

Facility Decommissioning Evaluation Building 683-D, Chlorine Unloading and Storage

This is a Simple Model Decommissioning per Facility Disposition Manual 1C

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Printed in the United States of America

Prepared for
U.S. Department of Energy
and
Savannah River Nuclear Solutions LLC
Aiken, South Carolina

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. 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

A review of the existing characterization data, process/building history, sample data and walk downs of the facility, supports the determination that this building and its ancillary structures meet the criteria of a Clean Building, Simple Model as described in Facility Disposition Manual 1C, Procedure 501. This decision is supported by the documentation found throughout the body of this document. No chemical or hazardous radioactive contaminants are associated with this structure.

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". The scope of this evaluation includes Building 683-D, which is further described in the next section.

The proposed decommissioning end-state for this facility is demolition to the building slab.

The described decommissioning activities are not the final area closure actions. 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 substances to the environment.

Facility Description

Building 683-D (Figure 1) is located on the west side of 400-D Area on the Savannah River Site (SRS) in South Carolina. Figure 2 shows the location of 683-D with respect to surrounding buildings. Building 683-D is a steel and masonry constructed building on a concrete slab foundation. The original facility comprised the gaseous chlorination room and a storage pad to the west and was constructed in 1952. The building now comprises approximately 4400 ft² as constructed via addition circa 1986. The building is approximately 110' by 40' and the roof of the building is 21' high on the sides and about 28' high at the apex. The sides of the building are made of expanded metal mesh to allow for appropriate ventilation of the structure. The remainder of the outer shell of the structure is comprised of sheet metal and concrete block and mortar. In the southeast corner of the structure is the chlorination room. The walls of the chlorination room are concrete block and mortar. The chlorination room is approximately 13' by 36' and 10' high (interior dimensions) and is located inside the larger 4400 ft² structure. Figure 3 provides the layout of the structures. There is an overhead bridge crane in the central storage room, and a smaller bridge crane in the chlorination room. The overall building is free of hazardous materials/components including exit signs, fluorescent tubes, polychlorinated biphenyl (PCB) ballasts, batteries, etc. The electricity and water to the building were disconnected in 2014 as discussed in the "Deactivation Project Final Report Building 484-D Powerhouse and Ancillary Buildings", V-PCOR-D-00042 (Reference 6). A small portion of the building housed the sodium hypochlorite injection system. The sodium hypochlorite injection system used metering pumps to inject required amounts of sodium hypochlorite into the Flash Mixer of 483-1D and into the basin of the 485-D cooling tower (neither 483-1D nor 485-D are within the scope of this decommissioning evaluation). The building was also used for storage of chemicals and construction materials and for minor maintenance activities. All gaseous chlorination equipment, including storage racks, has been removed from the interior of the building.



Figure 1. Building 683-D, Chlorine Unloading and Storage

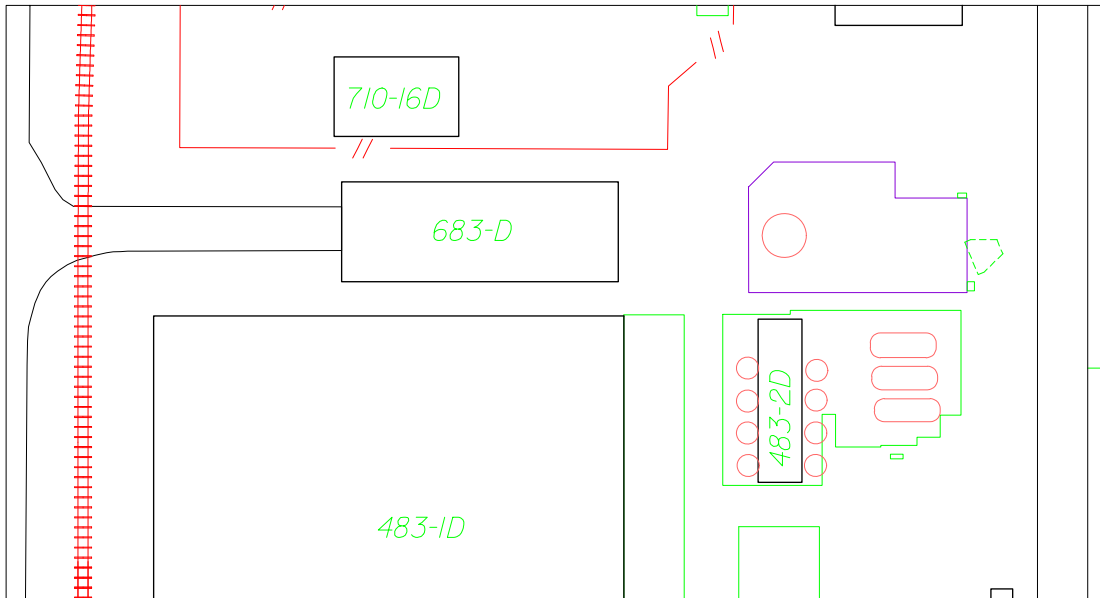


Figure 2. Building 683-D Surrounding Area

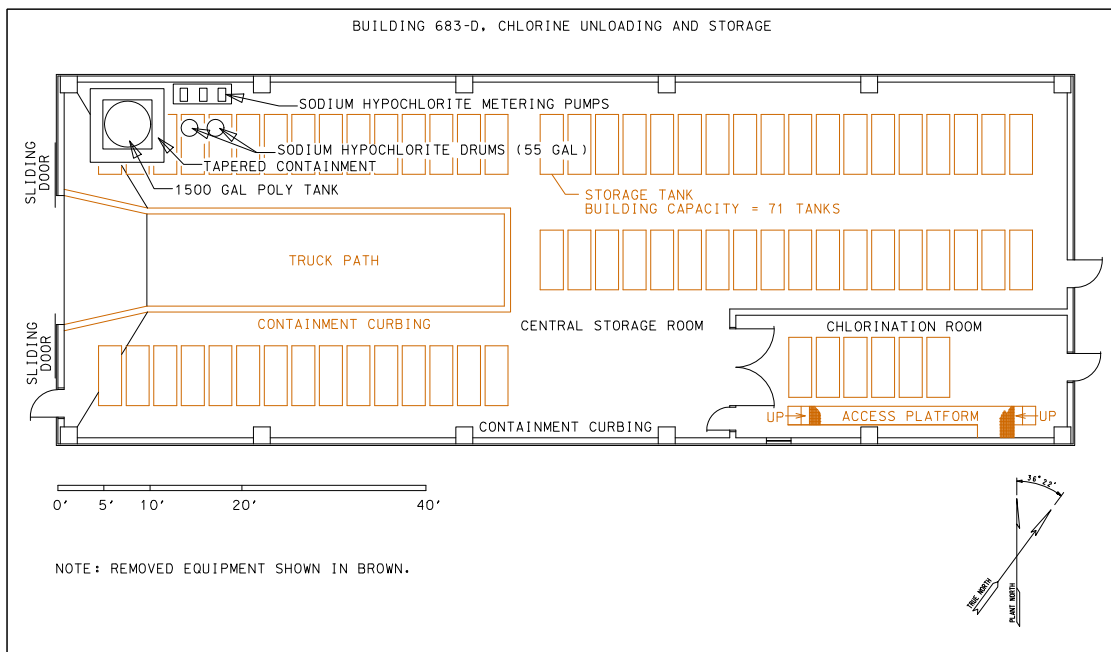


Figure 3. Building 683-D Layout

Process History

A review of records, walk downs and interviews indicate that no chemical or radioactive processes were performed in this building (i.e., no chemical, mechanical, or electrical energy or interaction was performed to change the state of an input material or to produce a new output product).

Building 683-D was previously used as storage for materials used in the gaseous chlorination injection of service water from 1953 until 1992 that took place outside the boundaries of this building. A sodium hypochlorite injection system had three small metering pumps with associated tubes, pipes and valving for the system. The metering pumps drew sodium hypochlorite from 55- gallon drums for use outside of 683-D. There was a 1500- gallon polyethylene tank that was put in place for the system; however, it was never used, and remained empty until it was removed circa 2012. The pumps and drums were located within a portable containment dike and have been removed. Terbutylazine (ChemTreat™ CL-2032) was also stored in the building and removed.

There is no evidence of spills of sodium hypochlorite, terbutylazine, or gaseous chlorine in the building. Review of the SRS Occurrence Reporting and Processing System / Site Item Reportability and Issue Management (ORPS/SIRIM) database conducted from the effective date of the Federal Facility Agreement (FFA), August 16, 1993 to present revealed no indication of spills at Building 683-D. The FFA serves as a review of releases/spills to the environment prior to August 16, 1993. Further, review of spill files maintained by SRS reveals no spill history for the building.

Chemical Process

Chemical Name	Process Location	Evidence of Spills?
N/A	N/A	N/A
N/A	N/A	N/A

N/A – not applicable

Radioactive Process

Isotope	Contaminated Areas/Others
N/A	N/A

N/A – not applicable

Terbutylazine is not hazardous per 40 Code of Federal Regulators 302.4, Designation of hazardous substances. Sodium hypochlorite is hazardous with a reportable quantity (RQ) of 100 pounds (lb). Chlorine is hazardous with an RQ of 10 lb.

There are stains in the concrete that appear to be from oil. As previously mentioned, the spaces of 683-D were used for maintenance activities as well as storage. Lube oil coolers, pumps, valves, and other equipment have been stored and/or serviced within the structure, both in the central storage room and in the chlorination room. Stained areas of concrete are shown in Figure 4. The slab of Building 683-D is in good condition. There is a crack in the slab in the chlorination room (Figure 4). The stains in the concrete are near the crack, but do not appear to present a migration issue.

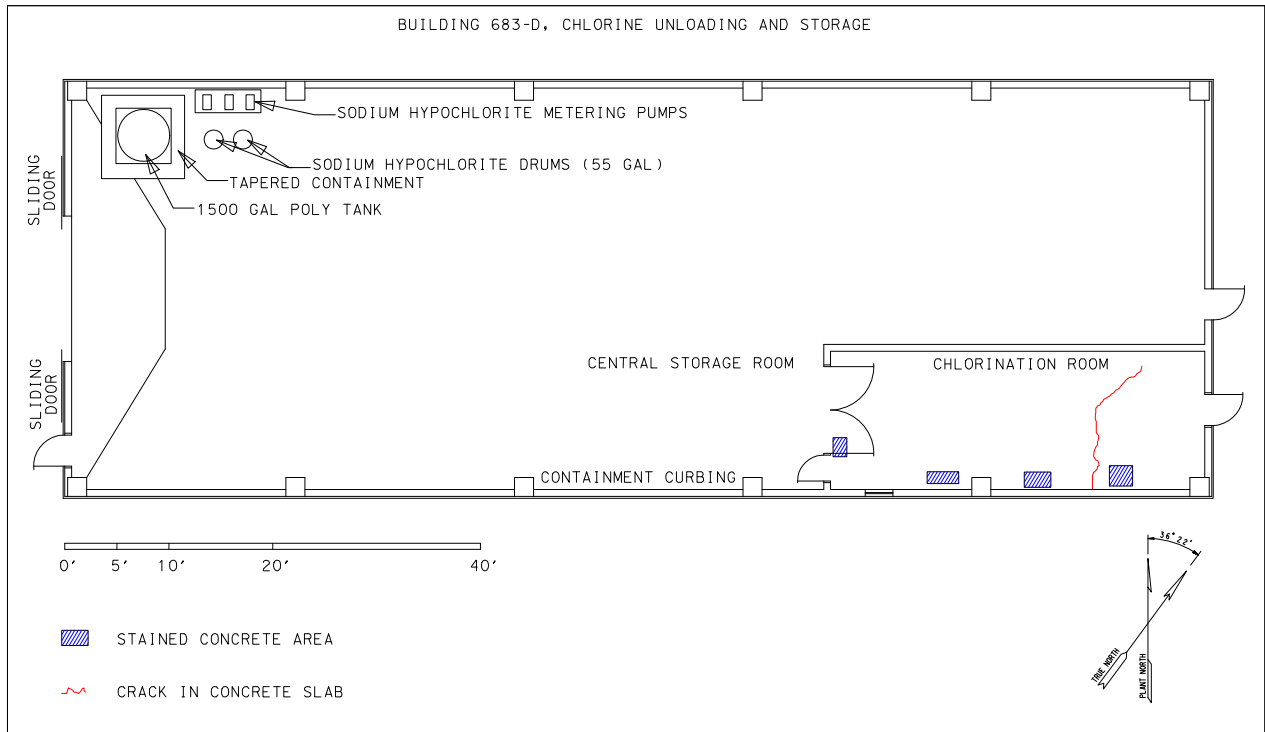


Figure 4. Building 683-D Layout (Showing Stains and Crack)

The containment curbing around the truck path (Figure 3) has been taken down to be even with the surrounding slab. This was done around the time of conversion from the use of gaseous chlorine to sodium hypochlorite. The remainder of the perimeter containment curbing around the building was also breached, in intervals at ground level, to allow rainwater to drain from inside the structure.

Summary of Existing Characterization

Characterization has been accomplished using a combination of process knowledge/historical release information, verification walk downs and a review of S-EHA-D-00001, “Hazards Survey for D-Area” (Reference 5).

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 SRS ORPS/SIRIM database conducted from the effective date of the FFA, August 16, 1993, to present and a review of the FFA. The FFA serves as a review of releases/spills to the environment prior to August 16, 1993.

Activities in this facility have only ever involved gaseous chlorine and sodium hypochlorite (bleach). Sodium hypochlorite was substituted for gaseous chlorine because it is a low-hazard, inexpensive and effective biocide in water treatment. Gaseous chlorine is a gas at room temperature. Releases of chlorine gas would have been to the air and would have had no impact on the structure except in possibly contributing to corrosion of metals used in construction. Sodium hypochlorite is used in a 12.5% solution with water. It is a stable, low hazard source of chlorine in solution. Even so, when left to the open air, the chlorine volatilizes out of solution. There is no documented evidence of spills of sodium hypochlorite in the facility. If there were any spills, the remaining residual contamination would release its chlorine into the atmosphere and be rendered harmless. Any stains in the concrete slab of the structure will be cleaned with a strong surfactant, such as BioSolve™ as part of the decommissioning activities for the building. Area Completion Project (ACP) environmental completion organization does not require a final survey to be conducted for this facility.

An asbestos survey of the building was conducted on November 6, 2019 and one location was recorded as Presumed Asbestos Containing Material (PACM). The results of that survey are included in Q-APG-D-00015, “Baseline Asbestos Inspection Report of Building 683-D”, Reference 7. The gaskets were inaccessible for bulk sampling and were therefore considered PACM. If the work method employed during decommissioning avoids separation of the flanges, they will not be disturbed. Gaskets in unbroken flanges are determined to be encased in hardened substance and therefore are not subject to regulatory requirements.

Wastes generated during decommissioning will be characterized and managed in accordance with 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 the SRS’s Cold War Built Environment Cultural Resources Management Plan (Reference 4), in which the facilities with historical significance are listed. This facility is not listed in that reference and therefore is not historically significant.

Part 2. Evaluation

Clean Facilities				
	Question	Yes	No	Justification
1.	<p>Has the facility ever contained or processed radioactive or hazardous material other than stored packaged material or materials of construction?</p> <p><i>If yes, go to question 4.</i></p>		X	<p>A review of records, walk downs and interviews indicate that no chemical or radioactive processes were performed in this building (i.e., no chemical, mechanical, or electrical energy or interaction was performed to change the state of an input material or to produce a new output product). Activities in this facility have only ever involved gaseous chlorine and sodium hypochlorite (bleach). Sodium hypochlorite was substituted for gaseous chlorine because it is a low-hazard, inexpensive and effective biocide in water treatment. Gaseous chlorine is a gas at room temperature. Releases of chlorine gas would have been to the air and would have had no impact on the structure except in possibly contributing to corrosion of metals used in construction. Sodium hypochlorite is used in a 12.5% solution with water. It is a stable, low hazard source of chlorine in solution. Even so, when left to the open air, the chlorine volatilizes out of solution. Stains in the concrete slab of the structure will be cleaned with a strong surfactant, such as BioSolve™ as part of the decommissioning activities for the building. ACP ESH does not require a final survey to be conducted for this facility.</p>
2.	<p>If there was stored packaged material, has there ever been a spill?</p> <p><i>If No or N/A, this is a Simple Model. Stop.</i></p>		X	<p>There is no documented evidence of spills of sodium hypochlorite in the facility. If there were any spills, the remaining residual contamination would release its chlorine into the atmosphere and be rendered harmless.</p> <p>Building 683-D will be a Simple Model decommissioning.</p>
3.	<p>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)?</p> <p><i>If Yes, this is a Simple Model. Stop.</i></p>			N/A

Contaminated Facilities				
	Question	Yes	No	Justification
4.	Is the facility listed as a RCRA/CERCLA Unit in Appendix C of the SRS FFA? <i>If Yes, this is a CERCLA Model. Stop.</i>			N/A
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>			N/A
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>			N/A
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>			N/A
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>			N/A
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>			N/A
10.	Has the Department of Energy-Savannah River directed that the decommissioning be performed using the CERCLA Model? <i>If yes, this is a CERCLA Model. Stop</i>			N/A
12.	Is the facility a formerly nuclear, radiological, or high-hazard chemical facility? <i>If Yes, this is an Integrated Sampling Model. Stop.</i>			N/A
13.	Has Environmental Compliance and Area Completion Project'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>			N/A

N/A – not applicable

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	SRNS-RF-2008-00086-000-M&O	Revision 19-01-MO, Feb. 14, 2019	Standard Requirements Identification System FA00 Facility List.
2	WSRC-OS-94-42	Rev 0, Aug. 16, 1993 All updates through Sept. 21, 2018, including Rev. 0 Appendices C, G and K for Fiscal Year 2019	FFA for the SRS, Administrative Document No. 89-05-FF
3	N/A	N/A / Since 1993	D-Area SIRIM and ORPS reports 08/1993 to 05/2009.
4	N/A	Final January 26, 2005	SRS's Cold War Built Environment Cultural Resources Management Plan
5	S-EHS-D-00001	April, 2006	D-Area Hazards Survey
6	V-PCOR-D-00042	Rev. 0/ July 1, 2014	Deactivation Project Final Report Building 484-D Powerhouse and Ancillary Buildings
7	Q-APG-D-00015	Rev. 0, November 18, 2019	Baseline Asbestos Inspection Report of Building 683-D