



Rocky Flats Environmental Technology Site

TYPE 1 RECONNAISSANCE LEVEL CHARACTERIZATION REPORT (RLCR)

CLOSURE PROJECT FOR BUILDING 223A

REVISION 0

August 28, 2003

CLASSIFICATION REVIEW NOT REQUIRED PER
EXEMPTION NUMBER CEX-005-02

43

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REPORT (RLCR)

CLOSURE PROJECT FOR BUILDINGS 223A

REVISION 0

August 28, 2003

Reviewed by: _____ Date: _____
Don Risoli, Quality Assurance

Reviewed by:  Date: 9/2/03
D.P. Snyder, RISS ESH&Q Manager

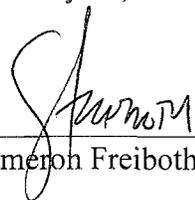
Approved by:  Date: 09/02/03
Cameron Freiboth, K-H Project Manager

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ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
CERCLA	Comprehensive Emergency Response, Compensation and Liability Act
DCGL _{EMC}	Derived Concentration Guideline Level – elevated measurement comparison
DCGL _W	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity
VOCs	Volatile organic compounds

EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) was performed to enable facility "Typing" per the DPP (10/8/98) and compliant disposition and waste management of Building 223A. Because this facility was an anticipated Type 1 facility, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). All facility surfaces were characterized in this RLC, including the interior and exterior surfaces [i.e., equipment, floor (slab), walls, ceiling and roof]. Environmental media beneath and surrounding the facility was not within the scope of this RLCR and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

The RLC encompassed both radiological and chemical characterization to enable compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Reports.

Results indicate that no radiological contamination exists in excess of the PDSP unrestricted release limits of DOE Order 5400.5. No building materials suspected of containing asbestos were identified for sampling. All beryllium sample results were less than $0.1 \mu\text{g}/100\text{cm}^2$. Fluorescent light ballast may contain PCBs. Any PCB ballast will be managed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations. All demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), and Environmental Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal*, as applicable. All concrete associated with this facility meets the criteria for recycling concrete per the RFCA RSOP for Recycling Concrete.

Based upon this RLCR, Building 223A is considered a Type 1 facility. To ensure that the facilities remain free of contamination and the RLC data remain valid, Level 2 Isolation Controls have been established and the facilities posted accordingly.

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1 INTRODUCTION

A Reconnaissance Level Characterization (RLC) was performed to enable compliant disposition and waste management of Building 223A. Because this facility was an anticipated Type 1 facility, a PDS characterization was performed. All facility surfaces were characterized in this RLC, including the interior and exterior surfaces of the facilities [i.e., equipment, floor (slab), walls, ceiling and roof]. Environmental media beneath and surrounding the facility was not within the scope of this RLC Report (RLCR) and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed, among these is Building 223A. The location of this facility is shown in Attachment A, *Facility Location Map*. This facility no longer supports the RFETS mission and requires removal to reduce Site infrastructure, risks and/or operating costs.

Before this facility can be removed, a Pre-Demolition Survey (PDS) must be conducted; this document presents the PDS results. The RLC was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The RLC built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report for the Area 3-Group 1 facilities, dated May 2002, Revision 0.

1.1 Purpose

The purpose of this report is to communicate and document the results of the RLC effort. A RLC is performed before building demolition to define the pre-demolition radiological and chemical conditions of a facility. The pre-demolition conditions are compared with the release limits for radiological and non-radiological contaminants. RLC results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 Scope

This report presents the final radiological and chemical conditions of Building 223A. Environmental media beneath and surrounding the facility is not within the scope of this RLCR and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this RLC were the same DQOs identified in the Pre-Demolition survey Plan for D&D Facilities (MAN-127-PDSP.) Refer to section 2.0 of MAN-127-PDSP for these DQOs.

2 HISTORICAL SITE ASSESSMENT

A facility-specific Historical Site Assessment (HSA) was conducted to understand the facility history and related hazards. The assessment consisted of facility walkdowns, interviews, and document review, including review of the Historical Release Report (refer to the D&D Characterization Protocol, MAN-077-DDCP). Results were used to identify data gaps and needs, and to develop radiological and chemical characterization packages. Results of the facility-specific HSA were documented in a facility-specific *Historical Site Assessment Report (HSAR) for the Area 3-Group 1 Facilities*, dated May, 2002, Revision 0. Refer to Attachment B, *Historical Site Assessment Report*, for a copy of the Building 223A HSAR. In summary, the HSAR identified no potential for radiological and chemical hazards, except the potential for asbestos containing materials and PCBs in paint and light ballast.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

Building 223A was characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern. Based upon a review of historical and process knowledge, building walk-downs, and MARSSIM guidance, a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to the RISS Characterization Project files).

One radiological survey package (survey unit B223A-A-001) was developed for the interior and exterior of Building 223A. The survey package was developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA), removable surface activity (RSA), and scan measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*. Radiological survey data, statistical analysis results, and survey locations are presented in Attachment C, Radiological Data Summary and Survey Maps. The radiological survey unit package is maintained in the RISS Characterization Project files.

Forty-seven (47) TSA measurements (15 random, 19 biased, 10 equipment and 3 QC) and forty-four (44) RSA measurements (15 random, 19 biased and 10 equipment) were taken on the interior and exterior surfaces. A minimum 25% scan on the interior floor, 5% scan on interior walls, ceiling and equipment surfaces were performed, and a minimum 10% scan was performed on the exterior concrete pad, wall and roof surfaces of the facility. The RLC data confirmed that the facility does not contain radiological contamination above the surface contamination guidelines provided in the PDSP. Level 2 Isolation Control postings are displayed on the building to ensure no radioactive materials are inadvertently introduced.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

Building 223A was characterized for chemical hazards per the PDSP. Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on or in the facility. Based upon a review of historical and process knowledge, visual inspections, and PDSP DQOs, additional sampling needs were determined. A Chemical Characterization Plans (refer to RISS Characterization Project files) was developed during the planning phase that describe sampling requirements, the justification for the sample locations and estimated sample numbers. Contaminants of concern included asbestos, beryllium, RCRA/CERCLA constituents, and PCBs. Refer to Attachment D, *Chemical Data Summaries and Sample Maps*, for details on sample results and sample locations.

4.1 Asbestos

A survey of building materials suspected of containing asbestos was conducted in Building 223A in accordance with the PDSP. A CDPHE-certified asbestos inspector conducted the inspection and survey in accordance with the *Asbestos Characterization Protocol*, PRO-563-ACPR, Revision 1. No building materials suspected of containing asbestos were identified during the visual and tactile inspection of Building 223A, therefore, asbestos sampling and analysis was not performed as part of this RLC.

4.2 Beryllium (Be)

Based on the HSAR and personnel interviews, Building 223A is an anticipated Type 1 facility. There was not, however, adequate historical and process knowledge to conclude that beryllium was not used or stored in this building. Therefore, ten (10) biased beryllium samples were collected in accordance with the PDSP and the *Beryllium Characterization Procedure*, PRO-536-BCPR, Revision 0, September 9, 1999. Biased sample locations corresponded with the most probable areas of dust accumulation (including beryllium dust), assuming airborne deposition.

All beryllium smear sample results were less than $0.1 \mu\text{g}/100\text{cm}^2$. Beryllium laboratory sample data and location maps are contained in Attachment D, *Chemical Data Summaries and Sample Maps*.

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

Based on the HSAR, facility walk-downs and a review of RFETS waste management databases, Building 223A functioned as a waste storage facility. Although waste managed in Building 223A included RCRA/CERCLA regulated materials, there is no record of significant spills or evidence of contamination. Based on the above historical and process knowledge, RCRA/CERCLA sampling was not performed as part of this RLC.

Sampling for lead in paint in B223A was not performed. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal*, states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) waste, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal.

Building 223A may contain RCRA regulated materials such as mercury switches and leaded glass. A thorough inspection of the facility will be made and all regulated materials will be removed prior to demolition.

4.4 Polychlorinated Biphenyls (PCBs)

Based on the HSARs, interviews and facility walk-downs of Building 223A, no PCB-containing equipment or waste was ever present in the building making the potential for PCB contamination resulting from spills highly unlikely. Therefore, PCB sampling was not performed in Building 223A as part of this RLC.

Based on the age of Building 223A (constructed prior to 1980), paints used may contain PCBs. Consequently, painted surfaces must be disposed of as PCB Bulk Product Waste. Painted concrete surfaces can be used as backfill on site in accordance with approval received from EPA in November 2001 (letter from K. Clough, US EPA Region 8, to J. Legare, DOE RFFO, 8EPR-F, Approval of the Risk-Based Approach for Polychlorinated Biphenyls (PCB)-Based Painted Concrete), provided the concrete meets the unrestricted-release criteria outlined in the Concrete Recycling RSOP.

Because Building 223A may contain fluorescent light ballast containing PCBs, fluorescent light fixtures will be inspected to identify PCB ballast during removal operations. PCB ballast will be identified based on factors such as labeling (e.g., PCB-containing and non PCB-containing), manufacturer, and date of manufacturing. All ballast that does not indicate non PCB-containing are assumed to be PCB-containing.

5 PHYSICAL HAZARDS

Physical hazards associated with Building 223A consist of those common to standard industrial environments and include hazards associated with energized systems, utilities, and trips and falls. There are no unique physical hazards associated with this building. The building has been relatively well maintained and is in good physical condition, and therefore, does not present hazards associated with building deterioration. However, care should be taken during demolition activities as Building 223A is near active PAC 500-117.1 *North Chemical Site Storage*. Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of Building 223A, and consequent waste management, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments C and D) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original DQOs of the project.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- ◆ the *number* of samples and surveys;
- ◆ the *types* of samples and surveys;
- ◆ the sampling/survey process as implemented “in the field”; and,
- ◆ the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment E, *Data Quality Assessment Detail*.

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The demolition and disposal of Building 223A will generate a variety of waste. Estimated waste types and waste volumes are presented below. All waste can be disposed of as sanitary waste, except PCB Bulk Product Waste. There is no radioactive or hazardous waste. PCB ballast will be managed pursuant to site PCB waste management procedures.

Waste Volume Estimates and Material Types							
Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste
223A	1,500	0	600	1,400	0	0	None

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, Building 223A is classified as a RFCA Type 1 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999). The Type 1 classification is based on a review of historical and process knowledge, and newly acquired RLC data.

The RLC of Building 223A was performed in accordance with the DDCP and PDSP. All PDSP DQOs were met, and all data satisfied the PDSP DQA criteria. Building 223A does not contain radiological or hazardous waste. Any PCB ballast will be managed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations. All demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), and Environmental Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal*, as applicable. All concrete associated with this facility meets the criteria for recycling concrete per the RFCA RSOP for Recycling Concrete. Environmental media beneath and surrounding the facilities will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

To ensure this Type 1 facility remains free of contamination and the RLC data remain valid, Level 2 Isolation Controls have been established and the facility posted accordingly.

9 REFERENCES

- DOE/RFFO, CDPHE, EPA, 1996. *Rocky Flats Cleanup Agreement (RFCA)*, July 19, 1996.
- DOE Order 5400.5, "*Radiation Protection of the Public and the Environment.*"
- EPA, 1994. "*The Data Quality Objective Process,*" EPA QA/G-4.
- K-H, 1999. *Decommissioning Program Plan*, June 21, 1999.
- MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.
- MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.
- MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 3, July 15, 2002.
- MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.
- MARSSIM - *Multi-Agency Radiation Survey and Site Investigation Manual*, December 1997 (NUREG-1575, EPA 402-R-97-016).
- PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure*, Rev. 1, May 22, 2001.
- PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 1, May 22, 2001.
- PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.
- PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.
- PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.
- PRO-563-ACPR, *Asbestos Characterization Procedure*, Revision 0, August 24, 1999.
- PRO-536-BCPR, *Beryllium Characterization Procedure*, Revision 0, August 24, 1999.
- RFETS, *Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.*
- RFETS, *Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.*
- RFCA Standard Operation Protocol for Recycling Concrete*, September 28, 1999.
- Historical Site Assessment Report for the Area 3-Group 1 Facilities*, dated May 2002, Revision 0.

ATTACHMENT A

Facility Location Map

Area 3 Group 1 Building 223A

Standard Map Features

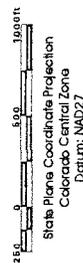
-  Buildings and other structures
-  Demolished buildings and other structures
-  Lakes and ponds
-  Streams, ditches, or other drainage features
-  Fences and other barriers
-  Paved roads
-  Dirt roads

DATA SOURCE BASE FEATURES:

Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by ES&G IBI, Las Vegas. Digitized from the orthophotographs. 1/95



Scale = 1 : 12450
1 inch represents approximately 1038 feet



State Plane Coordinate Projection
Colorado, Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

CE Dept. 300 926 / 707

Prepared by:

URS CONSULTANTS

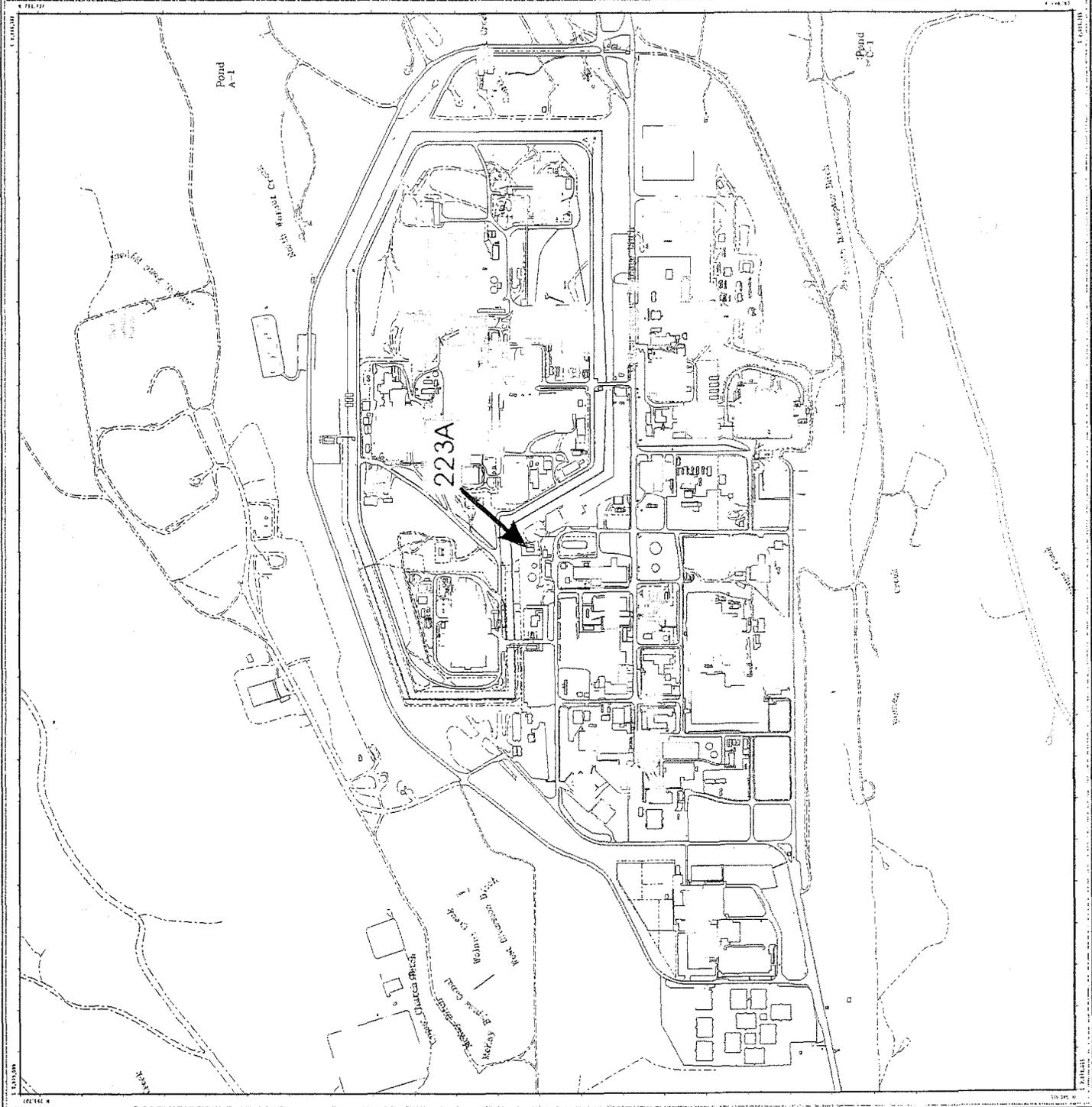
Prepared for:



MAP ID: FY 2002

Aug. 25, 2003

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ATTACHMENT B

Historical Site Assessment Report

**D&D RISS Facility Characterization
Historical Site Assessment Report
May, 2002 Rev. 0**

Facility ID: Area 3 - Group 1 - Buildings 223, 223A, 549, 551 Pad, 552, 553, 554, 556, 679, 680, 681, and the 750 HAZ Pad.

Anticipated Facility Type (1, 2, or 3): Buildings 223, 223A, 549, 551 Pad, 552, 553, 554, 556, 679, 680, 681, and the 750 HAZ Pad are anticipated Type 1 facilities.

This facility-specific Historical Site Assessment (HSA) has been performed in accordance with:
D&D Characterization Protocol, RFETS MAN-077-DDCP, latest version, and
Facility Disposition Program Manual, RFETS MAN-076-FDPM, latest version

Physical Description

Building 223

Building 223 is a 3500 sq. ft. Nitrogen Plant constructed in 1991. This facility is a steel frame building built on a concrete foundation. The walls and the roof are corrugated metal sheets mounted to a steel frame. The facility has two large purification tanks (Tanks 233 and 234) on the north side of the building used to remove moisture from the ambient air prior to the separation process. The facility also has a cooling tower on the west side of the building.

Building 223 has the following utilities; water, sanitary, electric, gas, steam heat, and an overhead sprinkler system and wall-mounted fire extinguishers provide fire protection.

Building 223A

Building 223A is currently the Environmental Restoration Storage Building constructed in 1975. The building is a 1980 sq. ft. metal frame building constructed on a concrete pad poured on grade. The walls and ceiling are corrugated sheet metal mounted on a steel frame.

Building 223A has the following utilities; electric, and fire protection is provided by wall-mounted fire extinguishers.

Building 549

Building 549 is currently a 1920 sq. ft. Fitness Center and was constructed in 1957. This building is a metal frame building constructed on a concrete slab. The walls and ceiling are insulated metal sheets attached to a steel frame. The walls have a sprayed-on insulation. The building has restrooms inside.

Building 549 has the following utilities; water, sanitary, electric, and fire protection is provided by wall-mounted fire extinguishers.

551 Pad

The 551 Pad is an approximately 20,000 sq. ft. fenced outdoor Permitted RCRA storage area (RCRA Unit 18.03) located east of Building 551. The 551 Pad is an asphalt pad that houses several cargo containers used to store RCRA/Low-level Mixed Waste. The storage yard is also used to store miscellaneous equipment, which are internally contaminated.

The 551 Pad has no utilities.

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Building 552

Building 552 is a 4170 sq. ft single-story compressed gas storage building constructed in 1953. The building is a non-insulated metal frame structure with possible asbestos siding and roof. The building is constructed on an elevated concrete slab, which is approximately 3-4 ft. thick.

Building 552 has the following utilities; electric and fire protection is provided by wall mounted fire extinguishers.

Building 553

Building 553 is a 1280 sq. ft. single-story welding shop constructed in 1953. The building is a non-insulated metal frame structure with asbestos siding and roof. The building is constructed on an elevated concrete slab, which is approximately 3-4 ft. thick.

Building 553 has the following utilities; electric, water and fire protection is provided by wall mounted fire extinguishers.

Building 554

Building 554 is a 1190 sq. ft. single-story warehouse storage and receiving building constructed in 1953. The building is a non-insulated a metal frame structure with asbestos siding and roof. Building 554 had the floor raised about 4 feet in the east half of the original structure in 1956.

Building 554 has the following utilities; electric, plant steam, and fire protection is provided by wall mounted fire extinguishers.

Building 556

Building 556 is a 640 sq. ft. single-story site maintenance building constructed in 1963. This building is a steel frame building with metal walls and a metal roof. Building 556 is built on a concrete slab. The building has two large roll-up garage doors on the east side of the building and an out-of-service air compressor located on the north side of the building.

Building 556 has the following utilities; electric, steam heat, pressurized air system. Fire protection is provided by wall-mounted fire extinguishers.

Building 679, and 680

Buildings 679 and 680 are both high voltage electrical transformers mounted on a 500 sq. ft. concrete pad. The transformers were installed in 1996 and are located approximately 15 ft. west of Building 681 (The Switchgear Building).

Building 679 and 680 have the following utilities: electric.

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Building 681

Building 681 is a 2302 sq. ft. switchgear building, constructed in 1996. Building 681 is a metal frame building constructed on a concrete pad. The walls and ceiling are non-insulated corrugated metal panels mount to the steel frame.

The following utilities: electric and fire protection is provided by wall mounted fire extinguishers.

750 HAZ Pad (a.k.a. RCRA Unit 1)

The 750 Pad is an approximately 17,000-sq. ft. fenced outdoor RCRA storage area (RCRA Unit 1). The 750 HAZ Pad located on an asphalt pad and contains several heated cargo containers to store RCRA/Low-level Mixed Waste.

The 750 HAZ Pad has the following utilities; electric, and fire protection is provided by wall-mounted fire extinguishers.

Historical Operations

Building 223

Building 223 houses the equipment for separating nitrogen from ambient air. Filtered air is compressed and purified in a heat exchanger. It is then passed through a distillation chamber where nitrogen is separated from the oxygen based on the differences in their liquefaction temperatures. The nitrogen is then piped throughout the plant. Excess nitrogen is liquefied and stored for future use. See the "Environmental Concerns" section below for IHSSs and PACs associated with this building.

Building 223A

Building 223A was originally built and owned by Air Products Corporation in 1975 to supply nitrogen to Buildings 776, 777, 707 and 371. In 1991 Air Products built a larger facility to the west of Building 223A and removed all of their equipment and tanks from this building. This building was not operated by RFETS personnel but by Air Products. From 1991 to 1995 the building sat empty at which time it became storage facility for CERCLA contaminated soils. See the "Environmental Concerns" section below for any IHSSs and PACs associated with this building.

Building 549

Building 549 was originally an electrical support building operated by J. E. Jones. From 1994 to 2001 the building was used as a Radcon support facility to house Southside Radcon support personnel. The building was used to count smears, store air samples, and support Southside Radcon operations. The building had a RMA in the northwest portion of the building, which was used to store radiological sources. None of these sources where known to have leaked. In 2001 the facility was closed and left vacant for about 6 months. In 2001 the building was converted to a fitness center. The building has no history of building contamination. See the "Environmental Concerns" section below for IHSSs and PACs associated with this building.

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551 Pad

The 551 pad is a fenced in RCRA storage area (RCRA unit 18.03). The 551 Pad storage yard houses several storage containers used to store RCRA/Low-Level Mixed Waste. The 551 Pad also is used to store internally contaminated equipment prior to final disposal. Originally the area was used to storage scrap metal which on occasion was found to contain low levels of contamination. A detailed history of the area currently called the 551 Pad is documented in PAC 500-117.2 "Middle Site Chemical Site Storage". There have been no known release to the environment since RCRA Unit 18.03 was established. See the "Environmental Concerns" section below for IHSSs and PACs associated with the 551 Pad.

Building 552

Building 552 is a storage building for cylinders of pressurized gas. Cylinders are received, stored and transferred from Building 552 to various onsite users. Empty cylinders are received from the various on-site users and stored pending pick-up by vendors. On occasion, contaminated cylinders are received from on-site users and must be decontaminated or packaged as LLW. See the "Environmental Concerns" section below for IHSSs and PACs associated with this building.

Building 553

Building 553 was originally the site chemical receiving and storage building. This activity ended in the late 1970's when the building became the metal fabrication building and was later used as a glovebox training building in the early 1990's. Chemicals stored here included, but were not limited to acids, bases, solvents and sulfates. See the "Environmental Concerns" section below for IHSSs and PACs associated with this building.

Building 554

Building 554 was the original Radiological Shipping and Receiving Building until Building 440 was constructed in early 1970s. This building had a criticality alarm system and health physics air-sampling system installed in the building. In the 1980s and 1990s the building was used as a general warehouse. In 1990 a drum crusher was installed. The drum crusher was removed in 2000. The facility has been a RCRA 90-Day pad used primarily for the storage of used light bulb for the last 8 years. During this time the building also housed several Material Stewardship support personnel in the office/break room on the north side of the building. Building 554 had the floor raised about 4 feet in the east half of the original structure in 1956. See the "Environmental Concerns" section below for IHSSs and PACs associated with this building.

Building 556

Building 556 was originally constructed as a welding shop and continued to operate as a welding shop until the late 1980s when the welding equipment was removed. Then the building was used as a general maintenance building. From approximately 1996 to 2000 the building was used as a Radcon support building. The Radcon support group did store sealed sources in a RMA in the building. None of the sources were known to have leaked and there was no building contamination associated with this activity. In 2002 the building began being used for welding training of D&D workers. See the "Environmental Concerns" section below for IHSSs and PACs associated with this building.

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Building 679, and 680

Building 679 and 680 are electrical transformers installed in 1996. These are non-PCB transforms and have no history of leaking. The transformers are located on a 500 sq. ft. concrete pad, which also acts as a secondary containment pad. These transformers where installed to re-place transformers 555 and 558. Building 679 and 680 were constructed on the site of the old transformers 555 and 558. See the "Environmental Concerns" section below for IHSSs and PACs associated with this building.

Building 681

Building 681 is a high voltage electrical switchgear building constructed in 1996. The equipment in this building has never contained PCBs or lead. The northeast corner of the building contains lead-acid batteries used for system back up. The batteries have no history of leaking. See the "Environmental Concerns" section below for IHSSs and PACs associated with this building.

750 HAZ Pad (a.k.a. RCRA Unit 1)

The 750 HAZ Pad is a fenced in RCRA storage area (RCRA Unit 1). The 750 HAZ Pad storage yard houses several heated storage containers used to store RCRA/Low-Level Mixed Waste. Originally the area was used to storage scrap metal which on occasion was found to contain low levels of contamination. A detailed history of the area currently called the 750 HAZ Pad is documented in PAS 500-903 and IHSS 500-197 "Scrap Metal Site 551". Although there have been release inside the storage containers in RCRA Unit 1, there have been no known release to the environment since RCRA Unit 1 was established. See the "Environmental Concerns" section below for IHSSs and PACs associated with this building.

See the "Environmental Concerns" section below for IHSSs and PACs associated with this building.

Current Operational Status

Building 223 is still operational. Building 223A is currently used to store CERCLA investigative derived waste. Building 549 is currently being used as a fitness center. The 551 Pad is currently being used as a permitted RCRA Storage Unit. Building 552 is currently being used as a gas cylinder storage and receiving building. Building 553 is currently empty. Building 554 is currently being used as a RCRA 90-Day storage area for collecting used light bulbs. Building 556 is currently being used for welding training. Building 679 is currently an operational transformer. Building 680 is currently an operational transformer. Building 681 is currently an operational switchgear building. The 750 HAZ Pad is currently an operational permitted RCRA Storage Unit.

Contaminants of Concern

Asbestos

Describe any potential, likely, or known sources of Asbestos:

Buildings 223A, 549, 552, 553, and 554 are posted as potentially containing asbestos. None of the facilities in this HSA have had a comprehensive asbestos survey.

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Beryllium (Be)

Describe any potential, likely, or known Be production or storage locations:

None of the building addressed in this HSA are on the List of known Be Areas.

Summarize any recent Be sampling results:

No recent Be samples collected on any of these facilities.

Lead

Describe any potential, likely, or known sources of Lead (e.g., paint, shielding, etc.):

Lead in paint and lead in electrical equipment may be a concern for some of the facilities in this HSA due to the age of construction. Lead shielding was temporarily used in Building 549 and 556 when these building were used to support southside Radcon operations. The lead shielding was removed when the Radcon operations ended.

See the section below for RCRA/CERCLA constituents for lead in waste steam references related to these buildings.

RCRA/CERCLA Constituents

Describe any potential, likely, or known sources of RCRA/CERCLA constituents (e.g., chemical storage, waste storage, and processes):

Building 553 was originally constructed as the site Chemical Receiving and Storage Facility and operated as the chemical receiving building until the late 1970s. Building 554 was the original Radiological Shipping and Receiving Facility until Building 440 was built in the early 1970s.

The 551 Pad and the 750 HAZ Pad are permitted RCRA units and will be closed in accordance with the Site RCRA Closure Plan.

See the "Historical Operations" section above for a detailed description of the operation which occurred in each facility addressed in this HSA. See the Building specific WSRIC for more detailed listing of the waste streams associated with each building addressed in this HSA.

Describe any potential, likely, or known spill locations (and sources, if any):

Additional RCRA/CERCLA release information is documented in the IHSS, PAC, and UBC section below.

Describe methods in which spills were mitigated, if any:

Spills were cleaned up to the standards of the day.

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PCBs

Describe any potential, likely, or known sources of PCBs (e.g., light ballasts, paints, equipment, etc.):

Due to the age of some of these facilities, there may be a concern with PCBs in paint, light ballasts, and electrical equipment. PCBs were not known to have been regularly handled in any of these facilities.

Describe any potential, likely, or known spill locations (and sources, if any):

No known PCB spills occurred in any of the facilities addressed in this HSA. However, Building 549 is located approximately 20 feet south of PAC 500-904 "Transformer leak 223-1/223-2". In addition, Building 679 and 680 were constructed on the old 555 and 558 transformer site which are currently PAC 500-901 and 500-903.

Describe methods in which spills were mitigated, if any:

No known PCB spills occurred in any of the facilities addressed in this HSA.

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Radiological Contaminants

Describe any potential, likely, or known radiological production or storage locations:

None of the buildings in this HSA are radiologically posted. Building 554 was the original Radiological Shipping and Receiving Building. Interviews indicate, that on occasion, contamination from the exterior of the drums where detected on the floor of Building 554. Today there is no indication of contamination remaining in Building 554.

Building 552, on occasion, received contaminated cylinders from the process buildings. Interviews indicate that in the past there was occasionally contamination found on the floor of Building 552 (in storage bays 3 and 4) from the exterior of the contaminated cylinders. Today there is no indication of contamination remaining in the building.

See the "Historical Operations" section above for a detailed description of the operation which occurred in each facility addressed in this HSA. See the Building specific WSRIC for more detailed listing of the waste streams associated with each building addressed in this HSA.

Describe any potential, likely, or known spill locations (e.g., known leaking sealed radioactive sources, leaking waste drums, potentially contaminated drains, etc.):

Additional RCRA/CERCLA release information is documented in the IHSS, PAC, and UBC section below. The 551 Pad and the 750 HAZ Pad are located on IHSSs. See section below for information on IHSSs PACs, and UBCs.

Describe methods in which spills were mitigated, If any:

Spills were cleaned up to the standards of the day.

Describe any potential, likely, or known isotopes of concern (e.g., weapons grade plutonium, uranium isotopes, pure beta emitters, mixed fission products, etc.):

The primary Isotope of concern includes, but is not limited to uranium and plutonium. Other than sealed sources, there were no known mixed fission products or pure beta emitters used in any of the facilities addressed in this HSA.

Describe any potential, likely, or known external facility contamination (e.g., stack release points, unfiltered ventilation, facility's physical location to known site releases, etc.):

See section below for information on IHSSs PACs, and UBCs.

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Environmental Restoration Concerns

Describe any ER concerns that could affect facility characterization (e.g., IHSSs, PACs, UBCs):

Building 223 is associated with or located near the following active IHSSs, PACs, and UBCs;

- 1) PAC 300-156.1 "Building 371 Parking lot", NFA approved in 2001.

Building 223A is associated with or located near the following active IHSSs, PACs, and UBCs;

- 1) PAC 500-117.1 "North Chemical Site Storage", Active.

Building 549 is associated with or located near the following active IHSSs, PACs, and UBCs;

- 1) PAC 300-186 "Valve Vault 12", Active.
- 2) PAC 500-117.1 "North Chemical Site Storage", Active.
- 3) PAC 500-904 "Transformer Leak -223-1/223-2", Active.

The 551 Pad is associated with or located near the following active IHSSs, PACs, and UBCs;

- 1) PAC 500-117.2 "Middle Site Chemical Site Storage", Active.
- 2) PAC 500-169 "Waste Drum Peroxide Burial", Proposed NFA in 1998 HRR Annual Update.

Building 552 is associated with or located near the following active IHSSs, PACs, and UBCs;

- 1) PAC 300-186 "Valve Vault 12", Active.

Building 553 associated with or located near the following active IHSSs, PACs, and UBCs;

- 1) IHSS 300-158 "Radioactive site - Building 551", Active.

Building 554 associated with or located near the following active IHSSs, PACs, and UBCs;

- 1) IHSS 300-158 "Radioactive site - Building 551", Active.

Building 556 associated with or located near the following active IHSSs, PACs, and UBCs;

- 1) IHSS 300-158 "Radioactive site - Building 551", Active.

Building 679, 680 and 681 associated with or located near the following active IHSSs, PACs, and UBCs;

- 1) IHSS 500-901 "Transformer Leak - 555", Proposed NFA 1996 Annual Update.

The 750 HAZ Pad is associated with or located near the following active IHSSs, PACs, and UBCs;

- 1) IHSS 500-197 "Scrap Metal Site", Active.
- 2) PAC 500- 903 "RCRA Storage Unit 1, NFA approved 1992

ATTACHMENT C

Radiological Data Summaries and Survey Maps

SURVEY UNIT 223A-A-001
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B223A (Interior and Exterior)

<u>Total Surface Activity Measurements</u>			<u>Removable Activity Measurements</u>		
	44	44		44	44
	Number Required	Number Obtained		Number Required	Number Obtained
MIN	-10.3	dpm/100 cm ²	MIN	-0.9	dpm/100 cm ²
MAX	84.2	dpm/100 cm ²	MAX	2.7	dpm/100 cm ²
MEAN	15.0	dpm/100 cm ²	MEAN	0.0	dpm/100 cm ²
STD DEV	19.8	dpm/100 cm ²	STD DEV	1.0	dpm/100 cm ²
TRANSURANIC DCGL _w	100	dpm/100 cm ²	TRANSURANIC DCGL _w	20	dpm/100 cm ²

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**SURVEY UNIT 223A-A-001
TSA - DATA SUMMARY**

Manufacturer:	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6
Instrument ID#:	1	2	4
Serial #:	2344	1273	2344
Cal Due Date:	1/29/04	1/9/04	1/29/04
Analysis Date:	8/18/03	8/18/03	8/20/03
Alpha Eff. (c/d):	0.220	0.212	0.220
Alpha Bkgd (cpm)	1.3	3.0	2.0
Sample Time (min)	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5
MDC (dpm/100cm²)	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm ²)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm ²)	Sample Net Activity (dpm/100cm ²) ^{1,2}
1	1	2.0	9.1	2.7	12.3	-7.2
2	2	6.7	31.6	2.0	9.4	15.3
3	4	8.0	36.4	2.0	9.4	20.1
4	1	1.3	5.9	6.0	27.3	-10.3
5	2	5.3	25.0	2.7	12.7	8.7
6	1	4.7	21.4	4.0	18.2	5.1
7	2	5.3	25.0	3.8	17.9	8.7
8	2	2.7	12.7	1.3	6.1	-3.5
9	1	6.7	30.5	5.3	24.1	14.2
10	1	1.3	5.9	3.3	15.0	-10.3
11	1	2.0	9.1	3.3	15.0	-7.2
12	1	5.3	24.1	4.7	21.4	7.8
13	4	8.7	39.5	1.3	6.1	23.3
14	2	4.7	22.2	4.7	22.2	5.9
15	4	8.0	36.4	3.3	15.6	20.1
16	2	4.7	22.2	4.0	18.9	5.9
17	1	4.7	21.4	2.0	9.1	5.1
18	2	3.3	15.6	2.0	9.4	-0.7
19	1	4.0	18.2	2.7	12.3	1.9
20	2	3.3	15.6	6.7	31.6	-0.7
21	2	6.7	31.6	3.3	15.6	15.3
22	1	2.7	12.3	2.0	9.1	-4.0
23	2	3.3	15.6	2.7	12.7	-0.7
24	2	11.3	53.3	6.0	28.3	37.0
25	2	5.3	25.0	2.0	9.4	8.7
26	1	7.3	33.2	2.7	12.3	16.9
27	1	6.7	30.5	3.3	15.0	14.2
28	1	3.3	15.0	2.7	12.3	-1.3
29	2	4.0	18.9	3.3	15.6	2.6
30	1	9.3	42.3	1.3	5.9	26.0
31	1	3.3	15.0	4.0	18.2	-1.3
32	1	5.3	24.1	3.3	15.0	7.8
33	2	9.3	43.9	1.3	6.1	27.6
34	2	6.7	31.6	2.0	9.4	15.3
35	2	11.3	53.3	6.0	28.3	37.0
36	2	13.3	62.7	2.7	12.7	46.5
37	2	21.3	100.5	6.0	28.3	84.2

**SURVEY UNIT 223A-A-001
TSA - DATA SUMMARY**

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2) ^{1,2}
38	1	7.3	33.2	3.3	15.0	16.9
39	1	18.0	81.8	3.3	15.0	65.6
40	2	14.7	69.3	5.8	27.4	53.1
41	1	7.3	33.2	1.3	5.9	16.9
42	2	6.0	28.3	4.7	22.2	12.0
43	1	10.0	45.5	6.0	27.3	29.2
44	2	10.0	47.2	7.3	34.4	30.9

1 - Average LAB used to subtract from Gross Sample Activity

16.3	Sample LAB Average
MIN	-10.3
MAX	84.2
MEAN	15.0
SD	19.8
Transuranic DCGL _w	100

QC Measurements

37 QC	1	14.0	63.6	2.7	12.3	51.2
24 QC	1	6.0	27.3	0.0	0.0	14.8
39 QC	2	14.7	69.3	5.3	25.0	56.9

1 - Average QC LAB used to subtract from Gross Sample Activity

12.4	QC LAB Average
Transuranic DCGL _w	100

**SURVEY UNIT 223A-A-001
RSC - DATA SUMMARY**

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	5	6	7	8
Serial #:	770	1164	924	959
Cal Due Date:	10/17/03	11/30/03	10/23/03	1/14/04
Analysis Date:	8/21/03	8/21/03	8/21/03	8/21/03
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.2	0.3	0.2	0.1
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm²)	7.0	8.0	4.5	4.5

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm ²)
1	5	0	-0.6
2	6	0	-0.9
3	7	0	-0.6
4	8	0	-0.3
5	5	1	0.9
6	6	0	-0.9
7	7	0	-0.6
8	8	0	-0.3
9	5	0	-0.6
10	6	0	-0.9
11	7	0	-0.6
12	8	0	-0.3
13	5	2	2.4
14	6	0	-0.9
15	7	0	-0.6
16	8	0	-0.3
17	5	0	-0.6
18	6	0	-0.9
19	7	1	0.9
20	8	0	-0.3
21	5	1	0.9
22	6	0	-0.9
23	7	1	0.9
24	8	0	-0.3
25	5	0	-0.6
26	6	0	-0.9
27	7	0	-0.6
28	8	2	2.7
29	5	0	-0.6
30	6	1	0.6
31	7	1	0.9
32	8	0	-0.3
33	5	0	-0.6
34	6	0	-0.9
35	7	1	0.9
36	8	1	1.2

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**SURVEY UNIT 223A-A-001
RSC - DATA SUMMARY**

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm ²)
37	5	1	0.9
38	6	0	-0.9
39	7	1	0.9
40	8	0	-0.3
41	5	1	0.9
42	6	1	0.6
43	7	1	0.9
44	8	2	2.7
		MIN	-0.9
		MAX	2.7
		MEAN	0.0
		SD	1.0
		Transuranic DCGL _w	20

ATTACHMENT D

Chemical Data Summaries and Sample Maps

Beryllium Data Summary

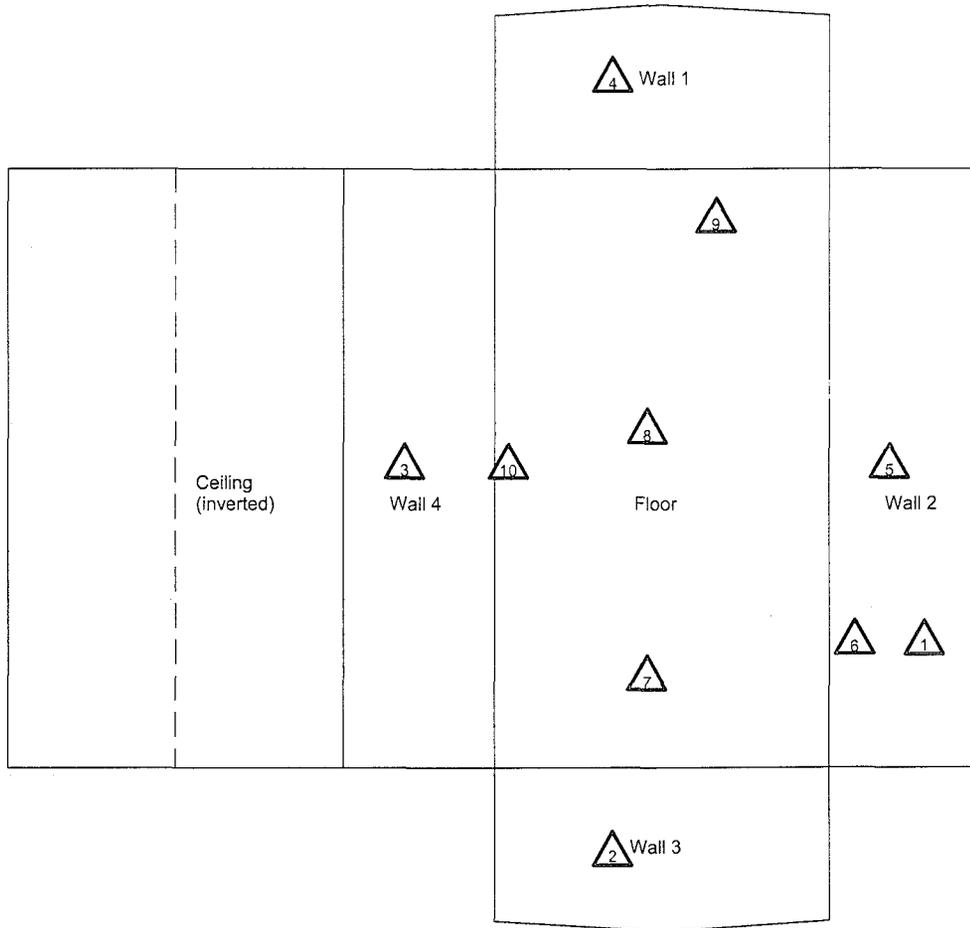
Sample Number	Map Survey Point Location	Sample Location	Result ($\mu\text{g}/100 \text{ cm}^2$)
Building 223A-RIN03D0527			
223A-02102003-315-101	1	On horizontal I-beam brace, east wall	< 0.1
223A-02102003-315-102	2	On horizontal I-beam brace, south wall	< 0.1
223A-02102003-315-103	3	On horizontal I-beam brace, west wall	< 0.1
223A-02102003-315-104	4	On horizontal I-beam brace, north wall	< 0.1
223A-02102003-315-105	5	On roll-top door, east wall	< 0.1
223A-02102003-315-106	6	On Styrofoam floor insulation at east wall	< 0.1
223A-02102003-315-107	7	On concrete floor	< 0.1
223A-02102003-315-108	8	On concrete floor	< 0.1
223A-02102003-315-109	9	On concrete floor	< 0.1
223A-02102003-315-110	10	On concrete floor	< 0.1

CHEMICAL SAMPLE MAP

Building 223A
Beryllium

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223A Interior



<p>SURVEY MAP LEGEND</p> <ul style="list-style-type: none"> Asbestos Sample Location Beryllium Sample Location Lead Sample Location RCRA/CERCLA Sample Location PCB Sample Location 	<p>Neither the United States Government nor Kaiser Hill Co. nor DynCorp I&ET, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.</p>	<p>N</p>	<p style="text-align: center;">0 FEET 25</p> <p style="text-align: center;">0 METERS 8</p> <p style="text-align: center;">1 inch = 18 feet 1 grid sq. = 1 sq. m.</p>	<p>U.S. Department of Energy Rocky Flats Environmental Technology Site</p> <p>Prepared by: GIS Dept. 303-966-7707 Prepared for:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> </div> <p>MAP ID: 02-0589/223A-IN-BE Aug 25, 2003</p>
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ATTACHMENT E

Data Quality Assessment (DQA) Detail

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed; the radiological survey assessment is provided in Table E-1 and beryllium in E-2. A data completeness summary for all results is given in Table E-3.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project Files. This report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique (MARSSIM) Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Beta/gamma survey designs were not implemented for Building 223A based on the conservatism of the transuranic limits used as DCGLs in the unrestricted release decision process. Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. All survey results were evaluated against, and were less than the Transuranic DCGL_w (100 dpm/100cm²) and the Uranium DCGL_w (5,000 dpm/100cm²) unrestricted release limits.

Consistent with EPA's G-4 DQO process, the radiological survey design (for those survey units performed per PDS requirements) was optimized by checking actual measurement results (acquired during pre-demolition surveys) against model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification. All media surveyed and sampled yielded results less than their associated action levels and with acceptable.

Based upon an independent review of the radiological data, it is determined that the original project DQOs satisfied MARSSIM guidance. All facility contamination levels were below applicable unrestricted release levels confirming a Type 1 facility classification. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable procedures, survey units were properly designed and bounded, and instrument performance and calibration were within acceptable limits. All results meet the PDS unrestricted release criteria.

Chain of Custody was intact; documentation was complete, hold times were acceptable (where applicable,) and packaging integrity/custody seals were maintained throughout the sampling/analysis process. Level 2 Isolation Controls have been posted to prevent the inadvertent introduction of contamination into the facility. On this basis, Building 223A meets the unrestricted release criteria with the confidences stated herein.

Table E-1 V&V of Radiological Surveys - Building 223A

V&V CRITERIA, RADIOLOGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		COMMENTS
QUALITY REQUIREMENTS		Measure	frequency	
ACCURACY	Parameters			
	initial calibrations	90% < x < 110%	≥ 1	Multi-point calibration through the measurement range encountered in the field; programmatic records.
	daily source checks	80% < x < 120%	≥ 1/day	Performed daily/within range.
PRECISION	local area background: Field	typically < 10 dpm	≥ 1/day	All local area backgrounds were within expected ranges (i.e., no elevated anomalies.)
	field duplicate measurements for TSA	≥ 5% of real survey points	≥ 10% of reals	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Unit 223A-A-001 (interior and exterior).	statistical and biased	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random and biased measurement locations controlled/mapped to ± 1m.
	Controlling Documents (Characterization Pkg; RSPs)	Qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	units of measure	dpm/100cm ²	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys usable results vs. unusable	> 95%	NA	See Table E-3 for details.
SENSITIVITY	detection limits	> 95%	all measures	
		TSA: ≤ 50 dpm/100cm ² RA: ≤ 10 dpm/100cm ²		MDAs ≤ 50% DCGL _w per MARSSIM guidelines.

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Table E-3 Data Completeness Summary For Building 223A

ANALYTE	Building/Area /Unit	Sample Number Planned (Real & QC) ^A	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Beryllium	Bldg. 223A (interior)	10 biased (interior)	10 biased (interior)	No beryllium contamination found, all results are below associated action levels	OSHA ID-125G: RIN03D0527 No results above action level (0.2ug/100cm ²) or investigative level (0.1 ug/100cm ²).
Radiological	Survey Area A Survey Unit: 223A-A-001 Building 223 (interior and exterior)	34 α TSA (15 random/19 biased) and 34 α Smears (15 random/19 biased) 10 α TSA and 10 α Smears (equipment-biased) 3 QC TSA 25% scan interior floor; 5% scan interior wall, ceiling and equipment; 3% scan exterior concrete pads, walls and roof surfaces	34 α TSA (15 random/19 biased) and 34 α Smears (15 random/19 biased) 10 α TSA and 10 α Smears (equipment-biased) 3 QC TSA 25% scan interior floor; 5% scan interior wall, ceiling and equipment; 3% scan exterior concrete pads, walls and roof surfaces	No contamination found at any location; all values below PDS unrestricted release limits	Transuranic and/or Uranium DCGLs as applicable