

**PRELIMINARY ASSESSMENT/SITE INSPECTION REPORT  
AND SWMU ASSESSMENT REPORT**

**UNIT NUMBER:** 497

**UNIT NAME:** C-410 Neutralization Room Inverter Vat

**DATE:** 12/11/01

**REGULATORY STATUS:** Solid Waste Management Unit (SWMU)

**LOCATION:** C-410 Complex

**APPROXIMATE DIMENSION:** 6 ft x 4 ft x 12 ft

**FUNCTION:** The neutralization room housed vats used to neutralize/clean residual electrolyte from fluorine cell components to facilitate repair/maintenance work. The inverter mechanism provided the means to position/manipulate cell heads for spray washing over the inverter vat to any residual electrolyte material. The inverter system was also used to spray off cell bodies after neutralizing in the settling basin (SWMU 508).

**BRIEF HISTORY:** The C-410 complex was constructed to produce uranium hexafluoride (UF<sub>6</sub>) from uranium trioxide by a series of reduction, hydrofluorination, and fluorination reactions. The complex began operation in 1953 and, with the exception of a four-year shutdown from 1964 to 1968, operated continuously until 1977. The neutralization room supported fluorine production, providing the means to prepare fluorine cells for required maintenance activities.

Cells requiring servicing were first emptied of electrolyte. This was accomplished at the filling area, with electrolyte forced from the removed cell via air pressure into a repaired cell to be conditioned. The cell head was removed and the cell body was submerged in the settling basin (SWMU 508) and allowed to soak to remove/neutralize any remaining electrolyte. The basin contained a soda ash solution, which was replenished as needed to maintain appropriate pH levels, until such time as a complete changeout of solution was necessary. The head was attached to the nearby inverter mechanism and sprayed with water to wash off any residual electrolyte. The body was subsequently removed from the settling basin and sprayed off in a similar fashion to remove any adhering materials.

The inverter trough drained continuously to the sludge pit (SWMU 513) located outside the C-410 facility, ultimately flowing to the holding pond (SWMU 19). The discharge was primarily water with some electrolyte residual.

**OPERATIONAL STATUS:** Inactive

**DATES OPERATED:** July 1953 to July 1964 and July 1968 to May 1977

**SITE/PROCESS DESCRIPTION:** When the C-410 complex was operational, a very large fluorine plant was an integral part of the overall UF<sub>6</sub> production process. Over 100 electrolytic fluorine cells were maintained to produce the fluorine needed for uranium tetrafluoride to UF<sub>6</sub> conversion. Cells requiring maintenance were flushed of electrolyte and taken to the neutralization room, where residual electrolyte was removed and neutralized in a large vat, or settling basin (SWMU 508) using a soda ash solution. Cells subsequently were repaired/refurbished in the C-411 facility, refilled with electrolyte, conditioned, and placed back into service. Based on pH measurements and the consistency of the solution, the vat was periodically drained via underground piping to a neutralization pit outside the C-410 Building for further processing prior to discharge. An inverter system was located adjacent to the soda ash vat and was used to position cell heads and neutralized cell bodies for spraying with water as a final rinse step in the process. Rinse water was discharged as it was generated (no hold-up) to the sludge pit (SWMU 513) and eventually flowed to the holding pond (SWMU 19).

**WASTE DESCRIPTION:** The contents of the neutralization vat periodically were drained to an outside pit for treatment prior to discharge. The waste solution was comprised primarily of water in the form of spent soda ash solution. Contaminants included lithium fluoride and sodium bifluoride, with some HF present. The effluent from the inverter system was primarily water, which flowed to the pit whenever spray washing was performed (no holdup).

**WASTE QUANTITY:** Visual inspection of the inverter vat located in the neutralization room showed it to be empty.

**SUMMARY OF ENVIRONMENTAL SAMPLING DATA:** There is no sampling data for this system.

**DESCRIPTION OF RELEASE AND MEDIA AFFECTED:** The water spray from inverter operations gravity drained to an outside neutralization pit (SWMU 513) prior to discharge. No information pertaining to the total released volume has been located.

**GROUNDWATER:** While this SWMU is located within the confines of the C-410 Building, periodic intentional discharges to an outside neutralization pit were routine. There is no data pertaining to groundwater contamination from this SWMU.

**SURFACE WATER:** While this SWMU is located within the confines of the C-410 Building, periodic intentional discharges to an outside neutralization pit were routine. There is no data pertaining to surface water contamination from this SWMU.

**SOIL:** While this SWMU is located within the confines of the C-410 Building, periodic intentional discharges to an outside neutralization pit were routine. There is no data pertaining to soil contamination from this SWMU.

**ECOLOGY AFFECTED [i.e., threatened/endangered (T&E) species]:** No known impacts. No federal or state listed T&E plant or animal species have been identified. The federally endangered Indiana bat (*Myotis sodalis*) potentially occurs in the vicinity, but the C-410 complex does not provide a suitable habitat.

**DOCUMENTATION OF NO RELEASE:** There is no documentation.

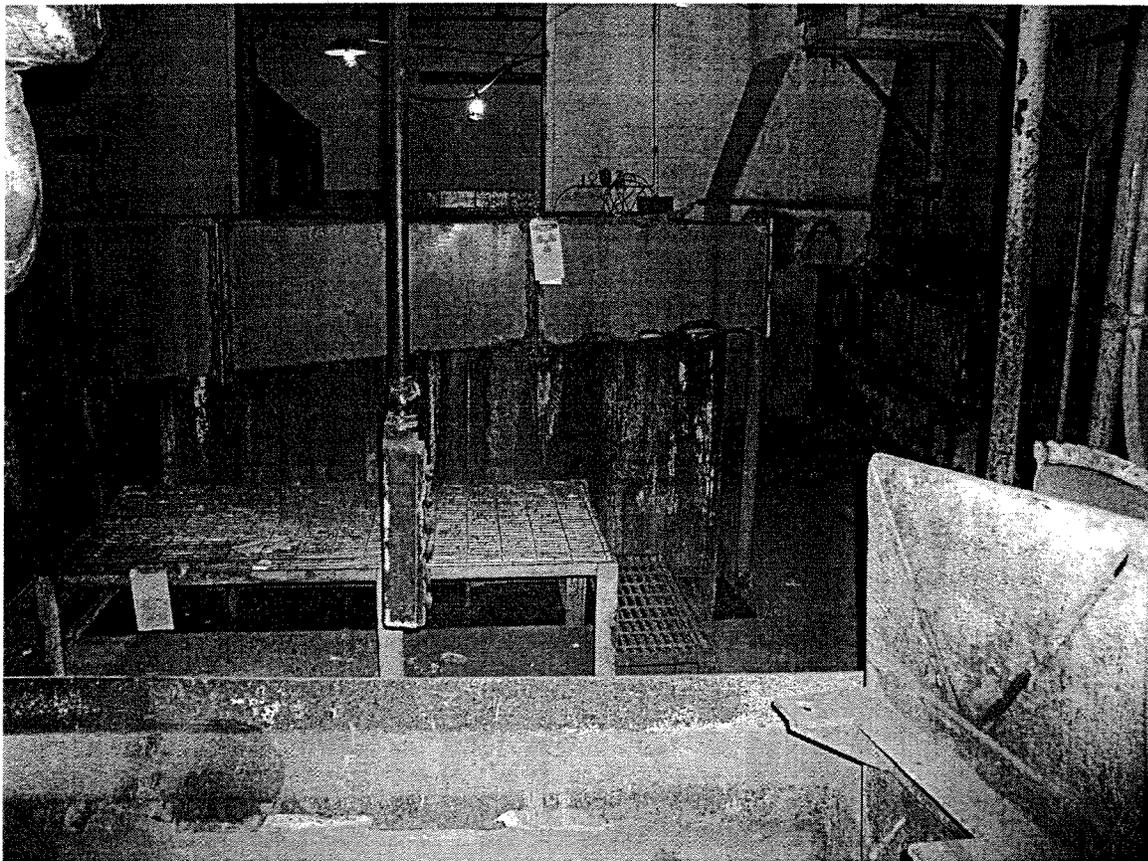
**IMPACT ON OR BY OTHER SWMU/AOC:** The following SWMUs are in the vicinity of the C-410/420 complex:

SWMU 11	SWMU 19	SWMU 20	SWMU 26
SWMU 40	SWMU 41	SWMU 47	SWMU 78
SWMU 169	SWMU 198	SWMU 203	

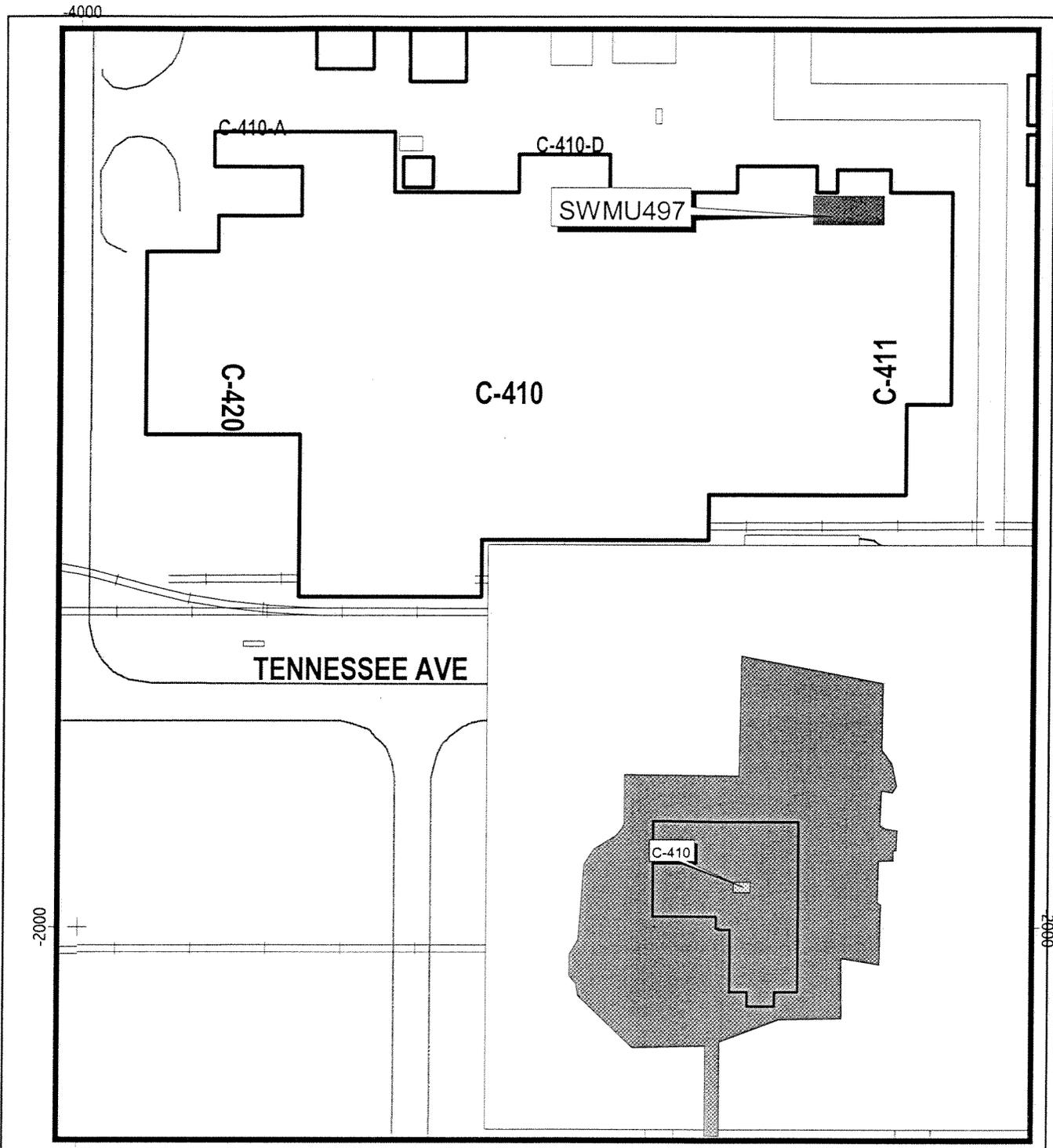
**PRG COMPARISON:** NA

**RFI NECESSARY:** This area is associated with an inactive facility that is included in the decontamination and decommissioning (D&D) program. Site evaluation work is underway at this time, along with planning associated with the infrastructure D&D phase. The need for a Remedial Investigation/Feasibility Study will be evaluated as part of the facility structure D&D phase.

**NOTE:** Elements included in this outline shall be considered and incorporated, as appropriate, when developing the above referenced document.



SWMU 497



U.S. DEPARTMENT OF ENERGY  
DOE OAK RIDGE OPERATIONS  
PADUCAH GASEOUS DIFFUSION PLANT

BECHTEL JACOBS  
BECHTEL JACOBS COMPANY LLC  
MANAGED FOR THE US DEPARTMENT OF ENERGY UNDER  
US GOVERNMENT CONTRACT DE-AC-05-99OR22700  
Oak Ridge, Tennessee • Paducah, Kentucky • Portsmouth, Ohio



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