination Information; April 5, 1991.
2. DOE/Oak Ridge National Laboratory Survey; R Foley and L. Floyd; Subject: Preliminary Site Survey at the Copperweld Steel Co. 4000 Mahoning Avenue, NW, Warren, Oh (CWO 001); ID# ORNL/RASA-90/2; December 1990.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Crane Co.  
Chicago, Illinois

**TIME PERIOD:** 1947-1949

**DESCRIPTION OF ACTIVITIES:**

Crane Co. supplied the AEC with uranium and thorium in the 1940s (and perhaps in the 1950s) and likely used materials containing uranium in manufacturing valves for the AEC. At the completion of one project in 1949, 1,000 pounds of contaminated wastes, including 346 grams of uranium, were shipped from Crane to Oak Ridge. In 1949, Crane also shipped 265 kg of normal uranium to Hanford. In 1954, records indicate government interest in purchasing more uranium and thorium from Crane, but this work has not been verified.

Documentation indicates that additional work was performed with radioactive materials after 1949, possibly up through 1954. Additionally, it appears that there is no radiological survey data from the operational or post-operational period. Based on the potential for work outside the listed end period of 1949 and the absence of radiological survey data this facility poses a potential for residual contamination.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE. Pertinent documents included, DOE Letter; J. Wagoner to Mayor R. Daley; Subject: Information concerning Crane Co. site; February 17, 1995.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Crucible Steel Co.  
Syracuse, New York

**TIME PERIOD:** 1951

**DESCRIPTION OF ACTIVITIES:**

In 1951, New York Operations office personnel performed a test forging and rolling of 10 thorium billets at Crucible Steel Co.

Documentation reviewed during this evaluation is limited but what has been available for review indicates that anticipated production of thorium slugs from billet stock may have extended past the 1951 date. The documentation is also void of any radiological characterization data which results in a determination that this site poses a potential for residual contamination outside the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Dorr Corp.  
Stamford, Connecticut

**ALSO KNOWN AS:** Dorr-Oliver Corp.

**TIME PERIOD:** 1954; 1963

**DESCRIPTION OF ACTIVITIES:**

The Dorr Corp. conducted waste-handling tests on low-level radioactive material (ammonium diuranate). This work was done as a subcontractor to NLO (Fernald). NLO (Fernald) personnel monitored the tests and took air quality samples.

Documentation reviewed describes activities conducted in 1954, however there is no description of activities supporting the 1963 date. Based on a review of the air sampling data gathered during the 1954 activities, which demonstrates generation of significant airborne radioactive material concentrations, and the absence of any documentation of area or equipment decontamination, or associated radiological surveys, it is concluded that this site poses a potential for residual contamination outside the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Dow Chemical Co.  
Walnut Creek, California

**ALSO KNOWN AS:** Pittsburg, California

**TIME PERIOD:** 1947-1957

**DESCRIPTION OF ACTIVITIES:**

The Dow operation involved process studies and experimental investigations on different uranium ores and thorium-bearing ores, including pilot-scale solvent extraction of uranium from phosphoric acid.

Documentation identifies the activities as research and investigative studies conducted under laboratory conditions and controls. A radiological survey, performed in 1977, identified overall contamination levels consistent with, and no higher than natural background levels, with the exception of relatively low levels of fixed activity discovered in an inaccessible area of a fume hood, which was subsequently decontaminated and removed. The presence of this contamination posed little, if any, potential for personnel exposure and is not significant.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** DuPont Deepwater Works  
Deepwater, New Jersey

**ALSO KNOWN AS:** Chambers Chemical and Dye Works  
E.I. Du Pont de Nemours and Co.  
Dyeworks-Carneys Point  
Deepwater Dyeworks

**TIME PERIOD:** 1942-1949; DOE uncertain-1988

**DESCRIPTION OF ACTIVITIES:**

In the 1940s, E.I. Du Pont de Nemours and Company (DuPont) produced uranium products and conducted research on uranium hexafluoride. These activities were conducted first for the U.S. Office of Scientific Research and Development, and later under contract to the MED and the AEC. DuPont also developed processes to convert uranium dioxide to uranium hexafluoride, and produced uranium oxide and uranium metal which was used to fuel the CP-1 reactor at the University of Chicago. After completion of these activities, the AEC conducted limited decontamination and released the site to DuPont for reuse. DuPont currently operates a chemical plant at this site.

Documentation reviewed clearly establishes the period of MED/AEC operations as beginning in 1942 and ending in or around 1949, at which time decontamination activities were performed and the buildings were released back to DuPont. Radiological surveys of the properties, performed for the DOE in 1977 and 1983 identified elevated concentrations of uranium in surface and subsurface soils, building rubble areas and structures. These findings of residual contamination led to the subsequent FUSRAP clean-up actions. The potential for residual radioactive contamination exists between cessation of operations in 1949 and initiation of FUSRAP actions, as well as, during operations.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1942 - 1988

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Dupont-Grasselli Research Laboratory  
Cleveland, Ohio

**ALSO KNOWN AS:** Standard Oil of Ohio

**TIME PERIOD:** 1943-1945

**DESCRIPTION OF ACTIVITIES:**

The Grasselli Laboratory participated in the development of the slug canning and coating processes for the Hanford site.

Documentation reviewed contains detailed descriptions of materials handled and processes being tested, both of which indicate a low potential for dispersion of contamination. No documentation of a radiological survey from the end of operations is known to exist. However, a radiological survey was performed in 1976 for the DOE which identified no radioactivity above background levels. This survey data and available process descriptions are adequate to determine that no significant residual contamination existed at the end of operations.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Edgerton Germeshausen & Grier, Inc.  
Boston, Massachusetts

**TIME PERIOD:** 1950-1953

**DESCRIPTION OF ACTIVITIES:**

Edgerton Germeshausen & Grier, Inc.(EG&G) was under contract to the AEC during the period from 1950-1953 for "research and development and manufacturing incident to the installation of scientific test instrumentation at AEC test sites; design, manufacture, test, maintenance of operations systems, weapons systems; and participation in weapons test evaluation." It is unclear from the documentation whether any radioactive materials were handled at the Boston location.

Documentation does not confirm or substantiate that radioactive materials were handled or involved at any time including, during 1950-1953. It appears that this is an assumption based on the potential that contained and/or sealed radioactive material sources were used in the development of scientific testing instrumentation.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Electro Circuits, Inc.  
Pasadena, California

**TIME PERIOD:** 1952-1953

**DESCRIPTION OF ACTIVITIES:**

Electro Circuits used uranium metal (approximately 300 lbs.) to conduct tests aimed at determining the usefulness of ultrasonics in the detection of pipe in ingots.

Based on the material form (metal) and the process of non-destructive inspection, there is little, if any, potential for residual radioactivity after the operations were completed and the material was returned to the custody of the AEC.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation available indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Electro Metallurgical  
Niagara Falls, New York

**ALSO KNOWN AS:** ElectroMet Corp.; Umetco Minerals Corp  
Union Carbide Corp.; Electro Metallurgical Corp.

**TIME PERIOD:** 1942-1953

**DESCRIPTION OF ACTIVITIES:**

In 1942, the Electro Metallurgical Company (ElectroMet), a subsidiary of Union Carbide and Carbon Corporation, was contracted by the MED to design, engineer, construct, and operate a metal reduction plant. This plant was to take uranium tetrafluoride and convert it to uranium metal. Developing the technology to produce pure uranium metal was a priority for the Manhattan Project. ElectroMet accomplished this conversion by taking the uranium tetrafluoride received from Union Carbide's Linde Air Products Division and reacting it with magnesium in induction furnaces. Once the metal was created, it was cast into ingots and the ingots were then shipped out for testing or for rolling. The leftover process residues were sent to other sites for uranium recovery, storage, or disposal. ElectroMet was also in charge of recasting metal, research and development in low- and high-grade uranium ores, and supplying calcium metal to Los Alamos and other laboratories. After the war ended, ElectroMet produced UF<sub>4</sub> that was reduced to metallic uranium either on site in Niagara Falls or by Mallinckrodt at the St. Louis Downtown Site. In 1946, production was suspended, and from 1950 through 1953, the plant began casting zirconium metal sponge into ingots. The plant was also used for titanium processing and uranium and thorium processing. Documentation reviewed contains a description of decontamination activities conducted at the cessation of AEC operations in 1953, along with data from a radiological survey performed at that time by the AEC. Review of this survey data and documentation that the facility where AEC operations were conducted was demolished in 1957, is sufficient to determine that little, if any, residual contamination existed after AEC operations. Radiological surveys performed in 1976 and 1980 for the DOE did identify contamination on the site. But, there is adequate documentation to demonstrate that the origin is from commercial activities and is not attributable to AEC work.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** ERA Tool and Engineering Co.  
Chicago, Illinois

**ALSO KNOWN AS:** Audio-Tex, Inc.

**TIME PERIOD:** 1944

**DESCRIPTION OF ACTIVITIES:**

From February through June 1944, ERA Tool and Engineering Co. contracted with the University of Chicago to supply services and supplies to the Met Lab, specifically to provide necessary personnel, facilities, and equipment required to produce special machining parts for special equipment, tools, jigs, fixtures, etc. from materials furnished by the University. It is unclear from the records whether ERA handled radioactive materials.

It is reasonable to assume that, if in fact radioactive materials were handled, they would have been of a limited quantity presenting little potential for residual contamination. This assumption is further supported through a radiological survey performed in 1989, which identified no radioactivity above background levels.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation available indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Extruded Metals Co.  
Grand Rapids, Michigan

**TIME PERIOD:** 1944

**DESCRIPTION OF ACTIVITIES:**

A November 7, 1944 document indicates that Extruded Metals participated in work related to metal fabrication for the Manhattan Project.

Documentation available during this evaluation is limited and what is available is insufficient to reach any determinations. The available documentation does not definitively confirm that radioactive materials were handled or processed at the facility, nor does it specifically address the time frame in which these activities may have been performed.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Fenn Machinery Co.  
Hartford, Connecticut

**TIME PERIOD:** 1950

**DESCRIPTION OF ACTIVITIES:**

Fenn Machinery Co. conducted tests to explore the feasibility of swaging uranium rods to finish size for use in Hanford's reactor. Records indicate two tests with the possibility of a third test, conducted during the month of June 1950. The tests probably took less than one day each to complete. The test consisted of swaging approximately 15 rods out to 4-foot lengths. Material was handled under MED/AEC with air sampling being conducted during two tests.

Although there was no documentation indicating decontamination, there was documentation indicating air monitoring during the test. Records indicate little likelihood of contamination after test.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website FUSRAP files, along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Fenwal, Inc.  
Ashland, Massachusetts

**ALSO KNOWN AS:** Kidde-Fenwal

**TIME PERIOD:** 1967-1968

**DESCRIPTION OF ACTIVITIES:**

In 1967 and 1968, NLO (Fernald) asked Fenwal to conduct tests aimed at determining the capabilities of Fenwal's fire extinguishing equipment for suppressing fires originating in uranium-contaminated magnesium. The tests were conducted at Fenwal facilities and involved small amounts of uranium. Some of Fenwal employees later traveled to NLO (Fernald) to service fire suppression equipment.

Documentation exists indicating that airborne radioactivity and surface contamination surveys were performed during the operation and resulted in very low radiological hazards. In addition, decontamination was performed and all material was returned to the NLO (Fernald) site.

This was a small-scale operation performed with a well-defined small amount of radioactive material.

The operation was well-defined and posed minimal radiological risks during the operation. Documentation exists indicating that monitoring and decontamination was performed.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website, memos from the director of Health and Safety of NLO (Fernald), and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

## **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Foote Mineral Co.  
East Whiteland Twp., Pennsylvania

**ALSO KNOWN AS:** Exton Cyrus Foote Mineral Co.  
Formil  
Shieldalloy Metallurgical  
Cyprus Foote Mineral Company

**TIME PERIOD:** 1940s-1991

**DESCRIPTION OF ACTIVITIES:**

Foote Mineral Co. produced monazite sands on a pilot plant scale, produced zirconium metal, separated hafnium from zirconium, produced lithium chemicals, processed lithium metal, and other ores, developed inorganic fluxes for the metal industry, and crushed and sized minerals. When the facility was closed in 1991, the site included more than 50 buildings and process areas.

The facility may have rolled some uranium metal during the mid 1940s.

Foote Mineral Co. was also a major importer of beryl ore from Brazil. Under contract to the AEC, Foote Mineral Co. procured 500 tons of beryl in 1947.

This facility reported closed in 1991 at which time it was reportedly decontaminated. Documentation also indicates that additional cleanup was performed in 1998. Both actions were performed by the Cyprus Foote Mineral Company. Without radiological survey data from these cleanup actions it is not possible to support the listed end date of 1991. The second cleanup action is however an indication that residual contamination existed after the end date.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website, FUSRAP Considered Sites Database, and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Frankford Arsenal  
Philadelphia, Pennsylvania

**ALSO KNOWN AS:** Pitman-Dunn Laboratories

**TIME PERIOD:** 1952-1954

**DESCRIPTION OF ACTIVITIES:**

The Frankford Arsenal performed experimental research on small amounts of uranium tetrachloride. Activities at the arsenal also involved the handling of normal uranium metal rods (approximately 500 pounds).

Although there is no documentation reviewed of any cleanup actions or radiological surveys conducted, it is felt that due to the amount of material at this site, there is little likelihood of significant contamination.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Gardinier, Inc.  
Tampa, Florida

**ALSO KNOWN AS:** U.S. Phosphoric Plant Uranium Recovery Unit  
Cargill Fertilizer

**TIME PERIOD:** 1951-54;1956-61

**DESCRIPTION OF ACTIVITIES:**

From 1951 to 1954, Gardinier, Inc. (under the name U.S. Phosphoric Productions) operated a pilot plant which recovered uranium from phosphoric acid. From 1957 to 1961, Gardinier, Inc. (under the name U.S. Phosphoric Productions) produced uranium by recovery of  $U_3O_8$  from phosphoric acid. The AEC contracted with Gardinier for both activities. The maximum production was 60 tons of uranium concentrate per year. The old uranium recovery facility is part of a large plant that is still used for the production of phosphoric acid and other phosphate products. Gardinier conducted its own uranium recovery operations in an area immediately west of the processing plant under a State of Florida license that expired in 1980.

Following a site visit in April 1977, ORNL personnel performed a complete radiological survey of the site from December 14-19, 1977. The final report stated that the contamination at this site has been identified as uranium and radium in concentrations exceeding NRC guidelines for the release of property for unrestricted use at some points inside the process building and in the outdoor area near the process building and pilot operations building. The contamination, except for that measured on or near the uranium recovery equipment located on the second floor of the process building, can be related primarily to radium or uranium in equilibrium with radium. Therefore, this contamination is most likely due to other parts of the phosphoric acid process rather than just uranium recovery.

Radioactive material other than that used for weapons production was processed during or after the time of DOE contracts and exposure to workers in that facility cannot be clearly attributed to either DOE or non-DOE sources. The survey conducted by ORNL personnel shows that levels of contamination above NRC guidelines for unrestricted use do exist at this site. However, the actual source of this contamination can be related to both AEC-related activities and Gardinier's own operations. It is not possible to separate the exposures based on the documentation reviewed.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

### **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

"Radiological Survey of the Former Uranium Recovery Pilot and Process Sites, Gardinier, Inc., Tampa Florida" DOE/EV-0005/21, ORNL-5714, abstract only, (survey performed Dec 14-19, 1977. DOE Authority Review [pages available aren't dated but appear to have been written after 1985] describes elevated contamination found in 1977 ORNL survey.

#### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

#### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** General Atomics  
La Jolla, California

**ALSO KNOWN AS:** GA  
Division of General Dynamics  
John Jay Hopkins Laboratory for Pure and Applied Science

**TIME PERIOD:** AWE 1960-1969; BE uncertain; DOE 1996-1999 (remediation)

### **DESCRIPTION OF ACTIVITIES:**

General Atomics was one of a number of private contractors that processed unirradiated scrap for the AEC in the 1960s. In addition, the Hot Cell Facility was used for numerous post-irradiation examinations of Department fuels, structural materials, reactor dosimetry materials, and instrumentation. The Department-sponsored activities at the General Atomics Hot Cell Facility primarily supported the High Temperature Gas Cooled Reactor and the Reduced-Enrichment Research Test Reactor programs. In December 1994, General Atomics notified the NRC and the State of California Department of Health Services of its intent to cease operations in the Hot Cell Facility.

General Atomics was also the operating contractor for the AEC's Experimental Beryllium Oxide Reactor (EBOR) at Idaho National Engineering Laboratory. General Atomics manufactured EBOR fuel elements (UO<sub>2</sub>-BeO) on site and examined them in the site's hot cell. A final closeout survey of the facility was conducted by ORNL in 2000, and the site was released for unrestricted use.

Documentation reviewed indicates that the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically between 1969 and 1996.

### **INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE worker advocacy website, and internal DOE/AEC correspondence provided by the Department of Energy Worker Advocacy Group.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1960 - 1999

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** General Electric Company (Ohio)  
Cincinnati/Evendale, Ohio

**ALSO KNOWN AS:** GE Evendale  
GE Cincinnati  
GE Lockland  
Air Force Plant 36

**TIME PERIOD:** 1961-1970

**DESCRIPTION OF ACTIVITIES:**

From 1961 through June 30, 1970, the AEC occupied Buildings C and D and certain other smaller auxiliary structures at AF Plant 36, Evendale, Ohio. The Evendale plant's major mission is to build aircraft engines. The AEC used this facility to work with a variety of radioactive materials, including uranium and thorium. This facility was also involved in the refining or fabrication of beryllium or beryllium oxide.

Documentation reviewed indicates that Aircraft Nuclear Propulsion (ANP) work reportedly began at this General Electric facility in 1951 as a joint Air Force/AEC program, which subsequently ended in 1961. Use of radioactive materials reportedly continued at this facility for other AEC related work until 1973.

A radiological survey performed at Building D in 1987 by ORAU, states that "preliminary measurements identified significant residual contamination exceeding the release guidelines" for unrestricted use. This survey resulted in additional decontamination efforts, and follow-up radiological surveys.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group. Pertinent documentation included, ORAU 88/H-106 Confirmatory Radiological Survey of the Building D Laboratory Area, General Electric Company, Evandale, Ohio.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** General Electric Plant (Indiana)  
Shelbyville, Indiana

**TIME PERIOD:** 1956

**DESCRIPTION OF ACTIVITIES:**

In 1956, this facility handled thorium metal under subcontract to NLO (Fernald). The work, which involved 500 pounds of thorium, was a test of compacting and shaping techniques using General Electric's equipment.

Documentation also exists which shows that the facility was effectively decontaminated (immediately) after the DOE work was completed.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** General Electric Vallecitos  
Pleasanton, California

**TIME PERIOD:** AWE 1958-1978;1981-1982; DOE 1998- present

**DESCRIPTION OF ACTIVITIES:**

In 1958, General Electric Vallecitos constructed four hot cells for post-irradiation examination of uranium fuel and irradiated reactor components. The U.S. Government's involvement (through the AEC and later, the DOE) was limited to a single hot cell, Hot Cell No. 4. Between 1965 and 1967, Hot Cell No. 4 was decontaminated, equipped with a stainless steel liner to contain plutonium, and dedicated to the study of mixed oxide fuel rods in support of the AEC's fast breeder reactor development programs. In 1978, Hot Cell No. 4 was placed on standby; it was used by Lawrence Livermore National Laboratory for six months in 1981 and 1982.

A confirmatory radiological survey of Building 400 at the General Electric Company, Vallecitos Nuclear Center was performed by ORAU in 1987-1988 for NRC License termination. It was found that the facility met required conditions for release for unrestricted use. This document ORAU 88/B-87 did not contain any information about past activities that were related to weapons development, and it could not be ascertained from the documentation if this the building involved.

No other information was available for review, that could be used to assess the nature of the operations or the time-frames involved.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal DOE/AEC correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Granite City Steel  
Granite City, Illinois

**ALSO KNOWN AS:** Old Betatron Building  
Granite City Site  
General Steel Castings Corporation  
National Steel Corporation

**TIME PERIOD:** 1958-1966; DOE 1993-1994

**DESCRIPTION OF ACTIVITIES:**

From 1958 through 1966, Granite City Steel (under the name General Steel Castings) performed quality-control work for the AEC. Specifically, it x-rayed uranium ingots to detect metallurgical flaws for the Mallinckrodt Weldon Spring site.

No documentation reviewed indicated that the facility was adequately decontaminated after DOE work was discontinued in 1966. Survey results showed small amounts of residual radioactivity in excess of federal guidelines remained in several areas of the x-ray building. The residual radioactive material at the site was likely the result of operations, such as the rubbing off of oxidized uranium during handling. DOE cleanup of the site was completed in June 1993. Documentation reviewed indicates that the potential for residual contamination existed outside of the period in which weapons-related production occurred, specifically between 1966 and 1993.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1958 - 1994

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Great Lakes Carbon Corp.  
Chicago, Illinois

**TIME PERIOD:** 1952-1958

**DESCRIPTION OF ACTIVITIES:**

Great Lakes Carbon Corp. studied graphite for the AEC in 1952 under contract AT(45-1)-269. Great Lakes Carbon Corp. felt it was 2 years and \$5 million dollars away from producing pile-grade graphite. In 1958, Great Lakes Carbon Corp. did some treat fuel work for ANL. As part of the contract, ANL agreed to decontaminate the facility used (Pilot Plant 3). Documentation exists which shows that the facility was effectively decontaminated (immediately) after the DOE work was completed (September 12, 1958).

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Gruen Watch  
Norwood, Ohio

**ALSO KNOWN AS:** Gruen Watch Co., Time Hall

**TIME PERIOD:** 1956

**DESCRIPTION OF ACTIVITIES:**

Gruen Watch conducted cold shaving and stamping and hot stamping washer tests for NLO (Fernald) in 1956. The tests involved shaving and stamping uranium washers on a 60-ton mechanical press and stamping washers from strips of uranium heated in a salt bath. Only small quantities of radioactive materials were handled.

Documentation exists which shows that contamination surveys were completed immediately after the DOE work was completed.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME** GSA 39th Street Warehouse  
Chicago, Illinois

**ALSO KNOWN AS:** Resco Air Conditioning, Refrigeration and Heating Co.

**TIME PERIOD:** 1940s

**DESCRIPTION OF ACTIVITIES:**

The 39<sup>th</sup> Street Warehouse was occupied by the ANL and/or its predecessor, the Metallurgical Laboratory, until approximately 1949. Activities at the building included the storage of radioactive materials.

A radiological survey of this property, including soil surface, sheds, and loading platforms in the rear yard, was completed on July 7, 1949. After decontamination, the building and grounds were determined to be below acceptable levels. ANL re-surveyed the site from July 11-14, 1977, and found no radioactivity above natural background.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Harshaw Chemical Co.  
Cleveland, Ohio

**ALSO KNOWN AS:** Harshaw Filtrol Partners  
Uranium Refinery

**TIME PERIOD:** 1942-1955

**DESCRIPTION OF ACTIVITIES:**

Harshaw Chemical Co. of Cleveland, Ohio refined black oxide and sodium diuranate to orange oxide and then to brown oxide for the Manhattan Project during World War II. The final result was a "green salt," which the Manhattan Project used to produce uranium hexafluoride for enrichment into weapons-grade fuel for nuclear weapons at the gaseous diffusion plants. Harshaw also produced uranium hexafluoride during the war. This production activity was expanded in 1947. Harshaw production was reduced in 1951, and by May of 1953 the green salt plant was dismantled and the hexafluoride plant was placed on standby. The contract for removal of AEC equipment continued until September 30, 1955.

Available documentation does make it clear that Harshaw Chemical Co. provided significant quantities of uranium, in various chemical forms, to the MED/AEC during the period of 1942 through 1955. There is also documentation that a radiological decontamination effort was made of the area and equipment, potentially as late as 1960. However, subsequent radiological surveys performed in 1976 through 1979 for the DOE, and then again in 1984, identified widespread uranium contamination that could very well be attributable to MED/AEC activities. It is not clear from the documentation what, if any, use of the facilities occurred subsequent to cessation of MED/AEC activities in 1960, or if the facilities were in use during or after the identification of residual contamination in 1976. The available documentation does not describe what cleanup actions have been taken at this facility or what its current use or status is.

The start date of 1942 appears appropriate. Widespread contamination was identified by Argonne in 1976-79, particularly in "Plant C," the building that was used for AEC/MED activities. It appears that AEC activities terminated about 1960, and that Harshaw continued with commercial uranium operations under a source material license. Complete information has not been found about radiological conditions in 1960 (at the end of AEC activities). Given the results of the 1976 FUSRAP survey, it is likely that significant contamination existed beyond the current period in which weapons-related production occurred.

## **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

Pertinent documents reviewed:

1. Brief History of the Work on the Manhattan District Project at the Harshaw Chemical Company, Cleveland, Ohio, by W. J. Harshaw (undated).
2. "Radiation Contamination Survey of Uranium Refinery at Harshaw Chemical Company, 1000 Harvard Boulevard, Cleveland Ohio" Survey conducted November 21, 1957, by Arthur Schoen.
3. Documents contained in files of Office of Worker Advocacy.
4. DOE-HASL memo, P.B. Klevin to W.B. Harris, "Radiation Survey of Harshaw 'Plant C' Equipment, May 31 - June 1, 1955," dated June 10, 1955.
5. Formerly Utilized MED/AEC Sites Remedial Action Program Radiological Survey of the Harshaw Chemical Company, Cleveland, Ohio, DOE/EV-005/48, ANL-OHS/HP-84-104, April 1984.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1942 - 1984+ (Contamination was identified in 1984 but the end date cannot be determined due to insufficient information)

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Heald Machine Co.  
Worcester, Massachusetts

**ALSO KNOWN AS:** Cincinnati Milacron

**TIME PERIOD:** 1960

**DESCRIPTION OF ACTIVITIES:**

Heald Machine Co. conducted a two-day acceptance test of a multi-bore drilling machine built by NLO (Fernald) in 1960. Uranium metal was machined as part of acceptance tests for the new machine tools. All materials and residues were shipped to NLO (Fernald).

Existing documentation shows that contamination surveys and decontamination were conducted immediately after the DOE work was completed.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Heppenstall Co.  
Pittsburgh, Pennsylvania

**ALSO KNOWN AS:** Tippins Inc.

**TIME PERIOD:** 1955

**DESCRIPTION OF ACTIVITIES:**

In 1955, the Mallinckrodt Chemical Company, a prime AEC contractor, subcontracted to the Heppenstall Co. to heat, press, and water-quench uranium metal. Work was performed by Heppenstall for approximately six months, during which time the plant processed approximately 100,000 pounds of normal uranium metal. Records indicate that the forging was done on a 1,000 ton press on a schedule of two days per month by a Heppenstall crew of eight men. Mallinckrodt supplied the salt bath furnace used to heat the metal to forging temperatures and quenching tank to Heppenstall. The equipment was returned to Mallinckrodt upon completion of the work.

Although the work dates are well-documented in the existing documentation, there is no documentation which indicates that the facility was adequately decontaminated after DOE work was discontinued. There are indications that HASL may have performed radiological surveys during the operations. These surveys could not be located at the time of this evaluation. Available documentation that was reviewed included radiological surveys conducted in 1987 and 1991. Both surveys indicated no residual contamination in excess of guideline values. There is no indication, however, of the contamination levels shortly after operations ceased.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

## **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Herring-Hall-Marvin Safe Co.  
Hamilton, Ohio

**ALSO KNOWN AS:** Diebold Safe Co.

**TIME PERIOD:** 1943-1951

### **DESCRIPTION OF ACTIVITIES:**

Intermittently from 1943 to 1951, the Herring-Hall-Marvin Safe Co. machined natural uranium metal slugs from rolled stock under subcontract to DuPont and the University of Chicago.

The dates listed on the DOE website are not supported by documentation. Although the work dates are roughly documented in the existing documentation, there is no documentation which indicates that the facility was adequately decontaminated after work was discontinued. However, there is documentation showing radiological surveys were conducted in 1988 and 1989. Both surveys indicated that there was a small amount of uranium contamination found. This small amount was decontaminated when found. In 1993, public attention was drawn to this facility by former workers who stated that the earlier surveys did not include the portion of the third floor where actual machining work was conducted. Surveys were conducted and radioactive residues were found to be in excess of DOE guidelines on over 25 percent of the third floor. Restricted access to the third floor was recommended to the current owner at this time. Decontamination of the surface contamination on the third floor was completed February 1995.

Documentation reviewed indicates that the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically between 1951 and 1995.

### **INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

1943 - 1995

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
--

**FACILITY NAME:** Hooker Electrochemical  
Niagara Falls, New York

**ALSO KNOWN AS:** Hooker Chemical Co.  
Occidental Chemical Corp.  
Occidental Chemical Corp., Specialty Chemical

**TIME PERIOD:** 1943-1948

**DESCRIPTION OF ACTIVITIES:**

In January, 1943, Hooker began work for the MED to manufacture fluoridated and chloridated organic chemicals. The by-product of this work was hydrochloric acid that was subsequently used in the chemical processing of a uranium-bearing slag as a precursor of uranium recovery.

Additional information is required to make a determination. Available documentation does not contain any information that indicates the presence of residual contamination outside of the period in which weapons-related production occurred. However there is no documentation identifying the radiological conditions at the cessation of operations or information that can be used to determine if the facility was adequately decontaminated after DOE work was discontinued. There is documentation of radiological surveys during the period of October 11-15, 1976. The conclusion from this survey, reports that residual radioactivity levels are within current Federal and State guidelines for unrestricted use.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

## **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Horizons, Inc.  
Cleveland, Ohio

**ALSO KNOWN AS:** Lamotite, Inc.

**TIME PERIOD:** 1944-1956

### **DESCRIPTION OF ACTIVITIES:**

During the 1940s and 1950s the metal handling facility was used for the production of granular thorium metal for the AEC and conducted some thorium research work for Savannah River. From July 1949 to November 1949, Horizons, Inc. was also under AEC contract to conduct research and perform development work on a process for the preparation of ductile, high-purity zirconium by fused salt electrolysis.

Documentation indicates that DOE predecessor contract activities started in 1952 and work may have continued through the early 1960's. A radiological survey was performed by ORNL in 1977 to determine the radiological status of the property. The results of that survey confirmed the presence of natural thorium and its decay products in the two buildings used for production of granular thorium metal. Under use conditions in effect at the time of the survey indicated that radiation exposures to employees working on the site were slightly greater than background exposure. However, contamination and beta-gamma dose rates in some isolated areas did exceed guidelines currently in use by the DOE.

### **INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group. Pertinent documentation included, Final Report (DOE/EV-0005/10); Formerly Utilized MED/AEC Sites Remedial Action Program Radiological Survey of the Former Horizons, Inc., Metal Handling Facility, Cleveland, Ohio, February, 1979.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1944 - 1977+ (Contamination was identified in 1977 but the end date cannot be determined due to insufficient information)

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
--

**FACILITY NAME:** Hunter Douglas Aluminum Corp.  
Riverside, California

**ALSO KNOWN AS:** Bridgeport Brass Co.

**TIME PERIOD:** 1959-1963

**DESCRIPTION OF ACTIVITIES:**

In 1959, Hunter Douglas Aluminum Corp. fabricated hollow tubing by impact extrusion of approximately 1,600 pounds of solid uranium stock for NLO (Fernald) to determine the feasibility of impact extruding solid uranium castings to close tolerance tubing. A subsequent subcontract with the Hunter Douglas Division on Bridgeport Brass called for the extrusion of cast zirconium-clad billets into moderator pieces for shipment to the GE Evendale Plant for final machining. Shipments of uranium between NLO (Fernald) and Hunter Douglas took place during 1962-1963.

The facility did not have the potential for significant exposure during operations due to the small amount of uranium (1,600 lbs) used. Also, it is noted in the NLO (Fernald) contract that Hunter Douglas was responsible for the decontamination and cleanup of facilities and equipment.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** International Minerals and Chemical Corp.  
Mulberry, Florida

**ALSO KNOWN AS:** Pilot Facility  
Uranium Recovery Unit at the Bonnie Plant  
Phosphate Chemicals Division, Bonnie Uranium Plant  
C.F. Industries, Inc.

**TIME PERIOD:** 1951-1961

### **DESCRIPTION OF ACTIVITIES:**

International Minerals and Chemical Corp. produced uranium as a byproduct of the recovery of phosphate chemicals and fertilizers. In 1951, AEC contracted with International Minerals and Chemical Corp. for the recovery of uranium, which was ultimately used for the production of weapons. The original production plant was shut down in 1959. During the years of operation, 100 tons of  $U_3O_8$  were produced, with a peak production of 2-3 tons per month. Starting in 1954, the uranium recovery unit was located at the Bonnie Plant. In 1955, it switched to the phosphoric acid process. International Minerals and Chemical Corp. became Central Farmers (now C.F.) Industries. In 1969, C.F. Industries became C.F. Chemicals, Bartow Phosphate Works. The phosphoric process was shut down in 1961.

A 1977 survey by ORNL identified radium in the soil up to 28 pCi/gram. This was not considered unusual at a phosphate plant as these levels are apparently within expected ranges at commercial phosphate recovery facilities. However residual contamination attributable to uranium production processes would also be expected and can not be distinguished from that originating from commercial activities..

### **INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** International Nickel Co., Bayonne Laboratories  
Bayonne, New Jersey

**TIME PERIOD:** 1951-1952

**DESCRIPTION OF ACTIVITIES:**

International Nickel Co. plated uranium slugs with nickel for use in nuclear weapons production.

The records were not completely clear, but it appears this was test work that was conducted, and not production levels. There was no specific information regarding exactly how many uranium slugs were processed. Available documentation indicates that there is little likelihood of residual contamination outside the stated dates and that there is no additional documentation available for review.

Based on the documentation available and the premise that no additional documentation exists, there is no reason to dispute the established period in which weapons-related production occurred dates.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
--

**FACILITY NAME:** International Rare Metals Refinery, Inc.  
Mount Kisco, New York

**ALSO KNOWN AS:** Canadian Radium and Uranium Corp.  
Pregals Mt. Kisco Refinery  
Pregal

**TIME PERIOD:** 1940s

**DESCRIPTION OF ACTIVITIES:**

International Rare Metals Refinery, Inc. processed pitchblende ores for the African Metals Corp. to extract uranium. The same ores were processed for the MED to recover uranium and radium. The exact quantities of ore processed by the facility was indeterminate in the records provided. The exact dates of MED involvement, similarly, could not be determined. Sometime in the 1950s, the company shifted to primarily producing radium for commercial and medical uses.

There were radiological surveys conducted at the facility in 1952 and 1956, identifying significant levels of removable and airborne radioactive material contamination. The site was apparently remediated sometime prior to 1996 by the state of New York, however there was no information regarding close-out surveys or the status of the facility today. The determination for this facility is based on the inability to distinguish residual contamination attributable to MED involvement from that originating from commercial operations.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** International Register  
Chicago, Illinois

**ALSO KNOWN AS:** Intermatic, Inc.

**TIME PERIOD:** 1943

**DESCRIPTION OF ACTIVITIES:**

International Register was involved in the development of uranium machining techniques for the Metallurgical Lab and the MED. There apparently was only a single test of center-less grinding conducted at the facility by Met Lab personnel. Only a few rods were ground, and the exact number is not specific.

There was a FUSRAP elimination recommendation conducted in 1987, indicating little likelihood of contamination, and no further action being necessary.

There were no radiological surveys performed during or after the test that were available in the provided documentation. However, given this was a one-time test, the likelihood of significant facility contamination is remote.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Ithaca Gun Company  
Ithaca, New York

**TIME PERIOD:** 1961-1962

**DESCRIPTION OF ACTIVITIES:**

In 1961 and 1962, Ithaca Gun Company (IGC) was under subcontract to NLO (Fernald), which was the prime contractor for the AEC NLO (Fernald) facility. Under the contract, Ithaca Gun Company conducted tests to determine the forging ability of the Gun Forging Machine (vertical forging unit) at IGC in 1961. These tests involved the forging of hollow uranium billets into tube. An additional test to investigate alternative methods of production of the I and E fuel cores was conducted at IGC in 1962.

Documentation exists which shows that the facility was effectively decontaminated (immediately) after the DOE Work was completed. The document titled, "Authority Review for Ithaca Gun Co." reveals that the testing site was vacuumed down to background levels after the completion of the test. All equipment was decontaminated using rags and solvents. All material was returned to NLO (Fernald).

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** J.T. Baker Chemical Co.  
Phillipsburg, New Jersey

**ALSO KNOWN AS:** Subsidiary of Vick Chemical Company

**TIME PERIOD:** None Listed

**DESCRIPTION OF ACTIVITIES:**

J. T. Baker Chemical Co. was licensed by AEC to process and distribute refined source material (uranium). The company had previously sought to purchase uranium compounds during World War II, but these were diverted for wartime use.

Available documentation does not provide any evidence of a contractual or similar relationship with the AEC, information about AEC operations involving radioactive material or radiological survey data from the facility. The available documentation does not provide any indication that J. T. Baker was anything other than a licensed commercial facility.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website, FUSRAP files, and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Jessop Steel Co.  
Washington, Pennsylvania

**TIME PERIOD:** 1950-1954

**DESCRIPTION OF ACTIVITIES:**

In the early and mid-1950s, the Jessop Steel Co. was under contract for metal fabrication to the AEC, with some work through DuPont. The Jessop Steel Co. probably received shipments of uranium metal in nickel scrap, to make stainless steel piping for NLO(Fernald). In 1954, Jessop shipped some radioactively-contaminated pickling liquor to Mallinckrodt Chemical Works. Also, in 1954, Jessop sheared uranium plates for DuPont under purchase order AX-3104 for eventual use at Savannah River Laboratory. In 1954, tentative plans were made for Jessop Steel to roll uranium for NLO(Fernald) billet production.

Available documentation indicates that Jessop was involved with limited amounts of radioactive materials to include shearing of some uranium metal pieces on March 2, 1954, but a trip report from December 1954 reports that Jessop had little or no experience with uranium.

Documentation does indicate the introduction of uranium through receipt of contaminated nickel in 1952. There is no documentation to determine if the facility was adequately decontaminated after DOE work was discontinued. Equipment and facilities involved with the work, were disposed or dismantled sometime after operations, up until the time-frame of 1960. Radiological surveys were conducted in 1988 identifying conditions which were not above background in the existing facilities.

Although no residual contamination was identified in the 1988 surveys, these surveys did not, or could not, be performed on facilities and/or equipment involved in operations which no longer existed.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Joslyn Manufacturing and Supply Co.  
Ft. Wayne, Indiana

**ALSO KNOWN AS:** Joslyn Stainless Steel Co.

**TIME PERIOD:** 1944-1952

**DESCRIPTION OF ACTIVITIES:**

From 1944 to 1949, this site was used under contract 7401-37-9 to MED/AEC to roll and machine uranium rods from billets. The billets were received by rail. Work was conducted under MED/AEC constant supervision, and scraps and ash generated were retained by MED/AEC personnel for uranium accountability. Small furnaces were used to heat the material. Three mills and straightening, cutting, threading, and grinding equipment were used in the operation. An outdoor area was used to burn waste.

No documentation exists which indicates that the facility was adequately decontaminated after DOE work was discontinued. A radiological survey was conducted by the AEC Health and Safety Laboratory on August 1, 1949 (at contract termination). Certain areas of the site were reported to have radioactivity levels above guidelines then in use. However, there is no record of any decontamination work. In 1976, ORNL personnel performed exploratory measurements to determine whether any significant contamination remained. Results indicated that radioactive surface contamination measurements were indistinguishable from instrument background levels.

With the absence of post operational radiological survey data and the indication that contract work continued through 1952, it is determined that this facility poses a potential for residual contamination outside the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Kaiser Aluminum Corp.  
Dalton, Illinois

**TIME PERIOD:** 1959

**DESCRIPTION OF ACTIVITIES:**

In 1959, Kaiser Aluminum Corp. completed extrusion of billets. The extrusion operation was carried out by Kaiser personnel under the supervision of Metallurgical Lab personnel. Normal  $U_3O_8$  was used in the elements.

Documentation exists which shows that the facility was effectively decontaminated (immediately) after the DOE work was completed.

**INFORMATIONAL SOURCES**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Kellogg/Pierport  
Jersey City, New Jersey

**ALSO KNOWN AS:** Vitro Corp. of America  
Kellogg Corp.

**TIME PERIOD:** 1943-1953; 1981-1998

**DESCRIPTION OF ACTIVITIES:**

In 1943, the M.W. Kellogg Company established the Kellogg Corp. to design and construct the first gaseous diffusion uranium enrichment facility, the K-25 Plant, in Oak Ridge, Tennessee. This work was conducted under contract to the MED and later to the AEC. In the 1940s and early 1950s, Kellogg conducted research and development on fuel reprocessing and component testing using uranium hexafluoride, and uranium processing and recovery techniques. In 1951, the Vitro Corp. of America assumed all the rights and obligations of the Kellogg Corp. In 1953, Kellogg discontinued all AEC contract work at the Kellogg/Pierport site.

A 1953 survey performed by Vitro indicated that the site had been decontaminated to standards that were applicable at that time. ORNL radiological surveys from the late 1970's identified conditions at background with the exception of a few well-defined hot spots near the location where the Lab Building used to be (it had been demolished). A report that is excerpted in the OWA files says the Kellogg Lab Building, Building 11, where all the radioactive material work reportedly occurred, was demolished in 1953.

Remedial action was conducted in 1979 by EnviroSphere, a division of Ebasco Services. About 1,000 barrels of contaminated soil were removed from isolated areas found in the ORNL survey of March, 1979. FUSRAP remedial action was completed in 1981. No documentation reviewed shows any DOE contract activity or remedial action after 1981.

It is unclear as to why the period in which weapons-related production occurred dates include the period after FUSRAP completion in 1981.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Kerr-McGee  
Guthrie, Oklahoma

**TIME PERIOD:** 1962-1973

**DESCRIPTION OF ACTIVITIES:**

Kerr-McGee processed unirradiated uranium scrap for the AEC in the 1960s.

No new information was available during this review. A determination cannot be reached.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME**                      Koppers Co., Inc.  
Verona, Pennsylvania

**TIME PERIOD:**                      1956-1957

**DESCRIPTION OF ACTIVITIES:**

In conjunction with the Kennecott Copper Co., Koppers conducted pilot plant tests for the production of uranium hexafluoride. In 1956, Koppers was licensed to receive 2,000 pounds of refined source material for use in studies toward the preparation of uranium dioxide for reactor fuel elements and 6,150 pounds of refined source material for use in research and pilot plant investigations on feed material processing. In October, 1957, they were authorized to receive 110 pounds of normal uranium hexafluoride. Most of the research work appears to have taken place at the Koppers Research Department in Verona, Pennsylvania.

Documents reviewed suggest that the work which the Koppers Co., Inc. was doing was licensed and could have been strictly a speculative commercial venture. They were commercially developing a UF<sub>6</sub> production process. On that basis, they were not considered under FUSRAP. It's not clear that the Koppers work was even done at AEC's urging.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** La Pointe Machine and Tool Co.  
Hudson, Massachusetts

**TIME PERIOD:** 1956

**DESCRIPTION OF ACTIVITIES:**

NLO (Fernald) conducted tests on broaching machine and arbor press, in which uranium was used.

Documentation exists which shows that the facility was effectively decontaminated immediately after DOE work was completed.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Landis Machine Tool Co.  
Waynesboro, Pennsylvania

**ALSO KNOWN AS:** Teledyne Landis Machine

**TIME PERIOD:** 1952

**DESCRIPTION OF ACTIVITIES:**

Landis Machine Tool Co. processed an MED/AEC test quantity of uranium slugs to be cold formed to specified dimensions, using center-less grinders.

The facility did not have the potential for significant exposure before or after operations.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Latty Avenue Properties  
Hazelwood, Missouri

**ALSO KNOWN AS:** Contemporary Metals Corporation  
Continental Mining and Milling  
Commercial Discount Corporation  
Futura Coatings, Inc.  
Jarboe Realty and Investment Company  
Hazelwood Interim Storage Site  
HISS  
Futura Coatings Site

**TIME PERIOD:** AWE1967-1974; DOE 1984-1998 (remediation)

**DESCRIPTION OF ACTIVITIES:**

The Mallinckrodt Chemical Company conducted uranium milling and refining operations under contracts with the MED/AEC at the St. Louis Downtown Site in Missouri. Mallinckrodt transported process residues to the St. Louis Airport Site for storage until the Commercial Discount Corporation of Chicago purchased them in 1967. Commercial Discount transported the residues to the Latty Avenue Properties for storage and processing. This material was sold to the Cotter Corporation in 1969 and was dried and shipped to their facilities in Canon City, Colorado. By 1974, most of the material had been sold and removed from the Latty Avenue Properties, leaving only residual contamination.

The 1984 Energy and Water Appropriations Act directed DOE to conduct a decontamination research and development project at four sites throughout the nation, including 9200 Latty Avenue and properties in the vicinity. Although contamination in Hazelwood did not result directly from atomic energy programs, Hazelwood properties were added to the DOE's FUSRAP by Congress to expedite decontamination. After reviewing the FUSRAP web page, Latty Avenue Properties remedial action is not showing completed at this time.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE Worker Advocacy Group.

Pertinent documents reviewed:

1. DOE (ORNL) Report, "Radiological Evaluation of Decontamination Debris at Futura Chemical Company Facility, 9200 Latty Avenue, Hazelwood, Missouri," dated

### **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

- September 9, 1981.
2. "Background Information, Hazelwood Site and Vicinity Properties, Formerly Utilized Sites Remedial Action Program," prepared for U.S. EPA by DOE, December 1986.
  3. DOE (ORNL) Interim Report, "Radiological Survey of the Property at 9200 Latty Avenue, Hazelwood, Missouri," September 1977.

#### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is potential for significant residual contamination outside of the period in which weapons-related production occurred.

#### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1967 - 1998

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Ledoux and Co.  
New York, New York

**TIME PERIOD:** 1946-uncertain

**DESCRIPTION OF ACTIVITIES:**

Ledoux and Co.'s work with uranium and nuclear materials began during the 1930s when the company first developed methods of analysis for uranium-bearing substances. From 1946 to 1955, Ledoux and Co. provided personnel who assayed uranium ore at the Mallinckrodt Chemical Works in St. Louis. By 1948, Ledoux was also providing personnel to perform assaying work at the Middlesex Sampling Plant, which probably continued until 1955.

Ledoux and Co. appears on NLO (Fernald)'s shipping and receipt reports for enriched uranium in 1986. Today, Ledoux and Co. represents many fuel fabricators at enrichment facilities offering surveillance, sampling, and analytical services at their Teaneck, New Jersey laboratory. Ledoux and Co. performs sampling, weighing, and analysis of all forms of nuclear materials from geological samples to enriched and depleted UF<sub>6</sub>. Ledoux and Co. has obtained licenses from the NRC to handle Special Nuclear Materials, Source Material, and By-Products.

The documentation contains information verifying that personnel and resources were supplied by Ledoux Company at several processing facilities in the late 1940s and early 1950s. However, there is no documentation showing that radioactive materials were ever handled at the New York, New York offices during this time frame. One document indicates that Ledoux and Co. received materials from NLO(Fernald) in 1986. However, the documentation does not describe the material form and quantity, nor does it specify the exact location or facility where the material was shipped.

While it appears that Ledoux and Company never handled radioactive materials at the New York sites, documentation available for review during this evaluation is insufficient to reach a final determination.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation. Pertinent documents included, DOE Letter; James W. Wagoner II to Rudolph Giuliani; Subject: Elimination of leDoux and Co. site in New York City; December 12, 1994.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Linde Air Products  
Buffalo, New York

**ALSO KNOWN AS:** Linde Air Products Div. Of Union Carbide  
Linde  
Linde Center  
Chandler Plant  
Chandler Street Plant  
Linde Chandler Plant

**TIME PERIOD:** 1945-1947

**DESCRIPTION OF ACTIVITIES:**

The Linde Air Products facility, also known as the Chandler Plant, was involved in the development and production of barrier for the Oak Ridge Diffusion Plant. During World War II, Linde was part of the Carbide and Carbon Chemical Corporation, later known as Union Carbide.

An AEC Realty & Leaseholding report shows that the Linde Air facility in Buffalo, New York was acquired in September, 1944 and terminated in November, 1947. The contracting period does not precisely correlate with the dates specified as the period in which weapons-related production occurred however documentation indicates that this facility did not handle radioactive materials and should not be mistaken for the Linde Tonawanda site.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Linde Ceramics Plant  
Tonawanda, New York

**ALSO KNOWN AS:** Tonawanda Laboratory  
Linde Air  
Paxair

**TIME PERIOD:** 1940-1950, DOE 1996 - 1997 (remediation)

**DESCRIPTION OF ACTIVITIES:**

From 1940 to 1948, Linde Ceramics performed uranium processing for the MED and the AEC, predecessor agencies of the DOE. Linde produced uranium metal and nickel in the Ceramics Plant. Limited development activities were also carried out at the Linde Research and Development Laboratory adjacent to the Ceramics Plant. African and Canadian ores were milled to black oxides at the plant. Documents indicate that the facility was placed on standby as of March 1, 1950. During World War II, Linde was a part of Carbide and Carbon Chemical Corporation, later known as Union Carbide.

Radiological surveys performed in the 1980s, identified conditions which subsequently led to FUSRAP actions. It is not clear from the available documentation how significant the potential radiological hazards were to non-occupational workers occupying these areas after 1950. However, the presence of this residual contamination and the need for FUSRAP activities indicates the need for further investigation to determine the potential for residual contamination after 1950. Documentation indicates that FUSRAP activities were initiated in 1990.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1940 - 1997

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Lindsay Light and Chemical Co.  
W. Chicago, Illinois

**ALSO KNOWN AS:** Kerr-McGee  
Reed-Keppler Park

**TIME PERIOD:** 1940-1953

**DESCRIPTION OF ACTIVITIES:**

Lindsay Light and Chemical Co. was a commercial processor of monazite sands, which yield several commercially valuable products, including the radioactive metal thorium. The MED and then the AEC purchased thorium from Lindsay. AEC contractors purchased a variety of products from this firm as well. Documents indicate that the firm supplied thorium to the MED and AEC through at least 1953. The facility received a source material license from the AEC in 1956, and it continued to process radioactive materials for commercial purposes until 1973.

Precise dates of operation are not determinable, this condition neither supports nor contradicts the “early 1940s” designation for the start of the period in which weapons-related production occurred. It would appear that Lindsay was performing thorium extraction processes for commercial purposes as early as 1931, well in advance of MED/AEC involvement. It also appears that AEC/MED may have processed of ores for source material purposes as late as 1963. Regardless of when thorium supply for MED/AEC ended, one available document indicates that a significant portion of the entire monazite processed at this site over its entire history may have been for MED/AEC activities. This condition results in a determination that residual radioactive material contamination existed after the cessation of MED/AEC activities and is indistinguishable from contamination resulting from commercial processing activities prior to or after MED/AEC involvement.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

Pertinent document: Argonne NL Report to the NRC; Written by Friferio, Larson and Stowe;  
Subject: Thorium Residuals in West Chicago, Illinois; September 1978.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

## **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Madison Site (Speculite)  
Madison, Illinois

**TIME PERIOD:** 1957-1960, DOE 1992-1998 (remediation)

**DESCRIPTION OF ACTIVITIES:**

Dow Chemical operated the Madison Site under subcontract to Mallinckrodt Chemical Company. Dow supplied the AEC with materials (chemicals, induction heating equipment, and metal magnesium products) and services. In March, 1960, Dow received an order for straightening uranium rods from Mallinckrodt.

A radiological survey was performed in 1989 by ORNL for the DOE which identified residual contamination approximately thirty years after the period in which weapons-related production occurred, which subsequently led to FUSRAP activities..

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation. Pertinent documents included, ORNL Report (ORNL/TM-11552); Preliminary Results of the Radiological Survey at the Former Dow Chemical Company Site, Madison, Ohio; Issued December 1990.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1957 - 1998

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Magnus Brass Co.  
Cincinnati, Ohio

**ALSO KNOWN AS:** Magnus Metals  
Moanes Brass

**TIME PERIOD:** 1954-1957

**DESCRIPTION OF ACTIVITIES:**

The site machined various forms of uranium metal under subcontract to the NLO(Fernald). The work was performed at two locations: Reading Road (from December,1954 through November,1955) and West 7th Street (from December,1955 through December,1957). Total production machining was approximately two or three hundred billets.

Documentation demonstrates that the machining work resulted in significant levels of residual contamination on equipment and surrounding areas during and after operations. A subsequent decontamination effort was reportedly performed but no radiological survey data is available documenting post-decontamination radioactivity levels. Based on the nature of operations, the amount of radioactive materials handled, and available radiological survey data from the operational period there is a high degree of probability that residual contamination existed beyond the end date.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

Pertinent document: DOE Memorandum; Williams to File; Subject: Elimination of the Magnus Brass Manufacturing Company from FUSRAP; April 8, 1991. Attachment: Authority Review for Magnus Brass Manufacturing Company; Circa 1991.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Massachusetts Institute of Technology  
Cambridge, Massachusetts

**ALSO KNOWN AS:** MIT, Hood Building

**TIME PERIOD:** 1942-1963

**DESCRIPTION OF ACTIVITIES:**

The Massachusetts Institute of Technology (MIT) was one of the institutions that contributed to early nuclear physics research in the United States. In addition to their research efforts, they also sent scientists to work at Los Alamos. For example, in 1942, MIT experimented on the process of melting and casting uranium metal, extracted uranium from low grade ores, studied the element beryllium, and experimented with nuclear propulsion systems. MIT also explored the coordination and the quality control of these processes. The building in which the research was done was demolished in 1963.

Records indicate that workers at MIT suffered from beryllium-related illnesses as early as 1947.

Documentation indicates uranium extraction research was performed by MIT in Cambridge, Massachusetts from 1942 through 1946. In 1946, MIT reportedly transferred the operations to the Watertown Arsenal (Bldg 421). American Cyanamid took over those activities in 1950. Activities in Bldg 421 reportedly continued through 1953 when the operations were transferred to a newly constructed laboratory in Winchester, Massachusetts. Documentation is not clear as to what activities were conducted at the MIT Cambridge site from 1946 through 1954. However, from 1954 through 1958, Nuclear Metals Inc. used the MIT Cambridge site for MED/AEC research. In 1958, Nuclear Metals Inc. moved operations to Concord, Massachusetts and the MIT Cambridge site was locked down and subsequently demolished in 1963. No radiological survey data was available for review, but as the period of 1942 through 1963 accounts for the entire time from initiation of activities through building demolition, the period in which weapons-related production occurred is deemed appropriate.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Mathieson Chemical Co.  
Pasadena, Texas

**ALSO KNOWN AS:** Pasadena Chemical Corp.  
Olin Mathieson Chemical Co.  
Mobil Mining and Minerals Co.

**TIME PERIOD:** 1951-1953

**DESCRIPTION OF ACTIVITIES:**

Mathieson Chemical extracted uranium oxides out of phosphoric acid compounds in a pilot study for the AEC.

Documentation describes the activities as bench-top type experiments for extracting uranium oxides from phosphoric acid compounds, which would most likely have been conducted under laboratory controls. There is no description of the quantities of uranium extracted or radiological conditions immediately after cessation of activities. But, it is reasonable to believe that laboratory work would not have resulted in widespread distribution or residual contamination post-operations. A radiological survey was performed for the DOE in 1977, with the only finding of residual contamination on inside surfaces of one sink and possibly the drain line, which in and of itself poses no significant exposure to personnel based on the low activity levels discovered.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Maywood Chemical Works  
Maywood, New Jersey

**ALSO KNOWN AS:** Maywood Site  
Maywood Interim Storage Site  
MISS  
Stepan Co.  
MCW

**TIME PERIOD:** 1947-1950; DOE 1984-1998 (remediation)

**DESCRIPTION OF ACTIVITIES:**

From 1916 to 1959, Maywood Chemical Works extracted radioactive thorium and rare earth elements from monazite sands for use in commercial products. From 1947 to 1950, the AEC purchased thorium compounds from the Maywood Chemical Company.

Documentation exists demonstrating the MED/AEC acquired thorium products from Maywood, starting in 1947, due to the “fertile” nature of the material. Documentation is unclear as to the exact quantity of material acquired. Documentation demonstrates that the radioactive material residues associated from these MED/AEC acquisitions constitutes only a portion of the overall residual contamination and potential radiological hazards. However, the inability to disregard these residues and/or distinguish them from non-MED/AEC residues necessitates the determination that a portion of the residual contamination requiring FUSRAP activities beginning in 1984, are attributable to former AWE activities.

Documentation reviewed indicates the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically between 1950 and 1984.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** McKinney Tool and Manufacturing Co.  
Cleveland, Ohio

**ALSO KNOWN AS:** Parker Rust Proof  
Meister-matic Inc.  
KC&F

**TIME PERIOD:** 1944

### **DESCRIPTION OF ACTIVITIES:**

Between May and August of 1944, McKinney Tool and Manufacturing Co. of Cleveland, Ohio, turned and ground unbonded slugs to provide fuel for the first nuclear reactors, including the three Chicago piles; the Oak Ridge X-10 reactor; and the Hanford B, D, and F production reactors and 305 test pile.

Radiological survey data gathered for the DOE in 1991 demonstrates that no residual contamination existed at that time however, there is no documentation identifying the radiological conditions at the end of the operations in 1944.

This site was eliminated from FUSRAP based on the results of a 1991 survey conducted 47 years after operations. A review of documented radiological conditions observed at C.H. Schnoor in Springdale, Pennsylvania and Baker Brothers in Toledo, Ohio, where similar activities were conducted, indicates that there is a potential for significant residual contamination having existed after operations ceased.

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation. Pertinent documents included;

1. DOE/Oak Ridge Laboratory Survey; R. Foley and M. Uziel; Subject Results of the Rad. Survey at the Former McKinney Tool and Mfg. Co., 1688 Arabella Road, Cleveland, OH (MTC001 and MTC002); ID#: ORNL/RASA-91/7; November 1991.
2. DOE report; Subject; Elimination Report for Former McKinney Tool Mfg. Co.; January 1994.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Medart Co.  
St. Louis, Missouri

**TIME PERIOD:** 1951-1952

**DESCRIPTION OF ACTIVITIES:**

The Medart Co. manufactured steel mill machining equipment which was useful in uranium processing. In 1952, Medart conducted broaching machine and arbor tests turning uranium for NLO(Fernald). According to a former Medart employee, the bar turning machine was eventually shipped to NLO(Fernald) for use at the FMPC.

Available documentation supports the operational period of 1951 and 1952. Radiological monitoring was performed during operations and the data identifies significant airborne radioactive material concentrations as having been generated (reports show activity levels in m<sup>2</sup>, these results most probably were meant to be reported in m<sup>3</sup> air concentrations.) This data indicates a strong potential for the dispersion of contamination throughout the immediate area of the facility where operations were performed. There is no documentation to demonstrate that decontamination efforts were initiated and no post-operational radiological survey data. Based on the available air monitoring data coupled with the absence of any post operational survey data this site poses a potential for significant residual contamination.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Metals and Controls Corp.  
Attleboro, Massachusetts

**ALSO KNOWN AS:** M&C Nuclear  
Metals and Controls Nuclear Corp.  
M&C  
Texas Instruments

**TIME PERIOD:** 1952-1967

**DESCRIPTION OF ACTIVITIES:**

Records indicate that the Metals and Controls Corp. fabricated fuel elements for production reactors, but it is unclear whether its work was related to the nuclear weapons complex. For example, Metals and Controls Corp. fabricated uranium foils for reactor experiments and fuel components, fabricated complete reactor cores for the Naval Reactors program, and fabricated uranium fuel elements for experimental and research reactors. Records indicate shipments of depleted uranium between Rocky Flats and M&C during the period from 1955-1958.

Available documentation indicates fuel was fabricated for research reactors (Battelle) potentially used in AWE support. While the documentation does indicate that activities performed at this facility had a high potential for the spread of contamination, it does not rule out AWE related residual contamination which would be indistinguishable from contamination generated from other non-AEC activities.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation. Pertinent documents included, NRC Investigative Report No. 078-154-A; March 1979.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Middlesex Municipal Landfill  
Middlesex, New Jersey

**ALSO KNOWN AS:** MML

**TIME PERIOD:** 1948-1960; DOE 1980-1998 (remediation)

**DESCRIPTION OF ACTIVITIES:**

From 1948 to 1960, the Middlesex Sampling Plant conducted thorium and uranium activities and disposed of the wastes at the Middlesex Municipal Landfill. Documentation is available and adequate to determine that the site was used for disposal of contaminated soils in 1948. In 1960, discovery of the contamination was made through observance of abnormal background radiation readings during a civil defense drill. Documentation establishes that subsequent to interactions between local and federal authorities, 650 cubic yards of surface material was removed on May 18, 1961. Residual subsurface contamination still existed after this action, but awareness of this condition and the documented radiation levels is considered to pose no significant exposure scenario.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1948 - 1998

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Midwest Manufacturing Co.  
Galesburg, Illinois

**ALSO KNOWN AS:** Maytag Co.

**TIME PERIOD:** 1944

**DESCRIPTION OF ACTIVITIES:**

A November 7, 1944 document indicates that Midwest Manufacturing Co. worked on the "self-lubricating draw die" which was related to metal fabrication for the Manhattan Project.

Documentation available for review during this evaluation is insufficient to reach a final determination. It is unclear if radioactive materials were involved, nor is it clear what activities were involved in the process development operations.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation. Pertinent documents included;

1. DOE Letter; Wagoner to Kimble; Subject; Midwest Manufacturing Co. Information; February 10, 1995.
2. Memorandum/Checklist; Wallo to the File; Subject; Midwest Manufacturing Co.; November 3, 1987.
3. MED Memorandum; Methods and Materials Section to Stearns; Subject; Metallurgical Fabrication and Physical Studies; November 7, 1944.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Mitchell Steel Co.  
Cincinnati, Ohio

**TIME PERIOD:** 1954

**DESCRIPTION OF ACTIVITIES:**

In 1954, Mitchell Steel Co. may have participated in the machining of a sample lot of four hollow extrusion uranium billets from ingots for NLO(Fernald). It is unclear whether Mitchell conducted the test or performed any additional work for NLO(Fernald) or the AEC.

Documentation available for review during this evaluation is insufficient to reach a final determination. This facility performed a machining test on limited quantities of uranium (4 billets), and there is no documentation to demonstrate further work was performed. Cross referencing the 1954 National Lead Company of Ohio document "Request for a Subcontract To Produce Hollow Extrusion billets on a Lump Sum Basis" identifying Mitchell Steel Company, with four other companies, it appears after comparison that the Magnus Brass Manufacturing Company of Cincinnati was the contractor selected to continue this work.

Based on a review of the Magnus file describing the residual contamination after several years of activities with "hundreds of billets" it cannot be ascertained what the potential for residual contamination would be after only limited operations of the same nature were conducted at this facility. Additionally there is no radiological survey data from this facility, known to exist to identifying the conditions.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Mitts & Merrel Co.  
Saginaw, Michigan

**ALSO KNOWN AS:** Genesse Packing Co.

**TIME PERIOD:** 1956

**DESCRIPTION OF ACTIVITIES:**

In a test for NLO(Fernald), Mitts & Merrell reduced a thorium metal chunk to small particle size pieces in its Hog Grinder.

Review of the analytical air sampling data from 1956 results in a confirmation of a high degree of probability that radioactive contamination was dispersed during the operation. The available documentation refers to thorium metal (+10 pounds) without specification of the isotope, having been ground up to fine particles producing heavy visible dusting outside of the equipment. Without further documentation of follow-up decontamination actions taken at that time, and consideration of the assumption that no additional post-operations radiological survey documentation exists, it is determined that there is a significant potential for residual contamination after completion of this operation.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Monsanto Chemical Co.  
Dayton, Ohio

**ALSO KNOWN AS:** Scioto Laboratory  
Dayton Project

**TIME PERIOD:** 1943-1946

#### **DESCRIPTION OF ACTIVITIES:**

In 1943, the MED began the Dayton Project to investigate the chemistry and metallurgy of polonium. This work was initially performed at the Monsanto Research Corporation's Scioto research laboratory in Dayton, Ohio. In 1946, the Dayton Project moved to its own facility in Miamisburg, Ohio. In 1947, the Dayton Project became the Mound Plant.

Documentation indicates that project activities were transferred from Dayton to Miamisburg in 1946, but it is unclear if operations were fully ceased at Dayton. Documentation indicates that decontamination efforts may have been conducted at various locations during 1949. Radiological survey data from the 1990's was available for review for multiple areas confirming the absence of significant residual contamination at that time however the conditions when operations were ceased is unknown.

#### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation. Pertinent documents included;

1. Mound Laboratory Paper; "History of the Dayton Project" by Keith V. Gilbert; June 1969.
2. DOE/EPA/Ohio EPA Report; "Mound Plant Potential Release Site Package - PRS #320-325"; Public Release May 29, 1997.
3. USAF Report; Radiological Scoping Survey of Former Monsanto Facilities (Unit III and Warehouse); 4 Sept 1997.
4. DOE Letter, Fiore to Augustine (USACOE), concerning eligibility of Dayton sites for cleanup under FUSRAP, October 19, 1999.

#### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Museum of Science and Industry  
Chicago, Illinois

**TIME PERIOD:** 1946-1953

**DESCRIPTION OF ACTIVITIES:**

Portions of the East Pavilion of the Museum of Science and Industry were used by employees of the Metallurgical Laboratory and the ANL. Although the facility was primarily used as office space, it is believed that radioactive materials were handled at this facility and that a spill of radioactive material may have taken place near the service elevator on the ground floor.

While a description of specific activities performed and/or material handled is not available, it is clear that work was performed for the AEC by ANL at this facility from 1946 through 1953. Documentation demonstrates that decontamination activities and radiological surveys were performed by ANL in the East Pavilion of the facility in 1949. It should be noted that while no such documentation was available for review relative to the West Court, which ANL occupied through 1953, a radiological survey was performed for the DOE in 1977 resulting in no identifiable residual contamination above normal background readings.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** National Bureau of Standards, Van Ness Street  
Washington, District of Columbia

**ALSO KNOWN AS:** University of the District of Columbia

**TIME PERIOD:** 1943-1952

**DESCRIPTION OF ACTIVITIES:**

The National Bureau of Standards (NBS) contributed to weapons research and development from the early 1940s until 1952. They participated in experiments related to developing the purification process of uranium oxide. From the early 1920s until 1952, the NBS had a radioactivity laboratory used for measuring radium samples for medical purposes.

The National Bureau of Standards also provided oversight for uranium metal production. During World War II, considerable emphasis was placed upon uranium metal production. Researchers at Iowa State soon perfected a magnesium reduction process, which quickly became the standard. The National Bureau of Standards in Washington, D.C., among other laboratories, provided quality control of the production of uranium metal using the magnesium process. Records also indicate that the NBS worked with thorium.

Area decontamination and radiological surveys were performed and documented in 1952 and 1968. Both of these surveys identified significant levels of fixed alpha contamination along with localized and general area external dose rates significantly above background levels. Based on a review of the survey data and associated documentation, the principal cause of these elevated readings is attributable to non-AEC related residual radium contamination. This is not to say that residual uranium contamination did not exist beyond 1952, but if present, it would be insignificant.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** National Guard Armory  
Chicago, Illinois

**ALSO KNOWN AS:** Washington Park Armory

**TIME PERIOD:** 1942-1951; DOE 1980s-1988 (remediation)

**DESCRIPTION OF ACTIVITIES:**

In the 1940s, the Manhattan Project leased the National Guard Armory from the State of Illinois for uranium processing and radioactive material storage. In 1951, the site was returned to the State of Illinois.

A radiological survey was performed for the DOE from September 1977 through October 1978, identifying widespread contamination in several areas of the facility and localized concentrations in others. After reviewing the radiological survey data, it is determined that the potential for residual radioactivity existed between 1951 and the beginning of DOE activities in the 1980s. This determination is principally based on the identification of removable surface contamination in overhead areas up to 1,700 dpm/100cm<sup>2</sup> alpha and 2,500 dpm/100cm<sup>2</sup> beta-gamma.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1942 - 1988

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** National Research Corp.  
Cambridge, Massachusetts

**ALSO KNOWN AS:** NRC

**TIME PERIOD:** 1944-1952

**DESCRIPTION OF ACTIVITIES:**

National Research Corp. had MED experience in working with vacuum centrifugal castings, in developing jets and baffles for diffusion pumps, and in developing cold trap systems. National Research's work with vacuum centrifugal castings (contract W-7405-eng-293) involved casting tube alloy (uranium metal) using the "lost wax" technique. In 1948, National Research did work for Mallinckrodt involving the vacuum melting of approximately 500 pounds of uranium.

A December, 1946 letter indicates that National Research Corp. requested a "leak detector for use in connection with some special development work on beryllium." It is not clear whether this work was ever actually done.

Documentation indicates through interviews with former employees that work with radioactive materials may have continued past 1952. There is documentation indicating that 69 kg. of thorium metal inventory was unaccounted for. There is discussion of need for a radiological characterization survey by or for the DOE. It is unknown if this survey has been performed, no data was available for review.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Naval Research Laboratory  
Washington, District of Columbia

**TIME PERIOD:** 1943-1945; DOE 1959

### **DESCRIPTION OF ACTIVITIES:**

During World War II, the Naval Research Laboratory produced quantities of enriched uranium through a thermal diffusion process. The Navy built a small pilot plant at the Anacostia facility for this purpose.

In the 1950s, the Laboratory handled radioactive materials for different research applications, and it is listed in the AEC annual report for 1959 as having just over \$2 million in AEC-owned equipment on-site.

There was no documentation to firmly establish the start and end dates for gaseous diffusion activities, nor disclosure as to radiological conditions during and/or after completion of these operations. Based on these uncertainties it is possible that residual contamination existed after cessation of operations. Additionally, there was no disclosure relative to disposition of equipment used in the gaseous diffusion processes. Documentation was reviewed demonstrating issuance of a Source Material License and associated modifications in the 1950s, which contained identification of the material forms and quantities. Based on a review of the licensing documents there is a low probability of residual contamination or significant personnel exposure from these materials, but there is no disclosure identifying the disposition of these materials. The date of 1959 appears to be based on custody of AEC-owned equipment, there is no description of what the equipment was or the radiological status of the equipment.

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** New England Lime Co.  
Canaan, Connecticut

**ALSO KNOWN AS:** NELCO

**TIME PERIOD:** 1963

**DESCRIPTION OF ACTIVITIES:**

In 1963, the New England Lime Co. (NELCO) conducted tests on “prill,” a magnesium-uranium waste product, to determine the feasibility of recovering these materials for re-use in the nuclear weapons production system. The prill came from the AEC’s NLO (Fernald) facility. Six drums of prill were sent from NLO (Fernald) to NELCO for the test.

The New England Lime Co. also provided magnesium and calcium to the MED and AEC from 1944-1956. This work did not involve radioactive materials.

Documentation available for review describes the material handled as waste, bearing low uranium concentrations. This material description is adequate to assess a low potential for dispersion at significant activity levels. Documentation also describes that the workforce involved received fundamental training with respect to radioactive material handling, controls and monitoring, which additionally supports that no residual contamination is suspected post-operations.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** New York University  
New York, New York

**TIME PERIOD:** 1946-1952

**DESCRIPTION OF ACTIVITIES:**

New York University (NYU) worked on the development of counting equipment for the MED/AEC. NYU handled a small quantity of uranium for research purposes.

Documentation available for review during this evaluation is insufficient to reach a final determination. Available documentation does not clearly establish that research and development work performed for the AEC involved the handling of radioactive materials. There is documentation describing a request for a small quantity of UO<sub>3</sub> made in 1952, but there is no evidence of receipt or disposition of this material. While it appears that the form of radioactive materials which would have been used during instrumentation development, under laboratory controls, would have had a low probability for dispersion, there is no documentation indicating radiological surveys were or have been performed.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Norton Co.  
Worcester, Massachusetts

**TIME PERIOD:** 1943-1961

### **DESCRIPTION OF ACTIVITIES:**

Norton Co. manufactured refractory products from boron, beryllium uranium and thorium for the MED and the AEC. Work was done both at the Worcester facility and at a facility in Canada.

As early as 1943, Norton was providing boron to the SAM laboratory. In late 1945, Norton was subcontracted by Brush Beryllium to fuse beryllium oxide. Norton developed methods for shaping beryllium powder into rods and hexagonal rings using molds. It also used the process to produce beryllium oxide-uranium oxide hexagonal rings. By 1949, at least one death from beryllium poisoning had been recorded at Norton.

Norton also provided thorium and uranium products to the MED/AEC. The company produced uranium crucibles for Argonne and fused thoria slugs that were irradiated in Hanford reactors. Contracts indicate Norton continued to produce refractory materials for the AEC until 1961.

Documentation reviewed during this evaluation indicates work with radioactive materials, performed for the AEC may have ended sometime in the late 1950's. There is no radiological monitoring data from the operational period or after cessation of activities. Available documentation indicates a high degree of probability for residual contamination originating from uranium and/or thorium work. Norton received an AEC license in the mid 1950's however, residual contamination from prior MED/AEC AWE activities in the 1940's through the 1950's would be indistinguishable from non-AWE work.

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Nuclear Materials and Equipment Corp. (NUMEC) (Apollo)  
Apollo, Pennsylvania

**ALSO KNOWN AS:** Babcock & Wilcox  
Atlantic Richfield Corp.(ARCO)

**TIME PERIOD:** 1957-1983

**DESCRIPTION OF ACTIVITIES:**

The Nuclear Materials and Equipment Corp. (NUMEC) began operations at the Apollo and Parks Township facilities in the late 1950s. The Atlantic Richfield Corp.(ARCO) purchased the stock of NUMEC in 1967. In 1971, Babcock & Wilcox (B&W) purchased NUMEC and is the current owner of the Apollo and Parks Township facilities.

NUMEC processed unirradiated uranium scrap for the AEC in the 1960s. This facility also provided enriched uranium to the naval reactors program and included a plutonium plant, plutonium plant storage area, high-enriched uranium fuel facility, metals and hafnium complex and a uranium hexafluoride storage area. The facility also fabricated plutonium-beryllium neutron sources.

The B&W Apollo facility ceased manufacturing nuclear fuel in 1983.

Documentation indicates that the start date for the period in which weapons-related production occurred should be designated as 1957. Based on the nature of AEC-related activities, the contaminated state of the facility which subsequently led to D&D under NRC, and the inability to distinguish AEC related contamination from that of other originating activities, it is determined that AEC residual contamination existed beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Nuclear Materials and Equipment Corp. (NUMEC)  
(Parks Township)  
Parks Township, Pennsylvania

**ALSO KNOWN AS:** Babcock & Wilcox  
Atlantic Richfield Corp. (ARCO)

**TIME PERIOD:** late 1950s-1980

**DESCRIPTION OF ACTIVITIES:**

The Nuclear Materials and Equipment Corp. (NUMEC) began operations at the Apollo and Parks Township facilities in the late 1950s. The Atlantic Richfield Corp.(ARCO) purchased the stock of NUMEC in 1967. In 1971, Babcock & Wilcox (B&W) purchased NUMEC and is the current owner of the Apollo and Parks Township facilities.

The primary function of the NUMEC Parks Township facility was the fabrication of plutonium fuel, the preparation of high-enriched uranium fuel, and the production of zirconium/hafnium bars. The Parks Township facility ceased fuel fabrication activities in 1980.

Documentation suggests that the start date for the period in which weapons-related production occurred should be designated as 1957. Based on the nature of AEC-related activities, the contaminated state of the facility which subsequently led to D&D under NRC, and the inability to distinguish AEC related contamination from that of other originating activities, it is determined that AEC residual contamination existed beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Nuclear Metals, Inc.  
West Concord, Massachusetts

**ALSO KNOWN AS:** NMI  
Starmet, Inc.  
MIT Met Lab  
Whittaker Corp., Nuclear Metals Division

**TIME PERIOD:** 1954-1990

**DESCRIPTION OF ACTIVITIES:**

Nuclear Metals, Inc. was incorporated in 1954. Its work evolved out of the MIT Metallurgical Laboratory. In 1958, the company moved from Cambridge (where the MIT lab had been) to Concord. The company's current name is Starmet.

In 1958, Nuclear Metals began operating as a facility that produced depleted uranium products, primarily as penetrators for armor-piercing ammunition. It also supplied copper-plated uranium billets that were used to fuel Savannah River's production reactors. Other work at this facility included the manufacture of metal powders for medical applications, photocopiers and other applications. Thorium and thorium oxide were also handled at the site under license to the NRC.

During the period from 1962-1986, Nuclear Metals was the sole source supplier for beryllium alloy end closure fuel element rings used in the "N" Reactor in Richland. Records also indicate beryllium work for the AEC at various times during the 1940s and 1950s.

Documentation available for review during this evaluation does not support the period in which weapons-related production occurred as being appropriate. Documentation does support the start date of the period in which weapons-related production occurred as 1954, and that AEC work was performed at MIT, Cambridge, Massachusetts during 1954 through 1958. Documentation also supports that AEC activities were initiated at the new Concord facility in 1958. It is not discernable from the documentation when AEC/DOE work actually ended. Several documents indicate that the end of AEC/DOE work was in or around 1963. There are, however, records indicating that significant quantities of uranium were shipped to, and/or received from, DOE sites NLO (Fernald), Rocky Flats, and Savannah River as late as 1997. No radiological survey data was available from the site, but there are strong indications that the AEC/DOE work presents a significant potential for residual contamination, which is indistinguishable from non-AEC radioactive material contamination. In 2001, the site was added to the EPA Superfund List.

Documentation reviewed indicates the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically between 1960 and completion of cleanup activities.

## **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of written communiques by or for the DOE and FUSRAP documentation.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Oliver Corp.  
Battle Creek, Michigan

**TIME PERIOD:** 1956-1957;1961-1962

**DESCRIPTION OF ACTIVITIES:**

The Oliver Corp. participated in green salt briquetting testing for NLO(Fernald). Records indicate that testing took place in November,1956; July,1957; May,1961; and May,1962. It is unclear from the documentation whether the company ever performed this work at a production level. The DOE website states that the Oliver Corp. AEC license history indicates that it was licensed to receive 350 pounds of normal uranium (40-6977-03/08/63) and 20,000 pounds of uranium enriched in U-235 (70-646-03/26/62) (but comments that records indicate that it is not related to its work for NLO(Fernald)).

Trip reports from this period report that post-work surveys found no detectably contamination above background. Assuming that these surveys were sufficiently sensitive, the available documentation is sufficient evidence to support the dates provided, 1956-57 and 1961-62.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documents includes;

1. Memo, D.E. Carr to J.A. Quigley, M.D., "Trip Report to Oliver Corporation, Battle Crrek, Michigan, from October 31 to November 5, 1956," dated Dec 17, 1956.
2. Memo, E.M. Chenault to J.A. Quigley, M.D., "Trip Report to Oliver Corporation, Battle Creek Michigan, on July 22-26, 1957," dated Aug 7, 1957.
3. Memo, R. L. Bipes to J.A. Quigley, M.D., "Trip Report to the Oliver Corporation, Battle Creek, Michigan, on April 23-27 and May 3-5, 1962," dated May 21, 1962.
4. Memo, R.H. Starkey and E.M. Chenault to H. A. Kraus, "Additional precautionary health and safety steps necessary at Oliver Corp.," dated Aug 14, 1961.
5. Memo, R.H. Starkey and E.M. Chenault to J.A. Quigley, M.D., "Trip Report to the Oliver Corporation, Battle Crrek, Michigan, on April 10-14, 1961," dated May 1, 1961.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Painesville Site (Diamond Magnesium Co.)  
Painesville, Ohio

**ALSO KNOWN AS:** Uniroyal  
Lonza Chemical

**TIME PERIOD:** Early 1940s; DOE 1992-1998 (remediation)

### **DESCRIPTION OF ACTIVITIES:**

In the early 1940s, the Defense Plant Corporation constructed a magnesium production facility on the Painesville site, which was owned by the Diamond Magnesium Company. The AEC provided the site with 800 tons of radioactively-contaminated scrap steel which was used to control chlorine emissions during the magnesium production. Storage of this scrap metal radioactively-contaminated soil was at the Painesville site.

Although the magnesium plant was constructed in the early 1940's, the information available indicates that the radioactive contamination was introduced with contaminated steel in 1952 and 1953. It might be relevant that, in the OWA file for Spencer Chemical, there is an excerpt from a report titled, "AEC Annual Report to Congress for 1963," that contains a list of principal producers of uranium materials." That list includes the company Diamond Alkali which is not one of the "also known as" names for the Painesville Site.

### **INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

Pertinent documents reviewed:

1. Memo, R. P. Whitfield to Manager, Oak Ridge Operations, "Authorization for Remedial Action at the Former Diamond Magnesium Facility, Painesville, Ohio," dated Oct 8, 1992.
2. Memo, James W. Wagoner, II to L. Price, "Authorization for Remedial Action at Diamond Magnesium Site in Painesville, Ohio," dated Sept 25, 1992.
3. Foley, R.D. and R.F. Carrier, "Radiological Characterization Survey of the Former Diamond Magnesium Company Site, 720 Fairport-Nursery Road, Painesville, Ohio (DMP001, DMP002)," ORNL/TM-11817, December 1991.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1952 - 1998

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Penn Salt Co.  
Philadelphia/Wyndmoor, Pennsylvania

**TIME PERIOD:** 1953-1956

**DESCRIPTION OF ACTIVITIES:**

Penn Salt Co. experimented with samples of fluoride-containing by-products from AEC operations to determine if they could be used for hydrogen fluoride production or to extract uranium from the material. Penn Salt Co. was licensed to receive scrap from AEC operations.

Penn Salt Co. was licensed at one time to receive 2,000 pounds of magnesium fluoride scrap for testing. There is no information regarding any more than 350 pounds that were actually received and tested. Other information in the file supports that the material had a maximum of 5 percent U content. There is little else supported in the file.

The site was removed from FUSRAP in 1987 because of low probability for contamination.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Philadelphia Naval Yard  
Philadelphia, Pennsylvania

**ALSO KNOWN AS:** Abelson’s Pilot Plant  
Koppers Co.  
Naval Boiler& Turbine Laboratory

**TIME PERIOD:** 1944-1945

**DESCRIPTION OF ACTIVITIES:**

In 1944, the Navy built a thermal diffusion pilot plant using concentric hot and cold pipes at the Philadelphia Naval Yard. The S-50 plant at Oak Ridge was a large-scale version of this plant. A large quantity of uranium hexafluoride was processed at this site. The exact quantity, however, is unknown.

The site was not included in the FUSRAP system, as it is controlled by the Department of Defense. There is no information regarding the exact period of operation, nor the condition of the site when operations were concluded.

No new information was available during this review.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Picatinny Arsenal  
Dover, New Jersey

**TIME PERIOD:** 1948-early 1950s

**DESCRIPTION OF ACTIVITIES:**

The Picatinny Arsenal in Dover, New Jersey has assisted in the development and small-scale manufacturing of components since 1948. Picatinny has worked on fuses, detonators, firing sets, and generators for U.S. Army nuclear weapons, including nuclear artillery shells, demolition charges, and missile warheads. Although the Picatinny Arsenal disbanded its nuclear munitions group in the early 1950s, subsequent work did involve some nuclear weapons-related tasks.

Available documentation indicates that in 1947 or earlier, prior to the start of the period in which weapons-related production occurred, uranium billets were present at the site and documentation appears to imply that uranium metal machining had occurred prior to Dec 2, 1947. Available documentation does not establish an end period for work with radioactive materials, but does show activities up through 1951.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Podbeliniac Corp.  
Chicago, Illinois

**ALSO KNOWN AS:** Capitol Associates

**TIME PERIOD:** 1957

**DESCRIPTION OF ACTIVITIES:**

In 1957, NLO(Fernald) used equipment at the Podbeliniac Corp. to conduct an extraction experiment using uranium in solution. NLO(Fernald) later traveled to the site to oversee the decontamination of equipment used in the experiment.

Available documentation includes a National Lead of Ohio, trip summary describing the decontamination efforts and residual contamination levels after completion of a limited scale operation. Based on the available documentation and the premise that no further activities with radioactive materials were performed, the period in which weapons-related production occurred for this site is appropriate.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Precision Extrusion Co.  
Bensenville, Illinois

**TIME PERIOD:** 1949-1950; 1956-1959

### **DESCRIPTION OF ACTIVITIES:**

Precision Extrusion Co. was involved in several projects for the AEC and ANL. From 1949 to 1950, it extruded experimental fuel channel tubes from aluminum and aluminum-lithium alloys. During 1956 through 1959, Precision Extrusion performed several uranium extrusion projects on a small-scale basis.

It was not clear in the documentation whether the site handled any radioactive material in the 1949-1950 time period. All the work at that time appeared to be with aluminum and various alloys.

The work in the 1956-1959 time period seemed to be experimental in basis and was never performed on a production scale. All testing operations were accompanied by ANL personnel, and decontamination and surveying of the machinery was conducted after each test.

Available documentation supports the 1956-1959 effective period, but does not support the 1949-1950 period.

### **INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documents included;

1. Memo, H. Wm. Gaut to John R. Novak, "Extrusion of Uranium Oxide Aluminum Billets in Bensenville, Illinois," dated April 17, 1956.
2. Memo, G. T. Lonergan and C. S. McKee to John R. Novak, "Extrusion of Billets, Precision Extrusion Company, May 24, 1958," dated Aug 12, 1958.
3. Memo, C. S. McKee to J. R. Novak, "Survey at Precision Extrusion Company Following Extrusion of Billets," dated March 30, 1959.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Purdue University  
Lafayette, Indiana

**ALSO KNOWN AS:** Chemistry Building, Locomotive Lab

**TIME PERIOD:** 1940s

**DESCRIPTION OF ACTIVITIES:**

Purdue University was involved in research during the Manhattan Project. Documentation indicates they performed work related to “Hydrochlorination (sic) of T salts followed by a vapor phase chlorination of the resulting residue to give satisfactory  $\text{TCl}_4$  product with no appreciable loss of T material.”

Other work included unspecified testing of metal sawdust, and process development in the manufacture of fluorocarbons.

Materials used appear to be small research quantities. A FUSRAP determination made in 1987 indicates little likelihood for radioactive contamination.

Documentation exists supporting that limited research quantities of material were used. While there is no documentation identifying radiological surveys or decontamination that was provided, little potential exists for radioactive contamination resulting from AEC/DOE research beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Quality Hardware and Machine Co.  
Chicago, Illinois

**ALSO KNOWN AS:** Ravenswood Venture, Marden Manufacturing

**TIME PERIOD:** 1944-1945

**DESCRIPTION OF ACTIVITIES:**

Quality Hardware and Machine Co. had a contract to support the University of Chicago. The company canned experimental unbonded uranium slugs for Hanford, and may have canned all of the slugs used in the Hanford production reactors during World War II. As many as 48,000 slugs may have been canned by Quality Hardware and Machine Co. in the time frame of 1944-1945. The slug canning process that was probably used was developed by DuPont, and involved a “triple dip” including: 1) cleaning the slug in a nitric acid bath; 2) bathing in a molten bronze, tin, aluminum-silicon mixture; and, 3) water quenching. There is nothing to indicate that machining or turning of the uranium slugs occurred at these facilities. However, there would be removable contamination from the oxidization of the uranium slug prior to nitric acid cleaning. Once the slug was coated in aluminum, the potential for contamination is essentially eliminated.

Records indicate that the work may have been conducted at two facilities in the Chicago area. A 1978 internal DOE memo indicates that site 1, located on North Ravenswood in Chicago, was occupied by a furniture manufacturing company, Marden Manufacturing. There was no information regarding how long Marden Manufacturing has occupied the property. However, records indicate that the property had been transferred in 1968.

The facility at site 2, 1046 West Fullerton in Chicago, was apparently demolished and replaced by a grocery store as late as 1976. The Atlantic and Pacific Tea Company (a.k.a. A&P Grocery Store) was the property owner as of 1976, and DOE memoranda indicate that the building appeared new. There is no information regarding the use of the property prior to that.

Site 1 was recommended for a designation survey by ORNL in 1987, and FUSRAP records indicate that a survey was completed in 1989; however, the results were unavailable for review.

Documentation exists supporting that there was a significant quantity of material processed between 1944 and 1945. After 1945 however, there is no evidence that further coating of uranium was performed. While there is no documentation containing the results of the 1989 survey, little potential exists for radioactive contamination resulting from AEC/DOE research beyond the period in which weapons-related production occurred, as the process used to can the slugs should not have resulted in a significant spread of radioactive contamination.

## **Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website, DOE report DOE/EM-0319 “Linking Legacies”, along with documentation provided by the DOE Worker Advocacy Group consisting of internal DOE facility evaluation documentation.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** R. Krasburg and Sons Manufacturing Co.  
Chicago, Illinois

**TIME PERIOD:** 1944

**DESCRIPTION OF ACTIVITIES:**

R. Krasburg entered into a subcontract with the University of Chicago in 1944 for services and supplies for the Metallurgical Laboratory. R. Krasburg was required to provide necessary personnel, facilities and equipment to produce special machining parts for special equipment, tools, jigs, fixtures, etc. from materials furnished by the university. The documentation provided does not identify whether Krasburg actually handled radioactive materials.

A radiological survey of the facility conducted by Oak Ridge Associated Universities (ORAU) did not identify any radioactive contamination at the facility above the levels specified in 10 CFR 835. Exposure rates in the facility were well within the range typically considered background levels. The facility was removed from FUSRAP status in late 1989.

Documentation provided does not identify that radioactive material was used at the facility. Radiological surveys conducted support the facility is not contaminated above accepted guidelines.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** R. W. Leblond Machine Tool Co.  
Cincinnati Ohio

**TIME PERIOD:** 1961

**DESCRIPTION OF ACTIVITIES:**

NLO (Fernald) contracted with Leblond Machine for the purchase of a rapid boring machine in 1961. Acceptance testing of the machine was conducted at the Leblond facility two times in 1961 (January and August/September). It is not clear on the exact quantity of uranium that was used during the first test; however, there are references to fourteen 7-inch x 21-inch billets being successfully drilled. For the second test, documentation exists to support 60,000 pounds of uranium metal being shipped to the R.W. Leblond Machine Tool Co. for the test.

At the conclusion of each test, there is documentation to support decontamination of equipment, and a return of all metal, machining chips, fines, turnings and decontamination equipment to the FMPC. The cutting oil used in the process was released to Leblond after analysis showed that the uranium contamination was 2.4 mg/liter.

There is little likelihood of significant residual contamination remaining at the facility at the conclusion of the September testing period.

Documentation exists supporting that there were only two tests conducted at the facility. Given the nature of the described decontamination effort, and controls that were put in place during the testing, there is little potential for significant contamination at the facility after the second test was complete.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Radium Chemical Company, Inc  
New York, New York

**ALSO KNOWN AS:** J. Kelly

**TIME PERIOD:** 1943 - 1950

**DESCRIPTION OF ACTIVITIES:**

The Radium Chemical Company, Inc. was a major supplier of radioactive sources to the MED in the 1940s. Documentation exists to support that Radium Chemical had to devote large fractions of the laboratory to fulfill MED needs. MED, however, had no direct involvement or control over the activities at Radium. All purchases were made on a purchase order basis.

The facility was in operation as late as the 1980s. In 1987, the New York State Attorney General issued a Stipulation and Order intended to result in the ultimate decontamination of the facility. Decontamination was initiated in 1988, by the State of New York, however, there was no documentation indicating when the decontamination was complete.

There are no records to indicate exactly how many sources were purchased by MED and when such purchases stopped.

No new documentation was available during this review, but with the high level of residual contamination existing at the end of its commercial operations coupled with the presumption that radiological work practices were the same, there is a strong indication that residual contamination existed after MED involvement.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Rare Earths/W.R. Grace  
Wayne, New Jersey

**TIME PERIOD:** 1955-1967; DOE uncertain-1998

**DESCRIPTION OF ACTIVITIES:**

From 1948 to 1971, Rare Earths Inc. and W. R. Grace and Co. operated a plant at the Wayne site to extract thorium and rare earth elements from monazite sand ore. While this was primarily for commercial purposes, the documentation suggests that the company had entered into agreement with the AEC as early as 1948. The original AEC contract and other documentation is not included in the subject file. However, there is reference to a 1950 amendment to produce 9 tons of ThO<sub>2</sub> in 1951, and 12 tons in each of the years of 1952 and 1953.

Radiological surveys were conducted at the property in 1981 and 1982, and the site entered the FUSRAP process. The site was added to the National Priorities List in 1985. The Certification Docket from 1993 identifies DOE FUSRAP remedial actions at the property have been completed.

Documentation suggests that the period in which weapons-related production occurred start date should be 1950, or maybe even 1948. Based on the inability to distinguish AEC related contamination from that of commercial operations, results in a determination that AEC related residual contamination existed outside the period in which weapons-related production occurred..

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website, and internal DOE/AEC correspondence provided by the DOE Worker Advocacy Group.

Pertinent documents:

1. Contract No AT(29-6)-993 [might actually be contract AT(49-6)-993], dated July 9, 1957.
2. "An Aerial Radiological Survey of the W.R. Grace Property, Wayne Township, New Jersey," EG&G Survey Report, NRC-8113, November 1981.
3. "Radiological Survey of the W.R. Grace Property, Wayne Township, New Jersey," Final Report, January 1983 (performed by ORAU).
4. Contract No. AT(30-1)-1037, dated Nov 2, 1950.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1955 - 1998

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Reed Rolled Thread Co.  
Worcester, Massachusetts

**ALSO KNOWN AS:** Reed Rolled Thread and Die

**TIME PERIOD:** 1955

**DESCRIPTION OF ACTIVITIES:**

Reed Rolled Thread and Die conducted a thread roll test on 1,500 Savannah River plant slugs on September 14-15, 1955. There is little additional information regarding this test.

A FUSRAP determination in 1990, listed the site as “TBD”. There is no documentation supporting whether or not radiological surveys were conducted as part of this test or afterwards. Even though the duration of the test was reportedly only two days, the nature of the operation leads to a high probability of a spread of radioactive contamination.

Documentation exists supporting that there was only one planned operation involving AEC material, however, there is no documentation demonstrating the radiological status of the facility during or after the test. No new documentation was available during this review, the radiological status during and/or after the operation is still unknown and it is still unclear whether the planned operation was actually conducted.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Rensselaer Polytechnic Institute  
Troy, New York

**TIME PERIOD:** Unknown

**DESCRIPTION OF ACTIVITIES:**

Rensselaer Polytechnic Institute (RPI) conducted research on anisotropic self-diffusion in metals, as well as research in the diffusion of special nuclear materials (SNM) into glass fibers. There is no information regarding the quantity of materials that were used in this research. It is clear, however, that this was strictly research, and no production-level operations occurred at the facility.

RPI was recommended for removal from the FUSRAP list in 1987, as there were only research quantities of material used and little potential from contamination existed. The dates stated on the Worker Advocacy Website identify RPI as “unknown.” There is information to support research was being conducted as early as 1958 through at least 1965.

There is little likelihood of residual contamination after completion of contracted activities. Appropriate dates for the period in which weapons-related production occurred cannot be ascertained without copies of contracts AT(30-3)-328 and AT(30-3)-321.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Revere Copper and Brass  
Detroit, Michigan

**TIME PERIOD:** 1943-1950s

**DESCRIPTION OF ACTIVITIES:**

Revere Copper and Brass extruded uranium rods for the Hanford plant and Oak Ridge. While there is no indication of the exact quantity of material that was processed, at least 130 tons of material were processed for Oak Ridge in 1943. Documentation also suggests that thorium metal (presumably Th-232) was formed, rolled extruded, and /or machined by Revere Copper and Brass sometime during the above time period. Again, there is no indication of the quantity of material that was processed.

Argonne National Laboratory personnel performed a preliminary survey of the facility in 1981, finding no significant residual contamination in readily accessible areas or equipment. It was recommended in that report that a more detailed and thorough survey be performed to assess overhead and other surface areas for accumulated airborne uranium aerosols/dust based on the nature of the prior work performed and the absence of ventilation systems for control.

Information indicates that some of the equipment that was used during the AEC contract was still in use at the facility as late as 1981, but subsequently stolen when the facility was closed and demolished in 1984, prior to a detailed survey having been performed. DOE eliminated the facility from FUSRAP actions in 1990, based on the preliminary survey results ((1981) and the absence of the facility due to demolition (1984).

Based on the nature of uranium extrusion work and associated activities with thorium, coupled with the lack of a detailed radiological survey, it is determined that this facility poses a potential for significant residual contamination outside the period in which weapons-related production occurred up to the time that the facility was demolished.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation. Pertinent documentation included;

1. ANL Preliminary Survey Report; Subject: Notes and Comments Revere Copper and Brass, Detroit, MI, circa 4/22/81;
2. DOE Report, FUSRAP Elimination Report for the Former Revere Copper and Brass Corporation, 5851 West Jefferson Street, Detroit Michigan, March 30, 1990.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1943 - 1984

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Roger Iron Co.  
Joplin, Missouri

**ALSO KNOWN AS:** Roger Iron Works Company

**TIME PERIOD:** 1956

**DESCRIPTION OF ACTIVITIES:**

The Roger Iron Co. conducted a test operation involving the crushing of a dolomite c-liner for the AEC. The liner had trace amounts of uranium and magnesium fluoride. The test involved four individuals, including two employees of NLO (Fernald).

This was a single point test conducted at the vendor's facility. Air monitoring was performed during the crushing operation, both Breathing Zone and General Area samples were collected.

There is little information regarding the disposition of the material following the test. Given the results of the air monitoring, and the fact that this test was only conducted over a short period of time, with material only containing trace quantities of radioactive material, it is doubtful that there was a significant spread of radioactive contamination.

A FUSRAP determination made in 1990, excluded the site from further consideration.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Sciaky Brothers, Inc.  
Chicago, Illinois

**TIME PERIOD:** 1953

**DESCRIPTION OF ACTIVITIES:**

Sciaky Brothers, Inc. was under contract to ANL to perform a “Stitch Welding” operation on a single specimen of zirconium-clad uranium. The material that was provided was a single plate containing 12-13 grams of 93%-enriched uranium clad in zirconium.

This appears to be a single operation involving only one specimen. Given that the uranium was clad when provided to Sciaky Brothers, and the operation apparently only occurred once, there is little to no potential for radioactive contamination at this facility. The facility was removed from FUSRAP in 1987, and no further actions were recommended or taken.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Seaway Industrial Park  
Tonawanda, New York

**ALSO KNOWN AS:** Charles St. Plant

**TIME PERIOD:** 1974; 1989-1998

**DESCRIPTION OF ACTIVITIES:**

Seaway Industrial Park is a landfill located in Tonawanda, New York. In 1974, Ashland Oil excavated and created bermed areas on its property to construct two petroleum tanks. Some of the soil from this construction activity was placed in the Seaway landfill. Subsequent investigations revealed that the soil originally came from an area used for disposal of radioactive residues from the nearby Linde Air Products site, which processed uranium for the AEC and the MED.

A radiological survey of the property was conducted in 1978 as part of the FUSRAP process. The survey indicated that the site was contaminated in an approximately 13-acre area of the landfill. External exposures ranged from 8-80 microrem per hour, and averaged 36 microrem per hour. DOE cleanup activities were apparently begun, under the FUSRAP program in 1984. There is no documentation identifying when or if that activity was completed.

A pathway analysis was conducted in 1986, the results of which indicated that resultant exposures, from realistic but conservative models, would not exceed 100 mrem in one year. The report however is incomplete in the provided documentation. The site was apparently an active landfill at the time of the 1986 evaluation, and it is unclear when, or if, the site ever suspended operations in the time period.

Documentation provided supports that 1974 is the initial year of consideration; however, the potential for significant residual contamination existed between 1974 and 1998 (the year in which cleanup activities were completed), as this remained an active landfill for an indeterminate time past 1974. Given the exposure rates in the 1978 survey, the potential for significant external exposure to any one individual is low.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Seneca Army Depot  
Romulus, New York

**TIME PERIOD:** 1940s

### **DESCRIPTION OF ACTIVITIES:**

The MED temporarily stored approximately 2,000 drums of pitchblende ores at the Seneca Army Depot in the 1940s. The drums were stored in bunkers at the facility, which were returned to munitions storage after the drums were removed.

The eight bunkers used to store the ore were determined to be contaminated in 1976 during a survey conducted by the U.S. Army. "On Contact" radiation levels from 9-21 mrem/hr were reported in this survey. The U.S. Army performed an exposure evaluation based on the results of the survey, and determined that, because of occupancy factors and the locations of the contamination, an individual would not be exposed to more than 100 mrem per year as a result of the contamination in the bunkers. While the levels of residual contamination were low, and occupancy appears to have been low, the contamination did exist until 1985.

In 1985, remediation was completed at the Seneca Army Depot, and a closeout survey was performed. The site was removed from FUSRAP in 1985.

### **INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE worker advocacy website, and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

Pertinent documents:

1. Final Report, "Preliminary Engineering and Environmental Evaluation of the Remedial Action Alternatives for the Seneca Army Depot Site, Romulus, New York," Formerly Utilized MED/AEC Site Remedial Action Program, FBDO 409-315, November 1981.
2. Final Report, "Radiological Survey of the Seneca Army Depot," February 1977, (performed by ORNL).
3. Radiation Protection Study No. 28-43-0025-86, "Closeout Survey of Bunkers E801-E811, Seneca Army Depot, Romulus, New York," U.S. Army Environmental Hygiene Agency, July 29-31, 1985.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

1940 - 1985

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Seymour Specialty Wire  
Seymour, Connecticut

**ALSO KNOWN AS:** Reactive Metals, Inc.  
National Distillers and Chemical Co.  
Bridgeport Brass Co.

**TIME PERIOD:** 1962-1964; DOE 1985-1994

### **DESCRIPTION OF ACTIVITIES:**

From 1962-1964, Bridgeport Brass performed contract work at the Seymour site for the AEC. This work involved developing an extrusion process for natural uranium metal. After 1964, the work was consolidated at the Reactive Metals site in Ohio.

A radiological survey was conducted at the facility in 1964. According to the records, removable contamination ranged from 20-90 dpm/100 cm<sup>2</sup> and fixed contamination ranged from <800 dpm-3200 dpm/60 cm<sup>2</sup>. The facility was substantially renovated sometime prior to 1977, to house corporate printing operations and a warehouse. While residual contamination in 1964 met existing standards and a survey in 1977 didn't find need for decontamination, subsequent surveys in 1985 and 1993 found areas that exceeded then-applicable standards. A December 1985 memo determining that this site should be remediated, also states that the remaining contamination is inaccessible, and therefore if not disturbed poses no threat to anyone.

In 1985, the site was designated under FUSRAP for remedial action because of contamination detected in floor drains, soil contamination and minor surface contamination. Cleanup of the site was completed in 1993 with the removal of approximately 38 cubic yards of waste.

### **INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documents:

1. DOE memo Hazard Assessment dated 8/10/93;
2. ORNL survey report from 1985;
3. ORNL survey report from 1993;
4. ORNL final verification survey report from 1995.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

1962 - 1994

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Shattuck Chemical  
Denver, Colorado

**ALSO KNOWN AS:** Dawn Mining Corp  
Denn Mining Corp

**TIME PERIOD:** 1950s, 1963

**DESCRIPTION OF ACTIVITIES:**

Shattuck Chemical was a commercial supplier of uranium compounds in the 1950s and 1960s. However, the actual dates of operation are unclear in the available documentation. The Office of Worker Advocacy Website states that Shattuck Chemical supplied a small amount of uranium (quantity not stated) to the Rocky Flats plant.

There is nothing in the documentation reviewed that either supports or refutes that claim. In 1987, a FUSRAP elimination recommendation was made with the basis being “no records found which indicate there were any contracts between MED/AEC and Shattuck.”

No new documentation was available for review during this evaluation. Available documentation contains no clear evidence that Shattuck ever had a contract with MED/AEC. For the most part, Shattuck is referred to as a uranium producer for the commercial market. However, there is a 1951 AEC letter saying that a Mr. Potter from Shattuck had been a reliable source of information since 1943, and it appears that the DOE's investigation of recycled uranium uncovered one record of a shipment of 10 kg of uranium from Shattuck to Rocky Flats in 1963.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Shpack Landfill  
Norton, Massachusetts

**ALSO KNOWN AS:** Metal and Controls Nuclear Corp.  
Texas Instruments  
M&C Nuclear

**TIME PERIOD:** 1960-1965; DOE 1986-1998

### **DESCRIPTION OF ACTIVITIES:**

The Shpack Landfill began operating as a private landfill in the early 1960s and received both domestic and industrial waste. The landfill was closed by court order in 1965. In 1978, a concerned citizen detected elevated radiation levels at the site and contacted the NRC. The radiation levels were verified by the NRC in late 1978.

There is evidence to support that the site was used to dispose of uranium and radium-bearing waste in the 1950s. It appears that M&C Corp, now called Texas Instruments, is the source of the material in this site, and M&C Corp had a contract with AEC to produce fuel for naval reactors, starting in 1952. The site is currently undergoing a site investigation survey and remedial actions are scheduled to be initiated in late-2002 or 2003. Residues and waste containing uranium (enriched to > 90%), thorium, and radium have been detected in the soil and groundwater of the site. Radiological surveys taken in the late 1970s revealed extensive contamination at the landfill, so the effective period should be continuous from 1952 through remediation.

### **INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website, and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documents:

1. Memo, Sheldon Meyers to R.J. Hart, "Shpack Landfill, Norton, Massachusetts," dated Jan 27, 1981.
2. "Radioactive Material in Uncontrolled Location, Norton, Massachusetts," Report No. 078-154-A Part 1 of 2, U.S. NRC Office of Inspection and Enforcement, Mar 13, 1979.
3. "Radioactive Material in Uncontrolled Location, Norton, Massachusetts," Report No. 078-154-A Part 2 of 2, U.S. NRC Office of Inspection and Enforcement, June 7, 1979.
4. "Radiological Survey of the Shpack Landfill, Norton, Massachusetts," DOE/EV-0005/31, ORNL-5799, Dec 1981

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

1960 -1998

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Simonds Saw and Steel Company  
Lockport, New York

**ALSO KNOWN AS:** Allegheny-Ludlum Steel Corp.  
Simonds Saw and Steel Division  
Guteri Special Steel Corp.

**TIME PERIOD:** 1948-1956

**DESCRIPTION OF ACTIVITIES:**

Simonds Saw and Steel Company rolled uranium into rods for the AEC as part of the multi-site process overseen by the New York Operations Office for the production of uranium slugs for fueling the Hanford production reactors. Simonds also rolled thorium metal during this time, primarily for Babcock & Wilcox, Inc., but possibly for irradiation studies at the Hanford production reactor.

Records indicate that between 25 million and 35 million pounds of uranium, and 30,000 to 40,000 pounds of thorium may have been processed at this facility.

Contract activities with AEC ended sometime between 1957-58. A radiological survey by ORNL in 1977 found contamination in excess of standards, warranting remediation. Evaluation of exposures resulting from this contamination (published in 1979) indicates exposures to employees wouldn't be significantly different than background. DOE originally determined that it did not have authority to remediate this site, but according to the FUSRAP Considered Sites database, it is now considered a FUSRAP site under the Corp of Engineers and cleanup is pending.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documents:

1. Excerpts from Draft Report, "Radiological Survey of the Simonds Saw & Steel Company," (performed by ORNL), dated February 1977.
2. Undated report of unknown origin, "Guterl Steel Corporation, Lockport, New York," (describes visit to former Simonds site by two ORNL staff at the request of DOE on July 9, 1984)

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Southern Research Institute  
Birmingham, Alabama

**TIME PERIOD:** 1955-1958; 1962; 1976

**DESCRIPTION OF ACTIVITIES:**

The Southern Research Institute conducted several tests for the AEC and NLO(Fernald) during the above times. During the time frame of 1955-1958, the facility was licensed to receive source material from NLO(Fernald) for research on the properties of uranium-liquid metal fuel elements. During the time frame of 1955-58, the facility handled as much as 430 pounds of uranium, the majority being “refined source material” with no specifics as to its form.

In 1962, Southern Research Institute received 300 pounds of normal uranium for hot tensile experiments. The receipt was presumably uranium billets (only a few inches long).

There is no mention of the work performed in 1976, other than a FUSRAP document identifying test quantities of uranium. However, there is no mention of this work actually being performed. There is insufficient documentation to make an assessment of the scope of AEC activities during or after the time frame.

No new documentation was available for review during this evaluation.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Spencer Chemical Company (Missouri)  
Kansas City, Missouri

**TIME PERIOD:** 1958-1963

**DESCRIPTION OF ACTIVITIES**

Spencer Chemical Company processed unirradiated uranium scrap for the AEC recovering enriched uranium from it for use in the weapons complex. This work was apparently conducted under several AEC licenses at the time. There also was work conducted with thorium oxides, the detail of which is not known.

This facility appears to have been listed under the same Spencer Chemical Company-Jayhawks Works nuclear material license. But it would appear that there was no nuclear work performed at the Kansas City site. It was all done at the Jayhawk Works. Therefore there should only be one Spencer Chemical site -- the Jayhawk Works at Pittsburg, Kansas.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Spencer Chemical Co., Jayhawks Works  
Pittsburg, Kansas

**TIME PERIOD:** 1958-1963

### **DESCRIPTION OF ACTIVITIES:**

The Spencer Chemical Co., Jayhawks Works processed unirradiated uranium scrap for the AEC to recover the enriched uranium for use in the weapons complex. Other information in the provided documentation indicate there was some work with uranium hexafluoride, uranium oxide, and thorium. Uranium enrichments apparently ranged from depleted to 93%.

There were two Special Nuclear Material licenses issued to Spencer Chemical at this facility, #154 and #329. SNM-329 allowed the facility to possess up to 1,000 kilograms of 5% enriched uranium at any one time. SNM-154 was not available for this review, but in the absence of any identified license amendments to SNM-329, higher enriched work and thorium work may have been conducted under SNM-154. Spencer Chemical also had a Source Material License (C-4352) issued, however the specifications of that were unavailable. Spencer Chemical was cited for non-compliance with license conditions as a result of a May 2-5, 1961 inspection by the AEC. The total quantities of material handled under these licenses were indeterminate in the information, and in 1962, SNM-154 and SNM 329 were cancelled.

Conditions for license termination were stipulated in Dec. 18, 1962 letter from Donald Nussbaumer to Greenlee however there is no documentation that the stipulations were met. There is strong indication of dispersion of airborne radioactive material during operations (thorium and uranium), without decontamination verification at 1962 license termination, there is a high degree of potential for residual contamination existing past the date of 1963.

### **INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group, consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Sperry Products, Inc.  
Danbury, Connecticut

**ALSO KNOWN AS:** PCC Technical Industries

**TIME PERIOD:** 1952-1953

**DESCRIPTION OF ACTIVITIES:**

Sperry Products developed a process for performing non-destructive testing and examination of uranium plates for the Sylvania Corp. Based on documentation provided, the testing involved ultrasound of uranium plates. As much as 70 kg of uranium may have been processed through the facility between 1952 and 1953.

Given the nature of the work and the limited quantity of material used at the facility, there is little likelihood for residual radioactive contamination and subsequent employee exposure.

Documentation exists supporting that there was only a small quantity of material processed. While there is no documentation containing the results of radiological surveys, little potential exists for radioactive contamination resulting from AEC/DOE testing beyond the time period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group, consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** St. Louis Airport Storage Site (SLAPS)  
St. Louis, Missouri

**ALSO KNOWN AS:** Robertson Airport  
Robertson Storage Area

**TIME PERIOD:** 1946-1966; DOE 1984-1998

**DESCRIPTION OF ACTIVITIES:**

The St. Louis Airport Site Vicinity Properties are associated with both the St. Louis Airport Site and the Latty Avenue Properties. The MED acquired the St. Louis Airport Site in 1946 and used it to store uranium-bearing residues from the St. Louis Downtown Site from 1946-1966, when Continental Mining and Milling Company of Chicago purchased the waste, removed it from the storage site at the airport, and placed it in storage in Latty Ave. under an AEC license.

The information supports that as much as 121,000 tons of refining residue were stored at the site, containing as much as 236 pounds of uranium.

A draft environmental assessment conducted in 1981 indicates that “in 1973. . .the Airport Authority removed more residue from the site, razed and buried all onsite structures except the fence, and spread clean fill over the entire site to reduce radiation levels and control runoff and erosion.”

Radiological survey data from 1979 identified residual contamination.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Environmental reports from 1981 and 1986. Pertinent document: DOE Report (DOE/EV - 0005/16); Radiological Survey of the St. Louis Airport Storage Site, St. Louis, Missouri; Sept. 1979.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1946 - 1998

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Standard Oil Development Co. of NJ  
Linden, New Jersey

**ALSO KNOW AS:** Bayway Exxon

**TIME PERIOD:** 1942-1945

### **DESCRIPTION OF ACTIVITIES:**

Standard Oil performed a variety of tasks during World War II. It was under contract to coordinate materials for work to be done by the Metallurgical Laboratories of the MED. It also conducted studies to develop uranium metal through chemical reduction process, and to develop and construct centrifuges for uranium separation. It appears that the work took place at two separate facilities, one in Linden, New Jersey, one in Bayway, New Jersey. The Linden facility was, as of 1987, occupied by the Exxon Research and Engineering Company. The property in Bayway was occupied by an Exxon refinery operation.

Radioactive residues from MED operations were present at the site as late as 1949, including 475 pounds of  $UO_3$  in 75-pound containers and 1,100 pounds of uranium in process solution. There is no radiological survey data available from general areas, to evaluate the potential for dispersed radioactive contamination, however based on the presence of the containerized material described as being onsite in 1949 the potential for contamination exists beyond 1945. The company continued to provide consulting and analytical services for the AEC into the 1950s, as evidenced by a 1953 memo requesting the services of Standard Oil to assist in the development of a fluidized bed reactor for the conversion of UNH to  $UO_3$ , which may have involved the use of radioactive materials.

### **INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documents included;

1. Oak Ridge Associated Universities Letter; Berger to Wagoner; Subject: Visit to Potential Sites in Newark and Linden New Jersey; February 12, 1990.
2. Exxon Research and Engineering Company Letter; Buckman to Willis (Weston/OTS); providing a plot plan of the Linden Technology Center (old Standard Oil Development Company site); July 18, 1988.
3. Weston OTS Note; Stout to Williams (DOE); Revised Site Summary for the Exxon Company in Linden, New Jersey; March 22, 1991.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

Additional information is required

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Star Cutter Corp.  
Farmington, Michigan

**TIME PERIOD:** 1956

**DESCRIPTION OF ACTIVITIES:**

The Star Cutter Corp. was a manufacturer of machine tools. There is documentation to support that a one-time test was conducted with NLO (Fernald) to drill hollow uranium slugs. The test involved approximately 100 pounds of uranium. There is no evidence of any subsequent operations involving uranium.

The site was removed from FUSRAP action in 1991.

Little potential exists for radioactive contamination resulting from processing this material beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group, consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Staten Island Warehouse  
New York, New York

**ALSO KNOWN AS:** Archer Daniels Midland Company

**TIME PERIOD:** 1939-1942

**DESCRIPTION OF ACTIVITIES:**

This warehouse was used for uranium ore storage from the Belgian Congo during the period from 1939-1942. From this warehouse, the ore was transported to various MED sites for long-term storage and/or processing. The ore was the property of the African Metals Corporation and the MED contractor purchased only the U<sub>3</sub>O<sub>8</sub> content of the ore while African Metals retained ownership of the radium and precious metals in the ore. The ore contained 600 metric tons of uranium and 170 Ci. of radium.

Documentation identifies that ores stored at this location from 1939 through 1942 were a result of an independent speculative business enterprise. The MED learned of this material in 1942 and subsequently purchased and removed the ores at that time. The building where these ores were stored appears to have been demolished after MED acquisition of the materials sometime between 1942 and 1946. A radiological survey of the area of the demolished storage facility in 1980 identified a localized area of potential residual contamination. but is not significant.

As this material was not government controlled or owned, unlike the materials stored at the Baker and Williams Warehouses, until 1942 whereupon it was removed.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Stauffer Metals, Inc.  
Richmond, California

**ALSO KNOWN AS:** Stauffer-Tenescal Co.  
Tenescal Co.

**TIME PERIOD:** 1961

**DESCRIPTION OF ACTIVITIES:**

Stauffer Metals, Inc. performed a one-time test of melting uranium metal with an electron beam. There were 720 pounds of normal uranium metal provided for the test, and a single ingot was cast. The metal was apparently returned to the NLO (Fernald) site at the conclusion of the test.

There is no more information regarding this facility in the FUSRAP records. Because this was a one-time test, the likelihood for significant long-term contamination at the facility is remote.

There is little likelihood of long-term significant contamination resulting from this one-time operation.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Superior Steel Co.  
Carnegie, Pennsylvania

**ALSO KNOWN AS:** Copper Weld, Inc.  
Lot and Block 102J210

**TIME PERIOD:** 1952-1957

**DESCRIPTION OF ACTIVITIES:**

The company apparently rolled production quantities of uranium metal for NLO(Fernald) in the time frame identified above. A 1981 ORNL survey indicated that the site was contaminated in the area where the uranium operations took place, on and under floors, in sumps and on some of the machinery that was used during production. A 1985 survey indicated that the site was still contaminated, however, there are no specifics as to the level of contamination that was found during this survey. There is no information contained stating whether the site was ever remediated.

Available documentation states that residual contamination existing at the site is most likely from AEC activities however the site was eliminated from FUSRAP based on "It appears from the records that although the radioactive contamination remaining at this site may have been from DOE predecessor agencies (MED/AEC), there is no recorded evidence that the AEC had responsibility for the personnel health of the workers or public at this site or for decontamination of the site after work had been completed. Therefore, it is determined that the DOE has no authority for remedial action at this site."

While there is no known documentation to assess the radiological conditions at the time of contract termination, a Radiological Scoping Survey performed by ORISE in May 2001 was reviewed and found to confirm the presence residual uranium surface contamination in excess of guideline values for unrestricted release.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent document: ORISE 01-0740 Radiological Scoping Survey of Portions of the Former Superior Steel Company, Carnegie, Pennsylvania dated May 2001.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

1952 - 2001+ (Contamination was identified in 2001 but the end date cannot be determined due to insufficient information)

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Sutton, Steele and Steele Co.  
Dallas, Texas

**TIME PERIOD:** 1951;1959

**DESCRIPTION OF ACTIVITIES:**

Sutton, Steele and Steele Co. conducted two tests for the AEC, one in 1951, the other in 1959. In 1951, the test was aimed at devising a means of recovering uranium from low-grade wastes and residues. During the first test, 2 tons of C-liner and C-special were processed to determine whether the uranium could be separated from the dolomite and magnesium fluoride. As this was liner material, the uranium concentrations were relatively low, only about 50 pounds of uranium were processed through the equipment. At the conclusion of the test, the equipment was decontaminated and residues were returned to the AEC.

In 1959, NLO (Fernald) personnel evaluated Sutton, Steele and Steele's dry tabling equipment for the separation of uranium shot. Fifty pounds of normal uranium were processed in a single test to evaluate particle size separation. As in the first test, the equipment was decontaminated and monitored after the operation.

Sutton, Steele and Steele was eliminated from FUSRAP action in 1993 based on the low potential for residual contamination at the facility.

Little potential exists for radioactive contamination resulting from processing this material beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Swenson Evaporator Company  
Harvey, Illinois

**TIME PERIOD:** 1951

**DESCRIPTION OF ACTIVITIES:**

Swenson Evaporator was scheduled to perform a raffinate spray test for NLO (Fernald) on March 20, 1951. The test was supposed to involve a radioactive residue.

Documentation supports that because of public relations issues, and health department intervention, the test was never performed. There were approximately 40 drums of raffinate liquor that were delivered to Swenson for the test. Evidence supports that the drums were never opened and subsequently returned to NLO (Fernald). The exact dates of the shipments are not clear.

A FUSRAP determination in 1987 recommended removal from the FUSRAP process because of low potential for residual contamination.

Documentation supports that a limited evaluation was scheduled, however, never performed. There is little to no potential for residual contamination remaining at the site as a result of AEC/DOE activities.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Sylvania Corning Nuclear Corp.-Bayside Laboratories  
Bayside, New York

**ALSO KNOWN AS:** Sylvania Electric Products, Inc.  
Metallurgical Laboratory  
Sylvania Electric Corporation, Atomic Energy Division  
Sylvania Bayside Laboratories  
Sylcor

**TIME PERIOD:** 1947-1962

**DESCRIPTION OF ACTIVITIES:**

Sylvania Corning Nuclear Corp. (SCNC) investigated uranium and thorium powder metallurgy. It also produced powdered metal slugs, developed bonding techniques, and plated uranium metal slugs in nickel. The work with slugs included the conversion of uranium metal to metal hydride using hydrogen. The lab was also involved in determining the health hazards of and physical properties of uranium and beryllium powders and the applications of powder metallurgy to these metals and their alloys.

Other work at the facility included UO<sub>2</sub> wafer production, flat plate production, pipe cutting using abrasive wheel cutters, canning slugs, thorium slug canning, and thorium metal production.

In 1973, a FUSRAP site status report indicated that New York had terminated the facility's license after verifying there was no contamination at the site. The facility was demolished sometime before 1977. An ORNL survey of the property in 1977 identified no contamination at the site distinguishable from background. The site was removed from FUSRAP in 1993. Based on a description of the survey performed prior to turn-over to GTE Labs in 1962, coupled with results from follow-up surveys in 1973 and 1977, there is no indication that residual contamination existed beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documentation included, Aerospace Corporation memorandum from Vierzba to Mott, Sylvania-Corning Nuclear Corporation, Inc. Bayside, New York Disposition of Radioactive Materials.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Sylvania Corning Nuclear Corp.- Hicksville Plant  
Hicksville, New York

**ALSO KNOWN AS:** General Telephone and Telegraph Laboratories  
Sylcor

**TIME PERIOD:** 1952-1966

**DESCRIPTION OF ACTIVITIES:**

Sylvania Corning Nuclear Corp (SCNC) performed research and development with radioactive materials, principally uranium and thorium, for the AEC. The facility was licensed by the AEC to fabricate reactor fuel elements for the AEC, Sylvania use, for commercial sale, and for research use.

Documentation reviewed during this evaluation, indicates that a radiological survey performed in 1979 identified residual contamination at levels requiring some form of action. Exactly what actions have been taken was not included in available documentation.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documentation included;

1. AEC (SROC) Letter; Stetson to Pittman; Subject: Decontamination and Decommissioning of AEC Facilities (Your TWX, 10/29/73); November 13, 1973.
2. DOE Letter; W. Mott to R. Cunningham; Information regarding radiological survey; June 25, 1979.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Tech-Art, Inc.  
Milford, Ohio

**TIME PERIOD:** 1952

**DESCRIPTION OF ACTIVITIES:**

Tech-Art contracted with NLO(Fernald) in 1952 to grind inserts as part of a study of Firth Sterling H7 carbide profile inserts in conjunction with the machining development program. Based on the available documentation, there is little likelihood that this facility handled any radioactive material. There is a reference to “machine shop operations on government-owned materials at prescribed hourly rates of pay,” but exactly what was performed is not clear.

There is reference to a 1990 memorandum to the file, indicating that this site was to be evaluated by FUSRAP, but there is no documentation indicating that this was ever completed. The site remains classified as FUSRAP-TBD, based on the provided documentation.

There is insufficient documentation to determine whether radioactive material was actually handled by Tech-Art.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Tennessee Valley Authority  
Muscle Shoals, Alabama

**TIME PERIOD:** 1951-1955

**DESCRIPTION OF ACTIVITIES:**

The Tennessee Valley Authority performed research and development of uranium recovery at the National Fertilizer Development Center. The work involved extraction of uranium during the production of fertilizer from phosphate ore.

Very little uranium was produced at this facility, only about 2.5 kilograms. A preliminary survey of the facility, conducted in 1980 by ORNL showed that the radiation and contamination levels at the facility did not vary significantly from background.

A FUSRAP determination made in the 1980s recommended elimination from the process based on the limited material processed and low potential for radioactive contamination remaining at the facility after the operation was ceased.

There was limited radioactive material produced at the facility. Little potential exists for radioactive contamination beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Texas City Chemicals, Inc.  
Texas City, Texas

**ALSO KNOWN AS:** American Oil Company  
Morden, Incorporated  
Smith Douglass  
Amoco Chemical Company

**TIME PERIOD:** 1952-1956

**DESCRIPTION OF ACTIVITIES:**

Texas City Chemicals, Inc. produced uranium by recovery of  $U_3O_8$  from a phosphate fertilizer production plant. The AEC contracted with Texas City Chemicals for the recovery of uranium which was ultimately used in weapons production.

Contract specifications identify that as much as 12 tons of  $U_3O_8$  per year may have been produced at the plant during the contract years of 1952-1956.

Texas City Chemicals subsequently declared bankruptcy in 1956, and the facility in which the uranium was produced was demolished at an unknown time after that.

Radiological surveys performed at this site by, or for, the DOE in 1977 identified residual contamination (Ra-226) in excess of unrestricted use guidelines. A preliminary survey conducted by ORNL in 1980, did not identify radiation levels above what would normally be expected at a phosphate fertilizer plant in that region of the country. Subsequent evaluations determined that the Ra-226 contamination was not AEC attributable. However, based on the nature of the uranium recovery process and the amount of uranium produced, there is a high degree of probability that residual contamination existed after cessation of operations up until the time the facility used for this operation, was demolished and removed.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Titanium Alloys Manufacturing  
Niagara Falls, New York

**ALSO KNOWN AS:** Humphreys Gold Co.  
Titanium Alloys Manufacturing Co, Division of NLO(Fernald)  
Titanium Alloys Metals  
Titanium Pigment Co.

**TIME PERIOD:** 1950-1956

**DESCRIPTION OF ACTIVITIES:**

Titanium Alloys Manufacturing (TAM) was under contract in the 1950s to provide zirconium tetrachloride. In 1955, TAM was issued a license to do work related to the conversion of thorium scrap to anhydrous thorium fluoride. Further work in 1956 involved reducing ores and other uranium compounds by arc melting in an induction furnace.

Records also indicate that additional work was performed by TAM in 1969 for NLO(Fernald). This involved performing a feasibility study to electrolyze magnesium fluoride (with approximately 5% U content).

FUSRAP documentation mentions additional National Lead of Ohio contract work in 1976, but there is no reference to the type of material handled or nature of the work. (EM/FURAP Database Report Site Operations section (identified source 372).

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Titus Metals  
Waterloo, Iowa

**ALSO KNOWN AS:** Titus, Incorporated

**TIME PERIOD:** 1956

**DESCRIPTION OF ACTIVITIES:**

Titus Metals performed extrusion of uranium oxide billets into fuel plates for the Argonaut reactor at ANL in 1956. Records indicate that as many as 50 billets may have been extruded at the facility.

Records also indicate that, at the completion of the operation, the facility and equipment were decontaminated to non-detectable levels.

A FUSRAP determination made in 1987 recommended elimination from the process based on the decontamination of the facility, the limited material processed, and low potential for radioactive contamination remaining at the facility after the operation was ceased.

There was limited radioactive material use, and the operations only lasted a few days. Provided documentation supports that the facility was decontaminated at the conclusion of the operations at Titus Metals. Little potential exists for radioactive contamination beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Tocco Induction Heating Div.  
Cleveland, Ohio

**ALSO KNOWN AS:** Ohio Crankshaft Company  
Tocco Heat Testing  
Park Ohio Industries

**TIME PERIOD:** 1968-1969

**DESCRIPTION OF ACTIVITIES:**

Tocco Induction Heating Div. had a contract to develop induction heating coil equipment for heating fuel cores at its Ohio facility. The work was apparently carried out under AEC license SUB-895. This license was issued in October, 1966 and authorized Tocco Induction Heating Div. to possess up to 7,600 pounds of uranium (natural and depleted).

The license was amended in 1967 to authorize up to 16,000 pounds of uranium. A 1968 inspection of the facility by AEC identified several areas of low-level contamination on the working area floor (300-1500 dpm/100cm<sup>2</sup>) and on the machinery (3,000-4,500 dpm/100 cm<sup>2</sup>).

In 1968, the facility sent a letter to AEC stating that all materials had been returned to NLO (Fernald), and questioning whether the license should be cancelled or allowed to expire. In January 1969, the AEC terminated the license. There was apparently no follow-up inspection of the facility.

In 1993, the NRC conducted a survey of the facility and found that the radiation levels and contamination levels in the facility did not vary significantly from background. Removable contamination surveys were also performed at the facility and there was no evidence of removable contamination detected.

Documentation reviewed indicates that the facility was licensed to perform work under contract with NLO (Fernald) from 1966 to 1969. There is however, no reason to expect that significant radioactive contamination existed at the facility after the 1969 date when the AEC license was terminated.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1966 - 1969

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Torrington Co.  
Torrington, Connecticut

**TIME PERIOD:** 1951-1953

**DESCRIPTION OF ACTIVITIES:**

The Torrington Co. performed small-scale swaging experiments on uranium rods in 1951, 1952, and 1953. In each of the tests, only small quantities of uranium were used in each of the three identified tests.

Given the short duration of the testing, and the limited use of uranium, it is not likely that significant contamination existed at the facility beyond the dates identified on the DOE Worker Advocacy Website.

A FUSRAP determination made in 1987, recommended elimination from the process, based on the limited quantity of material and low potential for radioactive contamination.

There was limited radioactive material use, and the resultant tests only lasted a few days. While there is no documentation containing the results of radiological surveys, little potential exists for radioactive contamination resulting from the limited use of radioactive material used at the site beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Tube Reducing Co.  
Wallington, New Jersey

**TIME PERIOD:** 1952; 1957

**DESCRIPTION OF ACTIVITIES:**

The Tube Reducing Co. conducted tests for NLO (Fernald) on the shaping and sizing of uranium rods. In January 1952, two uranium rods were processed. In 1957, another test was conducted, apparently using two more rods. The tests that were conducted were apparently of short duration, lasting only one or two days each.

Given the short duration of the testing, and the limited use of uranium, it is not likely that significant contamination existed at the facility beyond the dates identified on the DOE Worker Advocacy Website.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Tyson Valley Powder Farm  
St Louis, Missouri

**TIME PERIOD:** 1942-1949

**DESCRIPTION OF ACTIVITIES:**

The Tyson Valley Powder Farm was a storage site for radioactive materials during the 1940s. Records indicate that in 1946, 206,110 pounds of uranium were stored at this location for the MED. The material was stored using a variety of containers: metal drums with lids, wooden barrels with lids, and wooden barrels without lids.

Given the quantity of material at the facility and the variety of storage methods used, it is reasonable to assume that radioactive contamination was present in the facility during the time the storage took place.

The materials were removed from the site in 1948, and records suggest that the site was sold to a local municipality, and subsequently developed into a park.

The DOE OWA Website was updated to include 1949.

**INFORMATIONAL SOURCES:**

Sources of information reviewed during this evaluation included the DOE Worker Advocacy Website along with documentation provided by the DOE Worker Advocacy Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** U.S. Steel Co., National Tube Division  
McKeesport, Pennsylvania

**TIME PERIOD:** 1959-1960

**DESCRIPTION OF ACTIVITIES:**

In 1959 and 1960, the National Tube Division conducted tests for NLO (Fernald) to determine if rotary piercing of uranium was possible. This was conducted at the Christy Park Works in McKeesport, Pennsylvania.

There is no information regarding how many times these tests were conducted, nor the amount of uranium that was used in each of the tests.

There is a 1967 report indicating that the testing phase occurred during the 1959-1960 time frame. Rotary piercing of uranium was never adopted by NLO (Fernald).

Because no production quantities were apparently used, there is little likelihood of widespread or long-term facility contamination at the facility.

Test quantities of material were utilized in the 1959-1960 time frame, and there is little likelihood of long-term facility contamination.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** United Lead Co.  
Middlesex, New Jersey

**ALSO KNOWN AS:** Perry Warehouse; Middlesex Sampling Plant

**TIME PERIOD:** 1950-1957

**DESCRIPTION OF ACTIVITIES:**

From 1950 to 1955, United Lead Co., a subsidiary of National Lead Company, was the AEC's operating contractor for the Middlesex Sampling Plant. The Middlesex Sampling Plant sampled, assayed, stored, and shipped uranium, thorium, and beryllium ores. The plant discontinued uranium and beryllium assaying and sampling activities in 1955. Until 1967, the site was used as a thorium storage and sampling site.

Documentation indicates that operations began at this facility in 1943 and ended in 1955, at which time the facility was used for storage of radioactive materials through 1967. Work included receiving, storing, crushing, grinding, and sampling of ores received from African Metals and other sources.

In 1969, the property was transferred to the Department of the Navy and used as a Marine Corps training facility. In 1978, the property was transferred back to the DOE for remedial activities.

Documentation states that prior to the GSA transfer, the site was decontaminated. A subsequent survey performed by ORNL in 1976 identified significant residual contamination that led to decontamination and restoration activities of the facility and surrounding properties.

There was no information regarding the completion of remedial actions. However, it appears to have been completed in 1984.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1950 - 1984

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** United Nuclear Corp.  
Hematite, Missouri

**ALSO KNOWN AS:** Mallinckrodt Chemical Works, Chemical Div.

**TIME PERIOD:** 1958-1969

**DESCRIPTION OF ACTIVITIES:**

The United States Nuclear Corporation in Hematite, Missouri processed unirradiated scrap for the AEC, recovering enriched uranium for use in the nuclear weapons complex.

The exact quantities and forms of radioactive material processed at the facility could not be readily determined from available documentation. There are statements in the records that “thousands of pounds of uranium” were processed. Enrichments of the uranium varied from low-enriched to > 90%.

In 1970, United Nuclear Corp. received a contract from the AEC to fabricate fuel plate elements which was apparently terminated in 1972.

There is no documentation supporting the radiological status of the site at the end of the contract. However, United Nuclear Corp. was contracted to supply uranium fuel for the commercial nuclear industry as well as the AEC.

Documentation does indicate residual contamination post operations due to the presence of Tc-99, which may be attributable to cross contamination from the AEC/DOE uranium recycling programs. Documentation indicates that this site may have received recycled uranium from Paducah Kentucky into the 1970s.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** University of California  
Berkeley, California

**ALSO KNOWN AS:** California Resources and Development

**TIME PERIOD:** 1940s; DOE 1981-1982

**DESCRIPTION OF ACTIVITIES:**

Gilman Hall, located on the University of California-Berkeley campus, was the site of nuclear research involving plutonium and uranium. These activities were conducted during the 1940s, first in support of the U.S. Office of Scientific Research and Development and then for the MED and AEC. Only the third floor and basement areas were associated with MED activities.

No radiological survey data was available from the period ending MED/AEC activities in the 1940s however, the 1976 survey performed by Lawrence Livermore National Laboratories which identified low-level residual contamination and subsequently led to decontamination of the facility, indicates the potential for significant residual contamination post MED/AEC operations.

DOE completed the cleanup of all FUSRAP-related radioactive contamination in FY 1982. DOE-FUSRAP has no continuing presence at the site.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documents included DOE documents related to the Conditional Certification of Gilman Hall, University of California, May 1985.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1940 - 1982

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** University of Chicago  
Chicago, Illinois

**ALSO KNOWN AS:** Eckhardt Hall  
West Stands  
New Chemistry Lab and Annex  
Ryerson Physical Lab  
Kent Chemistry Lab

**TIME PERIOD:** 1942-1952; DOE 1984-1987 (remediation)

**DESCRIPTION OF ACTIVITIES:**

The University of Chicago Metallurgical Laboratory was involved in early uranium metallurgical work in 1942-1943. The first self-sustaining nuclear chain reaction was achieved at the university in a "pile" called the Chicago Pile 1, built by Enrico Fermi and his Met Lab colleagues.

The University of Chicago continued to perform research and metallurgical work for AEC until the early 1950s. The University of Chicago site includes seven buildings that were associated with MED/AEC nuclear research and development between 1942 and 1952. These include the new Chemistry Laboratory and Annex, West Stands, Ryerson Physical Laboratory, Eckhart Hall, Kent Chemical Laboratory, Jones Chemical Laboratory, and Ricketts Laboratory.

Radiological survey data from 1977 demonstrates that residual contamination attributed to MED/AEC activities existed, and led to subsequent FUSRAP actions. Cleanup of the sites where MED/AEC work was performed, was completed in 1987.

At the time of this report, this site is not listed on the OWA website.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documents included, Radiological Surveys performed by Argonne National Laboratories during 1977 (DOE/EV - 0005/23 0005/24 and 0005/26), along with a Draft Certification Docket for the Remedial Action Performed at the University of Chicago , Chicago, Illinois, From December 1982 to October 1987.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

1942 - 1987

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** University of Denver Research Institute  
Denver, Colorado

**TIME PERIOD:** 1963-1965

**DESCRIPTION OF ACTIVITIES:**

The University of Denver Research Institute is listed as a processor of radioactive materials for NLO(Fernald). It appears that the University of Denver handled test quantities of radioactive metal in February, 1965.

There is no information in the documentation about the specifics of any research conducted at the facility, nor the type of form or amounts of any radioactive material handled by the University of Denver. Without additional documentation, a definitive determination can be reached with respect to the potential for residual contamination.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** University of Florida  
Gainesville, Florida

**ALSO KNOWN AS:** J. Hillis Miller Health Center  
College of Medicine, Department of Radiology

**TIME PERIOD:** 1950s-1960s

**DESCRIPTION OF ACTIVITIES:**

The University of Florida handled test quantities of radioactive material for NLO(Fernald) during the 1950s and 1960s. There is no information regarding the quantities of material and the scope of work that may have been performed at this facility.

The exact dates could not be immediately determined. FUSRAP documentation indicates that this work may have been conducted only between 1959 and 1960.

The work at the University of Florida was apparently of limited scope. The site was eliminated from FUSRAP in 1990. There is no information in the documentation about the specifics of any research conducted at the facility, nor the type of form or amounts of any radioactive material handled by the University of Florida. Without additional documentation, a definitive determination can be reached with respect to the potential for residual contamination. .

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** University of Michigan  
Ann Arbor, Michigan

**TIME PERIOD:** 1944

**DESCRIPTION OF ACTIVITIES:**

The University of Michigan handled small quantities of uranium in 1944 under AEC contract.

The testing involved developing a coating mechanism to can uranium slugs to prevent them from corrosion. The University of Michigan subsequently was involved in the development of a non-destructive evaluation method to verify the integrity of the canning of the slugs.

All contract work was apparently terminated in April, 1944. It is apparent that only small quantities of material were used during these tests.

In 1987, the University of Michigan was removed from FUSRAP consideration under a general elimination recommendation.

There is little potential for significant facility contamination at the University of Michigan resulting from MED/AEC activities.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** University of Rochester Medical Laboratory  
Rochester, New York

**ALSO KNOWN AS:** University of Rochester School of Medicine and Dentistry  
University of Rochester Atomic Energy Project

**TIME PERIOD:** 1943-1986

**DESCRIPTION OF ACTIVITIES:**

The University of Rochester (U of R) had major responsibility for the medical aspects of the atomic weapons program during and after World War II. The U of R focused on two primary activities: 1) analysis of periodic medical examinations for all personnel at MED facilities, and 2) biomedical research, primarily with polonium, radium, and plutonium, to establish occupational radiological control standards.

After the war, the U of R received a contract from AEC to operate the Atomic Energy Project which focused on the biomedical aspects of nuclear energy, and was a major center for radiation experiments.

There was other unspecified work with uranium compounds, including metal, and thorium compounds during the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** University of Virginia  
Charlottesville, Virginia

**TIME PERIOD:** early 1940s; 1960s

**DESCRIPTION OF ACTIVITIES:**

The University of Virginia (UVA) played an integral role in developing the process used in enriching the uranium used in the development of nuclear weapons. Significant research was conducted surrounding the enrichment of uranium by centrifuge at UVA's facility.

The documentation was conflicting regarding the dates that the work was carried out, and some may have been confused with the university's operation of a research reactor from the 1960s to 1998.

There were indications that work under AEC contract may not have ceased until 1985 when research into the centrifuge process was terminated by DOE.

The facility was removed from FUSRAP determination because of no potential for significant facility contamination resulting from MED/AEC operations.

There is no information in the documentation about the specifics of any research conducted at the facility, nor the type of form or amounts of any radioactive material handled by the University of Virginia. Without additional documentation, a definitive determination can be reached with respect to the potential for residual contamination.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Utica St. Warehouse  
Buffalo, New York

**ALSO KNOWN AS:** Linde Air Products

**TIME PERIOD:** 1945

**DESCRIPTION OF ACTIVITIES:**

The Utica St. Warehouse was a storage facility for residues produced at the Linde Air Products operations in Buffalo, New York.

As of 1945, as much as 355,000 pounds of residues were stored at the facility in steel and wooden barrels. There is no information regarding how long the material was in storage, but it is indicated that several of the drums required repackaging because of deterioration.

The material was apparently moved out of the warehouse in late 1945. The facility was subsequently demolished sometime prior to 1981 and replaced with a parking lot. Surveys by ORNL conducted in 1982 did not indicate any radioactivity above what would be considered background and the site was removed from FUSRAP determination.

There is no information concerning the radiological status of the facility after the material was moved in 1945.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Ventron Corporation  
Beverly, Massachusetts

**ALSO KNOW AS:** Metal Hydrides Corp., Ventron Division  
Morton Thiokol, Inc.

**TIME PERIOD:** 1942-1948; DOE 1986-1998

**DESCRIPTION OF ACTIVITIES:**

Ventron Corporation was under contract with the MED and AEC from 1942-1948 to convert uranium oxide to uranium metal powder. Later operations were involved in recovery of uranium from scrap and turnings from a fuel fabrication plant in Hanford. During the period 1942-1948, Metal Hydrides was the AEC's primary scrap recovery contractor.

The Ventron Site consisted of several buildings that were once used to support AEC contracts. The buildings that were used as the foundry for scrap recovery operations were demolished shortly after the contract with AEC expired in 1948.

The site was surveyed as part of the FUSRAP process in 1982 and found to be significantly contaminated. Remedial cleanup was conducted in 1996-1998, and nearly 10,000 cubic yards of contaminated material were removed to a licensed facility. On August 8, 1997 the DOE determined that the site was clean, and released it for unrestricted use.

It was clear from available documentation that the site was significantly radiologically-contaminated for the entire period in which weapons-related production occurred.

Documentation reviewed indicates that the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically between 1948 and 1986.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1942 - 1988

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Virginia-Carolina Chemical Corp.  
Nichols, Florida

**ALSO KNOWN AS:** Conser Department of Phillips Brothers  
Englehard Minerals and Chemical Corp.  
Socony Mobile Oil Co.

**TIME PERIOD:** 1952-1957

**DESCRIPTION OF ACTIVITIES:**

The Virginia-Carolina Chemical Corp. produced uranium as a by-product of the recovery of phosphate chemicals and fertilizers. The AEC contracted with the company for the recovery of uranium which was ultimately used in weapons production.

The Virginia-Carolina Chemical Corp. was under contract to produce 12 tons of  $U_3O_8$  per year during the years 1952-1959. The facility that was used to extract the uranium was disassembled in 1960.

The plant underwent a complete shutdown and abandonment between the years 1969-1973, and as of 1979, was completely remodeled and modified from its original configuration.

Documentation reviewed indicates that the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically between 1957 and 1960.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Vitro Corp of America (New Jersey)  
West Orange, New Jersey

**ALSO KNOWN AS:** Heavy Metals Co.  
Vitro Chemical Co.

**TIME PERIOD:** 1951-early 1960s

**DESCRIPTION OF ACTIVITIES:**

Vitro was asked to submit a proposal for research on thorium fluoride production, scrap recovery, and waste recovery in 1951. The work was apparently carried out in 1952. However, it is unclear how much material was used in the process. In the late 1950s to 1960s, Vitro conducted work under AEC contract converting low-enrichment uranium dioxide to uranium carbide spheres. The uranium was then shipped from Rockwell International to Vitro, and then returned to Rockwell. This work lasted until at least 1965 when Vitro shipped 5,186 kilograms of 4.91% enriched uranium to Rockwell.

In 1958, Vitro apparently conducted work under contract with AEC Oak Ridge Operations for the separation of fission products.

Available documentation supports that scrap uranium recovery work was conducted and also indicates that production of ThF<sub>4</sub> from thorium nitrate work was being planned. There is an indication that Rockwell International received shipments of enriched uranium from Vitro (assumed to be New Jersey) as late as 1965. The processing facility used for these operations was demolished sometime prior to 1977 when radiological surveys were conducted identifying no radioactivity above what would be considered background. At the time of the survey the property was owned and occupied by the West Orange Tennis club. With the absence of any radiological survey data from the operational period or the facility after operations were completed, it is concluded that there is a reasonable potential that residual contamination existed at the facility up until the time the building was demolished.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documentation included, DOE Report; FUSRAP Elimination Report for the former Vitro Laboratories Vitro Corporation; West Orange, New Jersey; September 30, 1985.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

1951 - 1977

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Vitro Corp. of America (Tennessee)  
Chattanooga, Tennessee

**ALSO KNOWN AS:** Chattanooga Site owned by W.R.Grace  
Vitro Chemical, a subsidiary of Vitro Corporation  
Heavy Minerals Company.

**TIME PERIOD:** 1957-uncertain

**DESCRIPTION OF ACTIVITIES:**

The original owner of this site was Heavy Metals, Inc. and possessed an AEC license to process uranium and thorium products beginning as early as 1957. Documentation indicates that the company provided price quotes to the AEC for thorium products as early as 1954. But, there is no indication that it received a contract for that work. Vitro Chemical of Chattanooga, Tennessee, a subsidiary of Vitro Corp., took over the site at the end of 1959, and was under contract to the AEC to produce thorium metal, thorium fluoride and thorium oxide. This site was purchased by W.R. Grace in 1965.

While an end date is not specified for the period in which weapons-related production occurred, based on the amount of radioactive materials handled/processed for AEC activities, there is a high degree of probability that residual contamination existed after cessation of these operations, which would be indistinguishable from contamination originating from commercial operations.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Additional information is required

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Vitro Manufacturing (Canonsburg)  
Canonsburg, Pennsylvania

**ALSO KNOWN AS:** Vitro Rare Metals Company

**TIME PERIOD:** 1942-1957

**DESCRIPTION OF ACTIVITIES:**

Vitro Canonsburg was a major uranium milling facility. Starting in 1948, Vitro was under contract to recover uranium from scrap. During the period 1954-1956, Vitro produced production quantities of uranium tetra-fluoride for NLO(Fernald).

In 1949, Vitro received uranium scrap from the Tyson Valley Powder Farm. From 1957-1967, the site was used only for storage, and its license was changed to a storage-only facility. During the period of 1956-1957, 12,003,726 pounds of uranium-bearing wastes were removed from the facility and dumped in a landfill on the Pennsylvania Railroad property. The facility's AEC license was terminated in 1966.

In 1976, an ERDA survey identified "excessive radium contamination" at the facility. The Canonsburg site was designated for DOE remediation by the Uranium Mill Tailings Radiation Control Act.

The available documentation supports the 1942 beginning date. Documentation supports that uranium recovery operations under MED/AEC contracts ended in 1957 however surveys performed by Oak Ridge National Laboratory in 1977 identified "large quantities of radioactive wastes still remain, contaminating almost the entire site." A review of the radiological survey data indicates that MED/AEC residual contamination would be indistinguishable from contamination resulting from prior commercial radium production operations at this site.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Vulcan Tool Co.  
Dayton, Ohio

**TIME PERIOD:** 1959

**DESCRIPTION OF ACTIVITIES:**

The Vulcan Tool Co. conducted experiments involving the cutting of uranium slugs and tubes on a Brehm cutter at the request of NLO (Fernald). This was apparently a single test performed in October 1959. There is no information regarding the quantity of material used in the test; however, the likelihood of significant contamination remaining at the facility is remote.

Given that there was only a single test performed at the facility, the likelihood of significant contamination is remote at this facility.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** W.E. Pratt Manufacturing Co.  
Joliet, Illinois

**ALSO KNOWN AS:** William E. Pratt Manufacturing Co.  
Klassing Handbrake  
Altrachem, Inc.

**TIME PERIOD:** 1943-1946

**DESCRIPTION OF ACTIVITIES:**

The W.E. Pratt Manufacturing Co. performed metal fabrication for the University of Chicago Metallurgical Laboratory beginning in the spring of 1943. The purpose of the machining done by Pratt was to speed up delivery of pieces for the experimental pile and “learn all that could be learned” about handling uranium in turret lathes and screw machines.

In 1944, Pratt was subcontracted by the University of Chicago to finish “short metal rods” by center less grinding. This work continued until 1946. There is information to support that DuPont placed an order at one point to turn and grind unbonded Hanford slugs. As many as 48,000 unbonded Hanford slugs could have been processed by Pratt between 1944-1946. The contract with the University of Chicago was terminated in 1946 when operations were consolidated at the Hanford site.

This site poses a high probability for dispersion of radioactive materials during operations however most of the facility was demolished between 1943 and 1989 when the FUSRAP survey was performed. The controls during and decontamination after operations may have removed residual contamination however there is no documentation to demonstrate the effectiveness. The survey performed in 1989 indicates that while the conditions of the existing buildings met current unrestricted guidelines, those that were demolished may have had residual contamination up until the time of their disposition. Additionally, the building surveyed had been extensively remodeled prior to the 1989 survey.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

1943 - 1946

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** W.R. Grace (Tennessee)  
Erwin, Tennessee

**ALSO KNOWN AS:** Nuclear Fuel Services  
Davison Chemical

**TIME PERIOD:** 1958-1970

**DESCRIPTION OF ACTIVITIES:**

W.R. Grace processed unirradiated uranium scrap for the AEC, recovering enriched uranium for use in the nuclear weapons complex. The company also processed thorium, and in 1963 had as much as 36,782 pounds of thorium and thorium nitrate in inventory.

The company received an AEC license to engage in the conversion of UF<sub>6</sub> to forms needed for the fabrication of fuel elements for research and development. It is unclear what the elements were used for, as they may have been part of fuel manufacture for the Department of the Navy.

While it is unclear as to whether weapons development work was concluded in 1969, there is a strong probability that any residual contamination existing after that time would be indistinguishable from commercial operations contamination. There is a probability that AWE residual contamination existed outside the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** W.R. Grace and Company (Maryland)  
Curtis Bay, Maryland

**ALSO KNOWN AS:** Davison Chemical Corp.  
Agri-Chemicals Division

**TIME PERIOD:** 1955-1958

**DESCRIPTION OF ACTIVITIES:**

Processing of radioactive materials at W.R. Grace began in July, 1955 when Rare Earths, Inc. (W.R. Grace's predecessor) entered into a contract with the AEC to extract thorium and rare earths from naturally-occurring monazite sands. In 1956, the AEC contract and Rare Earths' license to possess, transfer, and use radioactive thorium was transferred to W.R. Grace and Company. The facility where thorium processing took place (Building 23) operated until late spring of 1957, when W.R. Grace and the AEC agreed to terminate the contract, effective January 31, 1958. At the time of contract termination, 998 tons of ore had been processed.

The wastes were buried in a landfill-type area covering about 4 acres. The site currently supports commercial activity.

In 1978, the landfill area was fenced off, and patrolled by the facility security guards to preclude access. Also in 1978, a radiological survey was conducted indicating that the landfill area was contaminated at depths up to 15 feet. The building where processing took place (Building 23) was also identified as contaminated, indicating "excessive alpha contamination on all five floors" and "radiation levels as high as 3 mr/hr around the vats and hoppers." Confirmation of residual contamination, 30 years after termination of AEC activities led to subsequent FUSRAP action authorization, however the current FUSRAP status is unknown.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent document; ORNL Report (ORNL/TM-10439); Results of the Indoor Radiological Survey at the W.R. Grace Co. Curtis Bay Site Baltimore Maryland; Issued - July 1989.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

1955 - 1978+ (Contamination was identified in 1978 but the end date cannot be determined due to insufficient information)

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** W.R. Grace Co., Agricultural Chemical Div. (Florida)  
Ridgewood, Florida

**TIME PERIOD:** 1954

### **DESCRIPTION OF ACTIVITIES:**

W. R. Grace performed pilot plant work on solvent extraction for Armour Fertilizer, which used the solvent process to extract uranium from phosphates. There was an AEC contract in place in 1954-1955 to perform this work.

The pilot plant was operated for approximately one month from November to December, 1954 in one building on the property. The building and equipment used for uranium production have since been dismantled.

A site survey was conducted in 1977, which did not indicate radiation and/or contamination levels above what would be considered background for this type of facility. Given the documented contract dates of 1954-1955, the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically between 1954 and 1955.

### **INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

### **PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Wah Chang  
Albany, Oregon

**ALSO KNOWN AS:** Teledyne Wah Chang

**TIME PERIOD:** 1956-1959;1971-1972

**DESCRIPTION OF ACTIVITIES:**

Wah Chang operations began in 1956 when, under contract with the AEC, Wah Chang reopened the U.S. Bureau of Mines Zirconium Metal Sponge Plant. Construction of new facilities, at the location of the existing plant, began in 1957. These facilities were established primarily for the production of zirconium and hafnium sponge. However, tantalum and niobium pilot facilities were also included. Melting and fabrication operations were added in 1959. Wah Chang may also have been involved in thorium work. In 1971-1972, a subcontract existed with Union Carbide Corporation (Y-12 plant) for melting uranium-bearing material.

Specific information regarding the scope of work conducted by Wah Chang or the radiological conditions of the facility is not contained within available documentation. It does appear that there was any work performed with radioactive materials from the 56-59 time frame. Re-melting of uranium in the 71-72 time was may conducted under license and with appropriate controls, posing a limited potential for residual contamination however, ERDA/FUSRAP surveys were apparently not performed. In 1987, a FUSRAP determination eliminated the site from further consideration.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Wash-Rite  
Indianapolis, Indiana

**TIME PERIOD:** 1953-1954

**DESCRIPTION OF ACTIVITIES:**

During 1953 and 1954, Wash-Rite was under contract with NLO (Fernald) to decontaminate work gloves by washing or cleaning. Residual uranium was found in the lint and solvent after cleaning. There is no specific information regarding how many times NLO (Fernald) used Wash-Rite.

The site was demolished sometime prior to 1991, the location of the original facility is now part of Interstate 70.

There is little likelihood of significant radioactive contamination existing at the facility at the conclusion of the NLO (Fernald) contract.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** Watertown Arsenal  
Watertown, Massachusetts

**ALSO KNOWN AS:** American Cyanamid Co.

**TIME PERIOD:** 1946-1952;1953-1957

**DESCRIPTION OF ACTIVITIES:**

The Watertown Arsenal continued the work begun in 1946 by the Massachusetts Institute of Technology (MIT) on methods for extraction of uranium and thorium from ore and to prepare metal grade uranium tetra fluoride. The work was transferred from MIT later that year to Watertown Arsenal. American Cyanamid Co. succeeded MIT in operating the project at Watertown Arsenal from 1951 until October, 1952, when it was transferred to the Winchester Engineering and Analytical Facility. The Watertown Arsenal was also involved in work requested by NLO(Fernald) between 1953 and 1957 which involved reducing hollow uranium tubes by the Hamiroll Swaging Process.

AEC activities were apparently conducted in Building 421 at the Watertown site. However, there is also information that supports Department of Army work being conducted at the same time, in the same facilities. AEC work was apparently transferred to a new laboratory in Winchester, Massachusetts sometime during 1953. The building in which AEC work was performed at the Watertown Arsenal was razed after 1967.

Documentation demonstrates that hollow uranium tube reducing was performed by Hamiroll Swaging Processes at the Watertown facility in 1958, generating significant airborne radioactive material concentrations. Additionally, FUSRAP documentation from the 1980's, confirms the presence of residual contamination and declares it "is probably the result of AEC related activities." This was noted as low level fixed contamination on the pad where the building had been and was not considered a significant source of exposure.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documents include, Memo, D.E. Carr to J.A. Quigley, April 3, 1958, "Trip Report To Watertown Arsenal, Watertown, Massachusetts on March 17-21, 1958", and DOE FUSRAP related documentation.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1946 - 1967

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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**FACILITY NAME:** West Valley Demonstration Project  
West Valley, New York

**ALSO KNOWN AS:** Nuclear Fuel Services, West Valley  
Western New York Fuel Services Center

**TIME PERIOD:** 1966-1973; DOE 1980-present

**DESCRIPTION OF ACTIVITIES:**

From 1966 to 1972, Nuclear Fuel Services, Inc., under contract to the State of New York, operated a commercial nuclear fuel reprocessing plant at the Western New York Nuclear Services Center. The plant reprocessed uranium and plutonium from spent nuclear fuel. Sixty percent of this fuel was generated at defense facilities. Spent nuclear fuel reprocessing generated approximately 600,000 gallons of liquid high-level radioactive waste. This waste was stored onsite in underground tanks.

In 1980, the United States Congress passed the West Valley Demonstration Project Act (Public Law 96-368), which authorized the DOE to conduct a technology demonstration project to solidify the liquid high-level waste at the Western New York Nuclear Services Center. Under this Act, DOE is also responsible for developing containers suitable for the permanent disposal of the solidified high-level waste at an appropriate Federal repository; transporting the containers to this repository; disposing of low-level waste and transuranic waste generated by high-level waste solidification; and decontaminating and decommissioning facilities used for the solidification. DOE is also responsible for dispositioning the spent nuclear fuel stored at the site.

In 1982, DOE selected vitrification as the treatment process for high-level waste. This process solidifies and stabilizes nuclear waste by mixing it with molten glass. Pretreatment of the high-level waste began in 1988 and was successfully completed in 1995. DOE expects to complete the West Valley Demonstration Project by 2023.

Documentation reviewed indicates the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically between 1972 and 1980.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1966 - 2003

### Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Westinghouse Advanced Reactors Division  
Plutonium Fuel Laboratories and the Advanced Fuel Lab  
Cheswick, Pennsylvania

**ALSO KNOWN AS:** Westinghouse Commercial Manufacturing

**TIME PERIOD:** 1971 - 1972

**DESCRIPTION OF ACTIVITIES:**

The Westinghouse Nuclear Fuels Division received shipments of nuclear materials from the AEC nuclear weapons complex in 1971 and 1972. The Cheswick site received a shipment of enriched uranium from the AEC's Fernald plant in 1971. It also received a shipment of plutonium in 1972 from the West Valley facility. This plutonium originated out of Hanford. Because this material came from the nuclear weapons complex, the site qualifies as an Atomic Weapons Employer for these years.

Although the Westinghouse facility in Cheswick, PA, conducted substantial work with radioactive materials in previous years, this work is not covered under EEOICPA because it was not related to nuclear weapons production. This includes the fabrication of nuclear fuels and reactor subsystems for naval, space, and civilian applications. Among the projects to which the Cheswick facility contributed were the Naval Nuclear Propulsion Program, the Nuclear Engine for Rocket Vehicle Application (NERVA) program, and the Liquid Metal Fast Breeder Reactor (LMFBR) program.

Documentation reviewed during this evaluation indicates that remedial actions were conducted, under NRC, up through 1979. Without specific information related to the work conducted with the materials in question, it appears that there is a potential for significant residual contamination outside the period in which weapons-related production occurred. This contamination could not be differentiated from contamination originating from non-AWE work.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Westinghouse Atomic Power Development Plant  
East Pittsburgh, Pennsylvania

**ALSO KNOWN AS:** East Pittsburgh Plant

**TIME PERIOD:** 1941-1944

**DESCRIPTION OF ACTIVITIES:**

Westinghouse prepared uranium metal for Enrico Fermi's staff and conducted development and pilot scale production of uranium oxide fuel elements. There could have been as much as 65 tons of uranium produced at this facility. But, the information is unclear as to whether all of the operations took place at the East Pittsburgh facility.

Documentation indicates that centrifuge assemblies existed at this facility as late as April 1946, with requests for disposition instructions. There is no available radiological survey data associated with this equipment. Additionally, documentation indicates that this facility was performing energy threshold and cross section fission studies in 1947, and was requesting information from the AEC on the process to obtain limited amounts of high purity metallic U-235.

A 1976 survey by ORNL did not identify any radioactive contamination above which could normally be considered background at the East Pittsburgh facility. The site was eliminated from FUSRAP consideration in 1985.

At the time of this report, documentation indicates that other Westinghouse facilities located in the Pittsburgh area may have been performing MED/AEC reactor development work, but are not listed on the AWE facility listing.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Westinghouse Electric Corp. (New Jersey)  
Bloomfield, New Jersey

**ALSO KNOWN AS:** North American Phillips Lighting

**TIME PERIOD:** 1941-1943

### **DESCRIPTION OF ACTIVITIES:**

Westinghouse Electric Corp., located in Bloomfield, NJ, was one of the large commercial contributors to Manhattan Project research with specific tasks related to uranium metal production and enrichment. Because developing the technology to produce pure uranium metal became a priority for the Manhattan Project, universities and private companies with experience in related chemical processes participated in the task. From 1942-1943, Westinghouse used a photochemical process for metallic uranium and supplied metallic uranium for the first self-sustaining chain reaction in Chicago. In addition to contributing to uranium metal production, Westinghouse Electric participated in activities related to uranium enrichment.

Westinghouse also worked with thorium, but it is unclear if that work took place in Bloomfield, or at another Westinghouse location. Records indicate thorium work may have occurred as late as 1949 at a Westinghouse facility. Three MED contracts were identified covering the dates August, 1942-August, 1944. There were two additional MED contracts that were issued in which the dates could not be verified.

A confirmatory survey was requested and performed by ORISE, of Building 7 in 1993 which identified areas of localized residual uranium surface contamination throughout several elevations of the facility, and widespread distribution of residual uranium surface contamination within the basement elevation. These survey results confirm that in 1993, Building 7 still had radiological contamination in excess of unrestricted release values.

### **INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent document: ORISE 93/H-110 Confirmatory Survey of Buildings 7,8,9, and 10A Bloomfield Lamp Plant Westinghouse Electric Corporation Bloomfield, New Jersey dated August 1993

### **EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1941 - 1993

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Woburn Landfill  
Woburn, Massachusetts

**ALSO KNOWN AS:** Winchester Engineering Vicinity Property

**TIME PERIOD:** 1955-1960

**DESCRIPTION OF ACTIVITIES:**

Fifty 55-gallon drums of low grade uranium ore were buried at the Woburn site. The material came from the AEC Raw Materials Development Laboratory operated by the National Lead Company under contract from 1955-1960.

Documentation indicates that the material in question had an activity level similar to granite, and was dumped from the drums into a truck for disposition, and subsequently co-mingled with other refuse and waste. The original landfill was excavated in 1974 and was replaced with clean backfill to support construction of a light industrial complex.

Radiological surveys of the old landfill site and the new landfill (where the excavated material was taken to) does not indicate radioactivity greater than expected background levels at either facility.

It appears that the dumping of the contents from fifty drums occurred in 1960, whereupon the drums were reused. Based on the described low-level radiological characteristics of the material and subsequent radiological surveys from the affected areas there is no indication or reason to suspect residual contamination of any consequence, existed beyond the date of 1960.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

## Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities

**FACILITY NAME:** Wolff-Alport Chemical Corp.  
Brooklyn, New York

**TIME PERIOD:** 1949-1950

**DESCRIPTION OF ACTIVITIES:**

Wolff-Alport Chemical Corp. was under contract with the AEC (#AT-30-1-Gen-287) for the procurement of thorium-containing sludge for stockpiling by the AEC. A March, 1949 document mentions the "current contract expires June 30, 1949 and will probably be extended for another year. Cost is approximately \$50,000 annually." This same document shows that almost 30,000 pounds of thorium oxalate sludge was provided to the AEC that year.

Records further indicate that activities were conducted as early as 1948 and continued on through 1954 when 238 drums of thorium oxalate sludge were sold to the AEC. Inventory records indicate that each year from 1948 to 1951 a minimum of 3,400 kilograms of thorium oxalate sludge were transferred to AEC.

There is a high potential that this site having residual thorium (and potentially thoron) contamination indirectly attributable to AWE activities. Wolff-Alport was a commercial producer of rare earths and only sold thorium process residues to the AEC incidentally. This is to say that thorium contamination existed at the site prior to AEC involvement and the sale of thorium sludge probably reduced the overall site contamination.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent documentation included, DOE Letter; Fiore to Solon; Subject; Notification of no DOE authority for Remedial Action at Wolff-Alport Chemical Corp.; 9/29/87. Attachment: FUSRAP Summary Report and Designation/Elimination Analysis for Wolff-Alport Chemical Corp. Brooklyn, N.Y. 1987.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

Residual contamination from AEC/DOE activities is indistinguishable from non AEC/DOE activities.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Wolverine Tube Division  
Detroit, Michigan

**ALSO KNOWN AS:** Hermes Automotive  
Mamif Corporation  
Division of Calumet Consolidated Copper Company

**TIME PERIOD:** 1943-1946

**DESCRIPTION OF ACTIVITIES:**

In 1943, the University of Chicago subcontracted to Wolverine Tube for help in extrusion of metals that were needed as part of the Manhattan Project. Wolverine Tube performed research on the fabrication of slugs and the process of aluminum canning and also experimented with thorium and beryllium.

From available documentation, there is no indication that residual contamination at any level of concern existed after cessation of AWE related work.

Documentation does however state that "Work probably continued through 1955 under sub-contract with Dupont (Savannah River Operations)."

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group. Pertinent document: (ORAU 90/A-16) Report; Radiological Survey at 1411 Central Avenue, Detroit, Michigan; June, 1990

**EVALUATION FINDINGS:**

The information evaluated was insufficient to make a determination concerning this site.

**Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities**

**FACILITY NAME:** Wyckoff Drawn Steel Co.  
Chicago, Illinois

**ALSO KNOWN AS:** Wyckoff Steel Co.  
Ferranti Steel and Aluminum Company

**TIME PERIOD:** 1943

**DESCRIPTION OF ACTIVITIES:**

In 1943, the Metallurgical Laboratory conducted experiments of center-less grinding equipment on uranium. Wyckoff Drawn Steel Co. surfaced two tubes and one rod; however, its process was deemed to be too expensive and too slow to be used in production.

Given that only one test was conducted using a limited amount of material, the facility is not likely to be contaminated beyond the date indicated on the DOE website.

In 1987, DOE FUSRAP completed an elimination report, removing this facility from FUSRAP activities.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Wyckoff Steel Co.

<b>Appendix A-3 Residual Radioactivity Evaluations for Individual Facilities</b>
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Newark, New Jersey

**TIME PERIOD:** 1950

**DESCRIPTION OF ACTIVITIES:**

Wykoff Steel Co. conducted a one-time test of methods to straighten and finish uranium rods on September 6, 1950. The materials used were only two four-foot uranium rods.

There were no radiological surveys performed during or after the test that were available in the provided documentation. However, given this was a one-time test, the likelihood of significant facility contamination is remote.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE Worker Advocacy Website and internal AEC/DOE correspondence provided by the DOE Worker Advocacy Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.