

**CERTIFICATION OF RCRA CLOSURE
FOR OU 15 IBSSs**

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ACRONYMS

CHWA	Colorado Hazardous Waste Act
DOE	Department of Energy
ER	EG&G Environmental Restoration
IHSSs	Individual Hazardous Substance Sites
OU	Operable Unit
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RFEDS	Rocky Flats Environmental Database System
RFETS	Rocky Flats Environmental Technology Site
RFI/RI	RCRA Facility Investigation/Remedial Investigation
SVOC	semi-volatile organic compound
TC	Toxicity Characteristic
VOC	volatile organic compound
WSIC	Waste Stream Identification and Characterization

1.0 INTRODUCTION

The purpose of this report is to certify the Resource Conservation and Recovery Act (RCRA) closure of six Individual Hazardous Substance Sites (IHSSs) that comprise Operable Unit 15 (OU 15) at the Rocky Flats Environmental Technology Site (RFETS). *WASTREN, Inc.*, as an independent third party, has been retained by the RFETS Environmental Restoration (ER) Program Division to perform this certification. This report provides the data to support the clean closure determination by the owner/operator and an independent professional engineer as required by 6 CCR 1007-3 265.115. The data required for this determination is included in this report or incorporated by reference from OU 15 RCRA Facility Investigation/Remedial Investigation (RFI/RI) documentation. The closure of the OU 15 IHSSs was performed in accordance with applicable Colorado Hazardous Waste Act (CHWA) interim status requirements in 6 CCR 1007-3 Section 265, the RFETS RCRA Part B Permit (CDPHE 1991) and the approved *Final Phase I RFI/RI Work Plan for OU 15* (the Work Plan)(DOE 1993).

1.1 PROJECT DESCRIPTION

The six IHSSs that comprise OU 15 include four drum storage areas (IHSS 178, 179, 180 and 211), a thermal treatment unit for uranium chips (IHSS 204), and a bench scale treatment unit for cyanide laboratory solutions (IHSS 217). The drum storage areas were used in the past to store RCRA wastes over 90 days. RCRA wastes were treated in the two treatment units. Per approved Technical Memorandum #1, traditional closure plans were not prepared for these units since they comprise an operable unit within the jurisdiction of the Rocky Flats Interagency Agreement (DOE 1991). The RFI/RI Work Plan serves as the State and EPA approved RCRA closure plan for operable unit IHSSs.

The geology and hydrogeology for the OU 15 is presented in detail in Section 2.0 of the *Final Phase I RFI/RI Report for OU 15 Inside Building Closures* (the Final Report)(DOE 1995) and will not be repeated in this *Certification of RCRA Closure for OU 15 IHSSs*.

1.2 HISTORICAL OVERVIEW

The six IHSSs included in OU 15 are all located within various buildings at RFETS. Table 1 presents a summary of information about the individual OU 15 IHSSs. This information was taken from the Final Report (DOE 1995).

Table 1 OU 15 IHSS Information Summary

IHSS	Description	Location	RCRA Unit #	Year of first use
178	Drum Storage Area	Building 881, Room 165	N/A	1953
179	Drum Storage Area	Building 865, Room 145	N/A	1970
180	Drum Storage Area	Building 883, Room 104	N/A	1981
204	Original Uranium Chip Roaster	Building 447, Rooms 32 and 502	45	Not specified
211	Drum Storage Area	Building 881, Room 266B	26	1981
217	Cyanide Bench Scale Treatment	Building 881, Room 131C	32	1952*

* Date of installation for the laboratory table and fume hood. The date that cyanide treatment began is not specified.

A variety of operations were conducted in the buildings that contain the OU 15 IHSSs. These operations include:

- Building 447 houses the uranium chip roaster, process waste collection, and utilities systems. Nuclear weapon component production, drum cleaning and composite metal chip cementation processes were operational in Building 447 in the past.
- General metallurgy research was the principal use of Building 865 while IHSS 179 was in operation.
- A variety of production and support operations have been located in Building 881. Parts comprised of uranium and nonradioactive materials were produced many years ago. The building houses a variety of laboratory and other support operations including utilities, maintenance, and process waste collection.
- Metal rolling, forming, and shearing operations were performed in Building 883. The operations were performed on uranium and nonradioactive metals.

1.3 WASTE CHARACTERIZATION

The wastes that were stored or treated in the IHSSs were characterized in the Work Plan (DOE 1993). The waste characterization from the Work Plan is summarized below.

IHSS 178, Drum Storage Area - The wastes in this drum storage area were generated in Building 881. The characterization of the RCRA constituents was based on analytical results for wastes from Building 881, typical of the waste stored at the IHSS 178. The possible RCRA constituents identified were 1,1,1-trichloroethane and Freon TF (1,1,2-trichloro-1,2,2-trifluoroethane).

IHSS 179, Drum Storage Area - The RCRA characterization of the waste stored in this area is based on analytical results from samples collected from drums stored in the IHSS in 1986. The drums contained oils and chlorinated solvents contaminated with radionuclides and beryllium. The samples were analyzed for total alpha (radioactivity), beryllium, and selected organic compounds. 1,1,1-trichloroethane and Freon TF (1,1,2-trichloro-1,2,2-trifluoroethane) were detected.

IHSS 180, Drum Storage Area - The wastes stored in this IHSS included oils contaminated with organic compounds and uranium. Samples of wastes stored in this area were analyzed for radioactivity, beryllium, and "general components" in 1986. The possible RCRA constituents identified were 1,1,1-trichloroethane and Freon TF (1,1,2-trichloro-1,2,2-trifluoroethane).

IHSS 204, Original Uranium Chip Roaster - The chip roaster was used to oxidize uranium metal chips to uranium oxide to control the pyrophoric characteristics of uranium metal chips. The uranium chips were historically coated with oil and coolants contaminated with Freon TF and 1,1,1-trichloroethane. Since January 1988, the uranium chips have not been coated with oils and coolants that have RCRA solvent contamination (DOE 1995). The uranium chips were fed into the roaster, ignited, and converted to oxide as the chips passed through the four tiers of the roaster. The oxide was collected in drums at the bottom of the roaster. Freon TF and 1,1,1-trichloroethane were the RCRA constituents identified, by process knowledge, for this unit.

IHSS 211, Drum Storage Area - The characterization of the RCRA constituents for this IHSS is based on the Waste Stream Identification and Characterization (WSIC) study at RFETS in 1986 and 1987. The constituents of waste stored in the area include waste solvents (carbon tetrachloride, acetone, methyl alcohol, and butyl alcohol) and metals (including arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, and thallium).

IHSS 217, Cyanide Bench Scale Treatment - The cyanide treatment unit was used to convert cyanide to cyanate in aqueous laboratory solutions within polyethylene bottles. The conversion was performed by adding calcium or sodium hypochlorite to oxidize the cyanide. Very low concentrations of other listed wastes (besides cyanide) may have been in these solutions.

1.4 UNIT DESCRIPTION

The OU 15 IHSSs are described in detail in the Final Report (DOE 1995). The unit descriptions are based on visual examinations of the units prior to sampling in April 1993. A brief description of the unit from this document is presented below.

IHSS 178. Drum Storage Area - This IHSS is located on the concrete floor of Room 165 in Building 881. There are two painted circles, each approximately four feet in diameter, on either side of a building column. A maximum of five 55-gallon drums could be placed in the IHSS. There are no secondary containment berms present around the IHSS or at the doors. With the exception of the two circles, the majority of the concrete floor is not painted. The unpainted concrete does have a finishing coat (sealer) and is in good condition.

IHSS 179. Drum Storage Area - This IHSS is located on a painted concrete floor in Room 145 in Building 865. The IHSS is adjacent to a large electrical panel. The IHSS is painted to mark its location and is approximately 8 feet by 12 feet. There are no secondary berms present around the IHSS. The paint and concrete floor are in good condition.

IHSS 180. Drum Storage Area - This IHSS is located on a painted concrete floor in Room 104 in Building 865. The IHSS is painted to mark its location and is approximately 10 feet by 16 feet. There are no secondary berms present around the IHSS. The paint and concrete floor are in good condition.

IHSS 204. Original Uranium Chip Roaster - This IHSS is comprised of a uranium chip roaster that is constructed of mild steel and alumina refractory brick. It is cylindrical with a diameter of 5 feet 6 inches and a height of 7 feet 4 inches. The chip inlet for the roaster is located in Room 502 and the main body of the roaster, including the oxide outlet ports is located in Room 32 of Building 447. The floors of both rooms are painted concrete. The floors are in good condition. There is black dust observable on the floors and exterior surfaces of the roaster. There are no secondary containment berms around Rooms 32 or 502. A wash rack/drum washing basin in Room 501 was also sampled for RCRA waste contamination. The concrete floor pad of the basin is sloped to a drain in the center of the pad. The pad and concrete berm are in good condition with no apparent gaps or cracks.

IHSS 211. Drum Storage Area - This IHSS is located on an epoxy-painted concrete floor in Room 266B of Building 881. The room is 10 feet by 20 feet and can store a maximum of twenty-nine 55-gallon drums. There are no secondary containment berms around the IHSS. There is a sealed crack, one to two inches wide, that runs the length of the room. Catch pans and collection bottles are used to collect any groundwater seepage into the room since Room 266B is partially below grade.

IHSS 217. Cyanide Bench Scale Treatment - This unit consisted of a 4 feet by 5 feet painted metal fume hood and laboratory table, three 4-liter polyethylene bottles, a glass beaker, and a chlorine-specific ion electrode. The floor within Room 131C of Building 881 is covered with linoleum tiles which are in good condition with some staining. Staining is evident on both the laboratory table and fume hood surfaces.

2.0 RCRA FACILITY INVESTIGATION

In addition to the review of the historical information presented in Section 1.0, two other investigative activities were performed to support OU 15 Inside Building Closures. These activities included a visual inspection and documentation of current conditions at each IHSS, and sampling and analysis of surfaces around each IHSS. A detailed description of the methods and results of these activities can be found in the Work Plan (DOE 1993), *Phase I RFI/RI Report Technical Memorandum #1* (Technical Memorandum #1)(DOE 1994), and the Final Report (DOE 1995).

The above activities were performed to meet the closure performance standards required by the RFETS RCRA Part B Permit (DOE 1991) issued October 30, 1991. The applicable standards as they appear in Section 5.1.2 of the Technical Memorandum #1 (DOE 1994) are as follows:

- a. Close the hazardous and mixed waste units in a manner that minimizes the need for further maintenance and controls; minimizes or eliminates the threat to human health and the environment; and minimizes or eliminates the post-closure escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground, surface waters, or the atmosphere.
- b. The closure performance standard for used rinsate from decontamination of concrete secondary containment areas shall be as follows:
 - (1) There must be no detectable levels of hazardous organic constituents;
 - (2) It must not exhibit any characteristic of a hazardous waste as defined in 6 CCR 1007-3 Part 261, Subpart C; and
 - (3) The levels of Toxicity Characteristic (TC) metals must be at or below the background level in the unused rinsate solution.
- c. Parameter selection for the used rinsate analysis will be based on the specific wastes stored at the unit. These wastes are specified in Part III of the State RCRA permit.

3.0 RCRA CLOSURE CERTIFICATION ACTIVITIES

The following activities were performed by *WASTREN* personnel to certify the OU 15 closure meets the performance standards described in Section 2.0.

3.1 VISUAL INSPECTION OF EACH IHSS

The OU 15 IHSSs were inspected on March 23, 1995, by a *WASTREN* representative to verify the unit descriptions in the OU 15 RFI/RI documentation (which are summarized in Section 1.4). A summary of the observations, by IHSS, is provided below.

IHSS 178, Drum Storage Area - The floor is unpainted except for the two circles and yellow paint around the fire control system pipes. The unpainted areas of the concrete floor are covered with a clear sealant. The floor is in good condition. Carpeting has been added to the floor since the rinsate samples were taken. There are no waste drums stored in this room. There is no visual evidence of spills or releases within the IHSS. It appears this area is no longer being used as a 90-day storage area.

IHSS 179, Drum Storage Area - The IHSS floor is painted yellow. The entire floor of Room 145 is painted. The floor is in good condition. There are no waste drums stored in the IHSS. There is no visual evidence of spills or releases within the IHSS.

IHSS 180, Drum Storage Area - The IHSS floor is painted yellow. The entire floor of Room 104 is painted. The floor is in good condition. There are no RCRA waste drums stored in the IHSS. Two low-level waste drums are in stored within the IHSS boundaries. There is no visual evidence of spills or releases within the IHSS.

IHSS 204, Original Uranium Chip Roaster - The painted floors are in good condition in Rooms 32 and 502. There is black dust observable on the equipment and on the floors. Other than the black dust, there are no signs of spills or releases within the IHSS. Equipment and drums are stored within both rooms. The floor of the wash basin is in good condition. There is debris from washing located in the rack. Analytical results from hot water rinsate of the IHSS do not indicate the presence of RCRA wastes in the black dust or washrack debris.

IHSS 211, Drum Storage Area - The entire floor of Room 266B is freshly painted. The new paint was applied after the hot water rinsate samples were taken. The crack in the floor is visible only by close inspection (For additional details on the cracked floor, refer to the Final Report (DOE 1995) description of IHSS 211). There are no RCRA waste drums stored in the IHSS although it is designated a 90-day storage area. There is no visual evidence of spills or releases within the IHSS.

IHSS 217, Cyanide Bench Scale Treatment - The remaining equipment from the cyanide treatment process is the lab table and fume hood. There is staining on this equipment as noted in the Final Report (DOE 1995). There are two penetrations in the lab table that appear to be process drains. The Work Plan (DOE 1993) states the drains are not part of the OU 15 closure. The Work Plan does not require sampling in the drains or inside the ventilation ducting exiting the fume hood. There is no waste stored within the IHSS.

3.2 SAMPLING PROCEDURES VERIFICATION

Verification that the sample procedures were followed was performed by comparing the procedures outlined to the activities reported. The sampling procedures are found in Section 7.0, Field Sampling Plan, of the Work Plan (DOE 1993). Section 3.0, Methods, of the Technical Memorandum #1 (DOE 1994), and Section 3.0, OU 15 Field Investigation, of the Final Report (DOE 1995) contain information on the sampling activities. Specifically, the sampling activities verified were:

- the number of samples including both rinsate and quality assurance/quality control (QA/QC) samples
- the procedure for taking the sample
- sample location
- chain of custody documentation.

No discrepancies were found between the planned events and reported events. However, the chain of custody forms displayed in Appendix D of the Final Report did not contain a receiver's signature. Data packages located in ER's library at Interlocken were reviewed. The data packages were found to contain the laboratory's copy of the chain of custody with all signatures.

3.3 ANALYTICAL SUITES VERIFICATION

The required RCRA analytical suites [the Target Analyte List for Metals, and the Target Compound List for semi-volatile organic compounds (SVOCs) and volatile organic compounds (VOCs)] are presented in Table 7-1 of the Work Plan (DOE 1993). The required suites were compared to the validated analytical results tabulated in the Rocky Flats Environmental Database System (RFEDS) printout and presented in Appendix E of the Final Report (DOE 1995). The review of Appendix E indicated that all the analyses requested in Section 7.3.2 of the Work Plan (DOE 1993) were performed. No discrepancies were found.

3.4 VERIFICATION THAT ANALYTICAL RESULTS MEET THE CLOSURE PERFORMANCE STANDARDS

Verification that the RCRA constituents comply with the closure performance standards in Section 5.T.2 of Technical Memorandum #1 was performed by comparing the validated analytical data presented in Appendix E of the Final Report to the closure standards in Section 2.0 of this report. In addition, one sample from the original data packages for each IHSS filed at ER's library was reviewed (about 10% of the total samples) to verify the accuracy of electronic data transfer from the contracted lab to the RFEDS. All of the data presented in Appendix E was then reviewed for compliance with the closure performance standards as stated in Section 2.0. No discrepancies were found.

4.0 CONCLUSIONS AND CLOSURE CERTIFICATION

The information in Technical Memorandum #1 (DOE 1994), and the Final Report (DOE 1995) provide the information required for RCRA closure of the OU 15 IHSSs. Review of the analytical data packages and independent visual inspections by *WASTREN, Inc.* support the RCRA closure information developed in these reports. Based on this information, the RCRA closure performance standards for OU 15 inside building closures have been met.

The undersigned hereby certify that closure of the previously described six IHSSs within Operable Unit 15 at the Rocky Flats Environmental Technology Site was performed in accordance with the specifications of the approved closure plan entitled "Final Phase I RFI/RI Work Plan for Operable Unit 15," dated March 1993 (DOE 1993).

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5.0 REFERENCES

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