

Facility Decommissioning Evaluation Building 236-H, By-Product Purification Facility

This is an Integrated Sampling Model Decommissioning per Facility Disposition Manual 1C

Prepared by: [Signature]
John K. Blankenship
EC&ACP Engineering
Environmental Compliance & Area Completion Projects

Date: 3/21/18

Reviewed by: [Signature]
J. M. Griffith
Project Manager, 236-H Decommissioning
Environmental Compliance & Area Completion Projects

Date: 3/22/18

Reviewed by: [Signature]
Terrence P. Killeen
Characterization Responsible Engineer
Environmental Compliance & Area Completion Projects

Date: 3/22/18

Approved: [Signature]
G. J. Alexander, Jr.
Manager, Tritium Operations Support
Savannah River Tritium Enterprise

Date: 3/27/18

Approved: [Signature]
Catherine M. Lewis
EC&ACP Remediation Support Manager
Environmental Compliance & Area Completion Projects

Date: 3/22/18

Approved: [Signature]
Amy J. Meyer
Environmental Compliance Functional Area Manager
Environmental Compliance & Area Completion Projects

Date: 3/26/2018

Approved: [Signature]
T. F. Gaughan
EC&ACP Engineering Manager
Environmental Compliance & Area Completion Projects

Date: 3/27/18

Savannah River Site
Aiken, South Carolina 29808



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DC/RO: Roland A. Rollins, Lead OSD/SRNS
(Name/personal Identifier and Position Title)
Date 1/30/18

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Introduction

This document contains an evaluation of available existing information about a facility that is slated for decommissioning. This evaluation screens the project to determine whether it is appropriate to conduct the decommissioning under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or to use a simpler graded approach.

This Facility Decommissioning Evaluation (FDE) consists of three sections. Part 1 contains a description of the project scope, including a brief summary of the purpose and history of the facility and photographs of the structures that are part of the project. Part 2 encompasses a series of questions, the answers to which determine the decommissioning model (CERCLA Model, Integrated Sampling Model, or Simple Model) that will be used. The three graded approach models are described in Facility Disposition Manual 1C, Procedure 501 (Reference 1). Part 2 also includes a justification for the answers to each question. Part 3 is a list of references that were used for the evaluation.

Conclusion

This facility is contaminated and the facility hazard category is Other Industrial. This project will be conducted using the Integrated Sampling Model described in Facility Disposition Manual 1C, Procedure 501.

Part 1. Project Scope

Scope

This Evaluation has been prepared in accordance with requirements found in Facility Disposition Manual 1C, Procedure 502, "Preparing Decommissioning Decision Documents" (Reference 2). The scope of this evaluation includes Building 236-H, which is further described in the next section:

The proposed decommissioning end-state for this facility is demolition to, but not including, the building slab. Any holes, sumps, etc. are to be grouted and any curbing breached.

Any contamination in the building slabs/foundations will be removed to a level that satisfies the applicable risk-based end-state. Decommissioning will target the EPA acceptable risk range for an Industrial Worker scenario with no contaminant migration to groundwater potential. Residual contamination will be defined and justified in the subsequent Decommissioning Project Final Report (DPFR). Contaminants and/or releases to the environment, not associated with the facility being decommissioned, are not within the scope of the decommissioning project.

The described decommissioning activities are not the final area closure actions. H Area Operable Unit will be responsible for the eventual completion/closure of the entire H Area. The decommissioning of a building is intended to reduce landlord costs, increase safety by removing excess facilities and reduce the potential for releases of hazardous substance to the environment.

Facility Description

Facility 236-H was constructed in 1964 and its south end addition in 1983. It (see Photo 1 & Figure 1) is located within the Tritium Facilities fenced area, which is a part of the Savannah River Site's H-Area. The 236-H Facility has a total of 1,512 square feet. The south end of the building (Zone B) consists of a 640 ft² (32' x 20') Armco pre-engineered metal structure; the center section of the building (Zone A) consists of a 320 ft² (13'-4" x 24') Armco pre-engineered metal structure; and the north end (Zone C) consists of a 552 ft² (23' x 24') reinforced concrete structure. The roof over the south and center sections of building are Armco metal roofing, while the north section (Burst Test Areas) roof is reinforced concrete. The three structures are joined to form a single building. The south end of the building housed the Helium Purification Room, which contained air hoods; the center section housed the 236-H Control Room; and the north section housed the Burst Test Areas (Burst Test Hood Room, Burst Test Compressor Room, and the Burst Test Stack/Blower Room). The facility is constructed on a reinforced concrete slab. The Helium Purification Room slab, near its northeast corner, contains a single 6" deep T-shaped pit (with a 4'-9" x 1'-4" leg of "T" and 3'-4" x 1'-2" crossbar of "T") added in 1965 to facilitate electrical conduit and cabinets. Also, a single 2" Sch. 40 stainless steel pump cooling water drain pipe runs from the Helium Purification Room to a Process Sewer manhole located outside the southeast corner of the 236-H Facility. There is a single 3" floor drain in the Burst Test Compressor Room which collected cooling water discharge from the Burst Test Compressor and piped it into the Storm Drainage system to the H2 Outfall. The T-shaped pit will be grouted and the drains plugged and grouted during Decommissioning. Air hoods, outside process tanks (2), Burst Test hood (less framework), Burst Test Bell Jar, and hoist have been/will be removed during Deactivation. Other equipment (i.e., compressor, blower, air handling unit, pumps, electrical gear, etc.) will be removed during Decommissioning.

There are no ancillary facilities associated with 236-H.

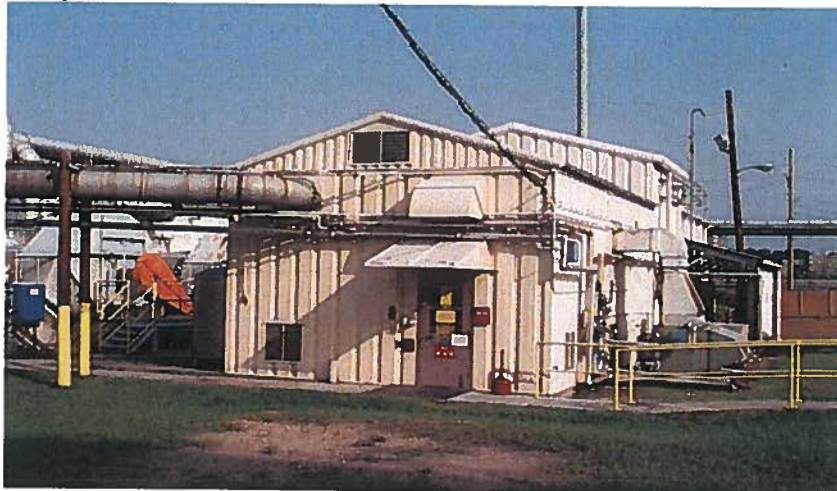


Photo 1 – Building 236-H (South End Looking North)

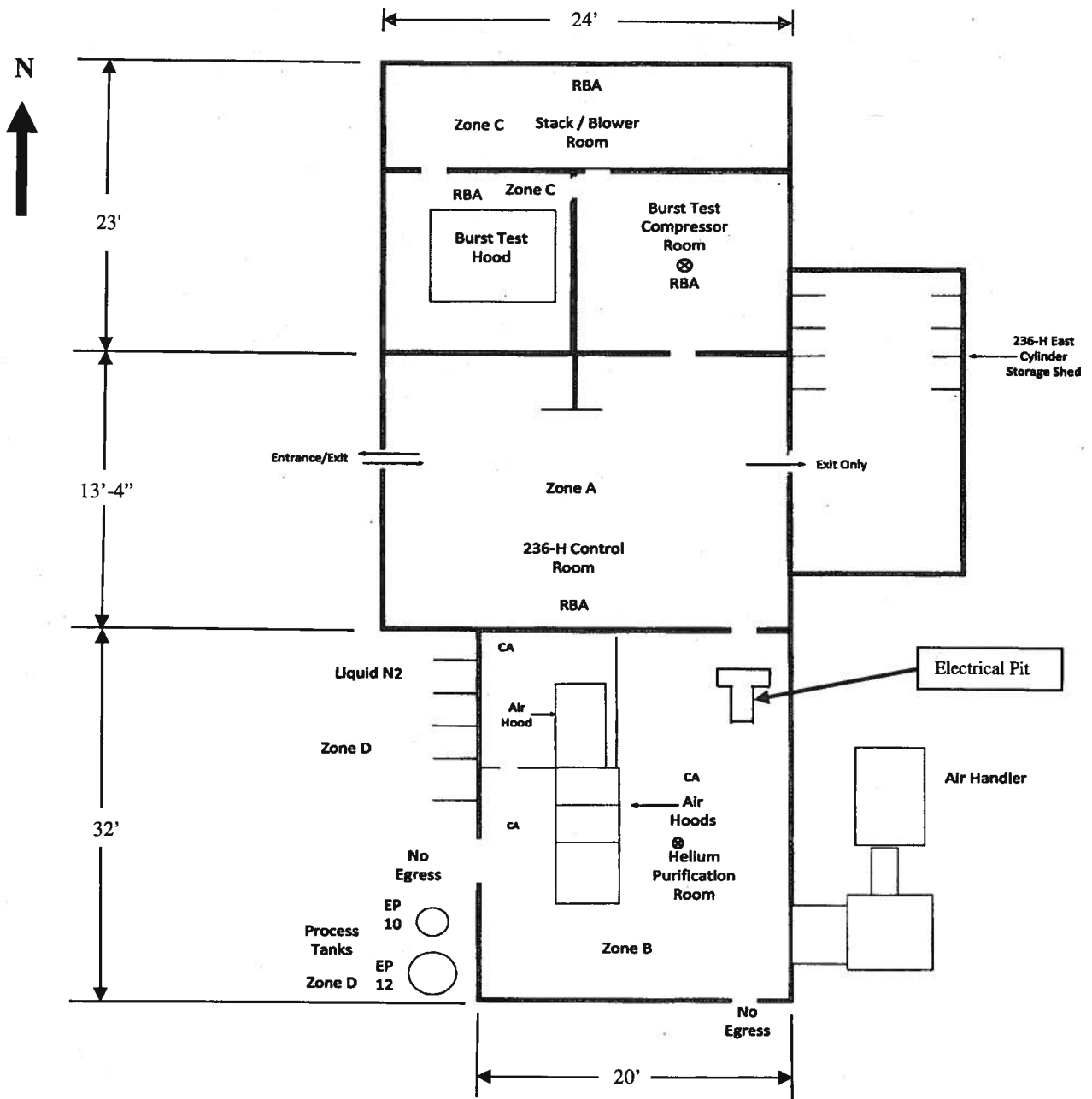


Figure 1 – 236-H Floor Plan

Legend:

- CA – Contamination Area
- RBA – Radiological Buffer Area
- ⊗ - Drains

The building is categorized as an Other Industrial Hazard Category facility. It contains Radiological Buffer Areas (RBAs) and a Contamination Area (CA). The CA is posted as less than 1,000,000 disintegrations per minute (dpm) tritium. All RBAs and CAs will be removed. Decommissioning activities will target 10,000 dpm/100 cm² (site tritium Surface Contamination Values), the EPA acceptable risk range for an Industrial Worker scenario, and contaminant migration to groundwater thresholds.

The facility was used for the purpose described in the following Process History section of this FDE.

Process History

Facility 236-H is located within the Tritium Facilities fenced area inside H-Area. Since the mid-1960s, approximately 52 years, 236-H has processed He-3, a by-product, resulting from the decay of Tritium. By-product was originally transferred to 236-H from H-Area Old Manufacturing (HAOM), and after HAOM tritium gas processing was shut down, to the H-Area New Manufacturing (HANM) facility. The 236-H process removed other gases (oxygen, nitrogen, argon, and tritium) from the He-3 using zeolite beds cooled by liquid nitrogen. The purified He-3 was then compressed into gas cylinders for storage. 236-H also contained process systems to pneumatically burst test reservoirs. Reservoir burst testing operations were discontinued over 25 years ago and that portion of 236-H placed in a safe shutdown configuration. Recently a system similar to 236-H, for processing He-3, was successfully built and started in HANM. The He-3 process in 236-H has now been shut down, transitioned to a safe state, and deactivation activities commenced, which is preparing the facility for turnover to Environmental Compliance & Area Closure Projects (EC&ACP) for decommissioning.

A historical review of spills/releases to the environment, which included a review of the Occurrence Reporting and Processing System/ Site Item Reportability and Issue Management (ORPS/SIRIM) database (Reference 6) conducted from the effective date of the Federal Facility Agreement (FFA), August 16, 1993, to present and a review of the FFA (Reference 7), which serves as a review of releases/spills to the environment prior to August 16, 1993, showed no record of any spills within the 236-H building or to the external environment. Interviews with Tritium personnel likewise revealed no evidence of a spill having ever occurred. A visual inspection of the building's concrete slab will be performed following deactivation. If any oil stains are present, the stained spots/areas will be cleaned during decommissioning with a strong surfactant (Biosolve) to remove all oil residue. This supports selection of the Integrated Sampling Model for 236-H.

Chemical Process

Chemical Name	Process location	Evidence of spills?
None	N/A	None

Radioactive Process

Isotope	Contaminated areas/others
Tritium	Helium Purification Room, Burst Test Hood Room, and potentially the Stack/Blower Room

Summary of Existing Characterization

Characterization has been accomplished using a combination of process knowledge/historical release information, verification walk downs and sampling as appropriate.

An important part of the characterization portion of this evaluation is a historical review of spills/releases to the environment. This review includes a review of the Occurrence Reporting and Processing System/ Site Item Reportability and Issue Management (ORPS/SIRIM) database (Reference 6) conducted from the effective date of the Federal Facility Agreement (FFA), August 16, 1993 to present and a review of the FFA (Reference 7). The FFA serves as a review of releases/spills to the environment prior to August 16, 1993. As stated in the Process History section, there is no record of a spill/release for the facility.

Radiological Protection will perform a post-Deactivation survey. Based on process knowledge/historical release information and the post-Deactivation survey results, a Sampling and Analysis Plan will be developed and implemented to characterize the facility. This will facilitate defining appropriate decommissioning activities to achieve the desired end state.

The remaining slab/foundation will have an appropriate verification survey after decommissioning (Reference 9). The results from verification survey and any other relevant data will be used to complete a risk evaluation to determine whether or not adequate decommissioning has been accomplished to support the applicable end-state. This will be documented in the subsequent DPFR

Wastes generated during decommissioning will be characterized and managed in accordance with Savannah River Site (SRS) procedures and State and Federal regulations.

Historical Significance

A review has been conducted in accordance with a Programmatic Agreement. This review resulted in the publication of a Cultural Resources Management Plan (Reference 8) in which the facilities are listed in its Table 2, Cold War Resources Inventory, as historically eligible or not eligible. This facility, 236-H, is listed in that reference as not eligible and therefore is not historically significant.

Part 2. Evaluation

Clean Facilities

	Question	Yes	No	Justification
1.	Has the facility ever contained or processed radioactive or hazardous material other than stored packaged material or materials of construction? <i>If yes, go to question 4.</i>	X		236-H processed He-3, a by-product, resulting from the decay of Tritium. The facility also contained process systems to pneumatically burst test reservoirs. Reservoir burst testing operations were discontinued approximately 25 years ago, with the balance of the facility shutdown 4-5 years ago.
2.	If there was stored packaged material, has there ever been a spill? <i>If No or N/A, this is a Simple Model. Stop.</i>			
3.	Was spill confined inside structure and cleaned to free release standard per Radiological Control Manual 5Q (for radiological) or continued occupancy per Industrial Hygiene Manual 4Q (for hazardous)? <i>If Yes, this is a Simple Model. Stop.</i>			

Contaminated Facilities

	Question	Yes	No	Justification
4.	Is the facility listed as a Resources Conservation and Recovery Act (RCRA)/CERCLA Unit in Appendix C of the SRS FFA? <i>If Yes, this is a CERCLA Model. Stop.</i>		X	A review of the SRS FFA's Appendix C found that Building 236-H is not listed.
5.	Is the facility listed as a Site Evaluation Area in Appendix G of the SRS FFA? <i>If Yes, this is a CERCLA Model. Stop.</i>		X	A review of the SRS FFA's Appendix G found that Building 236-H is not listed.
6.	Is there evidence that there has been a release of hazardous or radioactive materials outside the structure? <i>If Yes, this is a CERCLA Model. Stop.</i>		X	A historic review of spills/releases to the environment, which included a review of the Occurrence Reporting and Processing System/ Site Item Reportability and Issue Management (ORPS/SIRIM) database (Reference 6) conducted from the effective date of the Federal Facility Agreement (FFA), August 16, 1993, to present and a review of the FFA (Reference 7), which serves as a review of releases/spills to the environment prior to August 16, 1993, showed no record of any spills from 236-H to the external environment. Interviews with Tritium personnel likewise revealed no evidence of a spill having ever occurred.
7.	Is there a substantial threat of a release of hazardous or radioactive materials outside the structure? <i>If Yes, this is a CERCLA Model. Stop.</i>		X	There is no threat, substantial or otherwise, of a release of hazardous or radioactive materials outside the structure.
8.	Has the facility been assigned a hazard category as defined in Facility Safety Document Manual 11Q? <i>If No, stop and refer facility for evaluation to assign a hazard category, then proceed.</i>	X		Originally, 236-H was categorized as a "Nuclear Hazard Category 3 (HC-3)" facility. Following deactivation of the zeolite beds, kaowool traps, and mercury traps, the facility was downgraded to a "Radiological" facility, based on calculation SRNL-TR-2012-00263 (Reference 3). Subsequently as deactivation progressed, the facility was then downgraded again on 10/15/15 by NNSA to an "Other Industrial" facility ("all radiological and chemical hazards below 40 CFR 302.4 thresholds") via COR-SRFOMA-10.1.2015-645852 (Reference 4) based upon calculation S-CLC-H-01276 (Reference 5), dated 4/30/15.

	Question	Yes	No	Justification
9.	Is the hazard category Nuclear (HC- 2 or 3), radiological, or high hazard chemical? <i>If Yes, this is a CERCLA Model. Stop.</i>		X	Originally, 236-H was categorized as a "Nuclear Hazard Category 3 (HC-3)" facility. Following deactivation of the zeolite beds, kaowool traps, and mercury traps, the facility was downgraded to a "Radiological" facility, based on calculation SRNL-TR-2012-00263 (Reference 3). Subsequently as deactivation progressed, the facility was then downgraded again on 10/15/15 by NNSA to an "Other Industrial" facility ("all radiological and chemical hazards below 40 CFR 302.4 thresholds") via COR-SRFOMA-10.1.2015-645852 (Reference 4) based upon calculation S-CLC-H-01276 (Reference 5), dated 4/30/15.
10.	Has DOE-SR directed that the decommissioning be performed using the CERCLA Model? <i>If yes, this is a CERCLA Model. Stop.</i>		X	
11.	Does the complexity of the facility or the nature and extent of contamination warrant a higher than normal level of rigor and detail for decommissioning planning and evaluation? <i>If Yes, this is a CERCLA Model. Stop.</i>		X	
12.	Is the facility a formerly nuclear, radiological, or high-hazard chemical facility? <i>If Yes, this is an Integrated Sampling Model. Stop.</i>	X		Originally, 236-H was categorized as a "Nuclear Hazard Category 3 (HC-3)" facility. Following deactivation of the zeolite beds, kaowool traps, and mercury traps, the facility was downgraded to a "Radiological" facility, based on calculation SRNL-TR-2012-00263 (Reference 3). Subsequently as deactivation progressed, the facility was then downgraded again on 10/15/15 by NNSA to an "Other Industrial" facility ("all radiological and chemical hazards below 40 CFR 302.4 thresholds") via COR-SRFOMA-10.1.2015-645852 (Reference 4) based upon calculation S-CLC-H-01276 (Reference 5), dated 4/30/15.
13.	Has EC&ACP's Regulatory Support Group determined that a final survey is not required for this facility? <i>If Yes, this is a Simple Model. If No, this is an Integrated Sampling Model. Stop</i>		X	

Part 3. Review of Existing Records

The following facility records were reviewed as a part of this evaluation:

Ref #	Document No.	Revision/Date	Title
1	Manual 1C, Procedure 501	Rev. 5, 12/31/2014	"Decommissioning of Facilities"
2	Manual 1C, Procedure 502	Rev. 4, 12/31/2014	"Preparing Decommissioning Decision Documents"
3	SRNL-TR-2012-00263	Rev. 0, 11/6/2012	"Tritium Retention and Release from the Savannah River Site Deactivated 236-H He-3 Facility"
4	COR-SRFOMA-10.1.2015-645852	10/15/2015	"National Nuclear Security Administration (NNSA) Approval of the Tritium Facility (TF) 2015 Safety Basis Annual Update"
5	S-CLC-H-01276	4/30/2015	"Building 236-H Facility Hazard Categorization Downgrade (U)"
6	N/A	N/A	SRS Site Item Reportability Issue Manual (SIRIM)/Occurrence Reporting and Processing System Information System (ORPS) 8/16/93 to Present
7	WSRC-OS-94-42	Rev. 0, August 16, 1993, with updates through 2017	Federal Facility Agreement for the Savannah River Site, Administrative Document No. 89-05-FF
8	N/A	N/A	Savannah River Site's Cold War Built Environment Cultural Resources Management Plan
9	SRNS-RP-2018-00189	Rev. 0, February 2018	"Sample Analysis Plan (SAP) for the By-Product Purification Facility (236-H)"