



Rocky Flats Environmental Technology Site

PRE-DEMOLITION SURVEY REPORT (PDSR)

BUILDING 884 CLOSURE PROJECT

REVISION 0

November 7, 2002



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

1/60

IA-A-001184

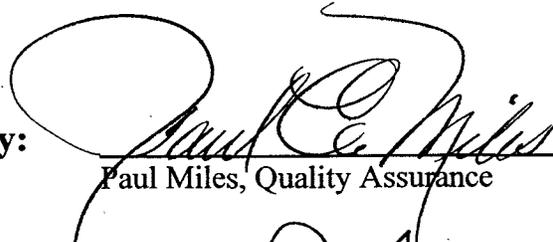
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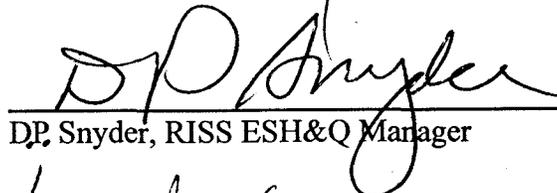
November 7, 2002

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TABLE OF CONTENTS

ABBREVIATIONS/ACRONYMS	IV
EXECUTIVE SUMMARY	V
1 INTRODUCTION	1
1.1 PURPOSE.....	1
1.2 SCOPE.....	1
1.3 DATA QUALITY OBJECTIVES.....	1
2 HISTORICAL SITE ASSESSMENT	2
3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS	2
4 CHEMICAL CHARACTERIZATION AND HAZARDS	3
4.1 ASBESTOS	4
4.2 BERYLLIUM (BE).....	4
4.3 RCRA/CERCLA CONSTITUENTS [INCLUDING METALS AND VOLATILE ORGANIC COMPOUNDS (VOCs)].....	4
4.4 POLYCHLORINATED BIPHENYLS (PCBS)	5
5 PHYSICAL HAZARDS	5
6 DATA QUALITY ASSESSMENT	5
7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES	6
8 FACILITY CLASSIFICATION AND CONCLUSIONS.....	6
9 REFERENCES	7

ATTACHMENTS

A	Facility Location Map
B	Radiological Data Summaries and Survey Maps
C	Chemical Data Summaries and Sample Maps
D	Data Quality Assessment (DQA) Detail

ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
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
HEUN	Highly Enriched Uranyl Nitrate
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
RSA	Removable Surface Activity
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 Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of Building 884. Because this Type 1 building will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) to supplement the Reconnaissance Level Characterization of this Type 1 facility. Building surfaces characterized as part of this PDS included the walls, ceilings, and roofs. Environmental media beneath and surrounding the facilities were not within the scope of this PDS and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

This PDS 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 Report and Reconnaissance Level Characterization Report.

Results indicate that no radiological or chemical contamination exists in excess of the PDSP unrestricted release limits. Because building 884 functioned as RCRA Unit 13, it will be closed under Clean Closure Option 1 of the RFCA RSOP for Facility Component Removal. Any potentially PCB-containing fluorescent light ballast and hazardous waste items (e.g., mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury-containing gauges, circuit boards, leaded glass, and lead-acid batteries) were previously removed from the building and therefore, do not impact decontamination and decommissioning activities.

Based upon this PDSR, the Building 884 structure can be demolished and the waste managed as PCB Bulk Product waste or as sanitary waste, and the concrete can be used for backfill on-site per the RFCA RSOP for Recycling Concrete. To ensure that the facility remains free of contamination and that PDS data remain valid, isolation controls have been established, and the area has been posted accordingly.

1 INTRODUCTION

A Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of Building 884. Because this Type 1 building will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) to supplement the Reconnaissance Level Characterization of this Type 1 facility. Building surfaces characterized as a part of this PDS included walls, ceilings and roofs. Environmental media beneath and surrounding the facilities were not within the scope of this PDS and will be addressed 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 884. The location of this facility is shown in Attachment A, Facility Location Map. This facility no longer supports the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Before this Type 1 facility can be demolished, the Data Quality Objectives (DQOs) for a Pre-Demolition Survey (PDS) must be satisfied; this document presents the PDS results for Building 884. The PDS 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 PDS is built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report and Reconnaissance Level Characterization Report.

1.1 Purpose

The purpose of this report is to communicate and document the results of the B884 PDS effort. A PDS is performed prior to building demolition to define the final radiological and chemical conditions of a facility. Final conditions are compared with the release limits for radiological and non-radiological contaminants. PDS 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 884. Environmental media beneath and surrounding the facilities are not within the scope of this PDSR 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 PDS 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.

6

2 HISTORICAL SITE ASSESSMENT

A Facility-specific Historical Site Assessment (HSA) and a Reconnaissance Level Characterization (RLC) was conducted to understand the facility history and related hazards. The HSA consisted of facility walkdowns, interviews, and document review, including review of the Historical Release Report, and were used to design the RLC. The Building 884 RLC was performed in FY 2002 as part of Area 1, Group 13 RLCR (Refer to *Reconnaissance Level Characterization Report for Area 1, Group 13 Facilities*, April 3, 2002, Rev. 0). Based on the RLC results, B884 was classified as a Type 1 facility, and therefore, PDS characterization was required before demolition of the facility. This report documents the results of that PDS. The HSA and RLC results were used to identify PDS data gaps and needs, and to develop radiological and chemical PDS characterization packages. HSA and RLC documentation are located in the RISS Characterization Project files.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

Building 884 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 for the Building 884 Radiological Characterization Plan). Two radiological survey unit packages were developed: B884-A-001 for the B884 interior and G13-B-002 for the B884 exterior (B884 exterior was surveyed per PDS requirements as part of the Group 13 RLCR). Individual radiological survey unit packages are maintained in the RISS Characterization Project files.

Building 884 survey unit packages were 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, survey locations, and radiological scan maps are presented in Attachment B, Radiological Data Summary and Survey Maps.

B884 Interior (Survey Unit B884-A-001)

Prior to the PDS, the building was stripped of equipment. The interior was classified as a MARSSIM Class 2 Survey Unit. A total of 49 TSA measurements (16 systematically grid, 15 pre media sampling, 15 post media sampling and 3 QC) and 46 RSA measurements (16 systematically grid, 15 pre media sampling, 15 post media sampling) were taken and scan surveys performed. 15 media samples were collected and analyzed using the Canberra ISOCS System. Alpha scan surveys of 100% of interior floor (111 m² minimum), 50% of the lower wall (<6 ft) surfaces (42 m² minimum) and 10% of the upper wall (>6 ft) and ceiling surfaces (20 m² minimum) at biased locations were performed. None of the measurements, scans, or media samples indicated elevated activity above applicable DCGL values. Radiological survey data, statistical analysis results, survey locations, radiological scan maps and gamma spectroscopy results are presented in Attachment B, Radiological Data Summary and Survey Maps.

B884 Exterior (Survey Unit G13-B-002)

The B884 exterior was classified as a MARSSIM Class 3 Survey Unit. The radiological surveys were performed to PDS criteria as part of the Area 1, Group 13 RLCR, Dated April 2002. A total of 15 TSA measurements (15 random, 2 QC) and 15 RSA measurements (15 random) were taken, and alpha scan surveys of 5% of the exterior surfaces (31 m² minimum) at biased locations were performed. None of the measurements or scans indicated elevated activity above applicable DCGL values. The exterior surfaces of B884 are acceptable for unrestricted release. Refer to Attachment B, Radiological Data Summary and Survey Maps for survey data, statistical analysis results, survey locations and radiological scan maps.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

Building 884 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 Plan was developed during the planning phase that describes sampling requirements and the justification for the sample locations and estimated sample numbers. The contaminants of concern were asbestos and beryllium. Refer to Attachment C, Chemical Summary Data and Sample Maps, for details on sample results and sample locations. Isolation control postings are displayed on affected structures to ensure no hazardous materials are introduced.

4.1 Asbestos

A survey of building materials suspected of containing asbestos was conducted in Building 884 in accordance with the RLCR for Group 13 dated April 3, 2002. A CDPHE-certified asbestos inspector conducted the inspections and sampling in accordance with the *Asbestos Characterization Protocol, PRO-563-ACPR, Revision 1*. Building materials suspected of containing asbestos were identified for sampling at the discretion of the inspector. After visual and tactile inspections of Building 884, all building materials suspected of containing asbestos were sampled, and all bulk sample results were "None Detected." On this basis, no additional Asbestos sampling was performed as part of this PDS. RLC Asbestos laboratory sample data and location maps are contained in Attachment C, "Chemical Data Summaries and Sample Maps."

4.2 Beryllium (Be)

A beryllium survey was conducted in Building 884 as part of the Group 13 RLCR. Random and biased sampling was performed in Building 884, and all RLC beryllium smear results were less than the investigative limit of $0.1 \mu\text{g}/100\text{cm}^2$ (Refer to Attachment C, "Chemical Data Summaries and Sample Maps"). Based on the analysis of radiological, chemical, and physical hazards, Building 884 was classified as a RFCA Type 1 facility. Because waste drum storage prevented complete beryllium sampling of the concrete floor in Building 884 during the RLC, additional biased beryllium sampling was performed after the drums were removed. As a result, thirteen (13) biased beryllium samples were collected on the underlying surfaces where the drums had been stored as part of this PDS. The smear samples were collected in accordance with the PDSP and the *Beryllium Characterization Procedure, PRO-536-BCPR, Revision 0, September 9, 1999*.

All beryllium smear sample results from Building 884 taken during this PDS and the RLC were less than the investigative limit of $0.1 \mu\text{g}/100\text{cm}^2$. Both PDS and RLC beryllium laboratory sample data and location maps are contained in Attachment C, "Chemical Data Summaries and Sample Maps."

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

Based on the HSAR for Group 13 facilities, interviews, facility walkdowns and a review of historical WSRIC processes, Building 884 operated as RCRA Unit 13 and stored non-liquid RCRA wastes. Because there were never any spills in Building 884, RCRA Unit 13 will be closed under Clean Closure Option 1 of the RFCA RSOP for Facility Component Removal. A visual inspection of the empty building by RISS Environmental Compliance personnel verified the absence of hazardous waste stains and/or residuals on the walls, interior surface of the roof and concrete pad. Therefore, RCRA/CERCLA contamination is not a concern, and samples were not taken as part of this PDS.

The building may have contained some RCRA regulated items, such as mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury containing gauges, circuit boards, and lead-acid batteries. However, these items have been removed and will be managed in accordance with the Colorado Hazardous Waste Act.

4.4 Polychlorinated Biphenyls (PCBs)

Based on the HSAR for Group 13 facilities, interviews, facility walkdowns and a review of historical WSRIC processes, Building 884 does not have a history of PCB use or storage.

Based on the age of B884, paints used on the facility may contain PCBs; and therefore, painted surfaces will be managed 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.

The facility may have contained PCB fluorescent light ballast, however, all PCB ballast have been removed from the facility and will not impact decontamination and decommissioning activities.

5 PHYSICAL HAZARDS

Physical hazards associated with Building 884 consists of those common to standard industrial environments, and include hazards associated with energized systems, utilities, and trips and falls. There are no unique hazards associated with the facility. The facility has been relatively well maintained and is in good physical condition, and therefore, does not present hazards associated with building deterioration. 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 884, and consequent waste management, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments B and C) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original project DQOs.

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 D.

10

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The demolition and disposal of Building 884 will generate a variety of wastes. Estimated waste types and waste volumes are presented below. All wastes can be disposed of as sanitary waste, except PCB Bulk Product Waste. PCB ballast and hazardous waste items have been removed and managed pursuant to Site PCB and waste management procedures. All concrete surfaces can be used as backfill onsite in accordance with the RFCA RSOP for Recycling Concrete.

WASTE TYPES AND VOLUME ESTIMATES							
Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
884	1600	30	600	1300	0	0	None

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, Building 884 is classified as an RFCA Type 1 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999). Building 884 possesses no radiological or chemical contamination in excess of the PDSP unrestricted release limits. PCB ballast and hazardous waste items have been removed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations.

The PDS for Building 884 was performed in accordance with the DDCP and PDSP, all PDSP DQOs were met, and all data satisfied the PDSP DQA criteria. 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 that Building 884 remains free of contamination and that PDS data remain valid, isolation controls have been established, and the facilities are posted accordingly.

11

9 REFERENCES

- DOE/RFPO, CDPHE, EPA, 1996. Rocky Flats Cleanup Agreement (RFCA), July 19, 1996.
- DOE Order 5400.5, "Radiation Protection of the Public and the Environment."
- DOE Order 414.1A, "Quality Assurance."
- 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. 4, 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 (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.
- RFETS, RFCA RSOP for Recycling Concrete, September 28, 1999
- Reconnaissance Level Characterization Report for Group 13 Facilities, April 3, 2002

12

ATTACHMENT A

Facility Location Map

884 Building Cluster

Standard Map Features

-  Buildings and other structures
-  Solar Evaporation Ponds (SEPs)
-  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 EG&G RSI, Las Vegas. Digitized from the orthophotographs. 1/95



Scale = 1 : 12460
1 inch represents approximately 1038 feet
25.0 0 500 1000 ft
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

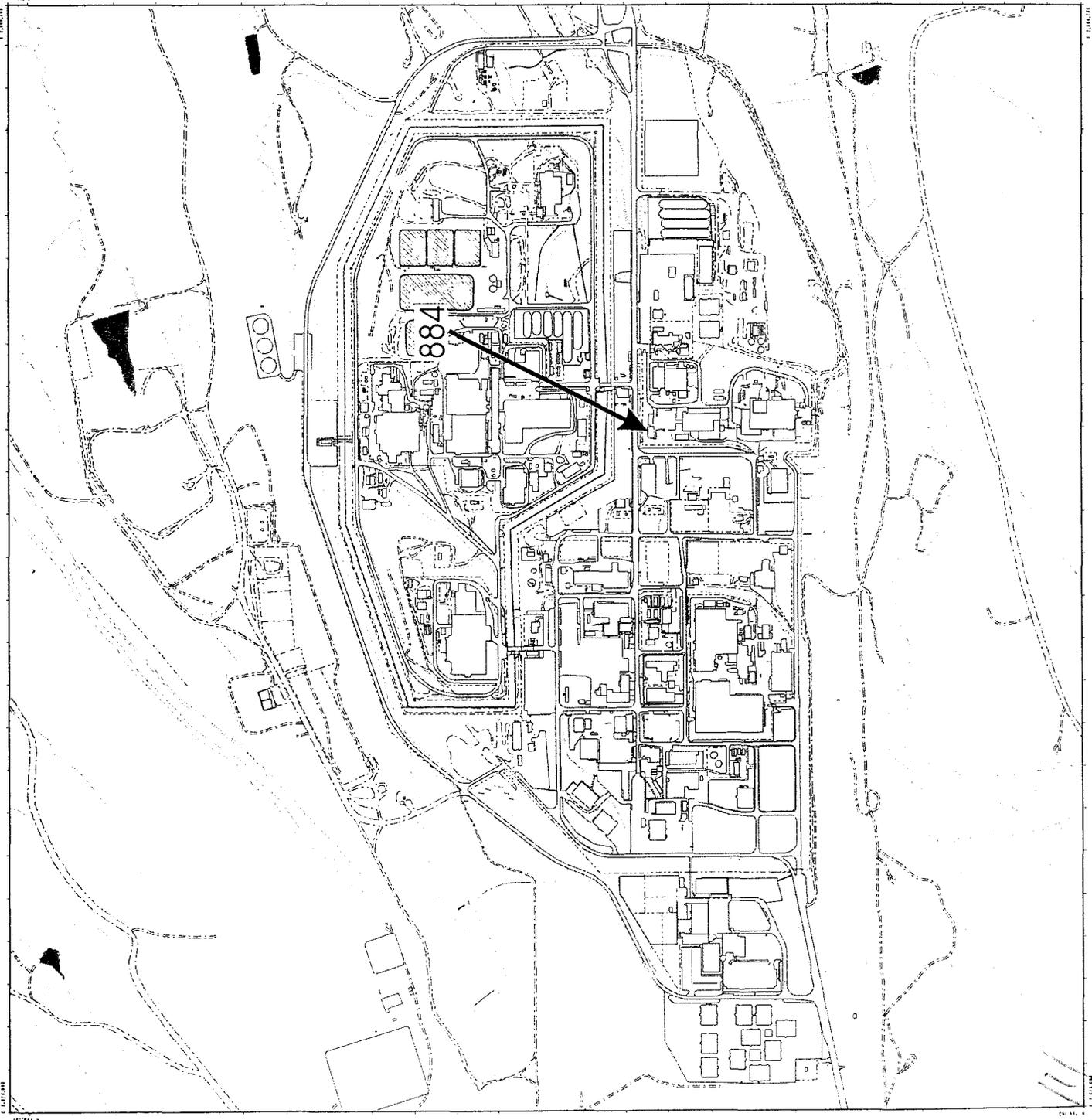
GIS Dept. 303-966-7707

Prepared for:



MAP ID: FY 2002

November 4, 2002



ATTACHMENT B

Radiological Data Summaries and Survey Maps

SURVEY UNIT B884-A-001
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B884 (Interior)

B884-A-001
PDS Data Summary

<u>Total Surface Activity Measurements</u>			<u>Removable Activity Measurements</u>		
	16	16		16	16
	Number Required	Number Obtained		Number Required	Number Obtained
MIN	-12.1	dpm/100 cm ²	MIN	-0.9	dpm/100 cm ²
MAX	17.4	dpm/100 cm ²	MAX	3.6	dpm/100 cm ²
MEAN	4.0	dpm/100 cm ²	MEAN	-0.1	dpm/100 cm ²
STD DEV	9.3	dpm/100 cm ²	STD DEV	1.1	dpm/100 cm ²
TRANSURANIC DCGL _w	100	dpm/100 cm ²	TRANSURANIC DCGL _w	20	dpm/100 cm ²

<u>Media (Pre & Post)</u> <u>Total Surface Activity Measurements</u>			<u>Media (Pre & Post)</u> <u>Removable Activity Measurements</u>		
	30	30		30	30
	Number Required	Number Obtained		Number Required	Number Obtained
MIN	-5.7	dpm/100 cm ²	MIN	-0.9	dpm/100 cm ²
MAX	72.2	dpm/100 cm ²	MAX	4.2	dpm/100 cm ²
MEAN	14.8	dpm/100 cm ²	MEAN	0.8	dpm/100 cm ²
STD DEV	15.8	dpm/100 cm ²	STD DEV	1.5	dpm/100 cm ²
TRANSURANIC DCGL _w	100	dpm/100 cm ²	TRANSURANIC DCGL _w	20	dpm/100 cm ²

<u>Media Samples</u>					
	15	15		15	15
	Number Required	Number Obtained		Number Required	Number Obtained
MIN	0.0	Transuranic dpm/100 cm ²	MIN	362.5	Uranium dpm/100 cm ²
MAX	0.0	dpm/100 cm ²	MAX	4020.9	dpm/100 cm ²
MEAN	0.0	dpm/100 cm ²	MEAN	2556.6	dpm/100 cm ²
STD DEV	0.0	dpm/100 cm ²	STD DEV	1215.5	dpm/100 cm ²
TRANSURANIC DCGL _w	100	dpm/100 cm ²	URANIUM DCGL _w	5,000	dpm/100 cm ²

**SURVEY UNIT B884-A-001
TSA - DATA SUMMARY**

Manufacturer:	N.E.Tech	N.E.Tech
Model:	DP-6	DP-6
Instrument ID#:	1	2
Serial #:	1366	394
Cal Due Date:	2/2/03	1/12/03
Analysis Date:	10/29/02	10/29/02
Alpha Eff. (c/d):	0.203	0.225
Alpha Bkgd (cpm)	2	4.0
Sample Time (min)	1.5	1.5
LAB Time (min)	1.5	1.5
MDC (dpm/100cm²)	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	8	39.4	7.3	36.0	11.0
2	1	6	29.6	7.3	36.0	1.2
3	1	9.3	45.8	8	39.4	17.4
4	1	8	39.4	6.7	33.0	11.0
5	2	10	44.4	7.3	32.4	16.0
6	2	6	26.7	3.3	14.7	-1.7
7	2	4	17.8	6	26.7	-10.6
8	2	10	44.4	6	26.7	16.0
9	1	7.3	36.0	3.3	16.3	7.6
10	2	6	26.7	6.7	29.8	-1.7
11	1	3.3	16.3	5.3	26.1	-12.1
12	1	6	29.6	6	29.6	1.2
13	1	6	29.6	8	39.4	1.2
14	1	6	29.6	5.3	26.1	1.2
15	1	4.7	23.2	3.3	16.3	-5.2
16	1	8	39.4	5.3	26.1	11.0

1 - Average LAB used to subtract from Gross Sample Activity

28.4	Sample LAB Average
MIN	-12.1
MAX	17.4
MEAN	4.0
SD	9.3
Transuranic DCGL _w	100

QC Measurements

5 QC	1	4.7	23.2	4.7	23.2	3.4
6 QC	1	5.3	26.1	3.3	16.3	6.4

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

19.7	QC LAB Average
MIN	3.4
MAX	6.4
MEAN	4.9
Transuranic DCGL _w	100

18

**SURVEY UNIT B884-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 #:	959	966	963	952
Cal Due Date:	1/18/03	11/6/02	1/3/03	1/31/03
Analysis Date:	10/29/02	10/29/02	10/29/02	10/29/02
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0	0.2	0.3	0.1
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm²)	9.0	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm ²)
1	5	0.0	0.0
2	6	0.0	-0.6
3	7	1.0	0.6
4	8	0.0	-0.3
5	5	0.0	0.0
6	7	0.0	-0.9
7	5	0.0	0.0
8	6	0.0	-0.6
9	7	3.0	3.6
10	6	0.0	-0.6
11	7	0.0	-0.9
12	8	0.0	-0.3
13	5	0.0	0.0
14	6	0.0	-0.6
15	8	0.0	-0.3
16	8	0.0	-0.3
		MIN	-0.9
		MAX	3.6
		MEAN	-0.1
		SD	1.1
		Transuranic DCGL_w	20

19

B884-A-001
Media TSA Data Summary

Manufacturer:	N.E.Tech	N.E.Tech	N.E.Tech
Model:	DP-6	DP-6	DP-6
Instrument ID#:	7	8	9
Serial #:	1250	394	396
Cal Due Date:	10/10/02	1/12/03	1/12/03
Analysis Date:	9/17/02	9/17/02	9/18/02
Alpha Eff. (c/d):	0.213	0.226	0.239
Alpha Bkgd (cpm)	0.7	2.7	3.0
Sample Time (min)	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5
MDC (dpm/100cm ²)	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}
Pre 1	8	8.7	38.5	4.1	18.1	27.0
Pre 2	8	5.3	23.5	4	17.7	12.0
Pre 3	8	7.3	32.3	4	17.7	20.8
Pre 4	8	4	17.7	4	17.7	6.2
Pre 5	8	6.7	29.6	1.3	5.8	18.2
Pre 6	7	2	9.4	2	9.4	-2.1
Pre 7	7	2	9.4	1.3	6.1	-2.1
Pre 8	7	3.3	15.5	1.3	6.1	4.0
Pre 9	7	4	18.8	1.3	6.1	7.3
Pre 10	7	4	18.8	2	9.4	7.3
Pre 11	7	2	9.4	1.3	6.1	-2.1
Pre 12	7	3.3	15.5	1.3	6.1	4.0
Pre 13	7	5.3	24.9	0.7	3.3	13.4
Pre 14	8	1.3	5.8	6.7	29.6	-5.7
Pre 15	8	5.3	23.5	4.7	20.8	12.0
Post 1	9	8.7	36.4	1.3	5.4	24.9
Post 2	9	14.7	61.5	2.0	8.4	50.0
Post 3	9	3.3	13.8	3.7	15.5	2.3
Post 4	9	5.3	22.2	2.7	11.3	10.7
Post 5	9	20.0	83.7	2.0	8.4	72.2
Post 6	9	6.0	25.1	3.3	13.8	13.6
Post 7	9	7.3	30.5	2.0	8.4	19.1
Post 8	9	6.0	25.1	2.0	8.4	13.6
Post 9	9	10.7	44.8	3.3	13.8	33.3
Post 10	9	7.3	30.5	2.7	11.3	19.1
Post 11	9	6.0	25.1	0.7	2.9	13.6
Post 12	8	6.0	26.5	2.7	11.9	15.1
Post 13	9	6.0	25.1	3.3	13.8	13.6
Post 14	9	3.3	13.8	3.4	14.2	2.3
Post 15	9	7.3	30.5	4.0	16.7	19.1

1 - Average LAB used to subtract from Gross Sample Activity

11.5	Sample LAB Average
MIN	-5.7
MAX	72.2
MEAN	14.8
SD	15.8
Transuranic DCGL _w	100

QC Measurements

Pre 2 QC	8	4	17.7	2	8.8	7.3
Post 2 QC	8	7.3	32.3	2.7	11.9	21.9

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

10.4	QC LAB Average
MIN	7.3
MAX	21.9
MEAN	14.6
Transuranic DCGL _w	100

20

B884-A-001
Media RSC Data Summary

Manufacturer:	Eberline	Eberline	Eberline	Eberline	Eberline	Eberline
Model:	Sac-4	Sac-4	Sac-4	Sac-4	Sac-4	Sac-4
Instrument ID#:	1	2	3	4	5	6
Serial #:	963	952	952	963	966	824
Cal Due Date:	1/3/03	1/31/03	1/31/03	1/3/03	11/6/02	10/1/02
Analysis Date:	9/17/02	9/17/02	9/19/02	9/19/02	9/19/02	9/19/02
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.1	0.1	0.2	0.2	0.1	0.3
Sample Time (min)	2	2	2	2	2	2
Bkgd Time (min)	10	10	10	10	10	10
MDC (dpm/100cm²)	9.0	9.0	9.0	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm ²)
Pre 1	1	2	2.7
Pre 2	2	0	-0.3
Pre 3	1	3	4.2
Pre 4	2	0	-0.3
Pre 5	1	1	1.2
Pre 6	2	0	-0.3
Pre 7	1	0	-0.3
Pre 8	2	0	-0.3
Pre 9	1	1	1.2
Pre 10	2	0	-0.3
Pre 11	1	3	4.2
Pre 12	2	1	1.2
Pre 13	1	2	2.7
Pre 14	2	1	1.2
Pre 15	1	0	-0.3
Post 1	3	0	-0.6
Post 2	4	1	0.9
Post 3	5	0	-0.3
Post 4	6	1	0.6
Post 5	3	0	-0.6
Post 6	4	0	-0.6
Post 7	5	2	2.7
Post 8	6	0	-0.9
Post 9	3	0	-0.6
Post 10	4	2	2.4
Post 11	5	0	-0.3
Post 12	6	2	2.1
Post 13	3	0	-0.6
Post 14	4	1	0.9
Post 15	5	1	1.2
		MIN	-0.9
		MAX	4.2
		MEAN	0.8
		SD	1.5
		Transuranic DCGL _w	20

21

**B884-A-001
Media Conversion**

LOCATION DESCRIPTION	SAMPLE LOCATION NUMBER	SITE SAMPLE ID	NUCLIDE	pCi/g (2)	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (in ²)	INDIVIDUAL NUCLIDE (dpm/100cm ²) (3)	ESTIMATED MDA (dpm/100cm ²) (4)	URANUM TOTAL (dpm/100cm ²)	TRANSURANIC TOTAL (dpm/100cm ²)	
B884 Floor	4	02S0242-004.001	U-234	5.030	4.440	260.0	24.5	1837	1621	2027.1		
			U-235	0.053	0.009			19	3			
			U-238	0.468	0.074			171	27			
			Pu-239	0.000	0.121			0	44			
			Pu-240	0.000	0.121			0	44			
			Am-241	0.000	0.015			0	5			0.0
B884 Floor	11	02S0242-011.001	U-234	3.220	5.800	258.0	24.5	1167	2102	1262.7		
			U-235	0.019	0.009			7	3			
			U-238	0.246	0.077			89	28			
			Pu-239	0.000	0.109			0	40			
			Pu-240	0.000	0.109			0	40			
			Am-241	0.000	0.013			0	5			0.0
B884 Floor	12	02S0242-012.001	U-234	8.120	5.160	248.0	24.5	2828	1797	3188.6		
			U-235	0.060	0.023			21	8			
			U-238	0.974	0.111			339	39			
			Pu-239	0.000	0.150			0	52			
			Pu-240	0.000	0.150			0	52			
			Am-241	0.000	0.018			0	6			0.0
B884 Floor	1,6	02S0242-016.001	U-234	0.363	0.093	343.0	24.5	175	45	362.5		
			U-235	0.027	0.010			13	5			
			U-238	0.363	0.093			175	45			
			Pu-239	0.000	0.115			0	55			
			Pu-240	0.000	0.115			0	55			
			Am-241	0.000	0.014			0	7			0.0
B884 Floor	2,8	02S0242-017.001	U-234	8.500	6.830	313.9	24.5	3747	3011	4020.9		
			U-235	0.037	0.013			16	6			
			U-238	0.584	0.102			257	45			
			Pu-239	0.000	0.138			0	61			
			Pu-240	0.000	0.138			0	61			
			Am-241	0.000	0.017			0	7			0.0
B884 Floor	3,13	02S0242-018.001	U-234	7.260	4.830	271.3	24.5	2766	1840	3069.7		
			U-235	0.045	0.014			17	5			
			U-238	0.751	0.102			286	39			
			Pu-239	0.000	0.148			0	57			
			Pu-240	0.000	0.148			0	57			
			Am-241	0.000	0.018			0	7			0.0
B884 Floor	5,7	02S0242-019.001	U-234	4.480	3.760	314.0	24.5	1975.7	1658.2	2173.1		
			U-235	0.059	0.011			25.8	4.9			
			U-238	0.389	0.080			171.6	35.2			
			Pu-239	0.000	0.113			0.0	49.9			
			Pu-240	0.000	0.113			0.0	49.9			
			Am-241	0.000	0.014			0.0	6.1			0.0
B884 Floor	9,10	02S0242-020.001	U-234	5.330	4.600	350.2	24.5	2621.6	2262.5	2956.2		
			U-235	0.042	0.009			20.9	4.6			
			U-238	0.638	0.080			313.8	39.4			
			Pu-239	0.000	0.125			0.0	61.7			
			Pu-240	0.000	0.125			0.0	61.7			
			Am-241	0.000	0.015			0.0	7.5			0.0
B884 Floor	14,15	02S0242-021.001	U-234	7.540	4.080	352.0	24.5	3727.6	2017.1	3948.2		
			U-235	0.020	0.010			9.9	4.9			
			U-238	0.426	0.069			210.6	33.9			
			Pu-239	0.000	0.099			0.0	49.1			
			Pu-240	0.000	0.099			0.0	49.1			
			Am-241	0.000	0.012			0.0	6.0			0.0
										MIN	362.5	0.0
										MAX	4020.9	0.0
										MEAN	2556.6	0.0
										SD	1215.5	0.0
										DCGL _w	5000	100

- Some of the paint samples were analyzed as grouped composites using the Canberra ISOCS Gamma Spectroscopy system.
- Critical Level test criterion were utilized in this analysis. If the net peak area was less than the L_c (critical level), then a "not detected" or "zero" decision was made. The LC value is always less than the applicable MDA, but greater than zero.
- If samples were composited, then individual nuclide dpm/100 cm² conversion is conservatively based on the composite sample weight. This assumption presumes that the total sample activity from composited samples is located at one, single sample location. This methodology ensures that no single sample location exceeds the applicable DCGLW.
- If samples were composited, then estimated MDA dpm/100 cm² conversion is conservatively based on the composite sample weight.

22



Analysis Results Header 11/1/2002 1:15:56 PM Page 1

***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 11/1/2002 1:15:56 PM

RIN Number : 02S0242
Analytical Batch ID : 0209194453
Line Item Code : RC10B019

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Sample Number : 02S0242-004.001
Lab Sample Number : CMLS-1713
Sample Receipt Date : 9/19/2002
Sample Volume Received : 2.60E+002 grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 2.595E+002 grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 9/18/2002 1:48:00 PM
Acquisition Started : 9/19/2002 2:39:40 PM

Count Time : 86400.0 seconds
Real Time : 86409.8 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 9/23/02
Efficiency Geometry ID : 02S0242-004.001

Analyzed By: Sean Stanfield Date: 11/01/02

Reviewed By: Sheri Chambers Date: 11/01/02

Bldg 884
Survey Unit 884-A-001
Media location #4



Sample and QC Sample Results Summary 11/1/02 1:15:56 PM Page 2

***** Sample and QC Sample Results Summary *****

Site Sample ID : 02S0242-004.001

Analytical Batch ID : 0209194453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1713

Geometry ID : 02S0242-004.001

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual
Appendix B; Basic Algorithms.

Analyte	Activity (pCi/grams)	2-Sigma Uncertainty (pCi/grams)	MDA (pCi/grams)
K-40	2.14E+000	2.01E-001	2.51E-001
CS-137	0.00E+000	0.00E+000	1.48E-002
TL-208	7.10E-002	9.78E-003	1.36E-002
PO-210	8.32E+002	1.01E+003	1.69E+003
BI-212	0.00E+000	0.00E+000	2.32E-001
PB-212	2.25E-001	1.44E-002	1.60E-002
BI-214	2.27E-001	2.17E-002	2.76E-002
PB-214	2.49E-001	1.51E-002	2.07E-002
RA-226	0.00E+000	0.00E+000	1.45E-001
AC-228	2.08E-001	2.81E-002	5.74E-002
TH-230	0.00E+000	0.00E+000	1.35E+000
Th-231	1.14E-001	2.67E-002	5.92E-002
PA-234	0.00E+000	0.00E+000	1.90E-002
PA-234M	0.00E+000	0.00E+000	1.80E+000
U-234	5.03E+000	2.70E+000	4.44E+000
U-235	5.31E-002	3.45E-003	9.00E-003
U238	4.68E-001	8.49E-002	7.41E-002
AM-241	0.00E+000	0.00E+000	1.48E-002

24



Analysis Results Header 11/1/2002 1:29:26 PM Page 1

***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 11/1/2002 1:29:26 PM

RIN Number : 02S0242
Analytical Batch ID : 0209194453
Line Item Code : RC10B019

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Sample Number : 02S0242-011.001
Lab Sample Number : CMLS-1714
Sample Receipt Date : 9/19/2002
Sample Volume Received : 2.58E+002 grams

B884
884-A-001
Media Sample #11

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 2.506E+002 grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 9/18/2002 2:00:00 PM
Acquisition Started : 9/20/2002 3:24:05 PM

Count Time : 86400.0 seconds
Real Time : 86408.8 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 9/23/02
Efficiency Geometry ID : 02S0242-011.001

Analyzed By: Sean Stanfield Date: 11/01/02

Reviewed By: Sheri Chambers Date: 11/01/02

25



Sample and QC Sample Results Summary 11/1/02 1:29:26 PM Page 2

***** Sample and QC Sample Results Summary *****

Site Sample ID : 02S0242-011.001

Analytical Batch ID : 0209194453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1714

Geometry ID : 02S0242-011.001

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual
Appendix B; Basic Algorithms.

Analyte	Activity (pCi/grams)	2-Sigma Uncertainty (pCi/grams)	MDA (pCi/grams)
K-40	1.51E+000	1.58E-001	1.86E-001
CS-137	0.00E+000	0.00E+000	1.37E-002
TL-208	4.87E-002	9.57E-003	1.34E-002
PO-210	7.07E+002	6.39E+002	1.06E+003
BI-212	0.00E+000	0.00E+000	2.09E-001
PB-212	1.45E-001	1.22E-002	1.52E-002
BI-214	1.48E-001	1.76E-002	2.52E-002
PB-214	1.46E-001	1.29E-002	2.00E-002
RA-226	0.00E+000	0.00E+000	1.45E-001
AC-228	1.31E-001	3.18E-002	5.33E-002
TH-230	0.00E+000	0.00E+000	1.23E+000
Th-231	0.00E+000	0.00E+000	6.49E-002
PA-234	0.00E+000	0.00E+000	1.81E-002
PA-234M	0.00E+000	0.00E+000	1.75E+000
U-234	3.22E+000	3.46E+000	5.80E+000
U-235	1.87E-002	1.03E-002	8.99E-003
U238	2.46E-001	1.36E-001	7.67E-002
AM-241	0.00E+000	0.00E+000	1.33E-002

26



Analysis Results Header 11/1/2002 1:44:31 PM Page 1

***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 11/1/2002 1:44:31 PM

RIN Number : 02S0242
Analytical Batch ID : 0209194453
Line Item Code : RC10B019

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Sample Number : 02S0242-012.001
Lab Sample Number : CMLS-1722
Sample Receipt Date : 9/19/2002
Sample Volume Received : 2.48E+002 grams

B884
884-A-001
Media Sample #12

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 2.475E+002 grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 9/18/2002 10:33:00 AM
Acquisition Started : 9/23/2002 1:50:37 PM

Count Time : 86400.0 seconds
Real Time : 86411.4 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 9/25/02
Efficiency Geometry ID : 02S0242-012.001

Analyzed By: Sean Stanfield Date: 11/01/02

Reviewed By: Sheri Chambers Date: 11/01/02

27



Sample and QC Sample Results Summary 11/1/02 1:44:31 PM Page 2

Sample and QC Sample Results Summary

Site Sample ID : 02S0242-012.001

Analytical Batch ID : 0209194453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1722

Geometry ID : 02S0242-012.001

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual
Appendix B; Basic Algorithms.

Table with 4 columns: Analyte, Activity (pCi/grams), 2-Sigma Uncertainty (pCi/grams), MDA (pCi/grams). Rows include K-40, CS-137, TL-208, PO-210, BI-212, PB-212, BI-214, PB-214, RA-226, AC-228, TH-230, Th-231, PA-234, PA-234M, U-234, U-235, U238, AM-241.



Analysis Results Header 11/4/2002 2:32:37 PM Page 1

***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 11/4/2002 2:32:37 PM

RIN Number : 02S0242
Analytical Batch ID : 0209194453
Line Item Code : RC10B019

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Sample Number : 02S0242-016.001
Lab Sample Number : CMLS-1732
Sample Receipt Date : 9/19/2002
Sample Volume Received : 3.43E+002 grams

B884
884-A-001
Media Samples 1 + 6

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 3.429E+002 grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 9/18/2002 1:45:00 PM
Acquisition Started : 9/24/2002 3:15:27 PM

Count Time : 86400.0 seconds
Real Time : 86408.7 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 9/30/02
Efficiency Geometry ID : 02S0242-016.001

Analyzed By: Sean Stanfield Date: 11/01/02

Reviewed By: Sheri Chambers Date: 11/01/02

29



Sample and QC Sample Results Summary 11/4/02 2:32:37 PM Page 2

***** Sample and QC Sample Results Summary *****

Site Sample ID : 02S0242-016.001
Analytical Batch ID : 0209194453
Sample Type (Result Identifier): OBJ
Lab Sample Number : CMLS-1732
Geometry ID : 02S0242-016.001
Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R
Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual
Appendix B; Basic Algorithms.

Analyte	Activity (pCi/grams)	2-Sigma Uncertainty (pCi/grams)	MDA (pCi/grams)
K-40	1.91E+000	2.07E-001	2.58E-001
CS-137	0.00E+000	0.00E+000	1.67E-002
TL-208	7.42E-002	2.43E-002	1.27E-002
PO-210	1.68E+003	4.34E+002	1.32E+003
BI-212	2.90E-001	1.39E-001	2.21E-001
PB-212	1.94E-001	1.71E-002	1.68E-002
BI-214	1.87E-001	2.18E-002	3.27E-002
PB-214	2.18E-001	1.75E-002	2.40E-002
RA-226	3.78E-001	6.85E-002	1.81E-001
AC-228	2.30E-001	3.72E-002	5.60E-002
TH-230	0.00E+000	0.00E+000	1.36E+000
Th-231	0.00E+000	0.00E+000	7.77E-002
PA-234	0.00E+000	0.00E+000	2.18E-002
PA-234M	0.00E+000	0.00E+000	2.03E+000
U-235	2.65E-002	4.03E-003	9.63E-003
U238/234	3.63E-001	1.90E-001	9.27E-002
AM-241	0.00E+000	0.00E+000	1.40E-002

30



***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 11/1/2002 2:05:44 PM
RIN Number : 02S0242
Analytical Batch ID : 0209194453
Line Item Code : RC10B019

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Sample Number : 02S0242-017.001
Lab Sample Number : CMLS-1733
Sample Receipt Date : 9/19/2002
Sample Volume Received : 3.14E+002 grams

B884
884-A-001
Mod. Samples 2+8

Result Identifier : N/A
Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 3.139E+002 grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 9/18/2002 9:57:00 AM
Acquisition Started : 9/25/2002 3:44:11 PM

Count Time : 86400.0 seconds
Real Time : 86410.5 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 9/30/02
Efficiency Geometry ID : 02S0242-017.001

Analyzed By: Sean Stanfield Date: 11/01/02

Reviewed By: Sheri Chambers Date: 11/01/02



Sample and QC Sample Results Summary 11/1/02 2:05:44 PM Page 2

***** Sample and QC Sample Results Summary *****

Site Sample ID : 02S0242-017.001

Analytical Batch ID : 0209194453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1733

Geometry ID : 02S0242-017.001

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual
Appendix B; Basic Algorithms.

Analyte	Activity (pCi/grams)	2-Sigma Uncertainty (pCi/grams)	MDA (pCi/grams)
K-40	4.29E+000	2.79E-001	3.01E-001
CS-137	0.00E+000	0.00E+000	1.82E-002
TL-208	1.33E-001	1.25E-002	1.54E-002
PO-210	0.00E+000	0.00E+000	1.80E+003
BI-212	2.76E-001	1.47E-001	2.35E-001
PB-212	3.59E-001	2.01E-002	2.05E-002
BI-214	3.62E-001	2.72E-002	3.42E-002
PB-214	3.67E-001	1.93E-002	2.60E-002
RA-226	8.22E-001	4.90E-001	2.10E-001
AC-228	3.79E-001	4.55E-002	6.78E-002
TH-230	0.00E+000	0.00E+000	1.60E+000
Th-231	6.17E-002	3.43E-002	7.60E-002
PA-234	0.00E+000	0.00E+000	2.44E-002
PA-234M	0.00E+000	0.00E+000	2.33E+000
U-234	8.50E+000	4.13E+000	6.83E+000
U-235	3.65E-002	2.90E-002	1.30E-002
U238	5.84E-001	1.04E-001	1.02E-001
AM-241	0.00E+000	0.00E+000	1.68E-002

32



Analysis Results Header 11/1/2002 2:13:41 PM Page 1

***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 11/1/2002 2:13:41 PM
RIN Number : 02S0242
Analytical Batch ID : 0209194453
Line Item Code : RC10B019

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Sample Number : 02S0242-018.001
Lab Sample Number : CMLS-1734
Sample Receipt Date : 9/19/2002
Sample Volume Received : 2.71E+002 grams

B884
884-A-001
Meda Samples 3+13

Result Identifier : N/A
Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 2.713E+002 grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 9/18/2002 9:45:00 AM
Acquisition Started : 9/26/2002 4:37:51 PM

Count Time : 86400.0 seconds
Real Time : 86411.1 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 9/30/02
Efficiency Geometry ID : 02S0242-018.001

Analyzed By: Sean Stanfield Date: 11/01/02

Reviewed By: Sheri Chambers Date: 11/01/02

33



Sample and QC Sample Results Summary 11/1/02 2:13:41 PM Page 2

***** Sample and QC Sample Results Summary *****

Site Sample ID : 02S0242-018.001

Analytical Batch ID : 0209194453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1734

Geometry ID : 02S0242-018.001

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual
Appendix B; Basic Algorithms.

Table with 4 columns: Analyte, Activity (pCi/grams), 2-Sigma Uncertainty (pCi/grams), MDA (pCi/grams). Rows include K-40, CS-137, TL-208, PO-210, BI-212, PB-212, BI-214, PB-214, RA-226, AC-228, TH-230, Th-231, PA-234, PA-234M, U-234, U-235, U238, AM-241.

34



Analysis Results Header 11/1/2002 2:15:11 PM Page 1

***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 11/1/2002 2:15:11 PM
RIN Number : 02S0242
Analytical Batch ID : 0209194453
Line Item Code : RC10B019

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Sample Number : 02S0242-019.001
Lab Sample Number : CMLS-1735
Sample Receipt Date : 9/19/2002
Sample Volume Received : 3.14E+002 grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

B884
884-A-001
Media Samples 5 + 7

Sample (Final Aliquot Size) : 3.140E+002 grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 9/18/2002 10:22:00 AM
Acquisition Started : 9/30/2002 9:12:23 AM

Count Time : 86400.0 seconds
Real Time : 86409.8 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 10/3/02
Efficiency Geometry ID : 02S0242-019.001

Analyzed By: Sean Stanfield Date: 11/01/02
Reviewed By: Sheri Chambers Date: 11/01/02



Sample and QC Sample Results Summary 11/1/02 2:15:11 PM Page 2

***** Sample and QC Sample Results Summary *****

Site Sample ID : 02S0242-019.001

Analytical Batch ID : 0209194453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1735

Geometry ID : 02S0242-019.001

Filename: C:\CMLS\Miscellaneous Data\U-234 Reanalysis for R

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual
Appendix B; Basic Algorithms.

Analyte	Activity (pCi/grams)	2-Sigma Uncertainty (pCi/grams)	MDA (pCi/grams)
K-40	0.00E+000	0.00E+000	4.22E-001
CS-137	0.00E+000	0.00E+000	1.61E-002
TL-208	7.06E-002	6.03E-003	1.08E-002
PO-210	0.00E+000	0.00E+000	1.53E+003
BI-212	1.56E-001	5.05E-002	1.63E-001
PB-212	1.83E-001	7.50E-003	1.37E-002
BI-214	2.24E-001	2.30E-002	2.98E-002
PB-214	2.34E-001	1.59E-002	2.38E-002
RA-226	0.00E+000	0.00E+000	1.81E-001
AC-228	2.45E-001	3.84E-002	5.92E-002
TH-230	0.00E+000	0.00E+000	1.36E+000
Th-231	3.87E-002	1.91E-002	5.60E-002
PA-234	0.00E+000	0.00E+000	2.10E-002
PA-234M	0.00E+000	0.00E+000	1.94E+000
U-234	4.48E+000	2.30E+000	3.76E+000
U-235	5.86E-002	7.54E-003	1.12E-002
U238	3.89E-001	8.49E-002	7.99E-002
AM-241	0.00E+000	0.00E+000	1.38E-002

36



Analysis Results Header 11/1/2002 2:13:58 PM Page 1

***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 11/1/2002 2:13:58 PM

RIN Number : 02S0242
Analytical Batch ID : 0209194453
Line Item Code : RC10B019

Filename: A:\OBJ00645.CNF

Sample Number : 02S0242-020.001
Lab Sample Number : CMLS-1736
Sample Receipt Date : 9/19/2002
Sample Volume Received : 3.50E+002 grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 3.502E+002 grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 9/18/2002 10:33:00 AM
Acquisition Started : 10/1/2002 9:44:29 AM

Count Time : 86400.0 seconds
Real Time : 86412.0 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 10/3/02
Efficiency Geometry ID : 02S0242-020.001

Analyzed By: Sean Stanfield Date: 11/01/02

Reviewed By: Sheri Chambers Date: 11/01/02

B884
884-A-001
Media Samples 9+10



Sample and QC Sample Results Summary 11/1/02 2:13:58 PM Page 2

***** Sample and QC Sample Results Summary *****

Site Sample ID : 02S0242-020.001

Analytical Batch ID : 0209194453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1736

Geometry ID : 02S0242-020.001

Filename: A:\OBJ00645.CNF

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Table with 4 columns: Analyte, Activity (pCi/grams), 2-Sigma Uncertainty (pCi/grams), MDA (pCi/grams). Rows include K-40, CS-137, TL-208, PO-210, BI-212, PB-212, BI-214, PB-214, RA-226, AC-228, TH-230, Th-231, PA-234, PA-234M, U-234, U-235, U238, AM-241.

38



Analysis Results Header 11/1/2002 2:21:49 PM Page 1

***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **

Report Generated On : 11/1/2002 2:21:49 PM

RIN Number : 02S0242
Analytical Batch ID : 0209194453
Line Item Code : RC10B019

Filename: A:\OBJ00646.CNF

Sample Number : 02S0242-021.001
Lab Sample Number : CMLS-1737
Sample Receipt Date : 9/19/2002
Sample Volume Received : 3.52E+002 grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 3.520E+002 grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 9/18/2002 9:46:00 AM
Acquisition Started : 10/2/2002 11:03:40 AM

Count Time : 86400.0 seconds
Real Time : 86410.4 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 10/3/02
Efficiency Geometry ID : 02S0242-021.001

Analyzed By: Sean Stanfield Date: 11/01/02

Reviewed By: Sheri Chambers Date: 11/01/02

B884
884-A-001
Media Samples 14+15



***** Sample and QC Sample Results Summary *****

Site Sample ID : 02S0242-021.001

Analytical Batch ID : 0209194453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1737

Geometry ID : 02S0242-021.001

Filename: A:\OBJ00646.CNF

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual
Appendix B; Basic Algorithms.

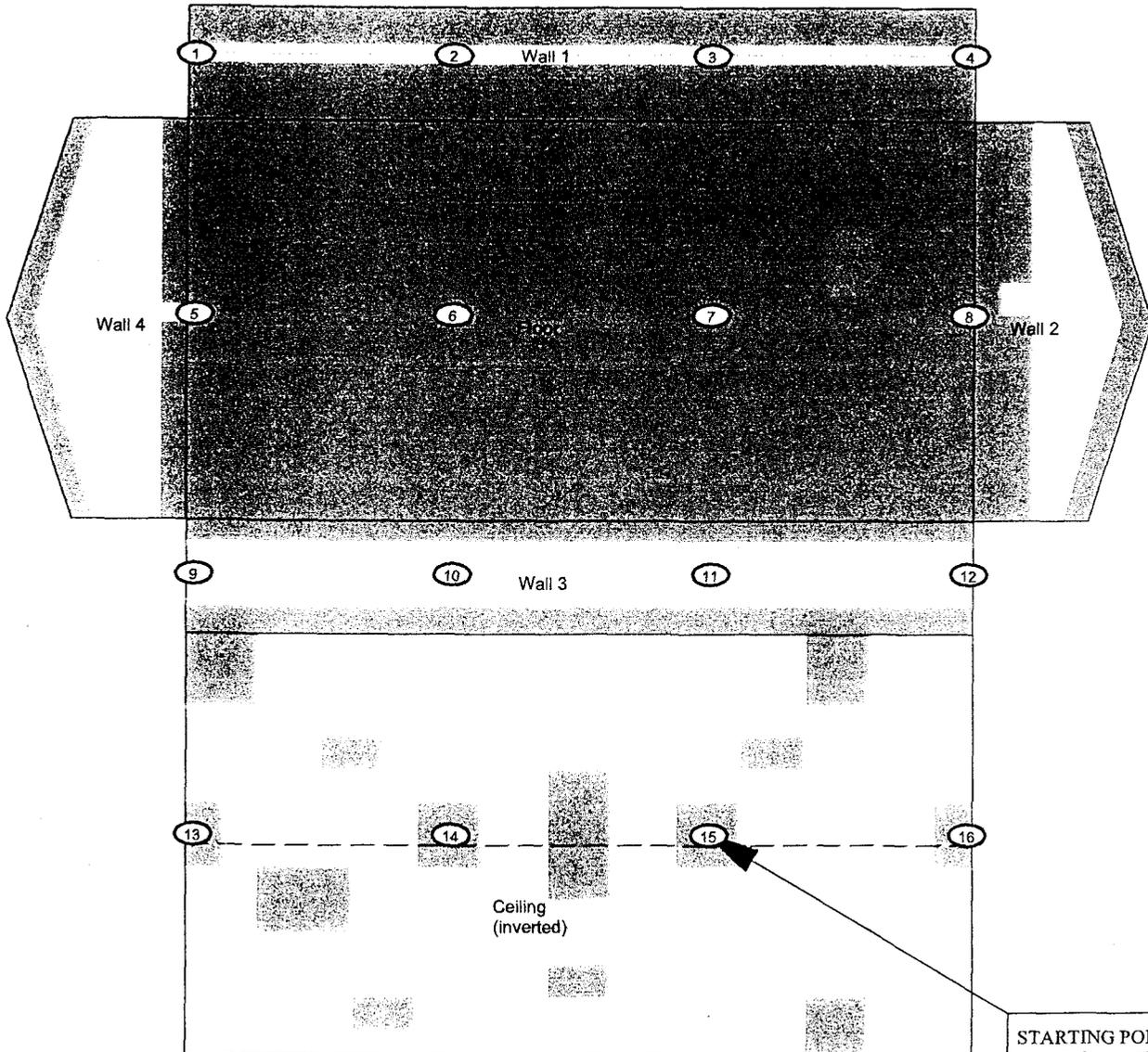
Analyte	Activity (pCi/grams)	2-Sigma Uncertainty (pCi/grams)	MDA (pCi/grams)
K-40	3.52E+000	2.17E-001	2.30E-001
CS-137	0.00E+000	0.00E+000	1.40E-002
TL-208	8.52E-002	9.65E-003	1.29E-002
PO-210	0.00E+000	0.00E+000	1.33E+003
BI-212	2.21E-001	1.19E-001	1.93E-001
PB-212	2.70E-001	2.64E-002	1.20E-002
BI-214	2.51E-001	2.00E-002	2.56E-002
PB-214	2.66E-001	1.46E-002	1.97E-002
RA-226	6.04E-001	1.74E-001	1.60E-001
AC-228	2.46E-001	3.30E-002	5.00E-002
TH-230	0.00E+000	0.00E+000	1.16E+000
Th-231	7.06E-002	2.28E-002	5.98E-002
PA-234	0.00E+000	0.00E+000	1.84E-002
PA-234M	0.00E+000	0.00E+000	1.69E+000
U-234	7.54E+000	2.52E+000	4.08E+000
U-235	2.01E-002	8.87E-003	9.90E-003
U238	4.26E-001	6.94E-002	6.86E-002
AM-241	0.00E+000	0.00E+000	1.21E-002

4/0

PRE-DEMOLITION SURVEY FOR BUILDING 884

Survey Area: A Survey Unit: B884-A-001 Classification: 2
 Building: 884
 Survey Unit Description: Interior of Building
 Total Area: 898 sq. m. Total Floor Area: 300 sq. m.

Building 884
Interior



STARTING POINT
FOR SQUARE
SAMPLING GRID
(X25, Y11)

Scan Area

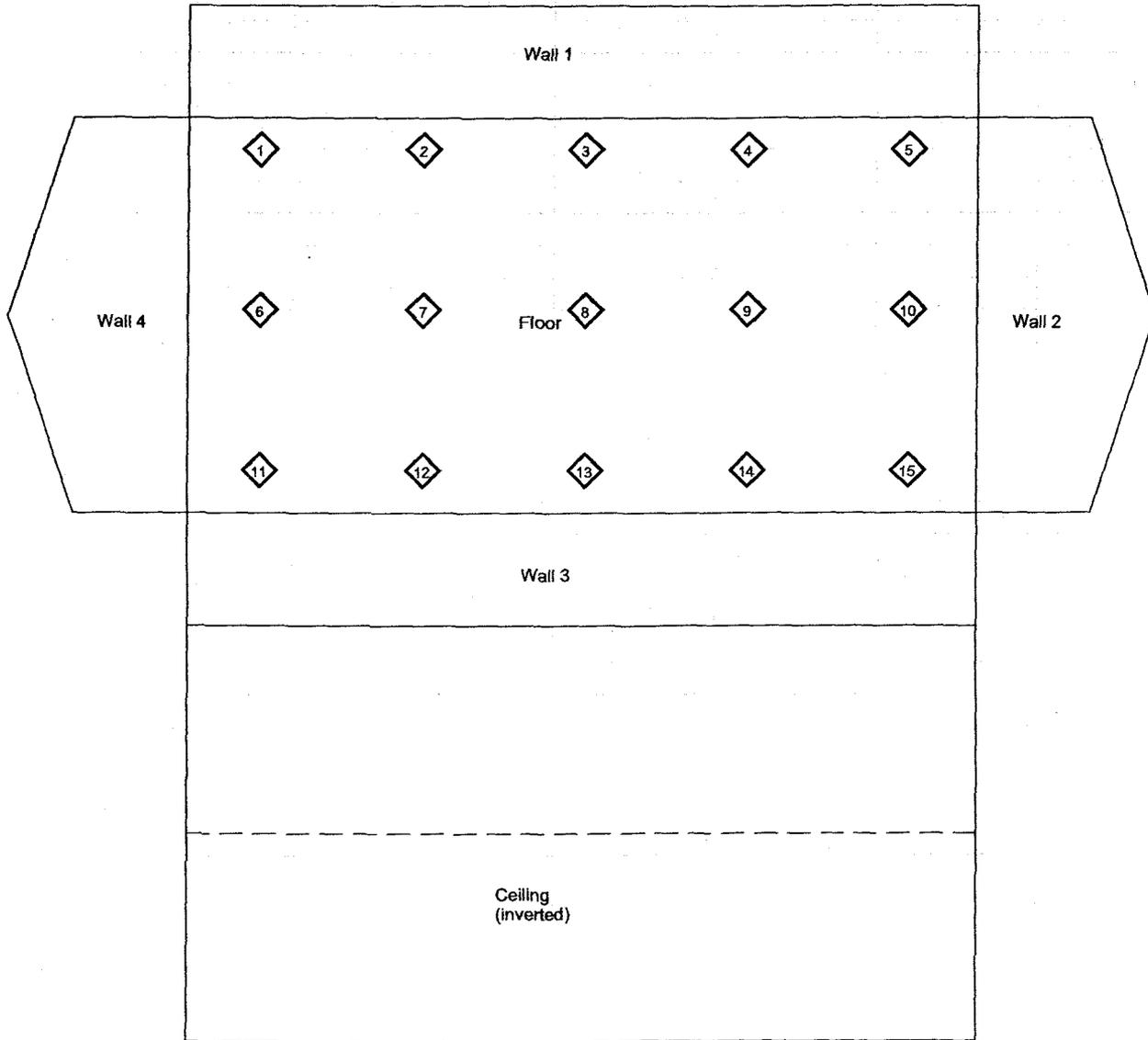
<p>SURVEY MAP LEGEND</p> <ul style="list-style-type: none"> Smear & TSA Location Smear, TSA & Sample Location Open/Inaccessible Area Area in Another Survey Unit 	<p>Neither the United States Government nor Kaiser Hill Co., nor DynCorp I&ET, nor any agency thereof, nor any of their employees, makes any 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 align="center">N</p>	<p align="center">0 FEET 25</p> <p align="center">0 METERS 8</p>	U.S. Department of Energy Rocky Flats Environmental Technology Site	
				<p>Scan Survey Information</p> <p>Survey Instrument ID & RCT ID #(s): 3,4,10,11,12,13,14,15,16,17,18,19</p>	<p>Prepared by: GIS Dept. 303-966-7707</p> <p align="center">DynCorp</p> <p align="center">THE ART OF TECHNOLOGY</p> <p>MAP ID: 02-0155/884-IN-SC</p>

4/1

PRE-DEMOLITION SURVEY FOR BUILDING 884

Survey Area: A **Survey Unit: B884-A-001** **Classification: 2**
Building: 884
Survey Unit Description: Interior of Building
Total Area: 898 sq. m. **Total Floor Area: 300 sq. m.**

**Building 884
Media Sample Map**



<p>SURVEY MAP LEGEND</p> <ul style="list-style-type: none"> Smear & TSA Location Smear, TSA & Sample Location Open/Inaccessible Area Area in Another Survey Unit 	<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>0 25</p> <p>FEET</p> <hr style="width: 100%; border: 1px solid black;"/> <p>0 8</p> <p>METERS</p>	<p>U.S. Department of Energy Rocky Flats Environmental Technology Site</p>
	<p>Scan Survey Information Survey Instrument ID #(s): <i>N/A</i> RCT ID #(s): <i>N/A</i></p>	<p>1 inch = 18 feet 1 grid sq. = 1 sq. m.</p>	<p>Prepared by: GIS Dept. 303-966-7707 Prepared for:</p> <p>DynCorp THE ART OF TECHNOLOGY</p> <p> KAISER HILL</p>	<p>MAP ID: 02-0155/884-MEDIA August 14, 2002</p>

112

SURVEY UNIT G13-B-002
RADIOLOGICAL DATA SUMMARY

Survey Unit Description: Exterior of B884

43

**G13-B-002
Radiological
Data Summary**

Total Surface Activity Measurements

15	15
Number Required	Number Obtained

MIN	20.7	dpm/100 cm ²
MAX	75.3	dpm/100 cm ²
MEAN	53.5	dpm/100 cm ²
STD DEV	16.3	dpm/100 cm ²

TRANSURANIC DCGL_w	100	dpm/100 cm ²
---	-----	-------------------------

Removable Activity Measurements

15	15
Number Required	Number Obtained

MIN	-0.6	dpm/100 cm ²
MAX	9.1	dpm/100 cm ²
MEAN	2.0	dpm/100 cm ²
STD DEV	3.1	dpm/100 cm ²

TRANSURANIC DCGL_w	20	dpm/100 cm ²
---	----	-------------------------

44

**SURVEY UNIT G13-B-002
TSA DATA SUMMARY**

Manufacturer:	NE Electra	NE Electra	NE Electra
Model:	DP-6	DP-6	DP-6
Instrument ID#:	7	8	11
Serial #:	3114	1379	3114
Cal Due Date:	4/25/02	5/6/02	8/15/02
Analysis Date:	2/7/02	2/7/02	3/13/02
Alpha Eff. (c/d):	0.209	0.202	0.208
Alpha Bkgd (cpm)	6.0	6.0	2.7
Sample Time (min)	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5
MDC (dpm/100cm ²)	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	7	14.7	70.3	6.7	32.1	43.2
2	11	21.3	102.4	8.7	41.8	75.3
3	7	18.7	89.5	2.7	12.9	62.3
4	11	15.3	73.6	6.7	32.2	46.4
5	11	19.3	92.8	8.7	41.8	65.7
6	11	18.0	86.5	4.7	22.6	59.4
7	7	10.0	47.8	2.0	9.6	20.7
8	7	16.7	79.9	5.3	25.4	52.8
9	11	17.3	83.2	6.7	32.2	56.0
10	7	20.7	99.0	3.3	15.8	71.9
11	11	14.7	70.7	5.3	25.5	43.5
12	11	11.3	54.3	6.0	28.8	27.2
13	11	21.3	102.4	6.0	28.8	75.3
14	7	14.7	70.3	8.0	38.3	43.2
15	7	18.0	86.1	4.0	19.1	59.0

1 - Average LAB used to subtract from Gross Sample Activity

27.1	Sample LAB Average
MIN	20.7
MAX	75.3
MEAN	53.5
SD	16.3
Transuranic DCGL _w	100

QC Measurements

30C	8	16.7	82.7	1.3	6.4	61.9
100C	11	21.3	102.4	7.3	35.1	81.6

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

20.8	QC LAB Average
QC MIN	61.9
QC MAX	81.6
QC MEAN	71.8
QC SD	14.0
Transuranic DCGL _w	100

45

**SURVEY UNIT G13-B-002
SMEAR DATA SUMMARY**

Manufacturer:	Eberline	Eberline	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	1	2	3	4	5	6
Serial #:	767	1164	767	1164	770	959
Cal Due Date:	4/30/02	5/13/02	4/30/02	5/13/02	7/25/02	7/14/02
Analysis Date:	2/7/02	2/7/02	3/14/02	3/14/02	3/14/02	3/14/02
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.1	0.2	0.0	0.0	0.1	0.0
Sample Time (min)	2	2	2	2	2	2
Bkgd Time (min)	10	10	10	10	10	10
MDC (dpm/100cm²)	7.0	8.0	4.5	4.5	7.0	4.5

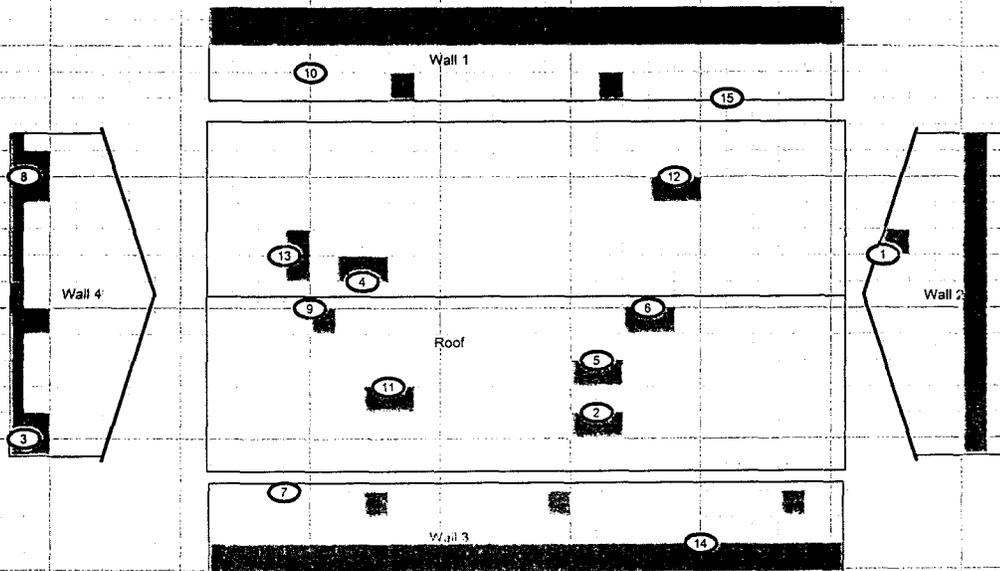
Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm ²)
1	2	0.0	-0.6
2	3	2.0	6.1
3	1	1.0	2.7
4	4	0.0	0.0
5	5	1.0	2.7
6	6	0.0	0.0
7	2	2.0	5.5
8	1	0.0	-0.3
9	3	0.0	0.0
10	1	0.0	-0.3
11	4	3.0	9.1
12	5	0.0	-0.3
13	6	0.0	0.0
14	1	0.0	-0.3
15	2	2.0	5.5
		MIN	-0.6
		MAX	9.1
		MEAN	2.0
		SD	3.1
		Transuranic DCGL _w	20

46

PRE-DEMOLITION SURVEY FOR GROUP 13

Survey Area: B Survey Unit: G13-B-002 Classification: 3
 Building: 884
 Survey Unit Description: Exterior
 Total Area: 613 sq. m. Total Floor Area: 328 sq. m.

Building 884
 Exterior



■ Scan Area

<p>SURVEY MAP LEGEND</p> <ul style="list-style-type: none"> ① Smear & TSA Location ⬠ Smear, TSA & Sample Location ■ Open/Inaccessible Area □ Area in Another Survey Unit 	<p><small>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.</small></p>	<p>N ↑</p>	<p>0 FEET 30</p> <p>0 METERS 10</p> <p>1 inch = 24 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. 303-866-7707 Prepared for:</p> <p>DynCorp THE ART OF TECHNOLOGY</p> <p>KAISER HILL</p> <p>MAP ID: 02-0155/B884-EX-SC March 22, 2002</p>

47

ATTACHMENT C

Chemical Data Summaries and Sample Maps

**Asbestos Data Summary
Building 884 - Group 13 RLCR Results**

Sample Number	Map Survey Point Location	Room	Sample Location	Analytical Results
884-02222002-315-204	204	Main	Gray "Rhino Hide" on concrete floor	None Detected

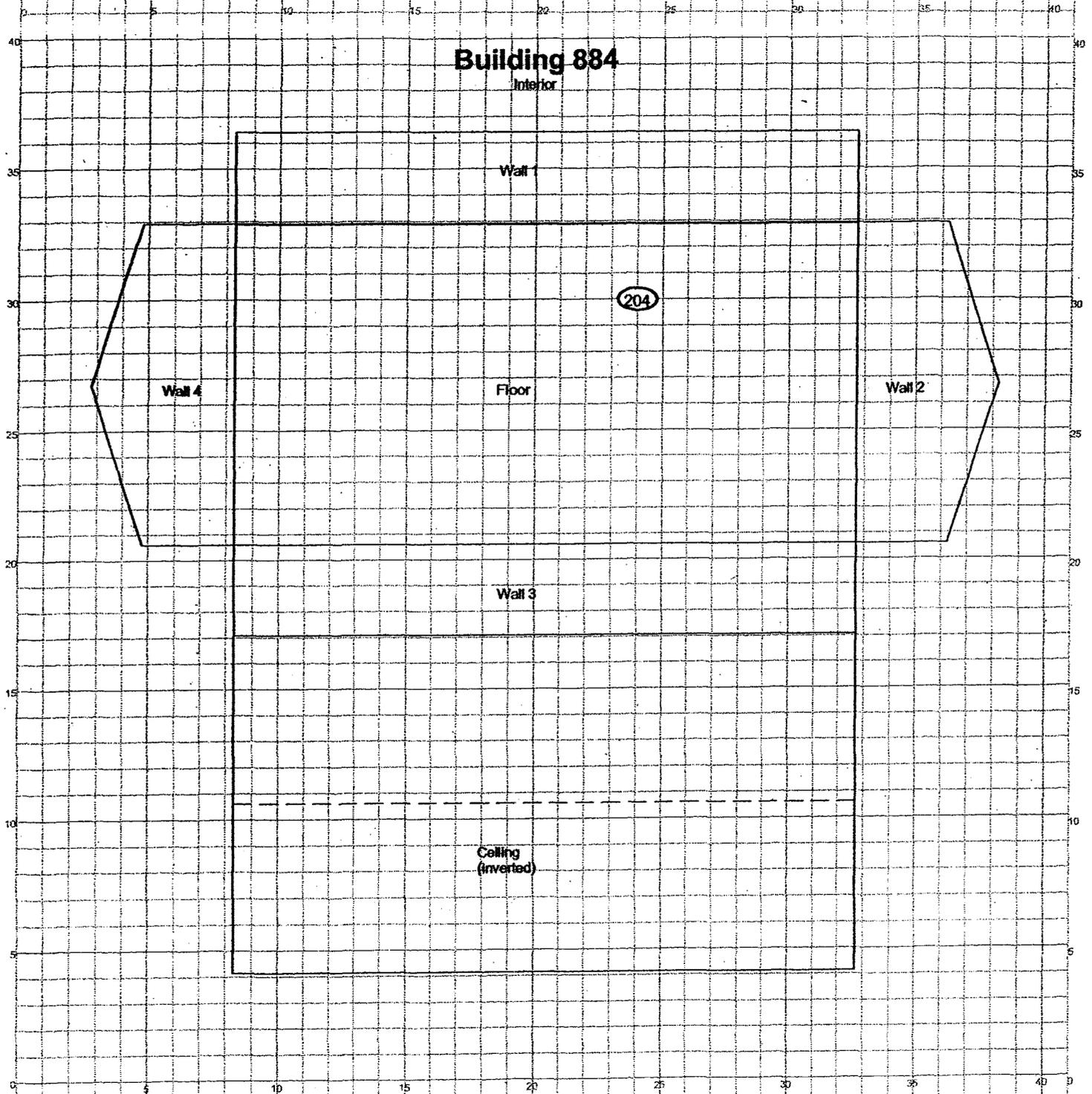
49

CHEMICAL SAMPLE MAP FOR GROUP 13

Building: 884 Interior

PAGE 1 OF 2

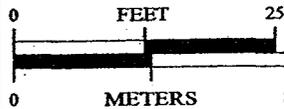
Building 884 Interior



SURVEY MAP LEGEND

-  Asbestos Sample Location
-  Beryllium Sample Location
-  Lead Sample Location
-  RCRA/CERCLA Sample Location
-  PCB Sample Location

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1 inch = 18 feet 1 grid sq = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site
Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for:



MAP ID: 02-0155/884AS-1

February 20, 2002

50

Beryllium Data Summary

Sample Number	Map Survey Point Location	Room	Sample Location	Result ($\mu\text{g}/100 \text{ cm}^2$)
Building 884 - Group 13 RLCR Results				
884-02222002-315-101	101	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-02222002-315-102	102	Main	East corrugated metal wall	< 0.1
884-02222002-315-103	103	Main	South corrugated metal wall	< 0.1
884-02222002-315-104	104	Main	West corrugated metal wall	< 0.1
884-02222002-315-105	105	Main	South wall, top of horizontal angle iron brace	< 0.1
884-02222002-315-106	106	Main	North corrugated metal wall	< 0.1
884-02222002-315-107	107	Main	South corrugated metal wall	< 0.1
884-02222002-315-108	108	Main	South corrugated metal wall	< 0.1
884-02222002-315-109	109	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-02222002-315-110	110	Main	Dark gray "Rhino Hide" on concrete floor	< 0.1
884-02222002-315-111	111	Main	North corrugated metal wall	< 0.1
884-02222002-315-112	112	Main	Dark gray "Rhino Hide" on concrete floor	< 0.1
884-02222002-315-113	113	Main	Dark gray "Rhino Hide" on concrete floor	< 0.1
884-02222002-315-114	114	Main	East corrugated metal wall	< 0.1
884-02222002-315-115	115	Main	West corrugated metal wall	< 0.1
884-02222002-315-116	116	Main	South corrugated metal wall	< 0.1
884-02222002-315-117	117	Main	North corrugated metal wall	< 0.1
884-02222002-315-118	118	Main	West corrugated metal wall	< 0.1
884-02222002-315-119	119	Main	East corrugated metal wall	< 0.1
884-02222002-315-120	120	Main	Gray painted concrete floor	< 0.1
884-02222002-315-121	121	Main	SW corner on south wall	< 0.1
884-02222002-315-122	122	Main	Top of ceiling/roof brace	< 0.1
884-02222002-315-123	123	Main	Top of horizontal angle iron brace, east wall	< 0.1
884-02222002-315-124	124	Main	Top of angle iron brace, wall to ceiling	< 0.1
884-02222002-315-125	125	Main	Top of angle iron brace, wall to ceiling	< 0.1
884-02222002-315-126	126	Main	Top of fire extinguisher, south wall	< 0.1
Building 884 - PDSR Results				
884-10172002-315-101	101	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-102	102	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-103	103	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-104	104	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-105	105	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-106	106	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-107	107	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-108	108	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-109	109	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-110	110	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-111	111	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-112	112	Main	Gray "Rhino Hide" on concrete floor	< 0.1
884-10172002-315-113	113	Main	Gray "Rhino Hide" on concrete floor	< 0.1

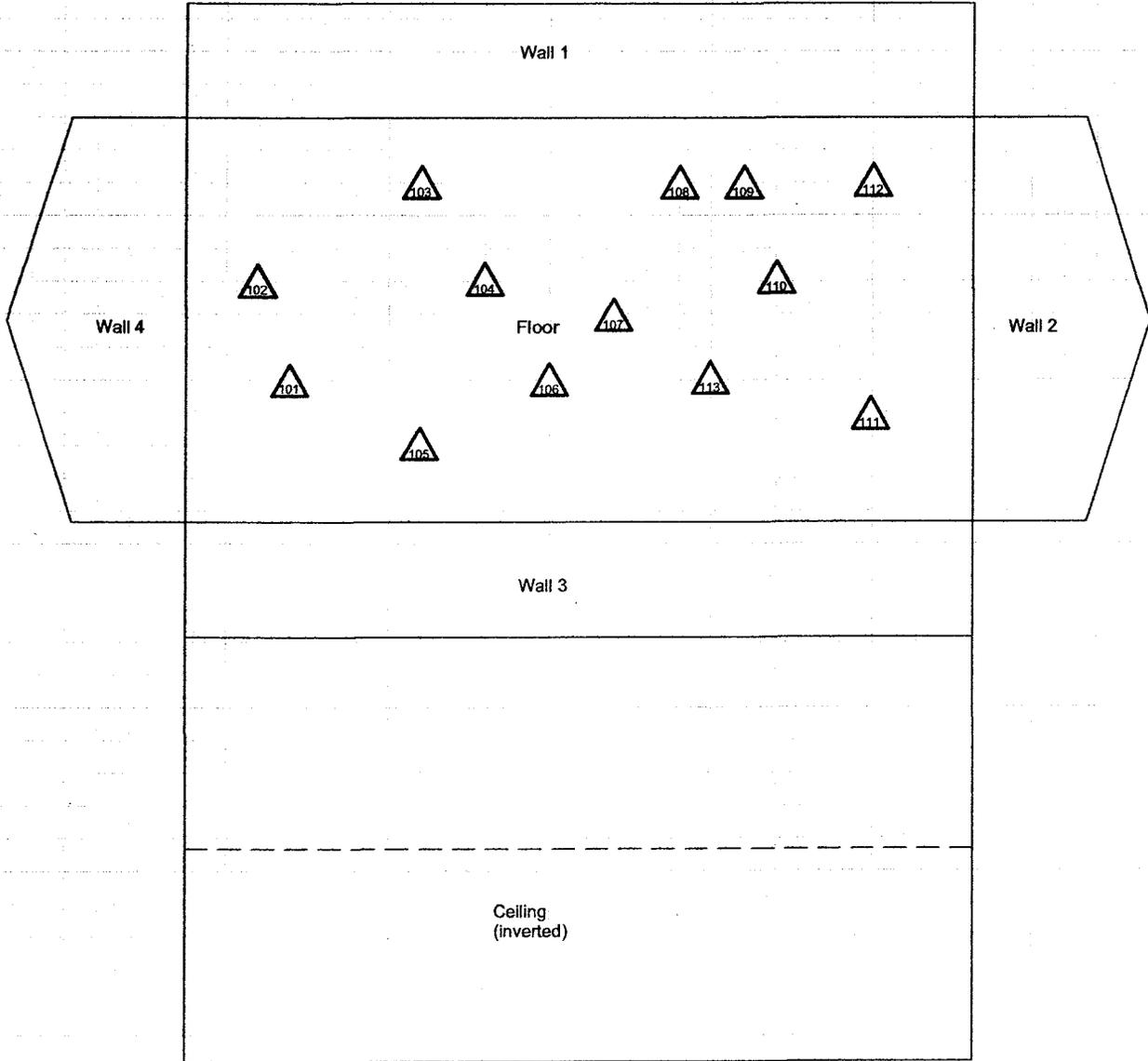
CHEMICAL SAMPLE MAP FOR GROUP 13

Building: 884 Interior

PAGE 1 OF 1

Building 884

Interior



<p><u>SURVEY MAP LEGEND</u></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>0 FEET 25</p> <p>0 METERS 8</p> <p>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> <p>DynCorp THE ART OF TECHNOLOGY</p> <p>KAISER HILL</p> <p>MAP ID: 02-0155/884-IN-BE October 22, 2002</p>
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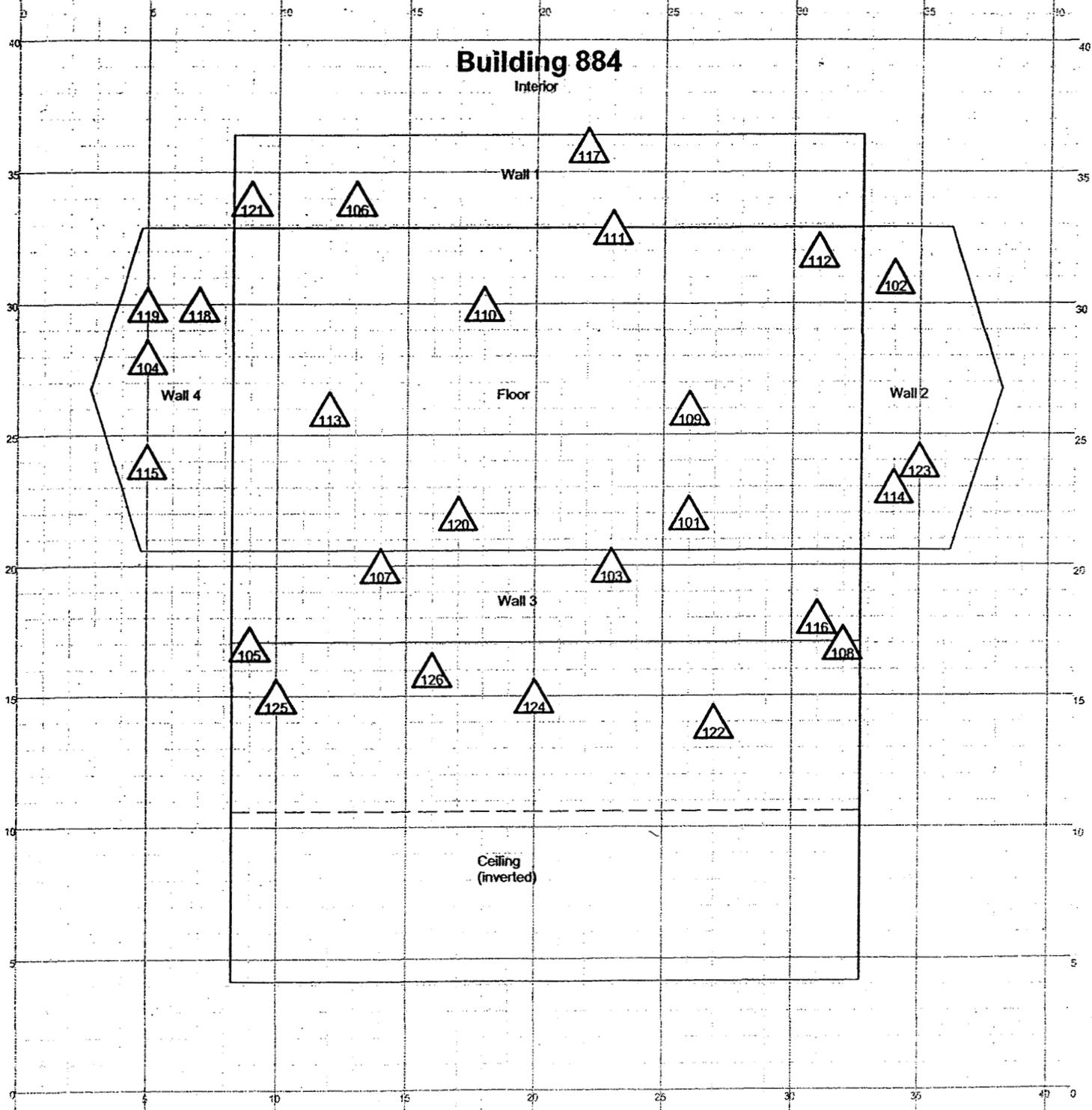
52

CHEMICAL SAMPLE MAP FOR GROUP 13

Building: 884 Interior

PAGE 1 OF 2

Building 884 Interior



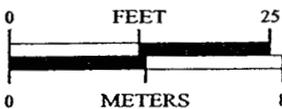
SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location

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- Open/Inaccessible Area
- Area in Another Survey Unit



1 inch = 18 feet 1 grid sq. = 1 sq. m.

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

Prepared by: GIS Dept. 303-966-7707

Prepared for:

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MAP ID: 02-5455/884BE-1

February 20, 2002

33

ATTACHMENT D

Data Quality Assessment (DQA) Detail

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION (V&V) 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 D-1 and beryllium in Table D-2. A data completeness summary for all results is given in Table D-3.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project File. The 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 884 based on the conservatism of the transuranic limits used as DCGLs in the unrestricted release decision process. Survey designs were implemented for B884 based on the transuranic limits used as DCGLs in the unrestricted release decision process. Media samples were taken and analyzed by ISOCS Canberra gamma spectroscopy. Transuranic isotope activity and Uranium and/or other naturally occurring isotope activity 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. Media results were converted to dpm/100cm² using the Media Conversion Table and are the values reported in the Radiological TSA Data Summary in support of the unrestricted release decision process.

Consistent with EPA's G-4 DQO process, the radiological survey design for each survey unit performed per PDS requirements was optimized by checking actual measurement results acquired during pre-demolition surveys against the 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.

DQA 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 certainties.

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 DCGL unrestricted release levels confirming Type 1 facility classification. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable RSPs and survey units were properly designed and bounded. Media samples results were converted to dpm/100cm² using the Media Conversion Table in the Radiological Data Summary-PDS section. All results were less than the applicable Transuranic DCGL_w (100 dpm/100cm²) and the Uranium DCGL_w (5000 dpm/100cm²), therefore, 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 facilities. On this basis, building 884 meets the unrestricted release criteria with the confidences stated herein.

Table D-1 V&V of Building 884 Radiological Results

V&V CRITERIA, RADIOLOGICAL SURVEYS		K-H RSP 16,000 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
ACCURACY	Parameters	Measure	Frequency	COMMENTS
	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.
	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
	MARSSIM methodology: Survey Units B884-A-001 and G13-B-002.	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.
	Units of measure	dpm/100cm ²	NA	Use of standardized engineering units in the reporting of measurement results.
	Plan vs. Actual surveys	> 95%	NA	See Table D-3 for details.
	Usable results vs. unusable	> 95%	NA	
	Detection limits	TSA: ≤ 50 dpm/100cm ² RA: ≤ 10 dpm/100cm ²	all measures	PDS MDAs ≤ 50% DCGL _w
COMPARABILITY				
COMPLETENESS				
SENSITIVITY				

57

Table D-2 V&V of Building 884 Beryllium Results

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		COMMENTS
BERYLLIUM	Prep: NMAM 7300 METHOD: OSHA ID-125G	LAB ---->	Johns Manville, Littleton, Co. RIN03Z0155	
		RIN ---->		
QUALITY REQUIREMENTS				
ACCURACY	Calibrations	Measure	Frequency	No qualifications significant enough to change project decisions, i.e. classification of a Type I Facility confirmed; all results were below associated action levels.
	Initial	linear calibration	≥1	
	Continuing	80% < %R < 120%	≥1	
	LCS/MS	80% < %R < 120%	≥1	
	Blanks - lab & field	< MDL	≥1	
PRECISION	Interference check std (ICP)	NA	NA	
	LCSD	80% < %R < 120% (RPD < 20%)	≥1	
REPRESENTATIVENESS	Field duplicate	all results < RL	≥1	
	COC	Qualitative	NA	
	Hold times/preservation	Qualitative	NA	
COMPARABILITY	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
	Measurement units	ug/100cm ²	NA	
COMPLETENESS	Plan vs. Actual samples	>95%	NA	
	Usable results vs. unusable	>95%	NA	
SENSITIVITY	Detection limits	MDL of 0.012 ug/100cm ²	all measures	

58

Table D-3 Data Completeness Summary For Building 884

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.)
Asbestos ¹	B884 (interior)	1 biased	1 biased (interior)	No ACM present, all results were none detect	40 CFR763.86; CCR 1001-10; EPA 600/R-93/116 RIN02D0948
Beryllium ²	B884 (interior)	21 random/5 biased (interior)	21 random/5 biased (interior)	No contamination found at any location	¹ Asbestos sampling for this Survey Area performed during the Group 13 RLCR, Dated April 3, 2002. 10CFR850; OSHA ID-125G – RIN02D0947 No results above the action level (0.2 ug/100cm ²) or investigative level (0.1 ug/100cm ²)
Beryllium	B884 (interior)	5 biased (interior)	13 biased (interior)	No contamination found at any location	² Beryllium sampling for this Survey Area performed during the Group 13 RLCR, Dated April 3, 2002. 10CFR850; OSHA ID-125G – RIN02Z0943 No results above the action level (0.2 ug/100cm ²) or investigative level (0.1 ug/100cm ²)
Radiological ³	Survey Area A Survey Unit: G13-B-002 Bldg. 884 (exterior)	15 α TSA and 15 α Smears (random) 2 QC TSA 5% scan	15 α TSA and 15 α Smears (random) 2 QC TSA 5% scan	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable. ³ Radiological surveys for this Survey Unit performed to PDS criteria during the Group 13 RLCR, Dated April 3, 2002.

59

Table D-3 Data Completeness Summary For Building 884

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.)
Radiological	Survey Area A Survey Unit: B884-A-001 Bldg. 884 (interior)	16 α TSA and 16 α Smears (systematic) and 30 TSA and 30 Smears (biased-15 pre media/15 post media) 15 Media Samples 3 QC TSA 100% scan interior floor, 50% scan walls < 6 ft., 10% of walls > 6 feet and ceiling	16 α TSA and 16 α Smears (systematic) and 30 TSA and 30 Smears (biased-15 pre media/15 post media) 15 Media Samples 3 QC TSA 100% scan interior floor, 50% scan walls < 6 ft., 10% of walls > 6 feet and ceiling	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCCGL as applicable. Media samples (pre and post) were analyzed by ISOCS Canberra gamma spectroscopy. Results were converted to dpm/100cm ² using the Media Conversion Table found in the Radiological Data Summary-PDS. All results were below the Transuranic DCCGL _w (100 dpm/100cm ²) and the Uranium DCCGL _w (5,000 dpm/100cm ²) unrestricted release limit. The converted results are reported in the PDS Radiological Data Summary and all are below unrestricted release criteria.

^A Number of asbestos samples required are an estimate only, final number of samples is at the discretion of IH.

¹ Asbestos sampling for this Survey Area performed during the Group 13 RLCR, Dated April 3, 2002.

² Beryllium sampling for this Survey Area performed during the Group 13 RLCR, Dated April 3, 2002.

³ Radiological surveys for this Survey Unit performed to PDS criteria during the Group 13 RLCR, Dated April 3, 2002.

50/60