

Status of F/H Area Radioactive Liquid Waste Tanks Being Removed from Service CY2018 Annual Report



March 2019



Savannah River Remediation
Savannah River Site
Aiken, SC 29808

Approvals

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Executive Summary

Per Section IX.B.2 of the Federal Facility Agreement (FFA) for the Savannah River Site (SRS), the United States Department of Energy (DOE) is required to submit a report to the United States Environmental Protection Agency – Region 4 (EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC) containing new or replacement waste tank system component assessments annually on or before March 9 of each year. Further, Section IX.E.3 of the SRS FFA requires that DOE submit to EPA and SCDHEC the status of the radioactive liquid waste tanks being removed from service. To fulfill these requirements, Calendar Year (CY) 2018 individual tank status reports and a list of FFA assessment reports are included in this report in Appendix A and Appendix B, respectively. Appendix L of the SRS FFA stipulates that with respect to the F-Area and H-Area waste tanks, in connection with the annual report, DOE shall report on the status of bulk waste and heel removal activities, Performance Assessments, General Closure Plans, operational closure of tanks, and implementation of Section 3116(a) of the *Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005* (NDAA). The information required by Appendix L is provided in Section 2 of this report.

In 2018, DOE continued to make progress regarding waste removal and closure. Extensive balance of plant modifications and procurements were made, and assembly/installation of new equipment was completed for two tanks (Tanks 3F and 10H) in preparation for salt waste removal and treatment. Water addition for initial salt dissolution in Tank 3F was performed in December 2018. The balance of plant modifications, assembly, and installation of an at-tank cesium removal system, Tank Closure Cesium Removal (TCCR), at Tank 10H was completed for the treatment of salt waste to accelerate tank closure. Salt dissolution activities resumed in Tank 10H in November 2018. Salt dissolution scoping/design activities were performed for Tanks 2F and 9H, and balance of plant modifications were initiated on Tank 9H to support future salt dissolution for waste removal.

SCDHEC and EPA approved a DOE request for continued usage of Tank 7F to support Tank 3F saltcake dissolution and transfer of dissolved salt solution to support preparation of salt batches for waste treatment. In addition, SCDHEC and EPA approved a DOE request for continued usage of Tank 8F to store aluminum-rich leachate resulting from the Low Temperature Aluminum Dissolution (LTAD) process performed in Tank 51H to support preparation of Sludge Batch 10. DOE, SCDHEC, and EPA agreed to modify FFA Appendix L, item 5 to read “DOE shall complete bulk waste removal efforts for one tank (Tank 15H) by 10/31/17, restart BWRE activities (i.e., water addition) in Tank 10H by 1/31/19, and completed [sic] bulk waste removal efforts for Tank 10H by 11/30/19.” DOE successfully completed the second piece of item 5, restart of Bulk Waste Removal Efforts (BWRE) activities in Tank 10H through the addition of water to dissolve saltcake, on November 8, 2018. SCDHEC also approved the continued usage of the 242-25H (3H) evaporator pot with two known leak sites in accordance with the submitted technical basis, as its operation is essential for the closure of future high-level radioactive waste tanks.

DOE hosted SCDHEC and the United States Nuclear Regulatory Commission (NRC) during an on-site monitoring visit in August 2018, consistent with their responsibilities under Section 3116(b) of the NDAA. No new issues were identified by the NRC during the visit.

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Acronyms

BWRE	Bulk Waste Removal Efforts
CGCP	Consolidated General Closure Plan for Waste Tank Systems
CY	Calendar Year
D&R	Disassembly and Removal
DOE	United States Department of Energy
DWPF	Defense Waste Processing Facility
EOY	End of Year
EPA	United States Environmental Protection Agency Region 4
FFA	Federal Facility Agreement for the Savannah River Site
FTF	F-Area Tank Farm
GSA	General Separations Area
HIH	Hose in Hose
HLW	High-Level Waste
HTF	H-Area Tank Farm
LDB	Leak Detection Box
LTAD	Low Temperature Aluminum Dissolution
LVMJ	Low Volume Mixing Jet
NDAA	Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005
NRC	United States Nuclear Regulatory Commission
PA	Performance Assessment
SCDHEC	South Carolina Department of Health and Environmental Control
SRNL	Savannah River National Laboratory
SRS	Savannah River Site
SRR	Savannah River Remediation
SWPF	Salt Waste Processing Facility
TCCR	Tank Closure Cesium Removal

1.0 Introduction

Section IX.B.2 of the Federal Facility Agreement (FFA) for the Savannah River Site (SRS) requires the United States Department of Energy (DOE) to annually submit a report to the United States Environmental Protection Agency – Region 4 (EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC):

“...for each F and H Area high-level waste tank system or component installed after the effective date of this Agreement, the DOE shall prepare a written assessment, certified by a registered professional engineer, that the waste tank system or component has sufficient structural integrity and is acceptable for the storing or treating of hazardous and/or radioactive substances.”

Section IX.B.3 further states:

“The assessment(s) shall demonstrate that the foundation, structural support, seams, connections, and pressure controls (if applicable) are adequately designed and that the waste tank system(s) have sufficient structural strength, compatibility with the hazardous/radioactive substances to be stored or treated, and corrosion protection to ensure that the waste tank system(s) or component(s) will not collapse, rupture, or fail. At a minimum, the assessment(s) shall include the information contained in Subsection B of Appendix B herein, entitled, *Design/Installation Standards for New and Replacement Tank System(s) and Components.*”

These waste tank system component assessments are to be “submitted annually on or before March 9 of each year for all components installed during the previous year.”

In addition, Section IX.E.3 of the SRS FFA states:

“The DOE will submit to EPA and SCDHEC an annual report on the status of tanks being removed from service under Subsection E.1 herein. This report will include any requests, subject to review and approval, for changes to the existing plan(s) and schedule(s) approved under Subsection E.1. This annual report shall be submitted in conjunction with the assessments submitted under Subsection B.3 herein.”

With respect to the waste tanks in F-Area Tank Farm (FTF) and H-Area Tank Farm (HTF), Appendix L, item 18, of the SRS FFA states:

“In connection with the annual report on the status of tanks being removed from service due by March 9th of each year in accordance with Section IX.E.3 of the FFA, DOE shall report on the status of bulk waste and heel removal activities for F Area and H Area tanks, F Area and H Area Tank Farm Performance Assessments, F Area and H Area Tank Farm General Closure Plans, operational closure of groups of tanks in F and H Areas, and implementation of Section 3116(a) of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 with respect to F Area and H Area tanks.”

The required assessments under Section IX.B are found in Appendix B of this report. The status of the old-style tanks being removed from service, as required in Section IX.E, are found in Appendix A of this report. Section 2 of this report contains the additional information required by Appendix L of the SRS FFA.

2.0 Overview of CY2018 Activities and Accomplishments

As of the end of Calendar Year (CY) 2018, of the 24 old-style tanks, eight tanks have been *operationally closed* (also referred to as *removed from service*): Tanks 5F, 6F, 17F, 18F, 19F, and 20F in FTF and Tanks 12H and 16H in HTF. *Bulk Waste Removal Efforts* (BWRE) have been declared completed on five additional old-style tanks: Tanks 4F, 7F, 8F, 11H and 15H. In addition, Salt Waste Processing Facility (SWPF) East and West Transfer Line initial tie-in work has been completed.

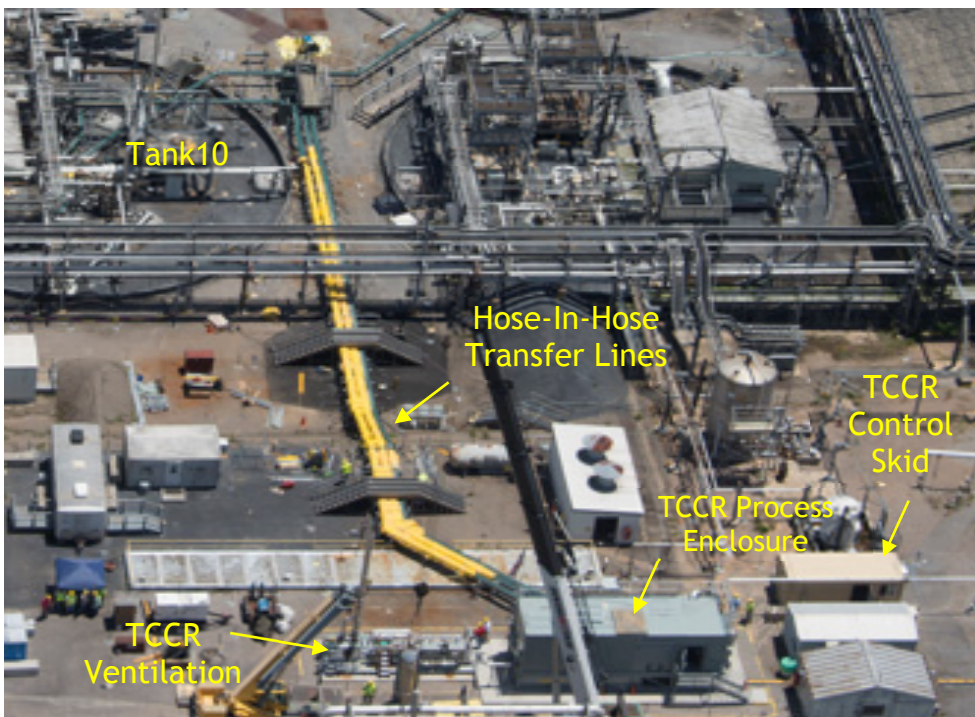
2.1 Highlights of Bulk Waste Removal Efforts, Operational Closure, and Post Closure Activities for the F- and H-Area Tanks

DOE procured through commercial sources an at-tank cesium removal system, Tank Closure Cesium Removal (TCCR), for the treatment of salt waste to accelerate risk reduction through waste removal and closure. The Factory Acceptance Test for the TCCR unit was completed in early 2018 and the TCCR equipment was delivered to SRS in April 2018. Figure 1 shows the TCCR process enclosure being received and installed in HTF. Savannah River Remediation (SRR) completed TCCR assembly and balance of plant modifications including installation of the Tank 10H transfer pump, the Tank 10H-to-TCCR above grade hose-in-hose (HIH) shielded transfer lines, and tie-ins to Tank 11H and support services. Figure 2 shows the major components of the TCCR salt treatment system.

Figure 1: Installation of TCCR Process Enclosure



Figure 2: TCCR Salt Treatment System



On October 2, 2017, SCDHEC and EPA approved a DOE request for a 45-day extension to FFA Appendix L items #6 and #12. Specifically, the completion of BWRE for 3 tanks by 9/30/17 and completion of operational closure of two tanks by 9/30/2017 was extended to 11/14/2017.

Based on a three-party (DOE, SCDHEC and EPA) discussion on November 1, 2017, the three agencies agreed to and subsequently signed on November 19, 2017, a *Suspension Agreement – Federal Facility Agreement (FFA) High-Level Waste (HLW) Tank Milestones* suspending Appendix L Items #6 and #12 commitments for completion of BWRE and operational closure of HLW tanks until May 2019. In addition, Appendix L Item #7, completion of BWR efforts for six tanks by 9/30/2018, was also suspended for the same duration. Under the Suspension Agreement the first regulatory meeting took place on September 28, 2018.

In August 2018, DOE, SCDHEC, and EPA agreed to modify FFA Appendix L, item 5 to read “DOE shall complete bulk waste removal efforts for one tank (Tank 15H) by 10/31/17, restart BWRE activities (i.e., water addition) in Tank 10H by 1/31/19, and completed [sic] bulk waste removal efforts for Tank 10H by 11/30/19.” DOE successfully completed the second piece of item 5, restart of BWRE activities in Tank 10H, through the addition of water to dissolve saltcake on November 8, 2018.

Restart of salt dissolution campaigns began in Tank 10H with the addition of approximately 250,000 gallons to the tank in November 2018. A recirculating system was installed in the tank to optimize the dissolution of the saltcake. Following initial salt dissolution, a sample analysis of the Tank 10H liquid indicated that remediation (chemical adjustment) of the liquid was required prior to TCCR processing. Chemical adjustment was completed in December 2018 and TCCR processing was initiated in January 2019.

In April 2018, SCDHEC and EPA approved the DOE request for continued usage of Tank 7F to support Tank 3F saltcake dissolution, and transfer and storage of this Tank 3F dissolved salt solution in Tank 7F. In September 2018, repairs on the transfer line between Tank 3F and 7F were completed by replacing the leak detection box (LDB) near Tank 7F, and the transfer pump was installed in Tank 3F. Figures 3 and 4 show the LDB replacement and riser mining to support the transfer pump installation in Tank 3F, respectively. The final water addition to Tank 3F through three Low Volume Mixing Jets (LVMJs) for the first batch of salt dissolution was completed on December 17, 2018. The first batch of dissolved salt solution was successfully transferred from Tank 3F to Tank 7F in January 2019.

In May 2018, SCDHEC approved the continued usage of the 242-25H (3H) evaporator pot with two known leak sites in accordance with the submitted technical basis, as its operation is essential for the closure of future high-level radioactive waste tanks. The leak sites are approximately the diameter of a human hair with a calculated leak rate of less than 1/10th of a gallon per day per leak site. The 3H Evaporator was restarted in July 2018. It continues to be in operation in accordance with an enhanced operations and monitoring plan. One of the leak sites has shown some wetness and growth, but within the calculated leak rate. The other leak site has shown no growth.

Figure 3: LDB Replacement at Tank 7F

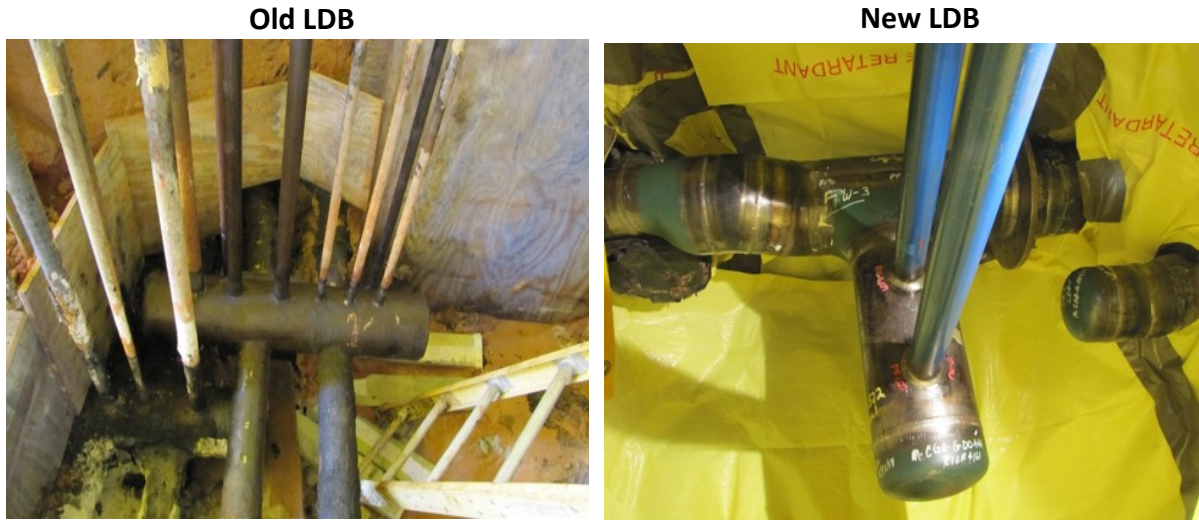


Figure 4: Riser Mining at Tank 3F Riser 5 to Support Transfer Pump Installation



In May 2018, SCDHEC and EPA approved the DOE request for continued usage of Tank 8F to store aluminum-rich leachate resulting from the Low Temperature Aluminum Dissolution (LTAD) process performed in Tank 51H to support preparation of Sludge Batch 10. Beginning in August 2018, through November 2018, approximately 238,000 gallons of aluminum-rich leachate were transferred to Tank 8F from Tank 51H.

Salt dissolution design activities for Tank 9H BWRE continued in CY2018, while disassembly and removal (D&R) activities were initiated. DOE completed D&R of the existing spray chamber on Tank 9H Riser 4 to support installation of a LVMJ for future salt dissolution (Figure 5). In addition, salt dissolution design activities for Tank 2F BWRE were initiated in CY2018.

**Figure 5: Tank 9H Riser 4 D&R
Before (With Spray Chamber)**



After (With Temporary Riser Cover)



The SWPF initial East & West Transfer Line tie in work has been completed, including the required piping modifications and jumpers to support future SWPF operations. The Transfer Lines remain blanked, which provides a physical isolation between the High-Level Waste (HLW) System and SWPF.

2.2 F- and H-Area Tank Farm Consolidated General Closure Plan Activities

In May 2018, DOE transmitted to SCDHEC Revision 3 of the *SRS Waste Removal Plan and Schedule for F-Area and H-Area Waste Tank Systems*, to incorporate completion of Tank 15H BWRE and changes related to the FFA minor modification incorporating the three-party signed *Suspension Agreement Federal Facility Agreement (FFA) High-Level Waste (HLW) Tank Milestones*. The *SRS Waste Removal Plan and Schedule for F-Area and H-Area Waste Tank Systems* document serves as an attachment to the *Consolidated General Closure Plan for F-Area and H-Area Waste Tank Systems*, and, as a requirement of the Consolidated General Closure Plan (CGCP), is updated as necessary to incorporate changes to the FFA milestones. In June 2018, SCDHEC responded to DOE that "...the agreement represents a conditional suspension of the milestones, not a change. At this time a change to the CGCP schedule is not appropriate." Therefore, Revision 2 of the *SRS Waste Removal Plan and Schedule for F-Area and H-Area Waste Tank Systems* is considered the latest approved version of the document.

2.3 Tank Farm Performance Assessments and Section 3116 Waste Determinations Activities

As part of the ongoing performance assessment (PA) maintenance program required by DOE Manual 435.1-1 and designed to reduce uncertainty, waste release testing on residual solids from Tank 12H was completed at the Savannah River National Laboratory (SRNL). These experiments built on previous testing with Tank 18F residual solids and demonstrated that solubility values used in the Tank Farm Waste Release Model for the PA are reasonable. The testing evaluated radionuclide release rates from residual solids samples for Tank 12H under various chemical conditions modeled in the HTF PA. Figure 6 shows the test apparatus inside the SRNL shielded cell.

Figure 6: Tank 12H Sample Test Equipment



The testing included iodine release rates in addition to plutonium, uranium, technetium and neptunium. The calculated doses associated with I-129 are conservative since the entire iodine inventory was modeled as being instantaneously soluble even though it is possible that iodine can form solubility-limiting solid phases with several metals (e.g., silver, mercury) that also occur in residual tank waste. The Tank 12H residuals testing results indicate that iodine is less soluble than assumed in the HTF PA Waste Release Model and demonstrates that the calculated doses associated with I-129 are likely conservative. The HTF PA peak dose in 10,000 years would be expected to decrease if a more realistic iodine solubility were used in PA modeling.

In CY2018, DOE hosted the United States Nuclear Regulatory Commission (NRC) and SCDHEC for an on-site observation visit in August 2018. This visit was in conjunction with the roles and responsibilities of Section 3116(b) of the *Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005*. DOE provided presentations relative to the status of Tank Farm activities since the previous visit in February 2016 including an overview of TCCR, ongoing Tank 12H waste release testing, ongoing updates to the General Separations Area (GSA) groundwater database and the most recent PORFLOW™ modeling. Tours were conducted in FTF, HTF, TCCR, and various locations in the GSA where groundwater first reaches the surface. No new issues were identified.

**APPENDIX A: CY2018 Individual Tank Status Reports for the F- and
H-Area Radioactive Liquid Waste Tank Farms**

Individual Tank Status Report

Introduction:

Appendix A provides information on the F-Area and H-Area Tank Farms' Waste Storage Tanks 1 through 24 being removed from service. Information in this Appendix, including end-of-year (EOY) volumes of material in the tanks, is reported as of the end of CY2018.

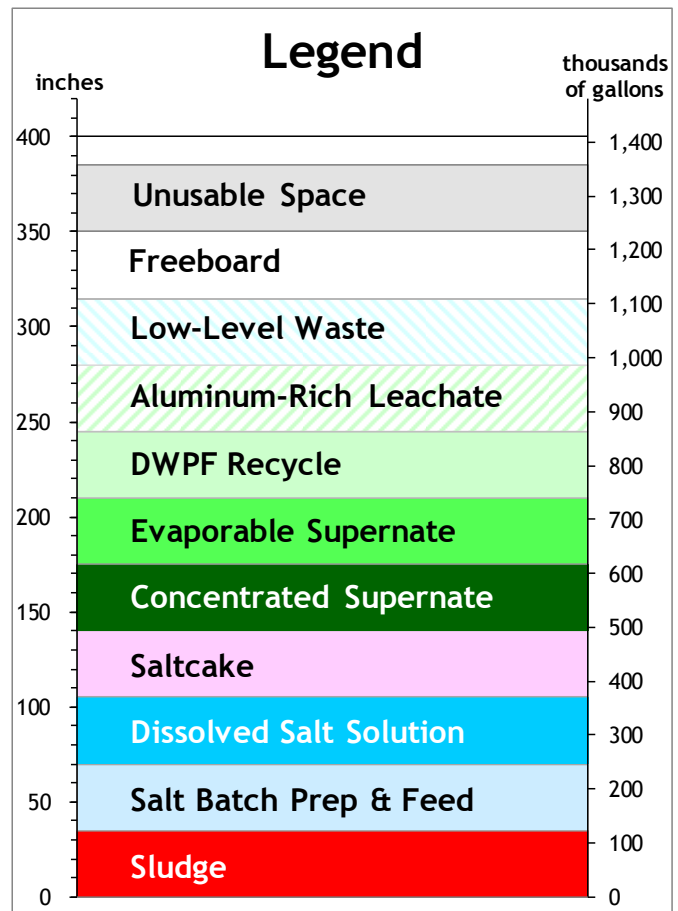
Several of the tanks experienced leakage in the past. A dark green background in the tank diagram indicates a tank that has a leakage history; tank storage liquid levels are currently maintained below the lowest known leak site.

Eight of the tanks are operationally closed:

- Tank 5 closed December 2013
- Tank 6 closed December 2013
- Tank 12 closed April 2017
- Tank 16 closed September 2015
- Tank 17 closed December 1997
- Tank 18 closed September 2012
- Tank 19 closed September 2012
- Tank 20 closed July 1997

Acronyms:

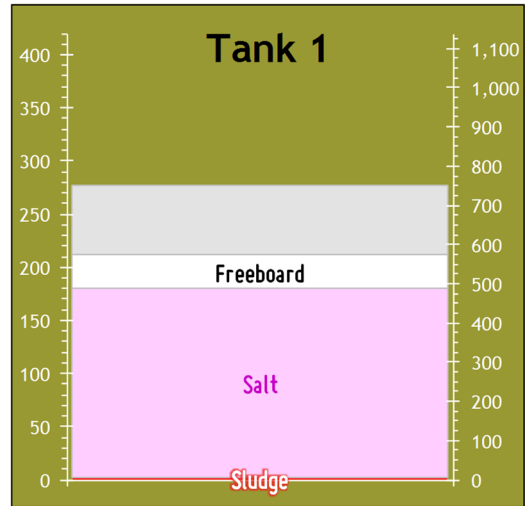
- ARP/MCU: Actinide Removal Process / Modular Caustic Side Solvent Extraction Unit
- BWRE: Bulk Waste Removal Efforts
- DWPF: Defense Waste Processing Facility
- EOY: End of Year (December 31, 2018)
- EPA: Environmental Protection Agency
- LTAD: Low Temperature Aluminum Dissolution
- TCCR: Tank Closure Cesium Removal
- SCDHEC: South Carolina Department of Health & Environmental Control
- SWPF: Salt Waste Processing Facility



Tank 1:

Area: F-Area
Service: Inactive Waste Storage Tank Under
Active Surveillance
Type: I
EOY Volume: 486,990 gallons

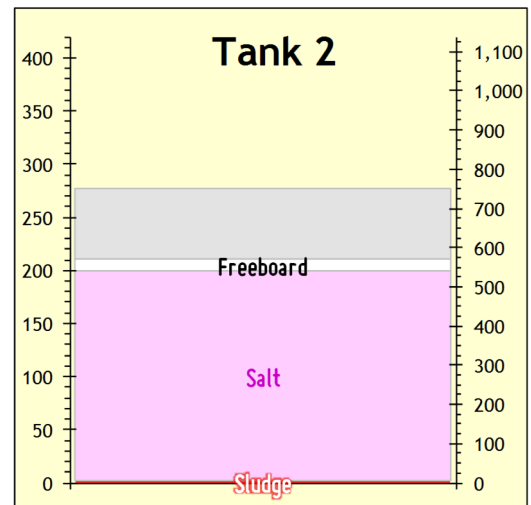
Status: There were no transfers in or out during
2018. The saltcake in Tank 1 will
eventually be dissolved and treated
through SWPF.



Tank 2:

Area: F-Area
Service: BWRE activities planning have been
initiated
Type: I
EOY Volume: 540,100 gallons

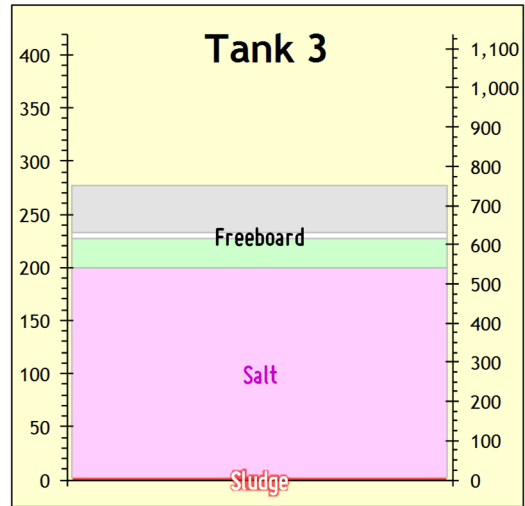
Status: There were no transfers in or out during
2018. Design activities have been
initiated to begin BWRE in Tank 2 by
dissolving the saltcake.



Tank 3:

Area: F-Area
Service: BWRE activities are ongoing
Type: I
EOY Volume: 616,530 gallons

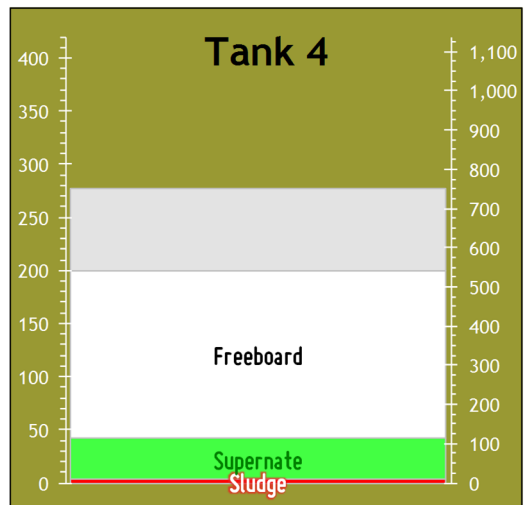
Status: During 2018, approximately 140,000 gallons of liquid – well water, flush water and rain water collected in the F-Area Catch Tank – were added to Tank 3 to dissolve the saltcake. In January 2019, the first batch of dissolved salt solution was transferred to Tank 7.



Tank 4:

Area: F-Area
Service: BWRE Complete – In 2011, SCDHEC and EPA approved the continued use of Tank 4 for storage of supernate for the purpose of keeping the remaining sludge hydrated to facilitate future tank cleaning activities.
Type: I
EOY Volume: 113,010 gallons

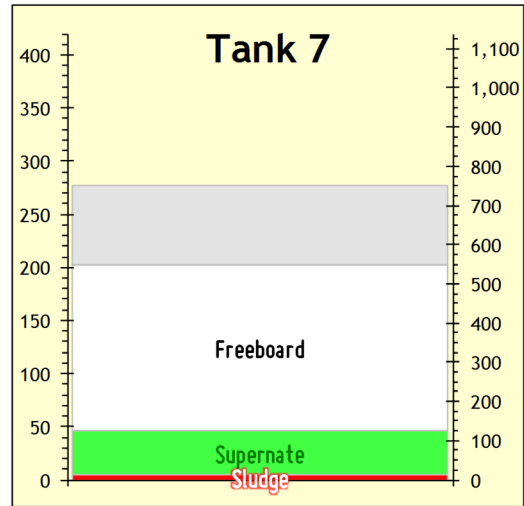
Status: There were no transfers in or out during 2018.



Tank 7:

Area: F-Area
Service: BWRE Complete – Approved by SCDHEC and EPA in 2018 to receive Tank 3 dissolved salt solution.
Type: I
EOY Volume: 125,200 gallons

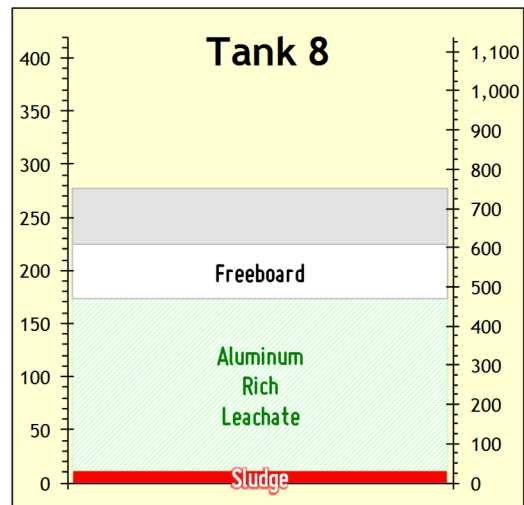
Status: Supernate was transferred out of Tank 7 to Tank 38 for volume reduction in the 2H Evaporator System in May and August 2018. These transfers were performed to prepare Tank 7 to receive dissolved salt solution from Tank 3.



Tank 8:

Area: F-Area
Service: BWRE Complete – Approved by SCDHEC and EPA in 2018 for storage of aluminum-rich leachate from LTAD in support of Sludge Batch 10 preparation.
Type: I
EOY Volume: 469,370 gallons

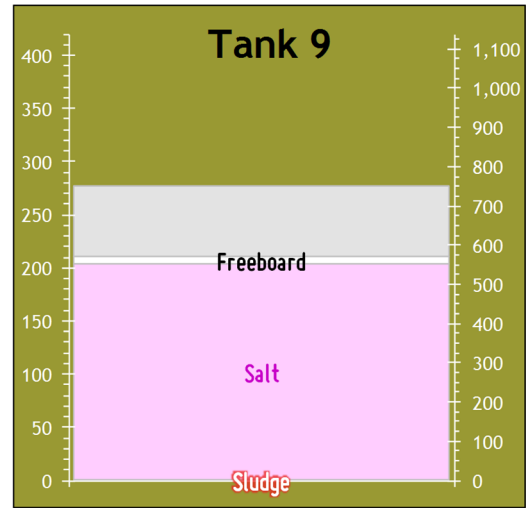
Status: During 2018, approximately 238,000 gallons of aluminum-rich decants were transferred from Tank 51 to Tank 8 following LTAD campaigns in support of Sludge Batch 10 preparation.



Tank 9:

Area: H-Area
Service: BWRE activities have been initiated
Type: I
EOY Volume: 551,490 gallons

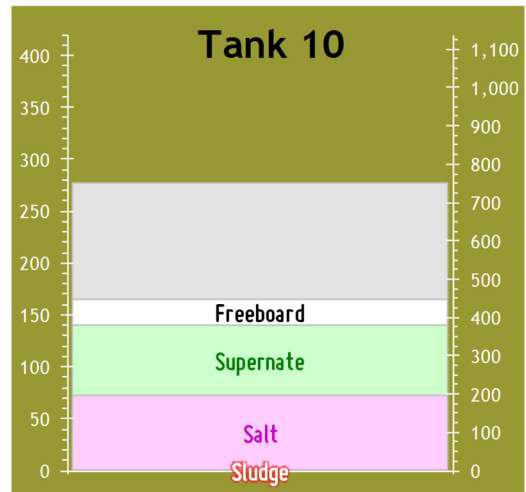
Status: Design activities have been initiated to dissolve saltcake in Tank 9 and to transfer it Tank 10 for eventual treatment via TCCR.



Tank 10:

Area: H-Area
Service: BWRE activities are ongoing
Type: I
EOY Volume: 381,570 gallons

Status: In late 2018 approximately 250,000 gallons of water and chemicals were added to Tank 10 to resume dissolution of the remaining saltcake. The resulting dissolved salt solution will be fed to TCCR for treatment on a per batch basis. The first batch of dissolved salt solution from this BWRE campaign began feeding to TCCR in January 2019.



Tank 11:

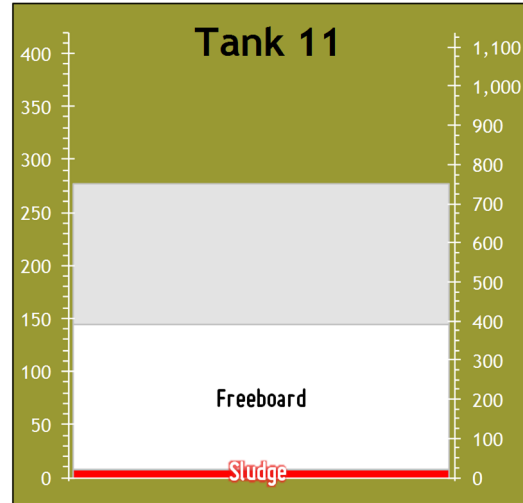
Area: H-Area

Service: BWRE Complete – Approved by SCDHEC and EPA in 2017 for receipt and storage of decontaminated salt solution from TCCR

Type: I

EOY Volume: 20,050 gallons

Status: In late 2018 a series of liquid additions – inhibited water, flush water, well water and chemicals – and transfers from Tank 11 to Tank 51 were performed to prepare Tank 11 to receive the decontaminated salt solution produced by TCCR. In all, approximately 215,000 gallons were transferred to Tank 51.



Tank 13:

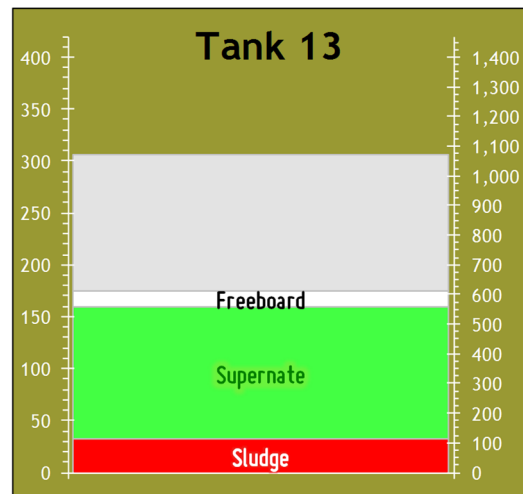
Area: H-Area

Service: Active Waste Tank that will be used as a Hub Tank in the support of future cleaning activities for Tanks 9, 10, 11, 14, and 15

Type: II

EOY Volume: 556,850 gallons

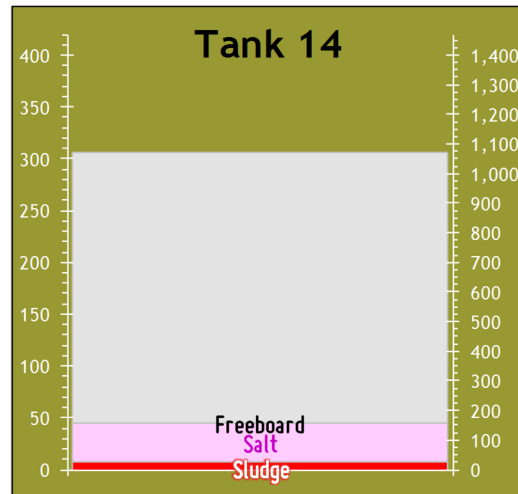
Status: In 2018, Tank 13 received over 224,000 gallons from Tank 15 to support lowering of the Tank 15 liquid level below an active leak site identified during routine inspection under the In-Service Inspection Program.



Tank 14:

Area: H-Area
Service: Inactive Waste Storage Tank Under
Active Surveillance
Type: II
EOY Volume: 157,500 gallons

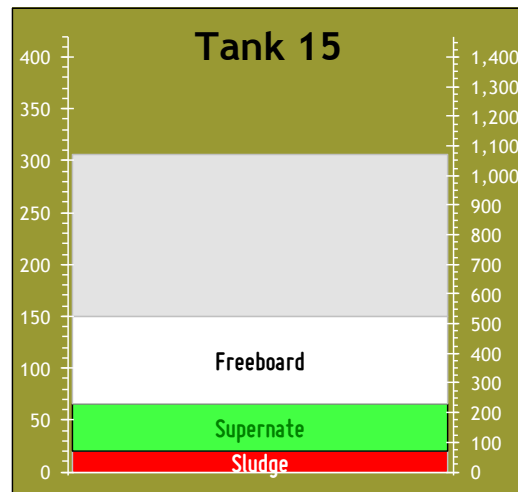
Status: There were no transfers in or out
during 2018.



Tank 15:

Area: H-Area
Service: BWRE Complete; Heel Removal in
preparation for grouting and removal
from service is ongoing
Type: II
EOY Volume: 231,350 gallons

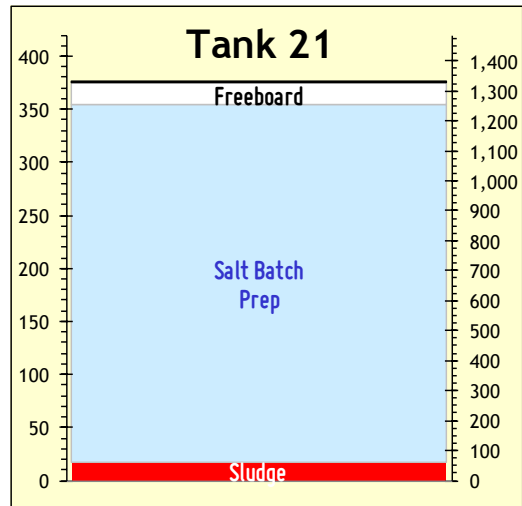
Status: Approximately 224,000 gallons were
transferred from Tank 15 to Tank 13
to support lowering of the Tank 15
liquid level below an active leak site
identified during routine inspection
under the In-Service Inspection
Program. Further heel removal
activities are restricted until
sufficient processing of Sludge Batch
9 is complete.



Tank 21:

Area: H-Area
Service: Salt Batch Blend Tank
Type: IV
EOY Volume: 1,252,800 gallons

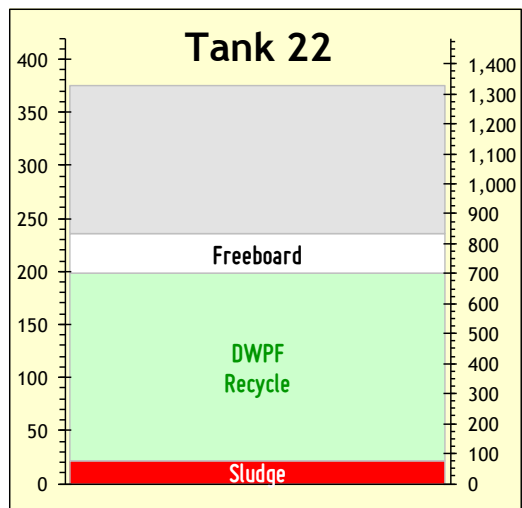
Status: There were no transfers in or out of Tank 21 during 2018. Tank 21 currently contains a fully qualified salt batch awaiting transfer to Tank 49 and will ultimately be treated in ARP/MCU or SWPF.



Tank 22:

Area: H-Area
Service: Storage Tank for DWPF Recycle
Type: IV
EOY Volume: 703,750 gallons

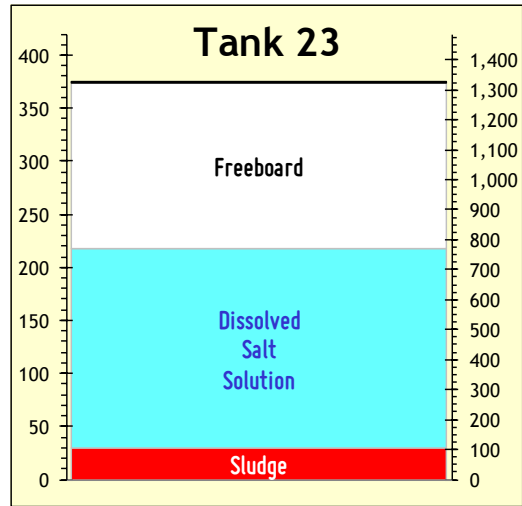
Status: In 2018, Tank 22 continued receiving and storing DWPF Recycle waste. This DWPF Recycle is volume reduced in the 2H Evaporator System, or beneficially reused in salt batch preparation or saltcake dissolution.



Tank 23:

Area: H-Area
Service: Salt Solution Hold Tank
Type: IV
EOY Volume: 771,010 gallons

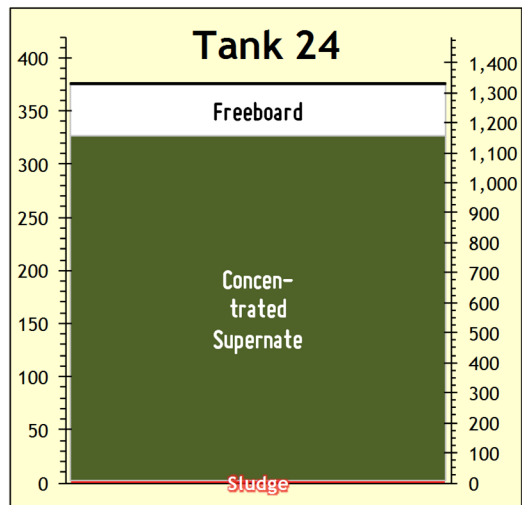
Status: In 2018, Tank 23 received additional dissolved salt solution from Tank 41. Some material was transferred back to Tank 41 supporting continued salt dissolution in Tank 41. This dissolved salt solution will be used in salt batch preparation and will ultimately be treated in ARP/MCU or SWPF.



Tank 24:

Area: H-Area
Service: Waste Storage Tank
Type: IV
EOY Volume: 1,158,300 gallons

Status: There were no transfers in or out of Tank 24 during 2018. The waste stored in Tank 24 is used in salt batch preparation and will ultimately be treated in ARP/MCU or SWPF.



**APPENDIX B: CY2018 Federal Facility Agreement System /
Component Assessment Reports**

Report Number	Title
M-ESR-H-00388 / Rev. 1	Waste Tank 49H Transfer Line Modifications
M-ESR-S-00164 / Rev. 1	SWPF Integration Modifications of Interarea Transfer Lines at the LPPP (511-S)
M-ESR-S-00195 / Rev. 0	SWPF Integration Modifications of Interarea Transfer Lines Downstream of the LPPP (511-S)
M-ESR-S-00196 / Rev. 0	Tie-in of Interarea LPPP (511-S) Downstream Transfer Lines and SWPF Transfer Lines
M-ESR-H-00506 / Rev. 0	TCCR System
M-ESR-H-00502 / Rev. 0	TCCR Dissolution Hose In Hose
M-ESR-H-00465 / Rev. 0	Waste Tank 49H New Transfer Line and Tie-in to Rock Bank
M-ESR-H-00498 / Rev. 0	Tank 49H Valve Box Transfer Line Modification
M-ESR-F-00288 / Rev. 0	The Replacement of Leak Detection Box LD-LDB-1

Savannah River Site

FEDERAL FACILITY AGREEMENT ASSESSMENT REPORT

FOR

WASTE TANK 49H TRANSFER LINE MODIFICATIONS

M-ESR-H-00388





REVISION 1

DISCLAIMER

This report was prepared by Savannah River Remediation LLC (SRR) for the United States Department of Energy under Contract No. DE-AC09-09SR22505 and is an account of work performed under that contract. Neither the United States Department of Energy, nor SRR, nor any of their employees makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, or product or process disclosed herein or represents that its use will not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trademark, name, and manufacturer or otherwise does not necessarily constitute or imply endorsement, recommendations, or favoring of same by SRR or by the United States Government or any agency thereof. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

APPROVAL SIGNATURES / SUMMARY OF CHANGES

APPROVALS

PREPARER  David Massey, Design Services Mechanical Engineer Project Management, Design and Construction Services	DATE 1-9-18
REVIEWER  Jeremy Brackman, Design Services Mechanical Engineer Project Management, Design and Construction Services	1-9-18
APPROVAL  Scott Wallace, Waste Transfer System Design Authority Tank Farm Engineering	1-9-18
APPROVAL  Michael B. Wood, Design Services Project Engineer, Project Management, Design and Construction Services	1.9.18

SUMMARY OF CHANGES

Rev. No	Reason for Change	Pages Affected	Issue Date
0	Initial Issue	All	8/29/2012
1	Complete revision	All	1/9/2018

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1.0 Executive Summary

This Assessment Report is being submitted to satisfy requirements of Section IX and Appendix B of the Savannah River Site (SRS) Federal Facility Agreement (FFA, Ref. 2.5.1).

The purpose of the Blend and Feed portion of the Salt Disposition Integration (SDI) Program is to modify the H-Area Tank Farm (HTF) tanks to blend salt waste and feed the waste to the Salt Waste Processing Facility (SWPF). Tank 49H will receive waste from tanks designated as Blend Tanks and feed the salt waste to the SWPF. A new waste transfer path from Tank 49H Riser B5 to SWPF will be required.

This task is divided into four FFA reports. The scope of this FFA is the installation of a new Submersible Transfer Pump (STP) in Tank 49H Riser B5 and a portion of the new waste transfer line. Jacketed waste transfer piping (WTS-L-1665) will be installed at the new pump at Riser B5, and will extend east across the tank top and adjoining roadway. Between Riser B5 and new jacketed transfer piping, a portion of existing waste transfer line WTS-L-651A will be analyzed, tested, rerated and retagged (as WTS-L-1665) per M-TRT-H-00099 (Ref. 2.5.11, see page 10 for illustration). This modification will be conducted under Design Change Package (DCP) M-DCP-H-09017 (Ref. 2.5.2) and associated DCFs, C-DCF-H-04424 (Ref. 2.5.12), C-DCF-H-04467 (Ref. 2.5.14), M-DCF-H-13187 (Ref. 2.5.15), M-DCF-H-13272 (Ref. 2.5.16), P-DCF-H-02173 (Ref. 2.5.17), J-DCF-H-05740, (Ref. 2.5.18), M-DCF-H-13172 (Ref. 2.5.19), E-DCF-H-08769 (Ref. 2.5.20), E-DCF-H-08820 (Ref. 2.5.21) E-DCF-H-08799 (Ref. 2.5.22), M-DCF-H-13297 (Ref. 2.5.23), and P-DCF-H-02180 (Ref. 2.5.24). The piping will then connect to another portion of jacketed waste transfer piping extending from the top of the roadway east of Tank 49H down the gabion stone bank west of the concrete culvert as discussed in the additional three (3) FFA reports.

The remainder of the Tank 49H waste transfer line tie-ins will be installed per M-DCP-H-09017 (Ref. 2.5.2) and FFA Assessment Report M-ESR-H-00465 (Ref. 2.5.8), M-DCP-H-15004 (Ref. 2.5.3) and FFA Assessment Report M-ESR-H-00462 (Ref. 2.5.9), and M-DCP-H-15016 (Ref. 2.5.4) and FFA Assessment Report M-ESR-H-00474 (Ref. 2.5.10).

2.0 Design Information

2.1 This modification includes the following activities:

2.1.1 Installation of a new STP in Waste Tank 49H Riser B5.

2.1.2 Installation of new stainless steel waste transfer line core (WTS-L-1665) with a carbon steel jacket piping as a secondary containment across the tank top and tie-in to existing waste transfer piping (See Ref. 2.5.2 and 2.5.11).

2.2 The portion of WTS-L-651A being rerouted is per Technical Report (TRT) M-TRT-H-00099 (Ref. 2.5.11) and includes the following activities:

2.2.1 Perform stress analysis on subject piping.

2.2.2 Document the subject piping meets Code requirements.

2.2.3 Document no physical changes are required to subject piping.

2.2.4 Perform hydro test on subject piping.

2.2.5 Document subject piping was monitored for movement and leak tightness during hydro test.

2.2.6 Ensure all investigations, analyses, and test records become permanent record.

2.2.7 Ensure over-pressurization is prevented.

2.3 Applicable SRS Engineering Standards and Engineering Guides:

2.3.1 SRS Engineering Standard 15060, Rev. 19, ASME B31.3 Additional Requirements for SRS Piping Systems

2.3.2 SRS Engineering Standard 05057, Rev. 5, Control of Welding

2.3.3 SRS Engineering Guides 15060-G, Rev. 8, Application of ASME B31.3

2.4 Applicable National Codes & Standards:

2.4.1 ASME B31.3-2016 Edition, Process Piping Code

2.5 Reference Documents

2.5.1 WSRC-OS-94-42, Administrative Document Number 89-05-FF, Federal Facility Agreement for the Savannah River Site, August 16, 1993

2.5.2 M-DCP-H-09017, Rev. 3, Waste Tank 49H Process Modifications

2.5.3 M-DCP-H-15004, Rev. 0, Tank 49 Jacketed Transfer Line Installation

2.5.4 M-DCP-H-15016, Rev. 1, Tank 49 Jacketed Transfer Line Installation

2.5.5 T-CLC-H-01028, Rev. 7, Tank 49H Riser B5 STP Discharge to Waste Transfer Piping Analysis

2.5.6 M-ML-H-07285, Rev. 5, Tank 49H Process Modifications

2.5.7 Assessment Report, Phase II for the F and H Area High Level Radioactive Waste Tank Farms, Rev. 0, 1991

2.5.8 M-ESR-H-00465, Rev. 0, Federal Facility Agreement Assessment Report for Waste Tank 49H New Transfer Line and Tie-In to Rock Bank

- 2.5.9 M-ESR-H-00462, Rev. 0, Federal Facility Agreement Assessment Report for Waste Tank 49H New Transfer Line Modification
- 2.5.10 M-ESR-H-00474, Rev. 0, Waste Tank 49H New Transfer Line Installation
- 2.5.11 M-TRT-H-00099, Rev. 0, Tank 49 Rerating Core Line WTS-L-651A
- 2.5.12 C-DCF-H-04424, Rev. 0, HTF Tank 49 – Riser B5 STP Discharge to SWPF Underground Transfer Line Support
- 2.5.13 M-QIP-H-00375, Rev. 2, Waste Tank 49H Process Modifications Quality Inspection Plan
- 2.5.14 C-DCF-H-04467, Rev. 2, Waste Tank 49H Process Modifications Transfer Line Supports
- 2.5.15 M-DCF-H-13187, Rev.1, Tank 49 Riser B5 Test Spool Assembly Addition
- 2.5.16 M-DCF-H-13272, Rev. 0, Tank 49 Riser B5 Turnover Boundary Modification
- 2.5.17 P-DCF-H-02173, Rev. 1, Tank 49 – Riser B5, Transfer Line Support
- 2.5.18 J-DCF-H-05740, Rev. 0, Update LPS Probe (LE-2006) ASPD Records
- 2.5.19 M-DCF-H-13172, Rev. 0, Grayloc Connector Hinge Pins
- 2.5.20 E-DCF-H-08769, Rev. 0, Tank 49 Heat Tracing
- 2.5.21 E-DCF-H-08820, Rev. 0, Tank 49 B3/B5 Electrical As Built Condition
- 2.5.22 E-DCF-H-08799, Rev. 0, Tank 49 Re-routing of Power Cable from Raceway “R588” to Raceway “R591”
- 2.5.23 M-DCF-H-13297, Rev. 0, Tank 49 IW Hose Modification
- 2.5.24 P-DCF-H-02180, Rev. 0, Tank 49 – Riser B4, Transfer Line

3.0 Waste Compatibility

The modifications in the scope of this assessment and their waste characterization will remain unchanged. The materials of construction used in the modifications are compatible with the waste stream. The modifications will not introduce any other materials that will invalidate the existing waste characterization.

4.0 Foundation Support

The integrity of the waste transfer line WTS-L-1665 and all the pipe supports were evaluated and were found to be satisfactory, see T-CLC-H-01028 (Ref. 2.5.5).

5.0 Leak Detection and Past Leaks

The Leak Detection for the new transfer lines will continue to meet Section IX and Appendix B of the FFA. These lines will still follow the design presented in Section 3.7.2 of the Phase II Assessment Report (Ref. 2.5.7), for Type II transfer lines.

6.0 Inspections

Piping material, fabrication, assembly, erection, inspection, examination, and testing shall be in accordance with:

- ASME Code B31.3 -2016 (Ref. 2.4.1)
- WSRC-TM-95-1, SRS Engineering Standards 15060 (Ref. 2.3.1)
- WSRC-TM-95-1, SRS Engineering Standards 05057 (Ref. 2.3.2)
- WSRC-IM-95-58, SRS Engineering Guide 15060-G (Ref. 2.3.3)
- Piping Data Sheet Package M-ML-H-07285 (Ref. 2.5.6)

Examination and leak testing inspections requirements for the transfer line are contained in M-TRT-H-00099 (Ref. 2.5.11) and M-QIP-H-00375 (Ref. 2.5.13).

7.0 Determination of Secondary Containment

The primary and secondary containments associated with this modification will replicate the existing line arrangement which satisfies FFA requirements and the requirements stated in Section 2.1 of the Phase II Assessment Report (Ref. 2.5.7) as previously evaluated in Section 3.6.6 of this same report. Therefore, no further assessment is needed.

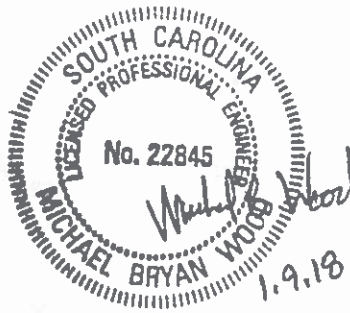
8.0 Professional Engineer Certifications (Design and Construction)

Design

This assessment report was prepared under my supervision and direction. I certify that the design for the modifications detailed in M-DCP-H-09017 and associated DCFs and M-TRT-H-00099 comply with applicable engineering standards and the requirements of Appendix B of the Federal Facility Agreement. These standards have been generally accepted as adequate in demonstrating leak tightness.

Stamp

Name: MICHAEL B. WOOD
License Number: 22845

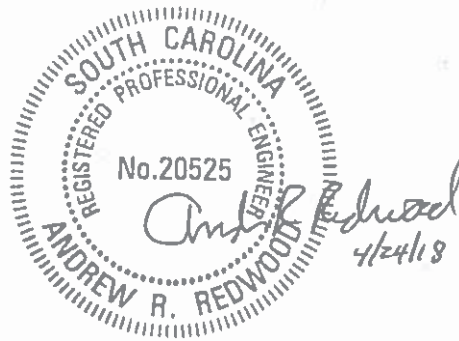


Construction and Installation

I have conducted an inspection, to the extent possible, of the completion of the modified system. Based upon the inspection, I certify that, to the best of my knowledge, information, and belief, the installation of the new transfer line was constructed in accordance with the approved design in M-DCP-H-09017 and associated DCFs and M-TRT-H-00099. The tests conducted to demonstrate leak tightness were found acceptable.

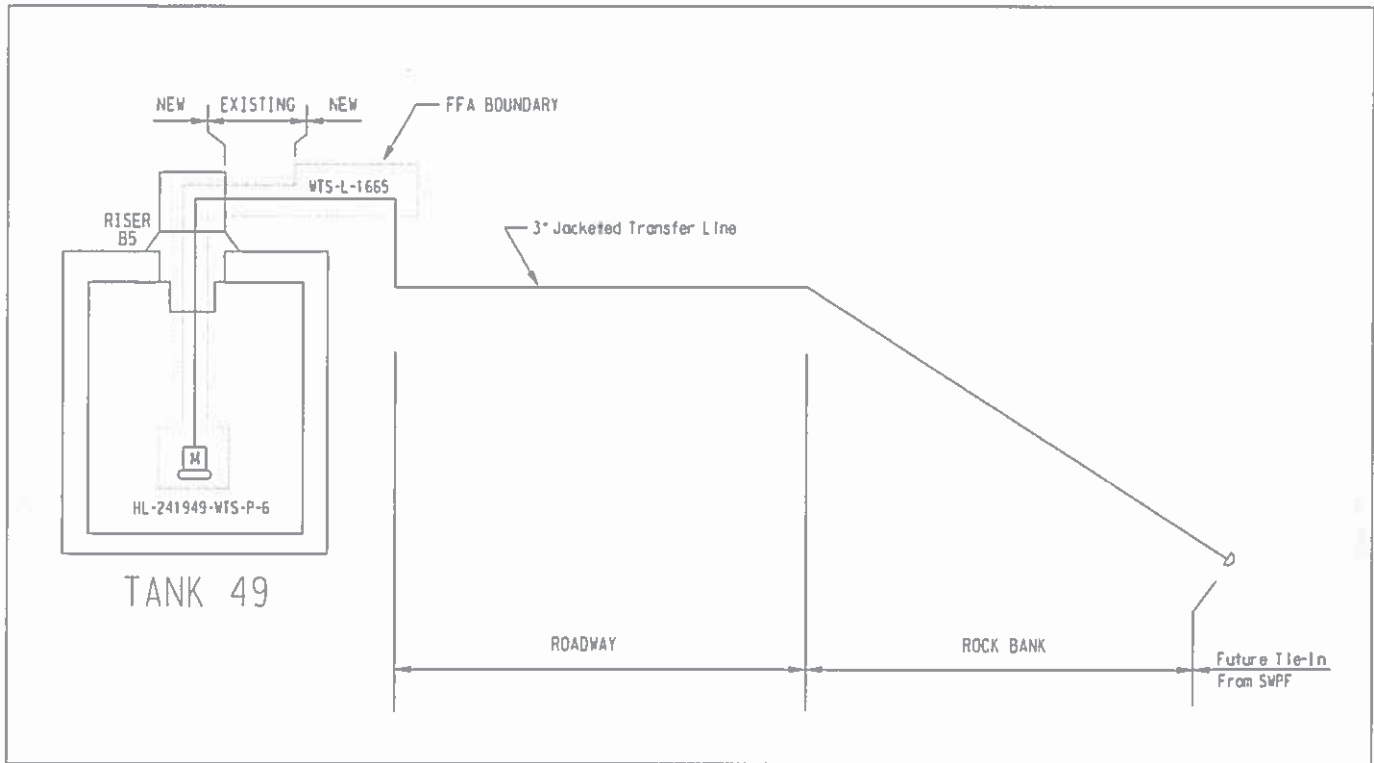
Stamp

Name: Andrew R. Redwood
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9.0 ATTACHMENT

9.1 Waste Tank 49H New Waste Transfer Line



Savannah River Site

FEDERAL FACILITY AGREEMENT ASSESSMENT REPORT

FOR

**SWPF Integration Modifications of Interarea
Transfer Lines at the LPPP (511-S)**

M-ESR-S-00164

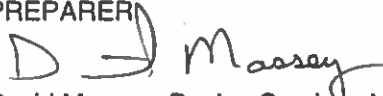

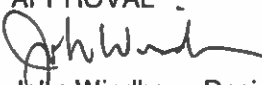

REVISION 1

DISCLAIMER

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APPROVAL SIGNATURES / SUMMARY OF CHANGES

APPROVALS

PREPARER  David Massey, Design Services Mechanical Engineer Project Management, Design and Construction Services	DATE 1.25.18
REVIEWER  Oren Webb, Design Services Mechanical Engineer Project Management, Design and Construction Services	1-25-18
APPROVAL  John Windham, Design Authority, SWPF Integration	1-25-18
APPROVAL  Ashok Gupta, Design Services Project Engineer, Project Management, Design and Construction Services	1/30/18

SUMMARY OF CHANGES

Rev. No	Reason for Change	Pages Affected	Issue Date
0	Initial Issue	All	7/20/2011
1	Complete revision	All	4/30/18

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1.0 Executive Summary

This Assessment Report is being submitted to satisfy requirements of Section IX and Appendix B of the Savannah River Site (SRS) Federal Facility Agreement (FFA, Ref. 2.4.1).

The Salt Waste Processing Facility (SWPF) is a new SRS facility that is designed to treat the salt portion of the High Level Waste inventory. Prior to facility operation, the Liquid Waste transfer system at H-Tank Farm will be connected to the SWPF through a series of underground jacketed waste transfer lines. The resulting waste streams will be disposed of through vitrification at the Defense Waste Processing Facility (DWPF) or by incorporation into grout at the Saltstone Processing Facility (SPF).

The scope of this FFA is the modification of existing underground jacketed waste transfer lines. Tie-ins will be made underground east of the Low Point Pump Pit (LPPP). Existing transfer line SDP1 will no longer terminate at the LPPP Sludge Cell nozzle 6. Instead, it will terminate at the LPPP Recycle Cell nozzle 7. The remaining piping at nozzle 6 will be capped and relabeled SDP1A. Existing transfer line SDP25 will no longer terminate at the LPPP Sludge Cell nozzle 5. Instead, it will terminate at the LPPP Precipitate Cell nozzle 6. The remaining piping at nozzle 5 will be capped and relabeled SDP25A. Additionally, a 16" elbow on waste transfer line jacket SDP24 will be replaced with a 10" tee and the core elbow will be replaced.

These modifications will be conducted per Design Change Package P-DCP-S-10005 (Ref. 2.4.2) and associated Design Change Forms, P-DCF-S-00594 (Ref. 2.4.7), P-DCF-S-00599 (Ref. 2.4.8), P-DCF-S-00606 (Ref. 2.4.9), P-DCF-S-00623 (Ref. 2.4.10), C-DCF-S-00768 (Ref. 2.4.11), C-DCF-S-00772 (Ref. 2.4.12), C-DCF-S-00775 (Ref. 2.4.13), C-DCF-S-00776 (Ref. 2.4.14), P-DCF-S-00626 (Ref. 2.4.15), C-DCF-S-00781 (Ref. 2.4.16) and C-DCF-S-00774 (Ref. 2.4.17). This task is not divided into two or more FFA reports.

2.0 Design Information

2.1 This modification includes the following activities:

- 2.1.1 Cut underground stainless steel waste transfer line core (SDP1) and secondary containment carbon steel jacket, previously connected to nozzle 6 at the LPPP Sludge Cell, and connect to the nozzle 7 stub out outside of the Recycle Tank Cell at the LPPP (See Ref. 2.4.2 and Attachment 9.1).

- 2.1.2 Cap the remaining portion of jacketed underground waste transfer piping connected to nozzle 6 at the LPPP Sludge Cell and relabel the core line from SDP1 to SDP1A (See Ref. 2.4.2 and Attachment 9.1).
- 2.1.3 Cut underground stainless steel waste transfer line core (SDP25) and secondary containment carbon steel jacket, previously connected to nozzle 5 at the LPPP Sludge Cell, and connect to the nozzle 6 at the Precipitate Cell at the LPPP (See Ref. 2.4.2 and Attachment 9.1).
- 2.1.4 Cap the remaining portion of jacketed underground waste transfer piping connected to nozzle 5 at the LPPP Sludge Tank Cell and relabel the core line from SDP25 to SDP25A (See Ref. 2.4.2 and Attachment 9.1).
- 2.1.5 Replace 16" elbow on waste transfer line jacket SDP24 with a 10" tee and replace the SDP24 core long radius elbow with a short radius elbow (See Ref. 2.4.2 and Attachment 9.1).

2.2 Applicable SRS Engineering Standards and Engineering Guides:

- 2.2.1 Engineering Standards Manual, WSRC-TM-95-1, Rev. 113:
 - 2.2.1.1 15060, Rev. 19, Additional Requirements for SRS Piping
 - 2.2.1.2 05057, Rev. 5, Control of Welding
- 2.2.2 Engineering Guides Index, WSRC-IM-95-58, Rev. 79:
 - 2.2.2.1 15060-G, Rev. 8, Application of ASME B31.3

2.3 Applicable National Codes & Standards:

- 2.3.1 ASME B31.3-2016 Edition, Process Piping

2.4 Reference Documents

- 2.4.1 WSRC-OS-94-42, Administrative Document Number 89-05-FF, Federal Facility Agreement for the Savannah River Site, August 16, 1993
- 2.4.2 P-DCP-S-10005, Rev. 1, SWPF Integration 511-S-WTL MOD's to 221-S and H Tank Farm
- 2.4.3 M-ML-S-00014, Rev. 2, SWPF Integration Transfer Line Tie-Ins
- 2.4.4 Assessment Report, Phase II for the F and H Area High Level Radioactive Waste Tank Farms, Rev. 0, 1991
- 2.4.5 T-CLC-S-00270, Rev. 2, Pipe Stress Evaluation of Underground Waste Transfer Line Connected to near Low Point Pump Pit for SWPF Tie-In
- 2.4.6 T-CLC-S-00278, Rev. 3, Seismic Evaluation of DWPF Transfer Line for SDP 24/25
- 2.4.7 P-DCF-S-00594, Rev. 0, SDI – WTL Mod's 511-S Weir Plate Detail

- 2.4.8 P-DCF-S-00599, Rev. 0, SWPF Integration-511-S-WTL Mod's to 211-S and H Tank Farm, Remove Holds
- 2.4.9 P-DCF-S-00606, Rev. 0, SWPF Integration, Tie-in and Closure Welds at 511-S Underground Transfer Lines
- 2.4.10 P-DCF-S-00623, Rev. 2, SWPF Integration, 511-S WTL Mod's. to line SDP25 Routing
- 2.4.11 C-DCF-S-00768, Rev. 0, SWPF Integration Pipe Support Location Tolerances
- 2.4.12 C-DCF-S-00772, Rev. 0, REA SWPF-51 Support Location Tolerance
- 2.4.13 C-DCF-S-00775, Rev. 1, SWPF Integration SDP25 Line Support Changes and Cushion Details
- 2.4.14 C-DCF-S-00776, Rev. 0, 511-S Building Excavation Gilsulate Tolerance Changes for P-DCP-S-10005 Rev 1
- 2.4.15 P-DCF-S-00626, Rev. 1, SWPF, 511-S WTL MOD's, SDP24 and SDP25 Tie-in Modifications for Existing Field Conditions
- 2.4.16 C-DCF-S-00781, Rev. 0, Core Pipe Support Changes
- 2.4.17 C-DCF-S-00774, Rev. 1, 511-S Building Excavation CLSM as Backfill
- 2.4.18 C-CLC-S-00216, Rev. 1, U.G. Piping & Foundations @ LPPP (511-S) for SWPF Tie-in (SDI)

3.0 Waste Compatibility

The modifications in the scope of this assessment and their waste characterization will remain unchanged. The materials of construction used in the modifications are compatible with the waste stream. The modifications will not introduce any other materials that will invalidate the existing waste characterization.

4.0 Foundation Support

The integrity of waste transfer lines SDP1, SDP1A, SDP24, SDP25, and SDP25A and associated pipe supports were evaluated and were found to be satisfactory, see calculations T-CLC-S-00270 (Ref. 2.4.5), T-CLC-S-00278 (Ref. 2.4.6), and C-CLC-S-00216 (Ref. 2.4.18).

5.0 Leak Detection and Past Leaks

The Leak Detection for the modified transfer lines will continue to meet Section IX and Appendix B of the FFA. These lines will still follow the design presented in Section 3.7.2 of the Phase II Assessment Report, for Type II transfer lines and will be sloped toward existing leak detection boxes.

6.0 Inspections

Piping material, cleanliness, fabrication, assembly, erection, inspection, examination, and testing shall be in accordance with:

- ASME Code B31.3-2016 (Ref. 2.3.1)
- SRS Engineering Standard 15060 (Ref. 2.2.1.1)
- SRS Engineering Standard 05057 (Ref. 2.2.1.2)
- SRS Engineering Guide 15060-G (Ref. 2.2.2.1)
- Piping Data Sheet Package M-ML-S-00014 (Ref. 2.4.3)

Examination and leak testing inspection requirements for the transfer lines are contained in the Quality Inspection Plan of P-DCP-S-10005 (Ref. 2.4.2).

7.0 Determination of Secondary Containment

The primary and secondary containments associated with this modification will replicate the existing line arrangement which satisfies FFA requirements and the requirements stated in Section 2.1 of the Phase II Assessment Report (Ref. 2.4.4) as previously evaluated in Section 3.7.2 of this same report. Therefore, no further assessment is needed.

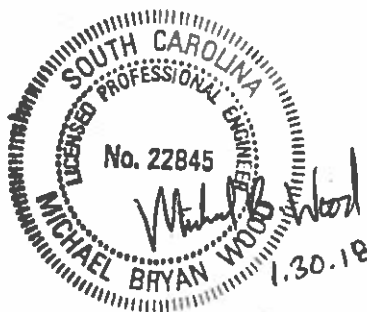
8.0 Professional Engineer Certifications (Design and Construction)

Design

This assessment report was prepared under my supervision and direction. I certify that the design for the modifications detailed in Design Change Package P-DCP-S-10005 and associated DCFs comply with applicable engineering standards and the requirements of Appendix B of the Federal Facility Agreement. These standards have been generally accepted as adequate in demonstrating leak tightness.

Stamp

Name: MICHAEL B. WOOD
License Number: 22845

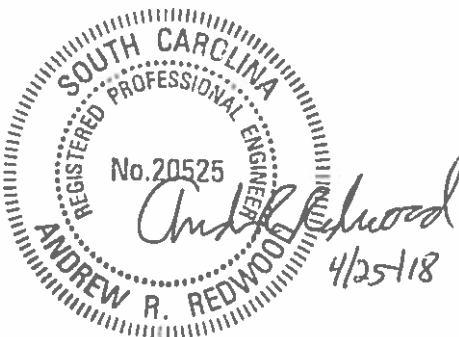


Construction and Installation

I have conducted an inspection, to the extent possible, of the completion of the modified system. Based upon the inspection, I certify that, to the best of my knowledge, information, and belief, the installation of the new waste transfer line was constructed in accordance with the approved design in Design Change Package P-DCP-S-10005 and associated DCFs. The tests conducted to demonstrate leak tightness were found acceptable.

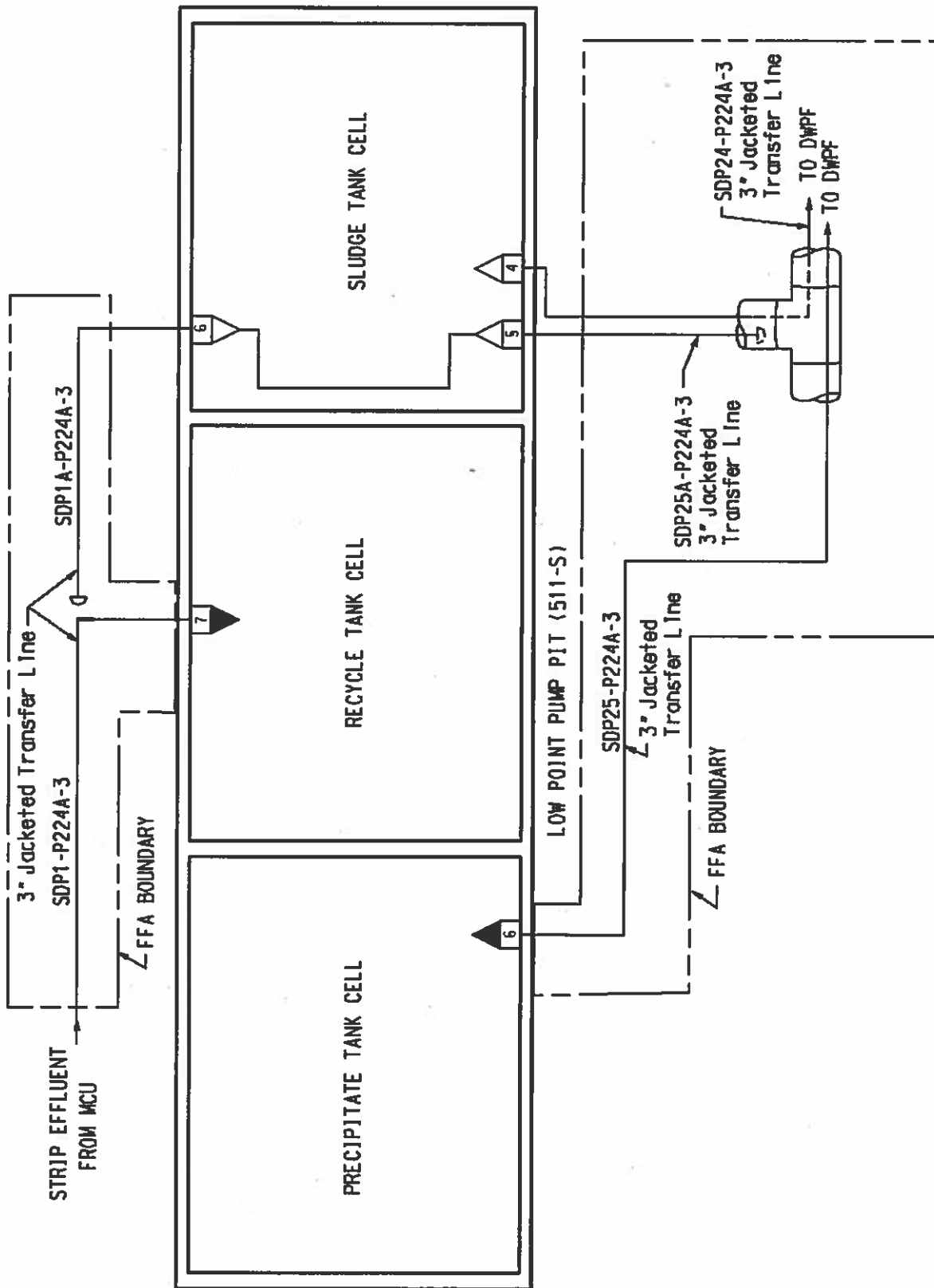
Stamp

Name: Andrew R. Redwood
License Number: 20525



9.0 ATTACHMENT

9.1 Modified Waste Transfer Piping at the LPPP (Building 511-S)



Savannah River Site

FEDERAL FACILITY AGREEMENT ASSESSMENT REPORT

FOR

**SWPF Integration Modifications of Interarea Transfer
Lines Downstream of the LPPP (511-S)**

M-ESR-S-00195

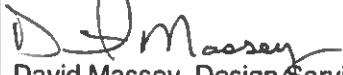

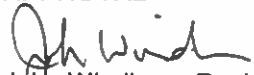

REVISION 0

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APPROVAL SIGNATURES / SUMMARY OF CHANGES

APPROVALS

<p>PREPARER  David Massey, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>DATE 1.25.18</p>
<p>REVIEWER  Oren Webb, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>1-25-18</p>
<p>APPROVAL  John Windham, Design Authority, SWPF Integration</p>	<p>1-25-18</p>
<p>APPROVAL  Ashok Gupta, Design Services Project Engineer, Project Management, Design and Construction Services</p>	<p>1/30/18</p>

SUMMARY OF CHANGES

Rev. No	Reason for Change	Pages Affected	Issue Date
0	Initial Issue	All	4/30/18

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1.0 Executive Summary

This Assessment Report is being submitted to satisfy requirements of Section IX and Appendix B of the Savannah River Site (SRS) Federal Facility Agreement (FFA, Ref. 2.4.1).

The Salt Waste Processing Facility (SWPF) is a new SRS facility that is designed to treat the salt portion of the High Level Waste inventory. Prior to facility operation, the Liquid Waste transfer system at H-Tank Farm will be connected to the SWPF through a series of underground jacketed waste transfer lines. The resulting waste streams will be disposed of through vitrification at the Defense Waste Processing Facility (DWPF) or by incorporation into grout at the Saltstone Processing Facility (SPF). The purpose of the SWPF Integration program portfolio of projects is to provide a waste transfer path from the H-Tank Farm and the SWPF and between the SWPF and the DWPF.

The scope of this FFA is the modification of existing jacketed waste transfer lines from the Low Point Pump Pit (LPPP) to a location close to the interface with SWPF. The final tie-in to the SWPF lines will be made at a later date under a separate package of work when appropriate regulatory requirements have been met. All tie-ins will be made underground, east of the LPPP. To accomplish this, a new transfer line, PCP001 will be tied into the LPPP Recycle Cell Nozzle 6. Additionally, a second new line, PCP116 will be tied in at the LPPP Precipitate Cell Nozzle 3. A third new line, SDP119, will be tied in at the LPPP Precipitate Cell Nozzle 7. All three lines and associated jackets will be terminated and capped near the SWPF ICD-10 Interface (Ref. 2.4.6).

These modifications will be conducted per Design Change Package P-DCP-S-10006 (Ref. 2.4.2) and associated Design Change Forms, C-DCF-S-00745 (Ref. 2.4.7), C-DCF-S-00741 (Ref. 2.4.8), P-DCF-S-00592 (Ref. 2.4.9), P-DCF-S-00600 (Ref. 2.4.10), P-DCF-S-00607 (Ref. 2.4.11), M-DCF-S-03277 (Ref. 2.4.12), C-DCF-S-00769 (Ref. 2.4.13), C-DCF-S-00777 (Ref. 2.4.14), and C-DCF-S-00774 (Ref. 2.4.15).

This task is not divided into two or more FFA reports.

2.0 Design Information

2.1 This modification includes the following activities as depicted in Attachment 9.1:

- 2.1.1 Remove the caps from the LPPP Precipitate Cell Nozzle 7 (PCP18) stub jacket and stub core. Connect a new carbon steel-jacketed, stainless steel-core line to the Nozzle 7 stub core and jacket. The new core line is identified as SDP119 and is terminated and capped near the SWPF IDC-10 interface. The jacket is expanded near the termination and capped to accept the end of a future, spare line from SWPF.
- 2.1.2 Remove the caps from the LPPP Precipitate Cell Nozzle 3 (PCP20) stub jacket and stub core. Connect a new carbon-steel jacketed, stainless steel-core line to the Nozzle 3 stub core and stub jacket. The new core line is identified as PCP116 and is terminated and capped near the SWPF IDC-10 interface. The jacket for this line combines with the jacket from 2.1.3 below. The combined jacket terminates and is capped near the SWPF ICD-10 interface.
- 2.1.3 Remove the caps from the LPPP Recycle Cell Nozzle 6 (RCZ27) stub jacket and stub core. Connect a new carbon-steel jacketed, stainless steel core line to the Nozzle 6 stub core and stub jacket. The new core line is identified as PCP001 and is terminated and capped near the SWPF IDC-10 interface. The jacket is combined with the jacket from 2.1.2 above. The combined jacket terminates and is capped near the SWPF ICD-10 interface.

2.2 Applicable SRS Engineering Standards and Engineering Guides:

- 2.2.1 Engineering Standards Manual, WSRC-TM-95-1, Rev. 113:
 - 2.2.1.1 15060, Rev. 19, Additional Requirements for SRS Piping
 - 2.2.1.2 05057, Rev. 5, Control of Welding
- 2.2.2 Engineering Guides Index, WSRC-IM-95-58, Rev. 79:
 - 2.2.2.1 15060-G, Rev. 8, Application of ASME B31.3

2.3 Applicable National Codes & Standards:

- 2.3.1 ASME B31.3-2016 Edition, Process Piping Code

2.4 Reference Documents

- 2.4.1 WSRC-OS-94-42, Administrative Document Number 89-05-FF, Federal Facility Agreement for the Savannah River Site, August 16, 1993.
- 2.4.2 P-DCP-S-10006, Rev. 1, SWPF-511-S-WTL MOD's From LPPP to SWPF
- 2.4.3 M-ML-S-00014, Rev. 2, SWPF Integration Transfer Line Tie-Ins

- 2.4.4 Assessment Report, Phase II for the F and H Area High Level Radioactive Waste Tank Farms, Rev. 0, 1991
- 2.4.5 T-CLC-S-00337, Rev. 1, SDI-511S, Piping Analysis of WTL from LPPP to SWPF
- 2.4.6 V-ESR-J-00010, Rev. 6, Waste Transfer Interference Control Document (ICD-10)
- 2.4.7 C-DCF-S-00745, Rev. 1, REA SWPF-26 and SWPF-52 Modification to Support Type R and Type S
- 2.4.8 C-DCF-S-00741, Rev., 0, SWPF-511-S-WTL Modification to Interim Drawing's Core Support Details
- 2.4.9 P-DCF-S-00592, Rev. 0, SDI – WTL Mod's at 511S, Pipe Bend Requirement Descriptions
- 2.4.10 P-DCF-S-00600, Rev. 0, SWPF Integration-511-S-WTL Modifications from LPPP to SWPF, Remove Holds
- 2.4.11 P-DCF-S-00607, Rev. 0, SWPF Integration, Tie-In and Closure Welds at 511-S Underground Transfer Lines
- 2.4.12 M-DCF-S-03277, Rev. 0, SWPF-511-S-WTL MOD's From LPPP to SWPF
- 2.4.13 C-DCF-S-00769, Rev. 0, SWPF Integration Support Tolerances
- 2.4.14 C-DCF-S-00777, Rev. 0, 511-S Building Excavation Gilsulate Tolerances Changes to P-DCP-S-10006 Rev. 1.
- 2.4.15 C-DCF-S-00774, Rev. 1, 511-S Building Excavation CLSM as Backfill

3.0 Waste Compatibility

The modifications in the scope of this assessment and their waste characterization will remain unchanged. The materials of construction used in the modifications are compatible with the waste stream. The modifications will not introduce any other materials that will invalidate the existing waste characterization.

4.0 Foundation Support

The integrity of the waste transfer lines PCP001, PCP116 and SDP119 and associated pipe supports were evaluated and were found to be satisfactory, see calculations T-CLC-S-00337 (Ref. 2.4.5).

5.0 Leak Detection and Past Leaks

The Leak Detection for the modified transfer lines will continue to meet Section IX and Appendix B of the FFA. These lines will still follow the design presented in Section 3.7.2 of the Phase II Assessment Report (Ref. 2.4.4), for Type II transfer lines and will be sloped toward existing leak detection boxes.

6.0 Inspections

Piping material, fabrication, assembly, erection, inspection, examination, and testing shall be in accordance with:

- ASME Code B31.3-2016 (Ref. 2.3.1)
- SRS Engineering Standard 15060 (Ref. 2.2.1.1)
- SRS Engineering Standard 05057 (Ref. 2.2.1.2)
- SRS Engineering Guide 15060-G (Ref. 2.2.2.1)
- Piping Data Sheet Package M-ML-S-00014 (Ref. 2.4.3)

Examination and leak testing inspection requirements for the transfer lines are contained in the Quality Inspection Plan of P-DCP-S-10006 (Ref. 2.4.2).

7.0 Determination of Secondary Containment

The primary and secondary containments associated with this modification will replicate the existing line arrangement which satisfies FFA requirements and the requirements stated in Section 2.1 of the Phase II Assessment Report (Ref. 2.4.4) as previously evaluated in Section 3.7.2 of this same report. Therefore, no further assessment is needed.

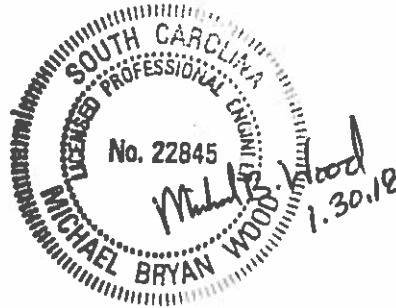
8.0 Professional Engineer Certifications (Design and Construction)

Design

This assessment report was prepared under my supervision and direction. I certify that the design for the modifications detailed in Design Change Package P-DCP-S-10006 and associated DCFs comply with applicable engineering standards and the requirements of Appendix B of the Federal Facility Agreement. These standards have been generally accepted as adequate in demonstrating leak tightness.

Stamp

Name: *MICHAEL B. WOOD*
License Number: *22845*

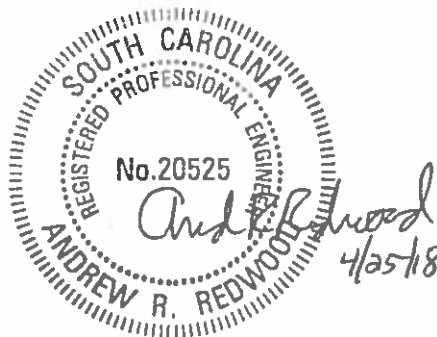


Construction and Installation

I have conducted an inspection, to the extent possible, of the completion of the modified system. Based upon the inspection, I certify that, to the best of my knowledge, information, and belief, the installation of the new waste transfer lines were constructed in accordance with the approved design in Design Change Package P-DCP-S-10006 and associated DCFs. The tests conducted to demonstrate leak tightness were found acceptable.

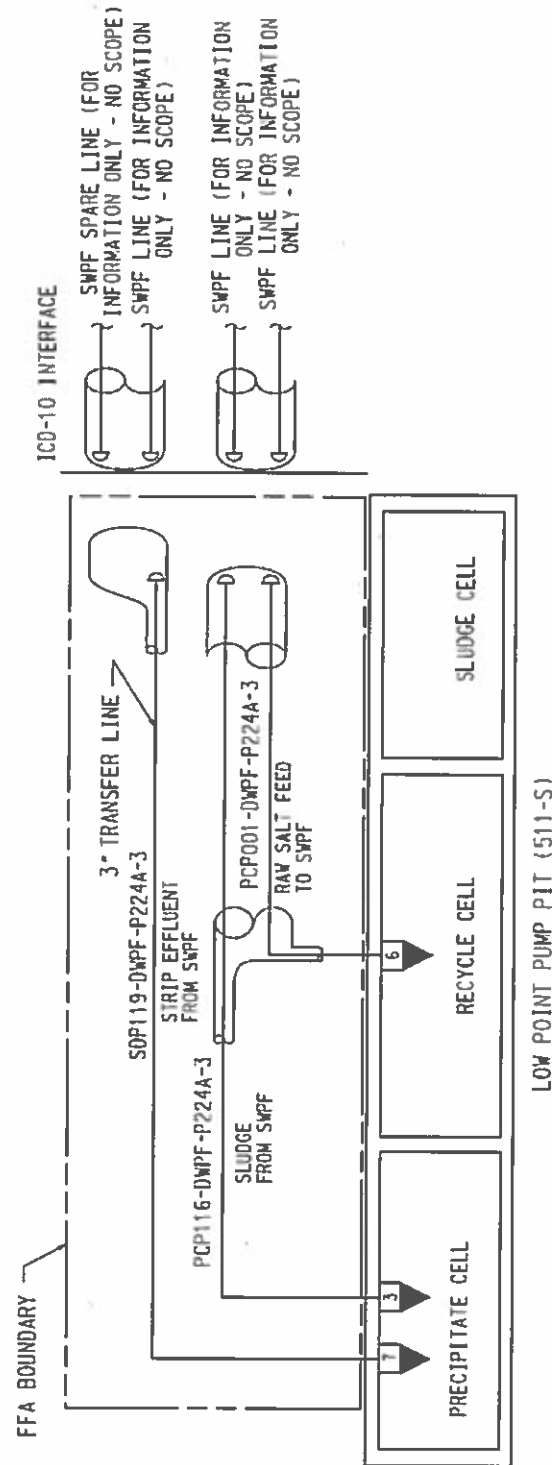
Stamp

Name: *Andrew R. Redwood*
License Number: *20525*



9.0 ATTACHMENT

9.1 Modified Waste Transfer Piping at the LPPP (Building 511-S)



Savannah River Site

FEDERAL FACILITY AGREEMENT ASSESSMENT REPORT

FOR

**Tie-in of Interarea LPPP (511-S) Downstream Transfer Lines and
SWPF Transfer Lines**

M-ESR-S-00196

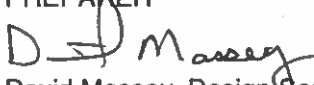
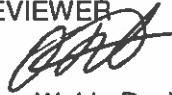


REVISION 0

DISCLAIMER

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APPROVAL SIGNATURES / SUMMARY OF CHANGES

APPROVALS

<p>PREPARER  David Massey, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>DATE 1.25.18</p>
<p>REVIEWER  Oren Webb, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>1-25-18</p>
<p>APPROVAL  John Windham, SWPF Integration System Design Authority, DWPF Engineering</p>	<p>1-25-18</p>
<p>APPROVAL  Ashok Gupta, Design Services Project Engineer, Project Management, Design and Construction Services</p>	<p>1/30/18</p>

SUMMARY OF CHANGES

Rev. No	Reason for Change	Pages Affected	Issue Date
0	Initial Issue	All	4/30/18

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1.0 Executive Summary

This Assessment Report is being submitted to satisfy requirements of Section IX and Appendix B of the Savannah River Site (SRS) Federal Facility Agreement (FFA, Ref. 2.4.1).

The Salt Waste Processing Facility (SWPF) is a new SRS facility that is designed to treat the salt portion of the High Level Waste inventory. Prior to facility operation, the Liquid Waste transfer system at H-Tank Farm will be connected to the SWPF through a series of underground jacketed waste transfer lines. The resulting waste streams will be disposed of through vitrification at the Defense Waste Processing Facility (DWPF) or by incorporation into grout at the Saltstone Processing Facility (SPF). The purpose of the SWPF Integration program portfolio of projects is to provide a waste transfer path from the H-Tank Farm and the SWPF and between the SWPF and the DWPF.

The scope of this FFA is the final tie-in of the SWPF lines. All tie-ins will be made underground, east of the Low Point Pump Pit (LPPP) at the ICD-10 interface (Ref. 2.4.6). To accomplish this, 1) three sections of pipe will be added to connect SWPF and SRR cores and 2) two sections of jacket will be added to connect the SRR and SWPF jackets (See Attachment 9.1). Specifically, the changes are

- Connect the SRR core line, PCP001 with the SWPF core line, HLW-0001.
- Connect the SRR core line, PCP116 with the SWPF core line, SLU-0116.
- Connect the SRR core line, SDP119, with the SWPF line, AQU-0119.
- Add a section of core line, SDP125 (Capped), to the SWPF spare line, AQU-6585.
- Connect the SRR jacket, containing PCP001 and PCP116 with the SWPF jacket containing HLW-0001 and SLU-0116
- Connect the SRR jacket containing SDP119 and SDP125 cores with the SWPF jacket containing AQU-0119 and AQU-6585.

These modifications will be conducted per Design Change Package P-DCP-S-10007 (Ref. 2.4.2) and associated Design Change Forms (DCF), P-DCF-S-00601 (Ref. 2.4.7), P-DCF-S-00608 (Ref. 2.4.8), P-DCF-S-00614 (Ref. 2.4.9), C-DCF-S-00778 (Ref. 2.4.10), and C-DCF-S-00774 (Ref. 2.4.11). This task is not divided into two or more FFA reports.

2.0 Design Information

2.1 This modification includes the following activities as depicted in Attachment 9.1:

- 2.1.1 Remove the caps from PCP001/PCP116 jacket, SDP119/SDP125 jacket, AQU-0119/AQU-6585 jacket and HLW-0001/SLU-0116 jacket.
- 2.1.2 Remove caps from PCP001, PCP116, SDP119, AQU-0119, AQU-6585, HLW-0001 and SLU-0116 core lines.
- 2.1.3 Connect the SWPF transfer core lines to the corresponding SRR lines:
 - 2.1.3.1 PCP001 to HLW-0001
 - 2.1.3.2 PCP116 to SLU-0116
 - 2.1.3.3 SDP119 to AQU-0119
 - 2.1.3.4 SDP125 to AQU-6585
 - 2.1.3.5 Connect the SRR and SWPF jackets containing PCP001/HLW-0001 and PCP116/SLU-0116
 - 2.1.3.6 Connect the SRR and SWPF jackets containing SDP119/AQU-0119 and SDP125/AQU6585.

2.2 Applicable SRS Engineering Standards and Engineering Guides:

- 2.2.1 Engineering Standards Manual, WSRC-TM-95-1, Rev. 113:
 - 2.2.1.1 15060, Rev. 19, Additional Requirements for SRS Piping
 - 2.2.1.2 05057, Rev. 5, Control of Welding
- 2.2.2 Engineering Guides Index, WSRC-IM-95-58, Rev. 79:
 - 2.2.2.1 15060-G, Rev. 8, Application of ASME B31.3

2.3 Applicable National Codes & Standards:

- 2.3.1 ASME B31.3-2016 Edition, Process Piping Code

2.4 Reference Documents

- 2.4.1 WSRC-OS-94-42, Administrative Document Number 89-05-FF, Federal Facility Agreement for the Savannah River Site, August 16, 1993
- 2.4.2 P-DCP-S-10007, Rev. 1, SWPF Integration-511-SWTL Mod's at SWPF Interface Control Point
- 2.4.3 M-ML-S-00014, Rev. 2, SWPF Integration Transfer Line Tie-Ins
- 2.4.4 Assessment Report, Phase II for the F and H Area High Level Radioactive Waste Tank Farms, Rev. 0, 1991
- 2.4.5 T-CLC-S-00337, Rev. 1, SDI-511-S Piping Analysis of WTL from LPPP to SWPF
- 2.4.6 V-ESR-J-00010, Rev. 6, Waste Transfer Interference Control Document (ICD-10)

- 2.4.7 P-DCF-S-00601, Rev. 0, SWPF Integration – 511-S-WTL Mod's at SWPF Interface Control Point, Remove Holds
- 2.4.8 P-DCF-S-00608, Rev. 0, SWPF Integration, Tie-in and Closure Welds at 511-S Underground Transfer Lines.
- 2.4.9 P-DCF-S-00614, Rev. 0, SWPF Integration, Modify Working Point Dimensions for Transfer Line Jacketed Piping.
- 2.4.10 C-DCF-S-00778, Rev. 0, 511-S Building Excavation Gilsulate Tolerance Changes to P-DCP-S-10007, Rev. 1
- 2.4.11 C-DCF-S-00774, Rev. 1, 511-S Building Excavation CLSM as Backfill
- 2.4.12 T-CLC-S-00339, Rev. 1, Evaluation of Anchor Blocks for Transfer Lines at DWPF & SWPF

3.0 Waste Compatibility

The modifications in the scope of this assessment and their waste characterization will remain unchanged. The materials of construction used in the modifications are compatible with the waste stream. The modifications will not introduce any other materials that will invalidate the existing waste characterization.

4.0 Foundation Support

The integrity of the waste transfer lines PCP001, PCP116 and SDP119 and associated pipe supports were evaluated and were found to be satisfactory, see calculations T-CLC-S-00337 (Ref. 2.4.5) and T-CLC-S-00339 (Ref. 2.4.12). SDP125 is a spare line without a designated service and will be evaluated when a service is identified.

5.0 Leak Detection and Past Leaks

The Leak Detection for the modified transfer lines will continue to meet Section IX and Appendix B of the FFA. These lines will still follow the design presented in Section 3.7.2 of the Phase II Assessment Report (Ref. 2.4.4), for Type II transfer lines and will be sloped toward existing leak detection boxes.

6.0 Inspections

Piping material, fabrication, assembly, erection, inspection, examination, and testing shall be in accordance with:

- ASME Code B31.3-2016 (Ref. 2.3.1)
- SRS Engineering Standard 15060 (Ref. 2.2.1.1)
- SRS Engineering Standard 05057 (Ref. 2.2.1.2)
- SRS Engineering Guide 15060-G (Ref. 2.2.2.1)
- Piping Data Sheet Package M-ML-S-00014 (Ref. 2.4.3)

Examination and leak testing inspection requirements for the transfer lines are contained in the Quality Inspection Plan of P-DCP-S-10007 (Ref. 2.4.2).

7.0 Determination of Secondary Containment

The primary and secondary containments associated with this modification will replicate the existing line arrangement which satisfies FFA requirements and the requirements stated in Section 2.1 of the Phase II Assessment Report (Ref. 2.4.4) as previously evaluated in Section 3.7.2 of the same report. Therefore, no further assessment is needed.

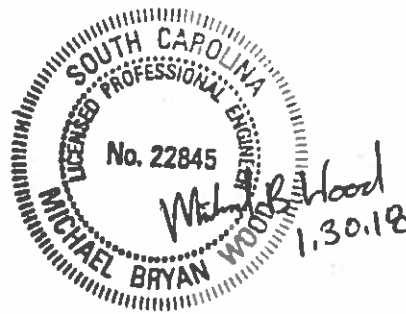
8.0 Professional Engineer Certifications (Design and Construction)

Design

This assessment report was prepared under my supervision and direction. I certify that the design for the modifications detailed in Design Change Package P-DCP-S-10007 and associated DCFs comply with applicable engineering standards and the requirements of Appendix B of the Federal Facility Agreement. These standards have been generally accepted as adequate in demonstrating leak tightness.

Stamp

Name: MICHAEL B. WOOD
License Number: 22845

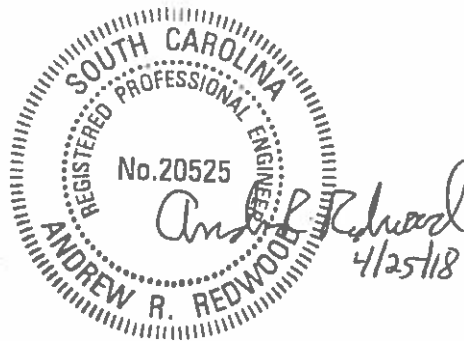


Construction and Installation

I have conducted an inspection, to the extent possible, of the completion of the modified system. Based upon the inspection, I certify that, to the best of my knowledge, information, and belief, the installation of the new waste transfer line was constructed in accordance with the approved design in Design Change Package P-DCP-S-10007 and associated DCFs. The tests conducted to demonstrate leak tightness were found acceptable.

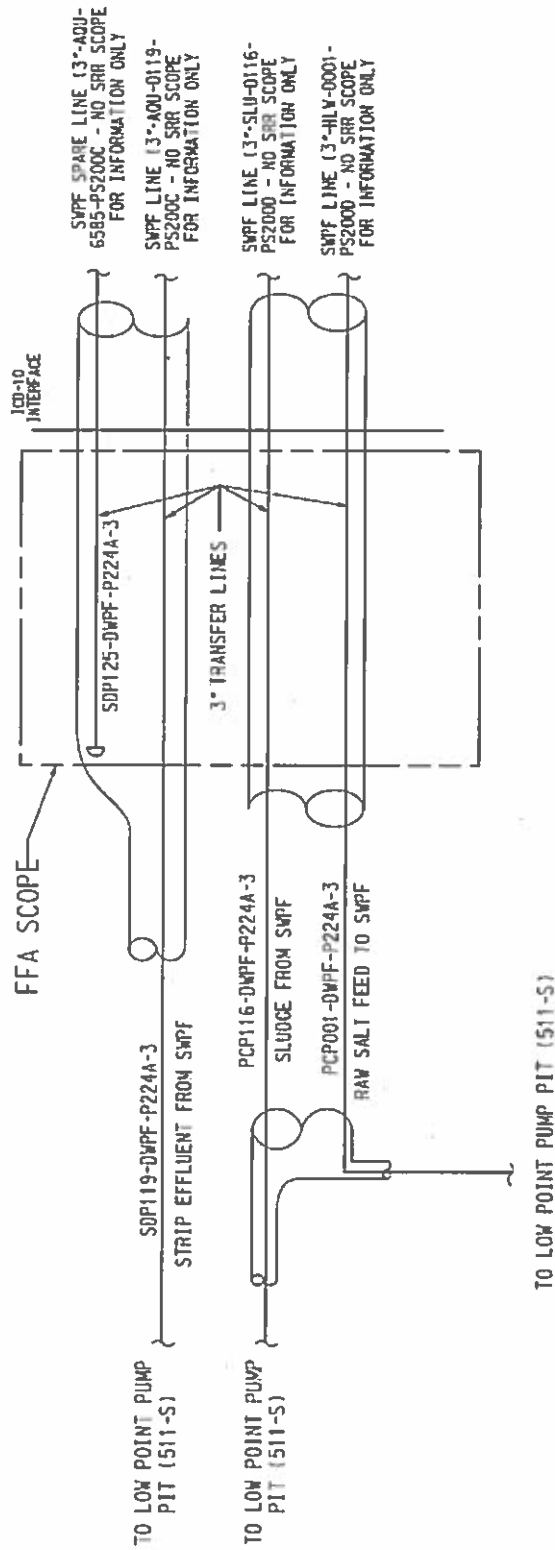
Stamp

Name: Andrew R. Redwood
License Number: 20525



9.0 ATTACHMENT

9.1 Modified Waste Transfer Piping at the LPPP (Building 511-S)



Savannah River Site

FEDERAL FACILITY AGREEMENT ASSESSMENT REPORT

FOR

TCCR SYSTEM

M-ESR-H-00506




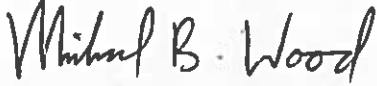
REVISION 0

DISCLAIMER

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APPROVAL SIGNATURES / SUMMARY OF CHANGES

APPROVALS

<p>PREPARER</p>  <p>Jeremy Brackman, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>DATE</p> <p>5-3-17</p>
<p>REVIEWER</p>  <p>Neil Carlson, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>5-3-17</p>
<p>APPROVAL</p>  <p>Robert Voegtlin, Waste Transfer System Design Authority Tank Farm Engineering</p>	<p>5/3/17</p>
<p>APPROVAL</p>  <p>Michael B. Wood, Design Services Project Engineer, Project Management, Design and Construction Services</p>	<p>5.3.17</p>

SUMMARY OF CHANGES

Rev. No	Reason for Change	Pages Affected	Issue Date
0	Initial Issue	All	10/23/2018

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1.0 Executive Summary

This Assessment Report is being submitted to satisfy requirements of Section IX and Appendix B of the Savannah River Site (SRS) Federal Facility Agreement (FFA, Ref. 2.3.1).

Waste Tank 10 has a planned operational closure date in accordance with the SRR Schedule. Based on N-TC-H-00001 (Ref. 2.3.3), Tank 10 contains approximately 194,000 gallons of salt cake and approximately 15,000 gallons of supernatant liquid with an inventory of 100,000 curies of radioactive cesium-137, and no viable transfer path or an installed system with which cesium extraction can be performed, a method of cesium removal is required.

The scope of this FFA is the installation of a Tank Closure Cesium Removal (TCCR) system used to facilitate the removal of cesium-137 from Tank 10 authorized per Design Change Package C-DCP-H-17001 (Ref. 2.3.4). After tank preparation, the supernatant liquid will be pumped to the TCCR system via hose-in-hose transfer lines to a group of ion exchange columns located inside the TCCR system housing where the radioactive cesium-137 is removed and solution is decontaminated. The decontaminated salt solution (DSS) is then discharged to Waste Tank 11 to allow emptying of Tank 10. In addition, a flush/recirculation line is required for TCCR system operation that will be routed back to Tank 10 and used as required.

Temporary Modification HTF-TMC-16-028 (Ref. 2.3.5) will install the hose-in-hose transfer, discharge and flush/recirculation lines under FFA M-ESR-H-00501 (Ref. 2.3.6).

This task is not divided into two or more FFA reports.

2.0 Design Information

2.1 This modification includes the following activity:

2.1.1 Installation of the TCCR system equipment. See Attachment 9.1 for FFA boundary.

2.2 Applicable National Codes & Standards:

2.2.1 Statement of Work X-SOW-H-00002 (Ref. 2.3.7) references all applicable National Codes and Standards

2.3 Reference Documents

- 2.3.1 WSRC-OS-94-42, Administrative Document Number 89-05-FF, Federal Facility Agreement for the Savannah River Site, August 16, 1993
- 2.3.2 Assessment Report, Phase II for the F and H Area High Level Radioactive Waste Tank Farms, Rev. 0, 1991
- 2.3.3 N-TC-H-00001, Rev. 1, Tank 10: Salt Dissolution & Cesium Removal via TCCR
- 2.3.4 C-DCP-H-17001, Rev. 0, TCCR Equipment and Foundation Siting
- 2.3.5 HTF-TMC-16-028, Rev. 0, TCCR Transfer Line Installation
- 2.3.6 M-ESR-H-00501, Rev. 0, Federal Facility Agreement Assessment Report for TCCR Transfer Hose In Hose Between Tank 10, Tank 11 and TCCR
- 2.3.7 X-SOW-H-00002, Rev 4, Tank Closure Cesium Removal (TCCR) System
- 2.3.8 SRRA094421-000112, Rev B, TCCR Enclosure Structural Assembly (Part 1)
- 2.3.9 SRRA094421-000113, Rev B, TCCR Enclosure Structural Assembly (Part 2)

3.0 Waste Compatibility

Waste characterization remains unchanged. The materials of construction used in this modification are compatible with the waste streams. The modification will not introduce any other materials that will invalidate the existing waste characterization.

4.0 Foundation Support

TCCR system equipment was designed in accordance with Statement of Work X-SOW-H-00002 (Ref. 2.3.7) and the structural integrity was evaluated by calculation SRRA094421-000112 (Ref. 2.3.8) and SRRA094421-000113 (Ref. 2.3.9). The results were found to be satisfactory.

5.0 Leak Detection and Past Leaks

The TCCR system will be provided with a leak detection system in the secondary containment designed and operated to detect the failure of the primary containment structure. Camera ports will also be provided at locations which have potential to leak (e.g. flanges, valves, pumps, etc.).

No past leaks exist as this is a new system.

6.0 Inspections

All TCCR system equipment inspection, examination, and testing shall be in accordance with the C-DCP-H-17001 (Ref. 2.3.4) and X-SOW-H-00002 (Ref 2.3.7).

7.0 Determination of Secondary Containment

This modification will add primary containment (piping, valves, vessels, etc.) and secondary containment (TCCR enclosure). Once installation of the TCCR system is installed, the primary and secondary containments will satisfy FFA requirements (Ref. 2.3.1) and the requirements stated in Section 2.1 of the Phase II Assessment Report (Ref. 2.3.2) as previously evaluated in Section 3.6.6 of this same report. Therefore, no further assessment of the primary and secondary containment of this modification is required.

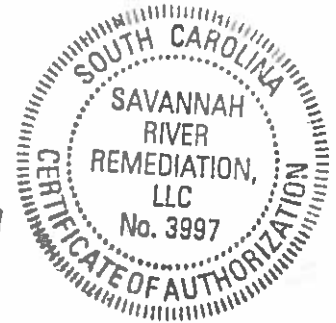
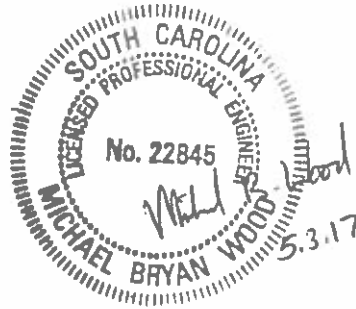
8.0 Professional Engineer Certifications (Design and Construction)

Design

This assessment report was prepared under my supervision and direction. I certify that the design for the modifications detailed in Design Change Package C-DCP-H-17001 comply with applicable engineering standards and the requirements of Appendix B of the Federal Facility Agreement. These standards have been accepted as adequate in demonstrating leak tightness.

Stamp

Name: MICHAEL B. WOOD
License Number: 22845

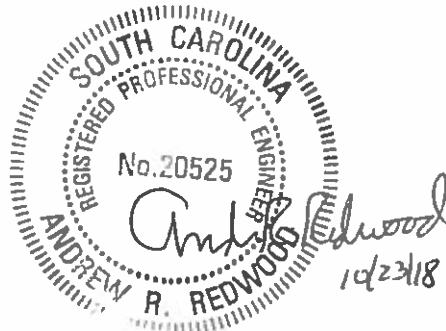


Construction and Installation

I have conducted an inspection, to the extent possible, of the completion of the modified system. Based upon the inspection, I certify that, to the best of my knowledge, information, and belief, the TCCR system equipment was constructed and installed in accordance with the approved design in Design Change Package C-DCP-H-17001. I further certify that the modification was tested in accordance with requirements summarized in Section 6.0 of this Report.

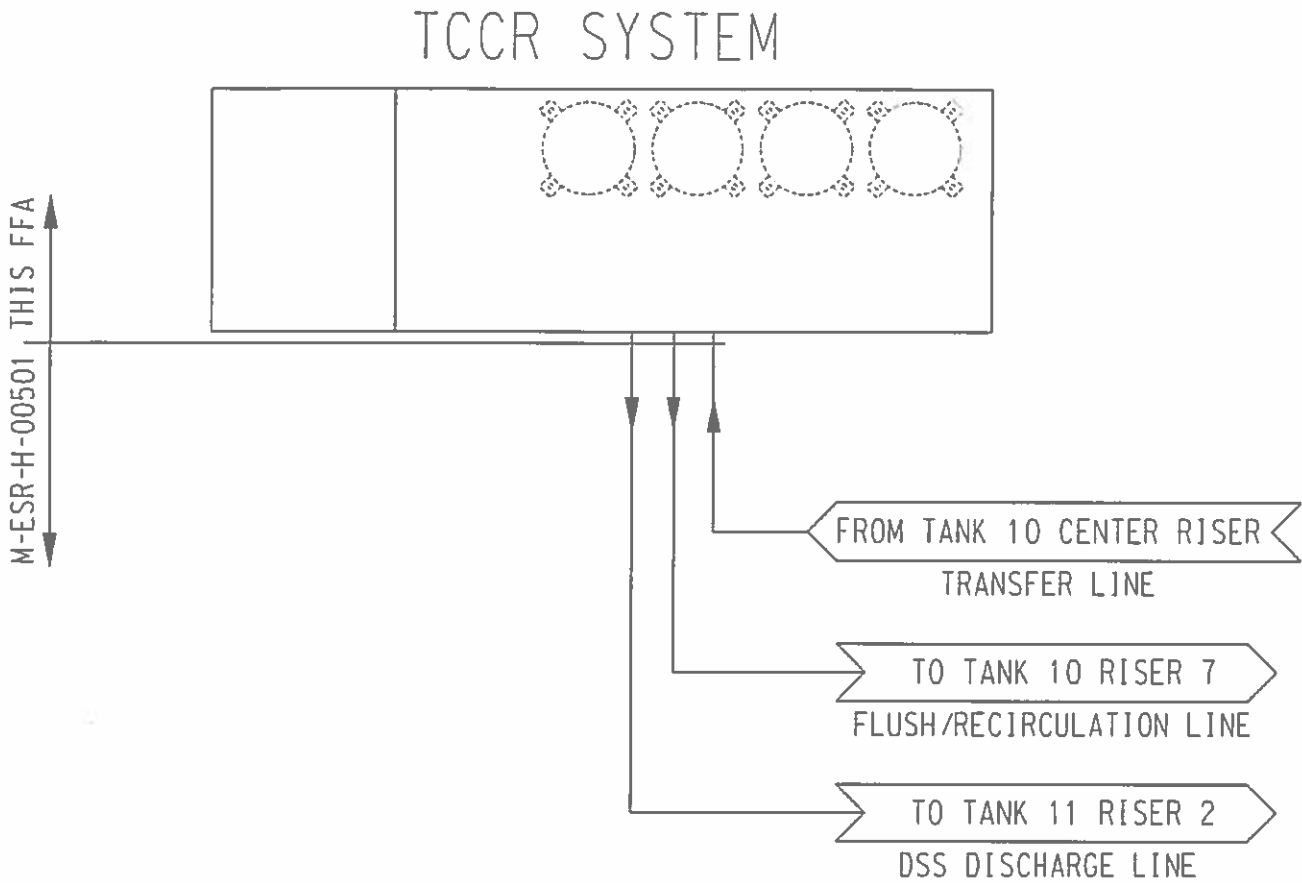
Stamp

Name: Andrew R. Redwood
License Number: 20525



9.0 ATTACHMENT

9.1 TCCR System



PRIMARY BOUNDARY - PIPING, VALVES, VESSELS, ETC. INSIDE TCCR ENCLOSURE
SECONDARY BOUNDARY - TCCR ENCLOSURE

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Savannah River Site

FEDERAL FACILITY AGREEMENT ASSESSMENT REPORT

FOR

TCCR DISSOLUTION HOSE IN HOSE





M-ESR-H-00502
REVISION 0

DISCLAIMER

This report was prepared by Savannah River Remediation LLC (SRR) for the United States Department of Energy under Contract No. DE-AC09-09SR22505 and is an account of work performed under that contract. Neither the United States Department of Energy, nor SRR, nor any of their employees makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, or product or process disclosed herein or represents that its use will not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trademark, name, and manufacturer or otherwise does not necessarily constitute or imply endorsement, recommendations, or favoring of same by SRR or by the United States Government or any agency thereof. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

APPROVAL SIGNATURES / SUMMARY OF CHANGES

APPROVALS

<p>PREPARER  Jeremy Brackman, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>DATE 10-23-18</p>
<p>REVIEWER  Oren Webb, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>10/23/18</p>
<p>APPROVAL  Robert Voegtlen, Waste Transfer System Design Authority Tank Farm Engineering</p>	<p>10/24/18</p>
<p>APPROVAL  Michael B. Wood, Design Services Project Engineer, Project Management, Design and Construction Services</p>	<p>10.23.18</p>

SUMMARY OF CHANGES

Rev. No	Reason for Change	Pages Affected	Issue Date
0	Initial Issue	All	11-11-18

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1.0 Executive Summary

This Assessment Report is being submitted to satisfy requirements of Section IX and Appendix B of the Savannah River Site (SRS) Federal Facility Agreement (FFA, Ref. 2.5.1).

Waste Tank 10 is a Type I, old style waste tank and has a planned operational closure date in accordance with the SRR Schedule. Because Tank 10 contains approximately 194,000 gallons of salt cake and approximately 15,000 gallons of supernatant liquid with an inventory of 100,000 curies of cesium-137, and no installed system which salt dissolution can be performed, the Tank Closure Cesium Removal (TCCR) system (Ref. 2.5.2) will be installed to facilitate removal of cesium-137.

Temporary Modification Package HTF-TMC-16-015 (Ref. 2.5.3) installs a system that will consist of Hose-In-Hose (HIH) dissolution lines on the Tank 10 tank top (See Attachment 9.1). The HIH dissolution lines consist of 1½ inch hose core lines and 3 inch hose jacket lines and will be installed aboveground. Prior to operation, the core hoses and jacket hoses of the HIH system will be continuously aboveground with no hose fittings located outside of the tanks to prevent the possibility of leakage. The HIH system is supported between the tank risers such that there is a continuous slope from the high-point of the HIH system back to the tank risers.

This task is not divided into two or more FFA reports.

2.0 Design Information

2.1 Temporary Modification Package HTF-TMC-16-015 (Ref. 2.5.3) installs:

2.1.1 Three 1½ inch core and 3 inch jacket HIH originating inside Tank 10 Center Riser and terminating inside Tank 10 Risers 1, 4 and 8 for dissolving salt cake within the tank.

2.2 The Temporary Modification includes the following activities:

2.2.1 The 1½ inch core hoses will be protected inside 3 inch jacket hoses to create the HIH piping system. Ensure the outer jacket hose is of sufficient length to extend into the vapor space of the tank risers. Similar hoses have been used for aboveground waste transfers.

2.2.2 Install supports for the HIH as required per design to ensure continuous slope from HIH system high point to each riser.

2.2.3 The HIH and tank risers shall be shielded so that the dose rate is less than 5 mrem/hour at 30 cm during non-transfer conditions (Ref. 2.5.2).

2.3 Applicable SRS Engineering Standards and Engineering Guides:

2.3.1 SRS Engineering Standard 15060, Rev. 20, Additional Requirements for SRS Piping Systems

2.3.2 SRS Engineering Standard 01064, Rev. 8, Radiological Design Requirements

2.3.3 SRS Engineering Standard 01060, Rev. 12, Structural Design Criteria

2.3.4 SRS Engineering Guide 15060-G, Rev. 8, Application of ASME B31.3

2.3.5 SRS Engineering Guide 15062-G, Rev. 0, Qualification and Maintenance of Nonmetallic Flexible Hose

2.4 Applicable National Codes & Standards:

2.4.1 ASME B31.3-2016 Edition, Process Piping

2.5 Reference Documents

2.5.1 WSRC-OS-94-42, Administrative Document Number 89-05-FF, Federal Facility Agreement for the Savannah River Site, August 16, 1993

2.5.2 N-TC-H-00001, Rev. 5, Tank 10: Salt Dissolution & Cesium Removal via TCCR

2.5.3 HTF-TMC-16-015, Rev. 2, Tank 10 Salt Dissolution Hose Installations

2.5.4 Assessment Report, Phase II for the F and H Area High Level Radioactive Waste Tank Farms, Rev. 0, 1991

2.5.5 M-CLC-G-00459, Rev. 1, Unlisted Component Evaluation for Waste Transfer Hose-In-Hose (HIH) Assemblies

2.5.6 T-CLC-H-01221, Rev. 0, TCCR BOP Flexible Hose Evaluation

3.0 Waste Compatibility

Waste characterization will remain unchanged. Hoses used in the Temporary Modifications are constructed of materials that have been proven to be compatible with the waste stream. The modifications will not introduce any other materials that will invalidate the existing waste characterization.

4.0 Foundation Support

The hose components of the HIH system are selected according to SRS hose requirements (Ref. 2.3.5). In addition, M-CLC-G-00459 (Ref. 2.5.5) evaluates any ASME B31.3 Code unlisted components to determine adequate design per ASME B31.3 Code (Ref. 2.4.1). The HIH aboveground support system was evaluated by calculation T-CLC-H-01221 (Ref. 2.5.6) and was shown to be adequately designed to support hoses and shielding.

5.0 Leak Detection and Past Leaks

The HIH system will be installed such that it is continuously sloped from the high point of the waste transfer system back to the tanks. Leak detection for the HIH assembly will be by video inspections of the tank internals during transfer. Video inspections will detect leakage of the transfer line core into the HIH jacket.

6.0 Inspections

Hose material, assembly, installation, inspection, examination, and testing shall be in accordance with:

- ASME Code B31.3-2016 (Ref. 2.4.1)
- SRS Engineering Standard 15060 (Ref. 2.3.1)
- SRS Engineering Guide 15060-G (Ref. 2.3.4)
- SRS Engineering Guide 15062-G (Ref. 2.3.5)

Examination and leak testing inspections for the HIH assembly are contained in the Quality Inspection Plans of HTF-TMC-16-015 (Ref. 2.5.3).

7.0 Determination of Secondary Containment

Once the operation of Temporary Modification is complete and the HIH transfer lines have been removed, the primary and secondary containments remain unchanged and satisfy FFA requirements and the requirements stated in Section 2.1 of the Phase II Assessment Report (Ref. 2.5.4) as previously evaluated in Section 3.6.6 of this same report. Therefore, no further assessment of the primary and secondary containment of this modification is required.

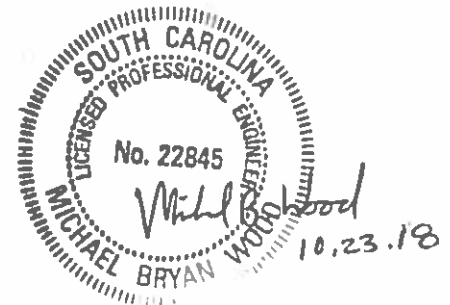
8.0 Professional Engineer Certifications (Design and Construction)

Design

This assessment report was prepared under my supervision and direction. I certify that the design for the modifications detailed in Temporary Modification HTF-TMC-16-015 complies with applicable engineering standards and the requirements of Appendix B of the Federal Facility Agreement. These standards have been generally accepted as adequate in demonstrating leak tightness.

Stamp

Name: MICHAEL B. WOOD
License Number: 22845



Construction and Installation

I have conducted an inspection, to the extent possible, of the completion of the modified system. Based upon the inspection, I certify that, to the best of my knowledge, information, and belief, the installation of the HIH dissolution and transfer lines were constructed in accordance with the approved design in Temporary Modification HTF-TMC-16-015. I further certify that the modification was tested in accordance with requirements summarized in Section 6.0 of this Report. The tests conducted to demonstrate leak tightness were found acceptable.

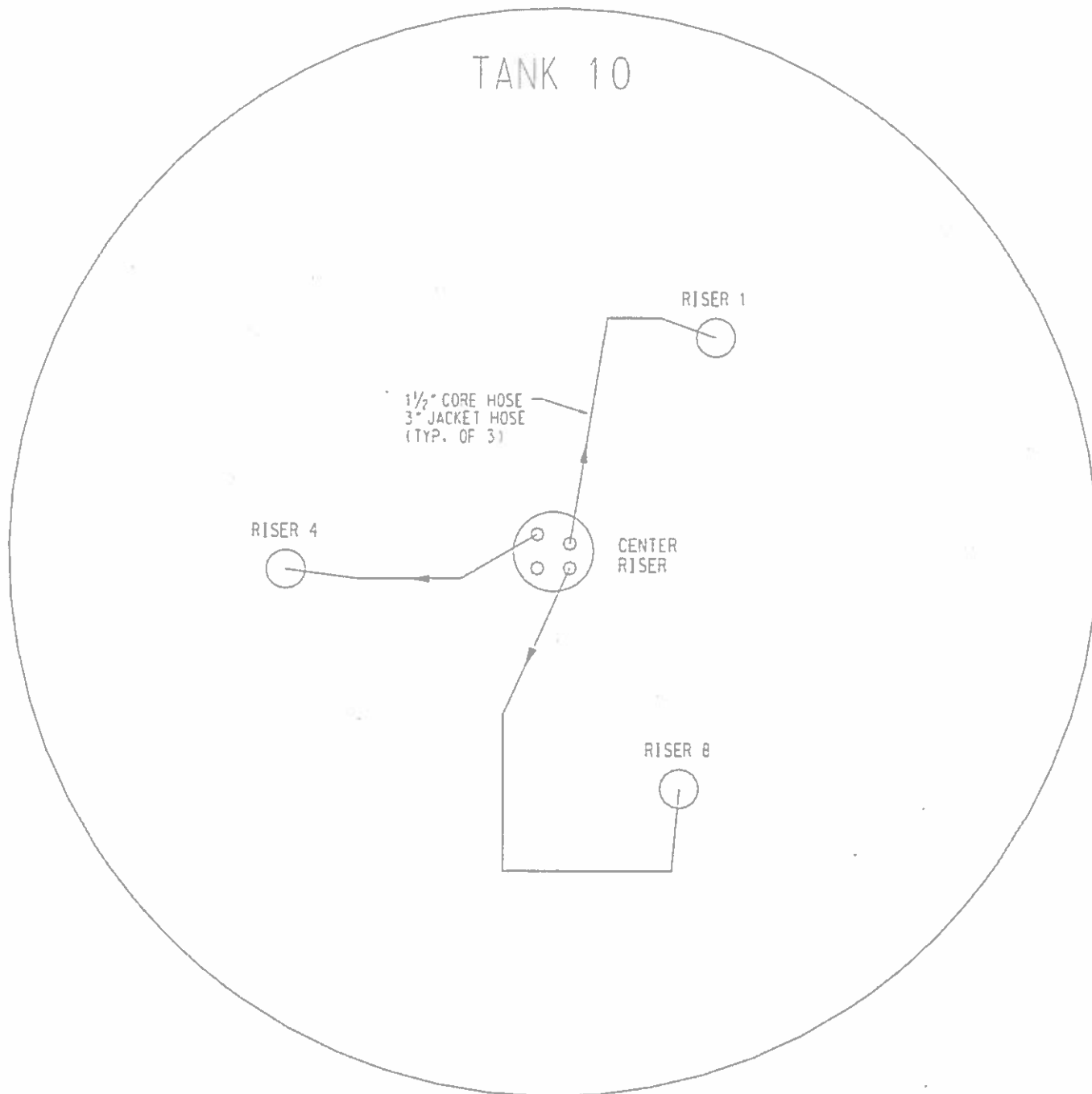
Stamp

Name: Andrew R. Redwood
License Number: 20525



9.0 ATTACHMENT

9.1 HIH Dissolution Lines



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Savannah River Site

FEDERAL FACILITY AGREEMENT ASSESSMENT REPORT

FOR

**WASTE TANK 49H NEW TRANSFER LINE
AND TIE-IN TO ROCK BANK**

M-ESR-H-00465

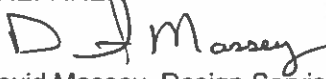

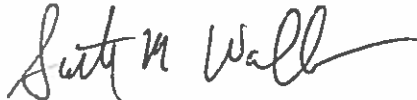

REVISION 0

DISCLAIMER

This report was prepared by Savannah River Remediation LLC (SRR) for the United States Department of Energy under Contract No. DE-AC09-09SR22505 and is an account of work performed under that contract. Neither the United States Department of Energy, nor SRR, nor any of their employees makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, or product or process disclosed herein or represents that its use will not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trademark, name, and manufacturer or otherwise does not necessarily constitute or imply endorsement, recommendations, or favoring of same by SRR or by the United States Government or any agency thereof. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

APPROVAL SIGNATURES / SUMMARY OF CHANGES

APPROVALS

<p>PREPARER  David Massey, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>DATE 1-2-18</p>
<p>REVIEWER  Jeremy Brackman, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>1-2-18</p>
<p>APPROVAL  Scott Wallace, Waste Transfer System Design Authority Tank Farm Engineering</p>	<p>1-2-18</p>
<p>APPROVAL  Michael B. Wood, Design Services Project Engineer, Project Management, Design and Construction Services</p>	<p>1.2.18</p>

SUMMARY OF CHANGES

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0	Initial Issue	All	1-10-18

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1.0 Executive Summary

This Assessment Report is being submitted to satisfy requirements of Section IX and Appendix B of the Savannah River Site (SRS) Federal Facility Agreement (FFA, Ref. 2.4.1).

The purpose of the Blend and Feed portion of the Salt Disposition Integration (SDI) Program is to modify the H-Area Tank Farm (HTF) tanks to blend salt waste and feed the waste to the Salt Waste Processing Facility (SWPF). Tank 49H will receive waste from tanks designated as Blend Tanks and feed the salt waste to the SWPF. A new waste transfer path from Tank 49H Riser B5 to SWPF will be required.

This task is divided into four FFA reports. The scope of this FFA is for a portion of the new waste transfer line. To accomplish this, jacketed waste transfer piping (WTS-L-1665) will be installed east of Tank 49H across the roadway and tie-in to existing waste transfer piping west of the gabion stone bank. This modification will be conducted under Design Change Package (DCP) M-DCP-H-09017 (Ref. 2.4.2) and associated DCFs, C-DCF-H-04424 (Ref. 2.4.11), P-DCF-H-02108 (Ref. 2.4.12), P-DCF-H-02110 (Ref. 2.4.13), and P-DCF-H-02127 (Ref. 2.4.14).

The remainder of the Tank 49H waste transfer line tie-ins will be installed per M-DCP-H-09017 (Ref. 2.4.2) and FFA Assessment Report M-ESR-H-00388 (Ref. 2.4.3), M-DCP-H-15004 (Ref. 2.4.4) and FFA Assessment Report M-ESR-H-00462 (Ref. 2.4.5), and M-DCP-H-15016 (Ref. 2.4.6) and FFA Assessment Report M-ESR-H-00474 (Ref. 2.4.7).

2.0 Design Information

2.1 This modification includes the following activity:

- 2.1.1 Install approximately 60 feet of new stainless steel waste transfer line core (WTS-L-1665) with carbon steel jacket piping as a secondary containment across the roadway east of Tank 49H and tie-in to existing waste transfer piping (See Ref. 2.4.2).

2.2 Applicable SRS Engineering Standards and Engineering Guides:

- 2.2.1 SRS Engineering Standard 15060, Rev. 19, ASME B31.3 Additional Requirements for SRS Piping Systems
- 2.2.2 SRS Engineering Standard 05057, Rev. 5, Control of Welding
- 2.2.3 SRS Engineering Guides 15060-G, Rev. 8, Application of ASME B31.3

2.3 Applicable National Codes & Standards:

2.3.1 ASME B31.3-2016 Edition, Process Piping Code

2.4 Reference Documents

- 2.4.1 WSRC-OS-94-42, Administrative Document Number 89-05-FF, Federal Facility Agreement for the Savannah River Site, August 16, 1993
- 2.4.2 M-DCP-H-09017, Rev. 3, Waste Tank 49H Process Modifications
- 2.4.3 M-ESR-H-00388, Rev. 1, Federal Facility Agreement Assessment Report for Waste Tank 49H Transfer Line Modifications
- 2.4.4 M-DCP-H-15004, Rev. 0, Tank 49 Jacketed Transfer Line Installation
- 2.4.5 M-ESR-H-00462, Rev. 0, Federal Facility Agreement Assessment Report for Waste Tank 49H New Transfer Line Modification
- 2.4.6 M-DCP-H-15016, Rev. 1, Tank 49 Jacketed Transfer Line Installation
- 2.4.7 M-ESR-H-00474, Rev. 0, Federal Facility Agreement Assessment Report for Waste Tank 49H New Transfer Line Modification
- 2.4.8 M-ML-H-07285, Rev. 5, Piping Data Sheet Package for Waste Tank 49H Process Modification
- 2.4.9 Assessment Report, Phase II for the F and H Area High Level Radioactive Waste Tank Farms, Rev. 0, 1991
- 2.4.10 T-CLC-H-01028, Rev. 7, Tank 49H Riser B5 STP Discharge to Waste Transfer Piping Analysis
- 2.4.11 C-DCF-H-04424, Rev. 0, HTF Tank 49 – Riser B5 STP Discharge to SWPF Underground Transfer Line Support
- 2.4.12 P-DCF-H-02108, Rev. 1, Tank 49 Transfer Line Backfill
- 2.4.13 P-DCF-H-02110, Rev. 0, Tank 49 Transfer Line Move North
- 2.4.14 P-DCF-H-02127, Rev. 0, Tank 49 Jacketed Transfer Line Installation
- 2.4.15 M-DCP-H-09017, Rev.2, Waste Tank 49H Process Modifications (Note: Rev. 2 of this DCP contains the Quality Inspection Plan referenced in Section 6.0, that was used for this portion of the piping installation)

3.0 Waste Compatibility

The modifications in the scope of this assessment and their waste characterization will remain unchanged. The materials of construction used in the modifications are compatible with the waste stream. The modifications will not introduce any other materials that will invalidate the existing waste characterization.

4.0 Foundation Support

The integrity of the waste transfer line WTS-L-1665 and all the pipe supports were evaluated and were found to be satisfactory, see T-CLC-H-01028 (Ref. 2.4.10).

5.0 Leak Detection and Past Leaks

The Leak Detection for the new transfer lines will continue to meet Section IX and Appendix B of the FFA. These lines will still follow the design presented in Section 3.7.2 of the Phase II Assessment Report (Ref. 2.4.9), for Type II transfer lines.

6.0 Inspections

Piping material, cleanliness, fabrication, assembly, erection, inspection, examination, and testing shall be in accordance with:

- ASME Code B31.3-2016 (Ref. 2.3.1)
- SRS Engineering Standard 15060 (Ref. 2.2.1)
- SRS Engineering Standard 05057 (Ref. 2.2.2)
- SRS Engineering Guide 15060-G (Ref. 2.2.3)
- Piping Data Sheet Package M-ML-H-07285 (Ref. 2.4.8)

Examination and leak testing inspections requirements for the transfer line are contained in the Quality Inspection Plan of M-DCP-H-09017 (Ref. 2.4.15).

7.0 Determination of Secondary Containment

The primary and secondary containments associated with this modification will replicate the existing line arrangement which satisfies FFA requirements and the requirements stated in Section 2.1 of the Phase II Assessment Report (Ref. 2.4.9) as previously evaluated in Section 3.6.6 of this same report. Therefore, no further assessment is needed.

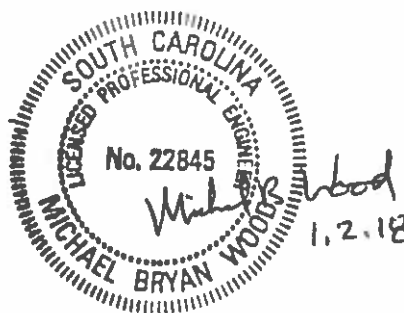
8.0 Professional Engineer Certifications (Design and Construction)

Design

This assessment report was prepared under my supervision and direction. I certify that the design for the modifications detailed in Design Change Package M-DCP-H-09017 and associated DCFs comply with applicable engineering standards and the requirements of Appendix B of the Federal Facility Agreement. These standards have been generally accepted as adequate in demonstrating leak tightness.

Stamp

Name: MICHAEL B. WOOD
License Number: 22845

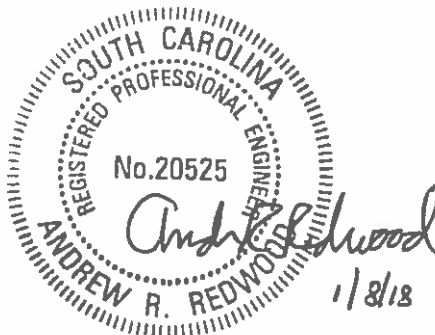


Construction and Installation

I have conducted an inspection, to the extent possible, of the completion of the modified system. Based upon the inspection, I certify that, to the best of my knowledge, information, and belief, the installation of the new waste transfer line was constructed in accordance with the approved design in Design Change Package M-DCP-H-09017 and associated DCFs. The tests conducted to demonstrate leak tightness were found acceptable.

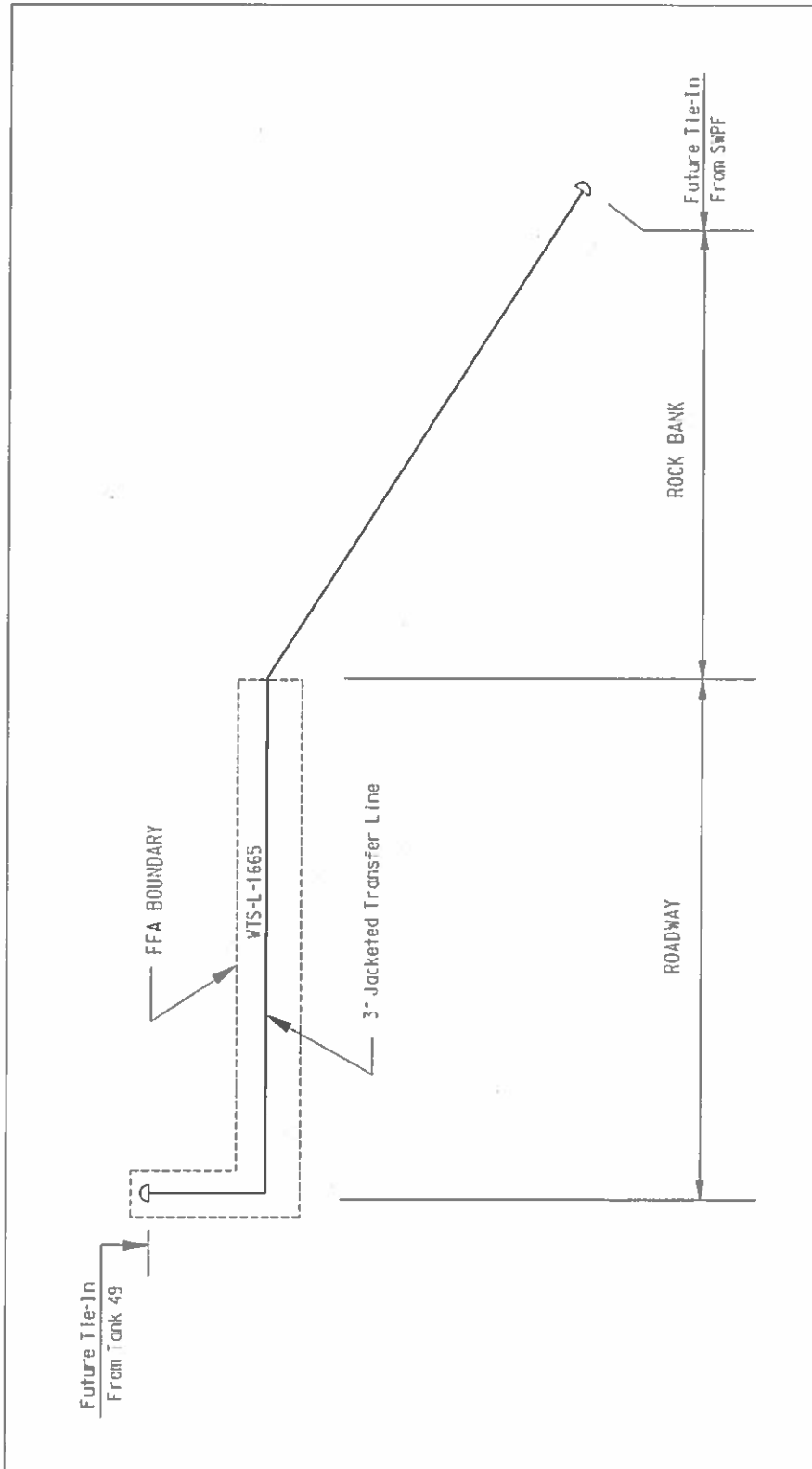
Stamp

Name: Andrew R. Redwood
License Number: 20525



9.0 ATTACHMENT

9.1 New Waste Transfer Line at Roadway



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Savannah River Site

FEDERAL FACILITY AGREEMENT ASSESSMENT REPORT

FOR

TANK 49H VALVE BOX TRANSFER LINE MODIFICATION

M-ESR-H-00498





REVISION 0

DISCLAIMER

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APPROVAL SIGNATURES / SUMMARY OF CHANGES

APPROVALS

<p>PREPARER  David Massey, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>DATE 1.2.18</p>
<p>REVIEWER  Jeremy Brackman, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>1-2-18</p>
<p>APPROVAL  Scott Wallace, Waste Transfer System Design Authority Tank Farm Engineering</p>	<p>1.2.18</p>
<p>APPROVAL  Michael B. Wood, Design Services Project Engineer, Project Management, Design and Construction Services</p>	<p>1.2.18</p>

SUMMARY OF CHANGES

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1.0 Executive Summary

This Assessment Report is being submitted to satisfy requirements of Section IX and Appendix B of the Savannah River Site (SRS) Federal Facility Agreement (FFA, Ref. 2.4.1).

The purpose of the Blend and Feed portion of the Salt Waste Processing Facility (SWPF) Integration Program is to modify the H-Area Tank Farm (HTF) tanks to blend salt waste and feed the waste to the SWPF. Tank 49H will receive waste from tanks designated as Blend Tanks and feed the salt waste to the SWPF. The waste transfer path from the Tank 49H Valve Box into Tank 49H will require modification.

The scope of this FFA is the modification of waste transfer line WTS-L-651A. To accomplish this, the existing jacketed waste transfer piping from Tank 49H Valve Box will be cut near Tank 49H Riser B4, and new jacketed piping will be installed to Riser B4 (see Attachment 9.1 for an illustration). This modification will be conducted per Design Change Package (DCP) M-DCP-H-09017 (Ref. 2.4.2) and associated DCF's M-DCF-H-13169 (Ref. 2.4.8) and P-DCF-H-02180 (Ref. 2.4.9).

2.0 Design Information

2.1 This modification includes the following activity:

2.1.1 Installation of approximately 13 feet of new stainless steel waste transfer line core (WTS-L-651A) with a carbon steel jacket piping as a secondary containment (Ref. 2.4.2, 2.4.6, and 2.4.7). See Attachment 9.1 for FFA boundary.

2.2 Applicable SRS Engineering Standards and Engineering Guides:

2.2.1 SRS Engineering Standard 15060, Rev. 18, ASME B31.3 Additional Requirements for SRS Piping Systems

2.2.2 SRS Engineering Standard 05057, Rev. 5, Control of Welding

2.2.3 SRS Engineering Guides 15060-G, Rev. 8, Application of ASME B31.3

2.3 Applicable National Codes & Standards:

2.3.1 ASME B31.3-2016 Edition, Process Piping Code

2.4 Reference Documents

2.4.1 WSRC-OS-94-42, Administrative Document Number 89-05-FF, Federal Facility Agreement for the Savannah River Site, August 16, 1993

- 2.4.2 M-DCP-H-09017, Rev. 3, Waste Tank 49H Process Modifications
- 2.4.3 M-ML-H-07285, Rev. 5, Piping Data Sheet Package for Waste Tank 49H Process Modification
- 2.4.4 Assessment Report, Phase II for the F and H Area High Level Radioactive Waste Tank Farms, Rev. 0, 1991
- 2.4.5 T-CLC-H-01028, Rev. 7, Tank 49H Riser B5 STP Discharge to Waste Transfer Piping Analysis
- 2.4.6 P-PI-H-08333, Rev. 0, RSS Interarea Transfer Line 3"-WTS-651A from Tank 49
- 2.4.7 P-PM-H-08479, Rev. 0, Liquid Waste Operations Tank Closure Projects Salt Disposition Integration Program Tank 49 Riser B4 Downcomer
- 2.4.8 M-DCF-H-13169, Rev. 0, Tank 49 Riser B4 Vent Relocation
- 2.4.9 P-DCF-H-02180, Rev. 0, Tank 49 – Riser B4, Transfer Line
- 2.4.10 M-QIP-H-00375, Rev. 2, Waste Tank 49H Process Modifications Quality Inspection Plan

3.0 Waste Compatibility

The modifications in the scope of this assessment and their waste characterization will remain unchanged. The materials of construction used in the modifications are compatible with the waste stream. The modifications will not introduce any other materials that will invalidate the existing waste characterization.

4.0 Foundation Support

The integrity of the waste transfer line WTS-L-651A and all the pipe supports were evaluated and were found to be satisfactory, see T-CLC-H-01028 (Ref. 2.4.5).

5.0 Leak Detection and Past Leaks

As stated in the Phase II Assessment Report (Ref. 2.4.4), there are no known past or present leaks involving the core pipes and secondary containment jackets associated with any of the Type II ITP waste transfer lines used in this modification.

6.0 Inspections

Piping material, fabrication, assembly, erection, inspection, examination, and testing shall be in accordance with:

- ASME Code B31.3-2016 (Ref. 2.3.1)
- SRS Engineering Standard 15060 (Ref. 2.2.1)
- SRS Engineering Standard 05057 (Ref. 2.2.2)
- SRS Engineering Guide 15060-G (Ref. 2.2.3)
- Piping Data Sheet Package M-ML-H-07285 (Ref. 2.4.3)
- Quality Inspection Plan M-QIP-H-00375 (Ref. 2.4.10)

Examination and leak testing inspections requirements for the transfer line are contained in M-QIP-H-00375 (Ref. 2.4.10).

7.0 Determination of Secondary Containment

The primary and secondary containments associated with this modification will replicate the existing line arrangement which satisfies FFA requirements and the requirements stated in Section 2.1 of the Phase II Assessment Report (Ref. 2.4.4) as previously evaluated in Section 3.7.2 of this same report. Therefore, no further assessment is needed.

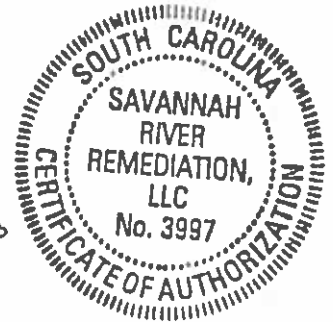
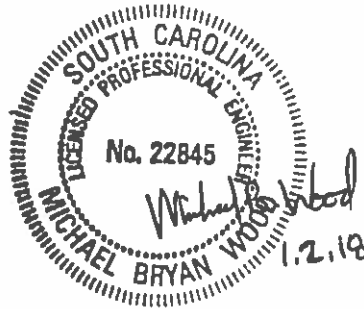
8.0 Professional Engineer Certifications (Design and Construction)

Design

This assessment report was prepared under my supervision and direction. I certify that the design for the modifications detailed in Design Change Package M-DCP-H-09017 and associated DCF's comply with applicable engineering standards and the requirements of Appendix B of the Federal Facility Agreement. These standards have been generally accepted as adequate in demonstrating leak tightness.

Stamp

Name: **MICHAEL B. WOOD**
License Number: **22845**

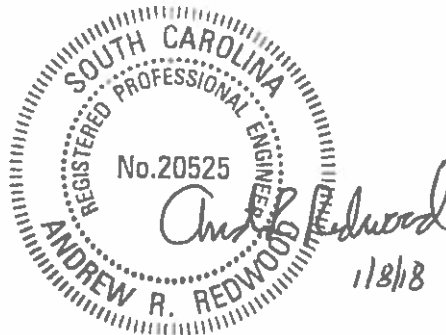


Construction and Installation

I have conducted an inspection, to the extent possible, of the completion of the modified system. Based upon the inspection, I certify that, to the best of my knowledge, information, and belief, the installation of the new waste transfer line was constructed in accordance with the approved design in Design Change Package M-DCP-H-09017 and associated DCF's. The tests conducted to demonstrate leak tightness were found acceptable.

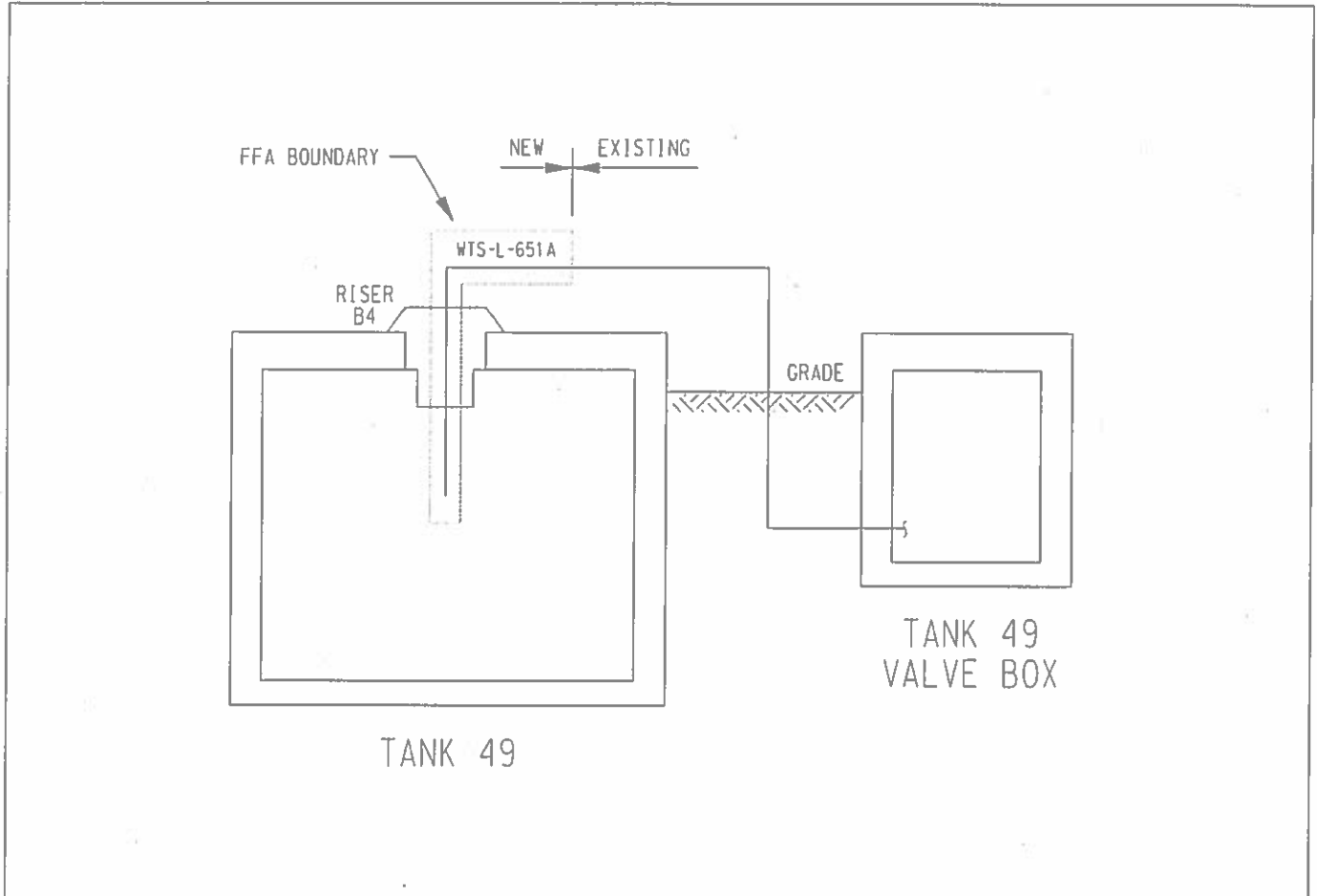
Stamp

Name: **Andrew R. Redwood**
License Number: **20525**



9.0 ATTACHMENT

9.1 Tank 49H Waste Transfer Line WTS-L-651A



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Savannah River Site

FEDERAL FACILITY AGREEMENT ASSESSMENT REPORT

FOR

THE REPLACEMENT OF LEAK DETECTION BOX LD-LDB-1

M-ESR-F-00288


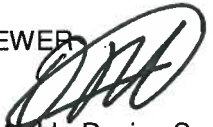


REVISION 0

DISCLAIMER

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APPROVAL SIGNATURES / SUMMARY OF CHANGES

APPROVALS

<p>PREPARER  David Massey, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>DATE 6.19.18</p>
<p>REVIEWER  Oren Webb, Design Services Mechanical Engineer Project Management, Design and Construction Services</p>	<p>6/25/18</p>
<p>APPROVAL  Scott Wallace, Waste Transfer System Design Authority Tank Farm Engineering</p>	<p>6-25-18</p>
<p>APPROVAL  Neil Combs, Design Services Project Engineer, Project Management, Design and Construction Services</p>	<p>6/26/18</p>

SUMMARY OF CHANGES

Rev. No	Reason for Change	Pages Affected	Issue Date
0	Initial Issue	All	

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1.0 Executive Summary

This Assessment Report is being submitted to satisfy the requirements of Section IX and Appendix B of the Savannah River Site (SRS) Federal Facility Agreement (FFA, Ref. 2.4.1).

Waste transfer line FL-241907-WTS-L-211 (WTS-L-211) is constructed of a 3" stainless steel primary core piping located below grade. This primary transfer line is encapsulated by another 4" pipe (jacket) constructed of carbon steel. The jacket drains to Leak Detection Box (LDB) FL-241907-LD-LDB-1 (LD-LDB-1). After a failed periodic pressure test of the jacket piping, further investigation revealed that the leakage emanated from the LDB, drain line, and/or connected waste transfer lines FL-241903-WTS-L-211 (WTS-L-211) and FL-241907-WTS-L-216 (WTS-L-216) near the LDB. No degradation was identified in the waste transfer core piping.

The scope of this FFA is to install a new LDB, isolate unused lines and jackets, replace potentially affected jackets attached to the LDB and replace a small portion of waste transfer line WTS-L-211 to facilitate installation.

Remove the old LDB drain line from service by removing it back inside of the WTS-L-211 jacket behind the seal plate. The drain line is not necessary for the operability of the LDB. In the event leakage occurs, the contents of the LDB can be evacuated through the inspection port (see Attachment 9.1).

Waste transfer line WTS-L-216 was previously routed from Tank 7F, Riser 6 through the LDB to Tank 5. This line was isolated from Tank 5 in the 1980s and capped. Per this modification, line WTS-L-216 will be capped outside the LDB.

This modification will be conducted per Design Change Package (DCP) P-DCP-F-17003 (Ref. 2.4.2) and Design Change Form (DCF) P-DCF-F-00883 (Ref. 2.4.6). This task is not divided into two or more FFA reports.

2.0 Design Information

2.1 This modification includes the following activities:

- 2.1.1 Replace leak detection box LD-LDB-1 at waste transfer line WTS-L-211.
- 2.1.2 Cap waste transfer line WTS-L-216 from Waste Tank 7F, Riser 6.
- 2.1.3 Cut out of service leak detection box LD-LDB-1 drain line.

2.1.4 The LDB and capped waste transfer piping will be coated per SRS Engineering Guide 09903-G (Ref. 2.2.1), insulated per SRS Engineering Guide 15250-G (Ref. 2.2.2), and backfilled per SRS Engineering Guide 01110 (Ref. 2.2.3).

2.2 Applicable SRS Engineering Standards and Engineering Guides:

2.2.1 SRS Engineering Guide 09903-G, Rev. 3, Corrosion Protection – Underground Steel

2.2.2 SRS Engineering Guide 15250-G, Rev. 2, Mechanical Insulation

2.2.3 SRS Engineering Standard 01110, Rev. 6, SRS Civil Site Design Criteria

2.2.4 SRS Engineering Standard 15060, Rev. 19, Additional Requirements for SRS Piping

2.2.5 SRS Engineering Standard 05057, Rev. 5, Control of Welding

2.2.6 SRS Engineering Guide 15060-G, Rev. 8, Application of ASME B31.3

2.3 Applicable National Codes & Standards:

2.3.1 ASME B31.3-2016 Edition, Process Piping

2.4 Reference Documents

2.4.1 WSRC-OS-94-42, Administrative Document Number 89-05-FF, Federal Facility Agreement for the Savannah River Site, August 16, 1993

2.4.2 P-DCP-F-17003, Rev. 0, Leak Detector Box at Tank 7 Riser 6

2.4.3 M-ML-F-02657, Rev. 0, Tank 7 Riser 6 LDB Replacement

2.4.4 Assessment Report, Phase II for the F and H Area High Level Radioactive Waste Tank Farms, Rev. 0, 1991

2.4.5 M-QIP-F-00105, Rev. 0, Leak Detection Box Replacement at Tank 7 Riser 6

2.4.6 P-DCF-F-00883, Rev. 0, Leak Detection Facilities Transfer Line Installation Plan and Details

3.0 Waste Compatibility

The modifications in the scope of this assessment and their waste characterization will remain unchanged. The materials of construction used in the modifications are compatible with the waste stream. The modifications will not introduce any other materials that will invalidate the existing waste characterization.

4.0 Foundation Support

The structural integrity of LD-LDB-1 and associated waste transfer line WTS-L-211 are not impacted by the cutting of the drain line and capping of waste transfer line WTS-L-216. The drain line does not provide structural support for the waste transfer line and jacket. Support for the leak detection box and waste transfer lines is provided by the backfill per SRS Engineering Guide 01110 (Ref. 2.2.3) and insulation per SRS Engineering Guide 15250-G (Ref. 2.2.2). The Backfill material was evaluated and was found to be satisfactory to support LD-LDB-1 and waste transfer lines WTS-L-211, see P-DCP-F-17003 (Ref. 2.4.2) for backfill requirements.

5.0 Leak Detection and Past Leaks

The Leak Detection system (LD) for the affected transfer lines will be modified but continue to meet Section IX and Appendix B of the FFA. These lines will still follow the design presented in Section 3.7.2 of the Phase II Assessment Report, for Type II transfer lines and will still be sloped towards the existing leak detection boxes.

As stated in the Phase II Assessment Report, there are no known past or presents leaks involving the core pipes and secondary containment jackets associated with any of the Type II ITP waste transfer lines used in this modification.

6.0 Inspections

Piping/Leak Detection Box material, fabrication, installation, inspection, examination, and testing shall be in accordance with:

- ASME Code B31.3-2016 (Ref. 2.3.1)
- SRS Engineering Standard 15060 (Ref. 2.2.4)
- SRS Engineering Standard 05057 (Ref. 2.2.5)
- SRS Engineering Guide 15060-G (Ref. 2.2.6)
- Piping Data Sheet Package M-ML-F-02657 (Ref. 2.4.3)
- Quality Inspection Plan M-QIP-F-00105 (Ref. 2.4.5)

7.0 Determination of Secondary Containment

The primary and secondary containments associated with this modification will replicate the existing line arrangement which satisfies FFA requirements and the requirements stated in Section 2.1 of the Phase II Assessment Report (Ref. 2.4.8) as previously evaluated in Section 3.7.2 of this same report. Therefore, no further assessment is needed.

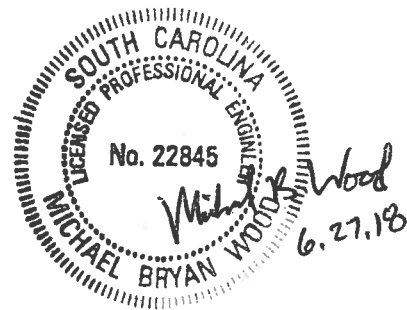
8.0 Professional Engineer Certifications (Design and Construction)

Design

This assessment report was prepared under my supervision and direction. I certify that the design for the modifications detailed in Design Change Package P-DCP-F-17003 and associated DCF complies with applicable engineering standards and the requirements of Appendix B of the Federal Facility Agreement. These standards have been generally accepted as adequate in demonstrating leak tightness.

Stamp

Name: *MICHAEL B. WOOD*
License Number: *22845*

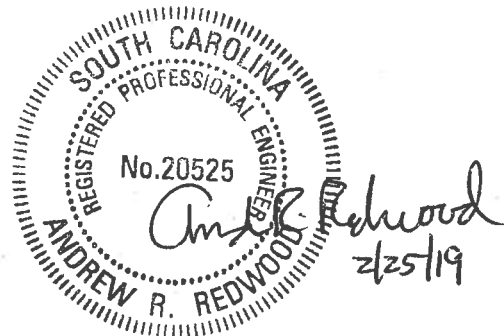
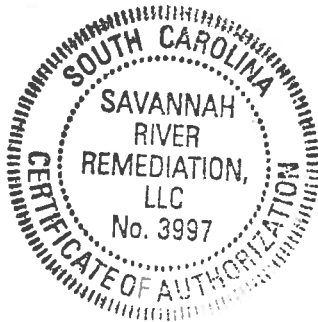


Construction and Installation

I have conducted an inspection, to the extent possible, of the completion of the modified system. Based upon the inspection, I certify that, to the best of my knowledge, information, and belief, the installation of the new waste transfer line was constructed in accordance with the approved design in Design Change Package P-DCP-F-17003 and associated DCF. The tests conducted to demonstrate leak tightness were found acceptable.

Stamp

Name: *Andrew R. Redwood*
License Number: *20525*



9.0 ATTACHMENT

9.1 Leak Detection Box and Capped Waste Transfer Lines

