

**TANK 50 WASTE COMPLIANCE PLAN
FOR TRANSFERS TO SALTSTONE**

**X-WCP-H-00014
Revision 25**

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REVISION HISTORY

Rev. 0, 9/05	Initial issue, this document supersedes WSRC-TR-2002-00162, Rev. 2
Rev 1, 4/06	LDD references added Allowance for process knowledge to serve as characterization basis.
Rev 2, 10-06	References and specifications for Batch 0 of the Disposition Processing Plan.
Rev 3, 10-06	Specific Admin Control notation changes.
Rev 4, 11-06	Saltstone Specific Admin Control notation changes.
Rev 5, 2-07	Specifications for Batch 0 generalized to cover Supernate Only
Rev 6, 12-07	Supernate Only and Slurried operation compliance approach changed.
Rev 7, 1-08	Supernate Only compliance approach changed; included deviation for low sodium material
Rev 8, 12-08	Mixing Operation requirements updated; ‘low Isopar L’ compliance added (eliminates the “without slurry pump” operation option while the ‘low’ isopar WAC limit is in effect; ‘real time’ deleted from descriptions of the monthly updated material balance. Deviation for Sodium molarity removed due to Saltstone WAC limit change which eliminated the need for the deviation.
Rev 9, 3-09	Added Butanol and Tributylphosphate alternative compliance concentrations.
Rev 10, 5-10	Added controls introduced to the DSA by HLW-CRF-10006. Section 3.4.3 Sampling section updated to include monthly Solvent Hold Tank sampling. Operational Controls subsection added to Section 3.4.3.
Rev 11, 4-11	Deleted Section 3.7, Hazard Categorization Updated reference to S-CLC-Z-00067
Rev 12, 6-11	Updated mixing options to allow for 2 or 1 pump operation.
Rev 13, 6-12	Updated for Saltstone WAC revision driven by a new Performance Assessment, DSA revision, and ELAWD project modifications Changed instances of ‘vault’ to Saltstone Disposal Unit (SDU). Added minimum MST strike time requirement to Section 3.5.1. Changed Process Chemistry Programs to LWO Engineering Technology Integration (ETI) Deleted outdated descriptive paragraph in section 3.1
Rev 14, 7-13	WCP changes driven by Saltstone WAC revision 12 (NGS, HGR, and gamma shielding). Organization names updated (Liquid Waste Tech. Integration changed to Tank Farm Facility Engineering).

	<p>Reference updates in Section 5.0. General Deviation request made in Section 4.5.</p>
Rev 15, 7-22	<p>Corrected the IDP value in Section 3.2. Implementation via SRR-LWE-2013-00136 (correction to 3.2 does not change compliance method or implementation).</p>
Rev 16, 1-14	<p>WCP changes driven by Saltstone WAC revision 13 (NH₄⁺, As, Co, Tc-99, I-129, and Cs-135). References updated to include latest revision numbers. Updated section 3.5.1 to address the change in Tc-99 concentration. General Deviation request made in Section 4.5. Changed references to Waste Solidification or WS Engineering to DWPF and Saltstone Engineering throughout document</p>
Rev. 17, 6-15	<p>Total reformat to better align with the Saltstone WAC (no revision bars). Moved ARP/MCU requirements into separate section. Added new section on Regulatory Criteria to support Saltstone WAC revision. Updated references.</p>
Rev. 18, 6-15	<p>Added description to ARP/MCU Section for Filter-Only option when MST strike is not required.</p>
Rev. 19, 12-15	<p>Removed requirement to perform TCLP on salt batch qualification sample. Included clarification on when analytical uncertainty should be included in accordance with Saltstone WAC Revision 15. Updated document format in accordance with ENG.08 guidance. No revision bars used.</p>
Rev. 20, 3-16	<p>Revision bars used Global: Changed “Low Organics Mode” to “Low Isopar L Operation” Global: Deleted reference to Saltstone Final Calculator Section 4.0: Removed requirement for TF Engineering and Operations to concur with SS Implementation checklist Section 5.3.4: Revised words in the “Other organics” section Section 5.3.6: Updated ETP compliance words Section 5.3.12: Created new Tk 50 temperature requirement to support SSRTs Global: Updated acronyms (revision bars not used)</p>
Rev. 21	<p>Created new reference for implementation of Sections 5.3.8.3 and 5.3.12.</p>
Rev. 22	<p>Section 5.3.4: Added words for evaluation to be performed if “other organics” are above SS WAC limits Section 5.3.9: Updated to include SDU6 Section 5.3.13: New Section for SDU 6 Liner/Coating Chemical Resistance Targets</p>

Rev. 23	<p>Section 5.3.2: Included volume of ETP WCHT in discussion of ammonia contribution to Tank 50</p> <p>Section 5.3.2: Clarified the minimum liquid level to be maintained in Tank 50</p> <p>Section 5.3.4: Specified the LWGR as the responsible group to perform evaluation if any of the “other organics” are outside of SS WAC limits.</p> <p>Section 5.3.13: Specified the WDA as the responsible group to evaluate constituents outside the Chemical Target value.</p>
Rev. 24	<p>Section 2.0: Expanded scope to include evaluation of interarea transfer line flushing with inhibited water</p> <p>Section 3.0: Clarified definition of Target</p> <p>Section 5.3.1: Increased SS IDP limit and expanded list of radionuclides that are significant contributors to IDP</p> <p>Section 5.3.3: Updated HGR section to include both radiolytic and new thermolytic HGR limits</p> <p>Section 5.3.4: Added requirement for evaluation to be performed for newly identified species that may contribute to flammability</p> <p>Section 5.3.6: Discussed removal of Hg speciation requirement due to increase in elemental Hg limit</p> <p>Section 5.3.9: Deleted Te-125m from list of contributors to Gamma Shielding</p> <p>Section 7.0: Updated references and added new reference for maximum dimethyl mercury concentration reported in Tank 50</p>
Rev. 25	<p>Section 2.0, 5.1.2: Included the Tank Closure Cesium Removal (TCCR) stream from Tank 11</p> <p>Section 5.3.3: Updated HGR compliance to include a range of nitrate, nitrite, hydroxide, and formate values that can be used to ensure the SS HGR limit is met</p>

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Requirement: This document meets the CST requirement of the following:

- CST Specific Administrative Control (SAC) 5.8.2.15
- CST Administrative Control 5.8.2.32

This document meets the Saltstone requirement of the following:

- Saltstone SAC 5.6.2.1

1.0 Purpose

In accordance with the Concentration, Storage and Transfer Facilities (CSTF) Technical Safety Requirements (TSR) Specific Administrative Control (SAC) 5.8.2.15, this Waste Compliance Plan (WCP) identifies the specific requirements of the Saltstone Production Facility Waste Acceptance Criteria (WAC) [1] and the Saltstone Documented Safety Analysis (DSA) [26]. This WCP is applicable to transfers from Tank 50H in H-Tank Farm (HTF) to the Saltstone (SS) Facility.

2.0 Scope

The Saltstone Facility (Z Area) consists of two facility segments: the Saltstone Production Facility (SPF), which receives and treats the salt solution to produce saltstone grout, and the Saltstone Disposal Facility (SDF), which consists of Saltstone Disposal Units (SDUs) used for the final disposal of the saltstone grout.

Tank 50H serves as the primary storage tank for aqueous waste before it is transferred to Saltstone. Current Tank 50H contents include waste from the initial demonstration of the In-Tank Precipitation (ITP) process, wastewater from the Effluent Treatment Project (ETP), Actinide Removal Process (ARP)/Modular Caustic Side Solvent Extraction Unit (MCU) product, and wastewater from the H-Canyon facility. Transfers into Tank 50H consist of ETP waste, ARP/MCU product, wastewater from the H-Canyon General Purpose Evaporator (GPE), Tank Closure Cesium Removal (TCCR) product from Tank 11, and other wastes (when authorized) to be transferred to Saltstone for treatment.

Operation of Tank 50H and the interarea transfer line is controlled administratively by H-Area Tank Farm Operations. Saltstone Facility Operations assumes responsibility for the aqueous waste when it enters the Salt Feed Tank (SFT) or the Salt Solution Receipt Tank(s) (SSRTs). If flushing of the interarea transfer line (IAL) to the SFT or an SSRT is required, the inhibited water addition must be evaluated by Tank Farm Engineering and reviewed and approved by Saltstone Engineering to ensure compliance with the SS WAC. Flush material sent to Tank 50 is evaluated by current Tank Farm programs.

The current Saltstone WAC [1] implements only Low Isopar L Operation (Isopar L \leq 11 ppm). Accordingly, this WCP addresses only Low Isopar L Operation.

3.0 Terms, Definitions, Acronyms

ARP – Actinide Removal Process

CLFL – Composite Lower Flammability Limit

CSTF – Concentration, Storage, and Transfer Facilities

D&S-FE – DWPF & Saltstone Facility Engineering

DIRT – Data Integrity Review Team

DOE – Department of Energy

DSA – Documented Safety Analysis

DSS – Decontaminated Salt Solution

DWPF – Defense Waste Processing Facility

ERD – Emergency Response Data

ETAF – Engineering Transfer Approval Form

ETP – Effluent Treatment Project

GPE – General Purpose Evaporator

HGR – Hydrogen Generation Rate

HLW – High Level Waste

HTF – H-Tank Farm

IAL – Interarea Transfer Line

ICD – Interface Control Document

IDP – Inhalation Dose Potential

ITP – In-tank Precipitation

KTPB – Potassium Tetrphenylborate

LIMIT – A type of acceptance criteria that, if not satisfied, will have an adverse impact on repository/regulatory requirements. Acceptance criteria designated as LIMITS must be met prior to transfer into Tank 50H or by blending in Tank 50H.

LWGR – Liquid Waste Generator Representative

LWO – Liquid Waste Organization

MCU – Modular Caustic Side Solvent Extraction Unit

MST – Monosodium Titanate

PA – Performance Assessment

PR – Problem Reporting

RCO – Radiological Control Operations

RCRA – Resource Conservation and Recovery Act

RCT – Recycle Collection Tank

SAC – Specific Administrative Control

SDF – Saltstone Disposal Facility

SDU – Saltstone Disposal Unit

SE – Strip Effluent

SFT – Salt Feed Tank

SHT – Solvent Hold Tank

SIRIM – Site Item Reportability and Issue Management

SPF – Saltstone Production Facility

SS – Saltstone

SSRT – Salt Solution Receipt Tank

STAR – Site Tracking, Analysis and Reporting

TARGET – A type of acceptance criteria that is set as a guideline to protect a

LIMIT - Acceptance criteria designated as TARGETS will be monitored on a confirmatory basis (e.g., quarterly). A WAC deviation is not required if an individual TARGET (radionuclide/chemical) that has been used in the derivation of a limit (IDP, HGR, Gamma Shielding, Other Organics – Flammability) has been exceeded as long as the waste generator can demonstrate that the LIMIT is still met. TARGETS are also used to show compliance with regulatory requirements when sample results/calculations/process knowledge indicate a significant margin exists between the maximum expected value and the regulatory requirement.

TCCR – Tank Closure Cesium Removal

TCLP – Toxicity Characteristic Leaching Procedure

TF-FE – Tank Farm Facility Engineering

TPB - Tetraphenylborate

TSR – Technical Safety Requirements

USQ – Unreviewed Safety Question

UWMQ – Unreviewed Waste Management Question

WAC – Waste Acceptance Criteria

WCHT – Waste Collection Hold Tank

WCP – Waste Compliance Plan

WCS – Waste Characterization System

WCT – Waste Collection Tank

WDA – Waste Disposal Authority

4.0 Responsibilities

The Saltstone WAC [1] states that Tank Farm Facility Engineering (TF-FE) is responsible for:

- Reviewing the Saltstone WAC.
- Preparing and maintaining a WCP that will ensure compliance with the Saltstone WAC and will serve as an agreement between H-Area Tank Farm Operations and Saltstone Operations for the transfer of aqueous waste from Tank 50H to the SPF.
- Adhering to the principles of minimizing waste generation when designing or modifying a process that treats or produces aqueous waste to be sent to the SPF.
- Developing the Tank 50H Material Balance / Isopar L DSS Blend Calculation and providing monthly updates to the Material Balance / Blend Calculation that will be independently reviewed and approved by Defense Waste Processing Facility (DWPF) & Saltstone Engineering (D&S-FE).

- When required, developing requests for deviations from the requirements of the Saltstone WAC.

The Saltstone WAC [1] states that H-Area Tank Farm (HTF) Operations/Facility Management is responsible for:

- Reviewing the Saltstone WAC.
- Pulling all samples for wastes transferred to the Saltstone Facility; however, ensuring the proper analyses are conducted on the sample depends on the basis of the sample. Analyses which fulfill the requirements of acceptance criteria as well as permit requirements are the shared responsibility of D&S-FE and TF-FE. Analyses which are needed to meet safety-related acceptance criteria not covered in the permit are the responsibility of TF-FE
- Establishing auditable programs that show compliance with the Saltstone WAC.
- Approving a WCP that serves as an agreement between HTF Operations and Saltstone Operations for the transfer of aqueous waste from Tank 50H to the SPF.
- Financing corrective actions required due to a failure by HTF Operations to conform with the Saltstone WAC.

5.0 Program Criteria

[*A/C* CST SAC 5.8.2.15 and CST Admin Control 5.8.2.32]

5.1 Compliance Strategy

The following strategy outlines the method by which the H-Tank Farm facility will ensure that the waste sent to SS meets the SS WAC [1].

5.1.1 Tank 50H Material Balance

A material balance will be maintained for Tank 50H to demonstrate compliance with the SS WAC requirements. The material balance will use current Tank 50 sample results, the characterization given by each waste generator that sends waste into Tank 50H, along with the volume of their transfer, to keep a running total of the volume and concentrations of SS WAC LIMITS in Tank 50H for each month that transfers are made to SS. This “blending” calculation will be a part of the Waste Characterization System (WCS) [10], a Level “B” software program maintained by the TF-FE. The material balance will also maintain the most recent sample results from Tank 50H for all constituents listed in SS WAC Attachments 8.1-8.4 [1].

Periodically, samples will be pulled from Tank 50H and analyzed for LIMIT and TARGET criteria (Table 1 below) [6]. These sample results will be used to validate the material balance calculation, as well as verify compliance to the Saltstone

WAC. These sample results are reviewed by the Data Integrity Review Team (DIRT) and entered into WCS with an analytical uncertainty of 2 sigma applied to the results. The most recent of these samples will be reported in the material balance. Due to the target constituents in SS WAC Attachments 8.2 and 8.4 (confirmatory criteria) [1] being analyzed only in Tank 50H, they will not be included in the blending calculation portion of the material balance. In addition, for LIMITS that have not been added to WCS, compliance with the SS WAC will be documented in the material balance report which is issued on a 45-day frequency when transfers are being made into the SS facility.

Table 1: Tank 50H Samples

Sample Requirement	Sample Frequency	Basis
Regulatory Compliance Liquid - Chemistry	Quarterly	Compliance of liquid chemistry with SS WAC permit tables. Mercury Speciation is performed as part of this analysis.
Offsite Toxicity Characteristic Leaching Procedure (TCLP)	Quarterly	Verification of non-hazardous nature of grout.
Regulatory Compliance Liquid - Radiological	Quarterly	Compliance of liquid radionuclides with SS WAC permit tables.
SDU Classification	Every 6 years	Evaluates the landfill requirements and effects on groundwater.

If at any time the material balance reflects that a criterion is not within the limits established by Saltstone, transfer procedures for Tank 50H to Saltstone transfers will be placed on administrative hold until a deviation request is approved by Saltstone, or Tank 50H is brought back into compliance.

Each waste generator is required to update WG08 [4] with their transfer information each month in which transfers are made to the Tank Farm.

5.1.2 Waste Streams

The transfer of rainwater from sumps to Tank 50H is permissible as long as the total alpha, total beta/gamma and pH are measured prior to transfer to ensure that the sump material is indeed rainwater.

Prior to transferring waste into Tank 50H, a waste generator must demonstrate compliance with the Saltstone WAC limits [2]. If a waste generator is unable to meet a Saltstone WAC LIMIT on any constituent(s), a deviation request will be made. The approval/disapproval of the deviation request by the Tank Farm and Saltstone will determine whether the waste stream will be approved to be transferred to Tank 50H.

Waste streams, from facilities outside of the Tank Farm, intended for transfer into Tank 50H will require the approval of a WCP by the Tank Farm. The Emergency Response Data (ERD) [7] will be the control point used by the Tank Farm to designate the waste stream as approved or unapproved for transfer into Tank 50H. These waste streams will be characterized, either through sample results or process knowledge, for LIMITS listed in the Saltstone WAC prior to their acceptance into Tank 50H, and all associated Saltstone WAC deviations will be noted. The Tank Farm will request a deviation from Saltstone to allow for the transfer of material that contains any constituents that may exceed the Saltstone WAC requirements.

Transfers into Tank 50 from ARP/MCU and TCCR are evaluated prior to processing via sampling and/or process knowledge characterization (tank history, previous samples, WCS data, etc.) and SS WAC compliance is documented in an acceptance/qualification report. The salt batch preparation process is described in more detail in the Tank Farm to DWPF WCP [35]. The strategy for the characterization and sampling of TCCR material in Tanks 10 and 11 has been outlined in Ref. 36. For both salt batch and TCCR material, the qualified batch must be approved in the ERD prior to transferring material into Tank 50.

Waste transfers from other tanks within the Tank Farm will be controlled by the Evaluated Transfer Approval Form (ETAF). An ETAF for a waste tank-to-waste tank transfer requires an engineering evaluation to be performed on any transfer into Tank 50H, in order to demonstrate Saltstone WAC compliance.

5.2 Prerequisite Programmatic Criteria

A WAC is an Interface Control Document (ICD) written by a waste receiving organization (Saltstone) describing the parameters (e.g., flow, temperature, composition) that must be considered in receiving the waste and defining criteria for acceptance of the waste. The DOE Order on radioactive waste management, DOE Order 435.1-1, requires that waste handling facilities have acceptance criteria.

A WCP is an ICD written by the sending organization (CSTF) describing how the sending organization will control the parameters to ensure compliance with the WAC of the receiving organization. When the liquid waste being sent is known to be outside WAC criteria, a strategy must be developed for safe management and future processing. Upon discovery, the sending organization is to inform the receiving organization of any requirements that have not been satisfied. It will then be determined what actions are to be performed by the sending and/or receiving organizations before the waste can be accepted by the receiving organization. This WCP documents the agreement between the organizations for handling the wastes. Requirements for the WAC and WCP documents for High Level Waste (HLW) are provided in Reference 32.

This document includes the specific requirements from the WAC [1] that are applicable to the transfer of the salt feed from the CSTF to SS. The specific requirements and the compliance plan methodology for meeting these requirements are cited in Section 5.3.

5.3 Compliance Plan

5.3.1 Inhalation Dose Potential

[*A/C* CST SAC 5.8.2.15]

[*A/C* Saltstone SAC 5.6.2.1]

The Saltstone WAC states the inhalation dose potential (IDP) for the material to be transferred shall have a total rem/gallon value less than or equal to 1.78E+05 rem/gallon, accounting for analytical uncertainty. The inhalation dose potential is based on the cumulative sum of a mixture of radionuclide dose conversion factors multiplied by the bounding radionuclide concentration for radionuclides that are significant contributors to inhalation dose: Co-60, Sr-90, Y-90, Tc-99, Ru-106, Cs-137, Pm-147, Eu-154, U-232, U-233, U-234, U-236, U-238, Pu-241, and Total α [1].

Compliance with the Saltstone IDP limit will be accomplished by meeting the individual radiological limits/targets, in Table 1 of the Saltstone WAC [1], for those constituents used to calculate the IDP limit (Co-60, Sr-90, Y-90, Tc-99, Ru-106, Cs-137, Pm-147, Eu-154, U-232, U-233, U-234, U-236, U-238, Pu-241, and Total α). As several of the IDP contributors are considered TARGETs and do not require update as part of the material balance, the most recent sample result will be provided in the material balance report. Prior to transferring waste into Tank 50H, a waste generator will be required to meet the WAC IDP concentrations for each of these constituents, in addition to the constituents listed in Attachment 8.3, with the exception of U-232. As this uranium constituent requires a special analytical method and is a negligible contributor to the overall IDP limit based on past salt batch concentrations, generators are not required to provide a characterization value for U-232. The Tank 50H material balance will maintain a periodic representation of the chemical/radiological WAC concentrations, including those used to determine the IDP (Table 1, [1]).

5.3.2 Limits/Targets for Chemicals Impacting Flammability

[*A/C* CST SAC 5.8.2.15]

[*A/C* Saltstone SAC 5.6.2.1]

Table 2 of the Saltstone WAC provides limits for the chemical contaminants impacting Flammability (i.e., ammonium, tetraphenylborate [TPB] and Isopar L), as well as limits and targets for Total Mercury, monomethyl mercury and dimethyl mercury [1]. Tank 50H compliance with these constituents will account for analytical uncertainty.

The WAC Limit for ammonium of 212 mg/L is less than the maximum that ETP currently may send to Tank 50H (720 mg/L [22]). The H-Canyon influent stream is limited to 0.0164 wt% (assuming 1.3 specific gravity, 213 mg/L [23]). Dating back to 2004, ETP averaged approximately 7000 gallons per month for transfer volume from the Waste Collection Tanks (WCT) into Tank 50H. ETP also has the ability to store concentrated waste in the Waste Concentrate Hold Tank (WCHT), which has an overflow volume of 30,000 gallons [11]. The monthly material balance communication will include an evaluation of the ammonium concentration in Tank 50H and show the impact of an additional 30,000 gallons at an ammonium concentration at 720 mg/L.

The total mass of TPB to be disposed of in an SDU is limited to 4.24 kg. X-ESR-H-00137 [24] indicates the total mass of transferable potassium TPB (KTPB) in Tank 50 is approximately 4.76 kg. The 4.76 kg of KTPB is proportional to 4.24 kg of TPB:

$$4.76 \text{ kg KTPB} * [319.22 \text{ g/mol TPB [1]} / (39.1 \text{ g/mol K [1]} + 319.22 \text{ g/mol TPB [1]})] = 4.24 \text{ kg TPB}$$

Revision 8 to the Saltstone WAC, X-SD-Z-00001 [1], introduced a Limit on Isopar L concentration of 11 ppm. Where the 11 ppm limit for Tank 50H to Saltstone transfer is a SAC the individual implementation steps outlined below are not SAC's.

Isopar L is introduced to Tank 50H from MCU Decontaminated Salt Solution (DSS) only. All other input streams to Tank 50H are Isopar L-free. Laboratory measurement, including uncertainty, of the MCU DSS stream has shown some individual transfers to Tank 50H to exceed the Isopar L WAC limit [18]. Thus, a strategy of blending DSS in Tank 50H with other waste is required.

In support of the blending required to maintain compliance with the Isopar L limit, a number of implementation steps are required:

- Slurry pump operations
Slurry pump operation shall be required to support transfers to Saltstone as described in Section 5.3.8.5.2, "Approach for consistency of feed with slurry pump operation". Minimum slurry pump operation as described in 5.3.8.5.2 will adequately mix the Isopar L throughout the supernate to assume uniform distribution [8].
- Blending evaluation
Periodic evaluation of the Isopar L concentration in Tank 50H will be required to demonstrate compliance. This will be accomplished by evaluating an allowable volume of DSS that may be transferred into Tank 50H.

Tank Farm procedures will ensure the maximum total volume of DSS evaluated for transfer into Tank 50H is not exceeded.

Tank Farm procedures will ensure the maximum total evaluated volume for Tank 50H to Saltstone transfer is not exceeded.

The evaluation will include the following: DSS sample results, including application of bias and uncertainty, transfer volumes during the evaluated period, and the amount of Isopar L in the heel of Tank 50H.

The evaluation's calculation and implementation approach is documented in X-ESR-H-00151 [21]. This document defines the nominal and bounding assumptions on Isopar L concentration used in the evaluation. DWPF and Saltstone Engineering concurrence is required for revision to X-ESR-H-00151. SRNL-STI-2011-00362 [17] and X-ESR-H-00146 [8], describe the quality of mixing outlined in section 5.3.8.5.2. Operating as described, the supernate and Isopar L will be adequately mixed such that the blending and calculation approach described in X-ESR-H-00151 [21] remains valid.

An evaluation result, based on DSS sample results, indicating an Isopar L concentration of 7 ppm or greater will result in termination of Tank 50H to Saltstone transfers.

A Level B software tool will be used to evaluate the Isopar L concentration in Tank 50H on a transfer by transfer basis.

- Sampling:

Each batch of DSS will be sampled for Isopar L concentration.

Quarterly WAC samples of Tank 50H will include analysis for Isopar L. The minimum detection limit, with bias included [18], may exceed the Isopar L limit. Under that condition, sample results from DSS and evaluation of blending in Tank 50H may be used as a process knowledge based input to the Tank 50H Material Balance and confirmation of compliance in place of the quarterly sample result.

The Solvent Hold Tank (SHT) shall be sampled quarterly and adjusted as necessary to ensure each of the MCU solvent components (Isopar L, Cs-7SB, BoBCalix/MaxCalix/blend of both, Trioctylamine /Tris(isodecyl)guanidine/blend of both) remains within concentration limits.

- Transfers:

Evaluations, as required by the ETAF, for any transfer into Tank 50H from another waste tank (e.g., Tank 23, Tank 49) will consider transfers from DWPF Recycle Collection Tank (RCT) or tanks that have received DWPF recycle since the startup of Strip Effluent transfers to DWPF. The DWPF RCT may contain Strip Effluent which has an Isopar L component.

If Tank 50H is in Premix Only operations, a maximum of 2 MCU DSS transfers may be received into Tank 50H between periods of mixing. Prior to a Tank 50H to Saltstone transfer, any MCU DSS transfer must be received within 24 hours of the most recent Tank 50H mixing operation.

The minimum level in Tank 50H shall be limited to 76 inches (72 inches [8] above the intake of the transfer pump (3 5/8") [12]). This low liquid level limit protects the allowance to receive 2 MCU transfers into Tank 50H between slurry pump operations yet continue to be adequately mixed for transfers to Saltstone.

A maximum volume, determined by the blending of unanalyzed DSS, may be received into Tank 50H. The blending evaluation will reflect this control.

- Operational Controls:

During MCU operation, the SHT density shall be monitored to ensure MCU solvent remains within operating limits.

An engineering evaluation shall be performed on a monthly basis to determine if Isopar L is required to be added to the SHT to ensure MCU solvent remains within operating limits. Isopar L shall be added to the SHT as required by the evaluation.

During MCU operation, the DSS coalescer differential pressure and pump discharge pressure shall be monitored (including alarm indication) to prevent coalescer breakthrough.

These operational controls serve to maintain solvent density within normal operating limits and coalescer integrity, both contributing to prevention of excess organic concentration in the DSS.

5.3.3 Hydrogen Generation Rate (HGR)

[*A/C* CST SAC 5.8.2.15]

[*A/C* Saltstone SAC 5.6.2.1]

The Saltstone WAC limit for radiolytic HGR is less than 1.41E-08 ft³/hr/gal (at 95 °C). In addition, the thermolytic HGR for salt solution transferred from Tank 50 shall have a combined TOC and aluminum contribution less than or equal to 0.05 wt%.

Table 2a of the SS WAC provides concentrations for HGR-significant radionuclides that will protect the radiolytic HGR limit. The SS WAC assumed an $f_{organic}$ of 0 to determine these concentrations. As the actual $f_{organic}$ value for influent streams and Tank 50 is greater than 0, verification of the individual limits alone is not sufficient to ensure that the overall HGR limit has been met. Reference 37 has calculated a range of nitrate, nitrite, and hydroxide concentrations and a bounding formate concentration that protects the radiolytic HGR limit at the individual radionuclide concentration limits/targets from Attachments 8.3 and 8.4 of the SS WAC. Verification that these constituents are within the ranges shown in Table 2, as well as verification of the SS WAC limits and targets in the Tank 50 material balance report ensures that the SS HGR is met. If any individual constituent exceeds the concentrations provided in the SS WAC, an HGR calculation will be performed using the equations provided in the SS WAC to verify that the SS radiolytic HGR limit has not been exceeded.

Table 2: Chemical Concentration Range for Saltstone Radiolytic HGR Compliance

Chemical	Concentration Range (mg/L)
Formate	< 5.29E+02
Hydroxide	8.75E+03 - 1.58E+05
Nitrate	5.20E+04 - 4.37E+05
Nitrite	3.25E+03 - 2.14E+05

Prior to transferring waste into Tank 50H, a waste generator will be required to demonstrate compliance with the SS WAC limit in one of these ways (verification of ranges and individual radiological limit/target verification or overall HGR calculation), using either sample results or process knowledge. For the 512-S wash water transfers containing high Cs concentrations and dilute chemistry, the evaluation required by the DWPF to TF WCP (Ref. 35) will ensure that Tank 50 remains within the SS WAC limit for Cs-137, Cs-134 and minimum chemical concentrations (i.e., Na, NO₂, NO₃, etc.) to protect the SS HGR and processing criteria limits. As U-232 requires a special analytical method and is a negligible contributor to the overall HGR limit based on past salt batch concentrations, generators are not required to provide a characterization value for U-232.

The thermolytic HGR limit of 0.05 wt% is protected by meeting the TOC and Aluminum targets listed in Attachment 8.2 of the SS WAC [1]. These values were selected as bounding from historical Tank 50 quarterly sample results. Verification in the material balance report that the quarterly sample results are within these target values ensures that the Tank 50 contents meet the SS thermolytic HGR limit. If any individual constituent exceeds the Al or TOC concentrations, a calculation will be performed using the equations provided in the SS WAC to verify that the SS thermolytic HGR limit has not been exceeded.

Neither radiolytic or thermolytic HGR calculations are required to include analytical uncertainty.

5.3.4 “Other Organics” Contribution to Flammability

[*A/C* Saltstone SAC 5.6.2.1]

Other than Isopar L, benzene, ammonia and hydrogen, the volatiles in salt solution shall not exceed the concentrations in Table 3 of the SS WAC, accounting for analytical uncertainty [1]. These “other organics” include butanol, TBP, isopropanol, methanol and NORPAR 13. Where sample analysis indicates a detection limit greater than the WAC limit, process knowledge will be used to demonstrate compliance and documented in the Material Balance communication.

If actual concentrations of any of these “other organics” are higher than the values in SS WAC Table 3, an engineering evaluation can be performed by the LWGR per the methodology referenced in Saltstone WAC Section 5.4.4.4 to demonstrate that the cumulative contribution to flammability from all five constituents remain less than or equal to the cumulative value from all five organic concentrations given in SS WAC Table 3.

If a new flammable chemical becomes evident in Tank 50, transfers to the SS facility shall be stopped and the new chemical(s) shall be evaluated to determine its contribution to flammability of SDUs 3 and 6, SFT and SSRTs. If the result is greater than 0.5% contribution to CLFL, no additional transfers from Tank 50 are allowed. If the evaluation result is less than 0.5%, no further action is required, and transfers may resume to the SS facility.

5.3.5 Nuclear Criticality Safety

[*A/C* Saltstone SAC 5.6.2.1]

By compliance to the Radionuclide Criteria LIMITS for the concentrations of U-233, U-235, Pu-241 and Total Alpha given in Saltstone WAC Attachment 8.3 [1],

accounting for analytical uncertainty, the fissile material inputs to the Saltstone Nuclear Criticality Safety Evaluation are met.

5.3.6 Chemical Criteria

The waste stored in Tank 50H is a complex mixture of insoluble and soluble chemical compounds that were generated from chemically processing nuclear materials at the Savannah River Site. The waste contains hydroxide, nitrite and various soluble and insoluble chemical compounds of toxic metals (i.e., lead, silver, cadmium, selenium). The major chemicals are the corrosion inhibitors needed to prevent corrosion of the carbon steel waste tanks and equipment. These major species include hydroxide and nitrite. Addition of other chemicals to Tank 50H, besides the aforementioned inhibitors, chemicals received in the incoming waste streams, and small quantities of defoaming agents used in the evaporators, requires Saltstone review and approval. The incoming waste streams into Tank 50H will be evaluated for impacts to the Saltstone WAC.

If a new hazardous chemical is discovered in the waste in Tank 50H or a non-hazardous chemical is discovered in Tank 50H at a concentration of greater than 0.5 M, the constituent will be reported to Saltstone in a timely manner in order to receive their approval prior to this material's transfer into Saltstone.

Aqueous waste transferred to the Saltstone Facility shall not contain or generate volatile organic materials at concentrations that can produce, at equilibrium, vapors in the flammable or explosive range during normal storage, treatment or disposal operations in Z Area. A characterization of the contents of Tank 50H will be maintained in WCS, including the organic constituents requested in the Saltstone WAC.

Aqueous waste transferred to the Saltstone Facility shall not contain or be capable of generating toxic gases, vapors, or fumes (excluding tritium) in quantities harmful to persons during normal transport, storage, handling, treatment, or disposal operations in Z Area.

Aqueous waste transferred to the Saltstone Facility shall not be classified as a Resource Conservation and Recovery Act (RCRA) listed waste, as designated by South Carolina Hazardous Waste Management Regulations or the Environmental Protection Agency (EPA), unless prior approval by South Carolina Department of Health and Environmental Control (SCDHEC) and DOE is granted.

Aqueous waste transferred to the Saltstone Facility shall not result in the saltstone being classified as RCRA hazardous waste, as designated by South Carolina Hazardous Waste Management Regulations or the EPA.

As all mercury species limits are bounded by the total mercury limit, only total mercury analysis is required for salt batch acceptance and in Tank 50 quarterly samples (General Purpose Evaporator [GPE] and ETP characterization values have already been demonstrated to be within all mercury species limits [10]). The SS WAC does contain a target for dimethyl mercury of 1.00E+00 mg/L, which is not bounded by the total mercury limit of 3.25E+02 mg/L. However, during the period of time which speciation of the Tank 50 quarterly WAC samples has been performed, the maximum analyzed dimethyl mercury value was 0.24 mg/L, including two sigma analytical uncertainty [34]. In addition, dimethyl mercury has sufficient vapor pressure to volatilize quickly. Based on this process knowledge, as well as the personnel hazard posed performing the speciation testing of dimethyl mercury, neither the Tank 50 quarterly samples nor the salt batch acceptance samples are required to be speciated.

5.3.6.1 Chemical Criteria Limits (SS WAC Attachment 8.1)

[*A/C* CST SAC 5.8.2.15]

[*A/C* Saltstone SAC 5.6.2.1]

A characterization of the contents of Tank 50H will be maintained in WCS for all chemical constituents listed in Attachment 8.1 of the Saltstone WAC [1], accounting for analytical uncertainty. Prior to transferring waste into Tank 50H, a waste generator must demonstrate compliance with the Saltstone WAC limits provided in Saltstone WAC Attachment 8.1 [1], to include sodium and insoluble solids (limits provided in Table 4 of the SS WAC [1]). If a waste generator is unable to meet a Saltstone WAC limit on any constituent(s), a deviation request will be made. The approval/disapproval of the deviation request by the Tank Farm and Saltstone will determine whether the waste stream will be approved to be transferred to Tank 50H. If at any time the material balance reflects that a constituent is not within the limits established by Saltstone, transfer procedures for Tank 50H to Saltstone transfers will be placed on administrative hold until a deviation request is approved by Saltstone, or Tank 50H is brought back into compliance.

5.3.6.2 Chemical Criteria Targets (SS WAC Attachment 8.2)

Periodic sample results for the constituents listed in Attachment 8.2 of the Saltstone WAC [1] will be reported in the Tank 50H material balance worksheet in WCS 1.5, accounting for analytical uncertainty. Where sample results are not available process knowledge may serve as characterization. Specifically, the concentration of Methanol is established through process knowledge [9]. The chemicals listed in this attachment are not considered significant contributors to accidents analyzed in their DSA at their current concentrations. The expected maximum concentration of these chemicals in the influent to Saltstone is at least

an order of magnitude less than the WAC target value [1]. The concentrations of these chemicals will only be determined on a confirmatory (i.e., quarterly) basis in Tank 50H. Waste generators transferring into Tank 50H will not be required to analyze for constituents in Saltstone WAC Attachment 8.2 [1]; therefore, these constituents will not be included in the Tank 50H material balance. The most recent Tank 50 sample results will be provided in the report. If a TARGET concentration is exceeded, then D&S-FE will reevaluate the TARGET concentration for the chemical and supply a new TARGET value to ensure the individual chemical concentration limit is protected for SPF.

5.3.7 Radionuclide

The transfer of aqueous waste to the Saltstone Facility that would produce solid saltstone to be classified, transuranic (TRU) waste or HLW waste is prohibited. In addition to the radiological limits and targets listed in the Saltstone WAC [1], a formal review and authorization by D&S-FE, Saltstone Environmental Support, and Saltstone Operations is required for the transfer of a waste known to contain a radionuclide that is not specifically listed in the Saltstone WAC, if that radionuclide's concentration is greater than or equal to 1.25E+04 pCi/mL.

5.3.7.1 Radionuclide Criteria LIMITS (SS WAC Attachment 8.3)

[*A/C* CST SAC 5.8.2.15]

[*A/C* Saltstone SAC 5.6.2.1]

A characterization of the contents of Tank 50H will be maintained in the material balance for radionuclide constituents listed in Attachment 8.3 of the Saltstone WAC [1], accounting for analytical uncertainty, to include the constituents used to determine IDP (Table 1, [1]) and gamma source strength (Table 5 [1]). Prior to transferring waste into Tank 50H, a waste generator must demonstrate compliance with the Saltstone WAC limits provided in Attachment 8.3 [1], to include the constituents used to determine IDP and gamma source strength. If a waste generator is unable to meet a Saltstone WAC limit on any constituent(s), a deviation request will be made. The approval/disapproval of the deviation request by the Tank Farm and Saltstone will determine whether the waste stream will be approved to be transferred to Tank 50H. If at any time the material balance reflects that a constituent is not within the limits established by Saltstone, transfer procedures for Tank 50H to Saltstone transfers will be placed on administrative hold until a deviation request is approved by Saltstone, or Tank 50H is brought back into compliance.

5.3.7.2 Radionuclide Criteria TARGETS (SS WAC Attachment 8.4)

Periodic sample results for the radionuclide constituents listed in Attachment 8.4 of the Saltstone WAC [1], accounting for analytical uncertainty, will be reported in the Tank 50H material balance worksheet in WCS 1.5. Where sample results are not available process knowledge may serve as characterization. Many of the

radionuclides listed in this attachment have TARGET acceptance criteria to protect the Performance Assessment (PA) curie limits or to protect the DSA and permit values [1]. The concentrations of these radionuclides will only be determined on a confirmatory basis in Tank 50H. Waste generators transferring into Tank 50H will not be required to analyze for constituents in Saltstone WAC Attachment 8.4 [1], therefore these constituents will not be included in the Tank 50H material balance. The most recent Tank 50 sample results will be listed in the material balance report. D&S-FE, Saltstone Environmental Support, and Saltstone Operations shall be notified when the concentration of any radionuclide contaminant in waste to be transferred exceeds the TARGETS shown in Attachment 8.4.

5.3.8 General Processing Criteria

5.3.8.1 pH Requirement

The pH of aqueous waste transferred to Saltstone will be greater than 10.3 (basic) as Tank 50H is part of the Tank Farm Corrosion Control Program [5]. The minimum hydroxide requirements in the corrosion control program ensure that this requirement will be met in Tank 50H. Waste generators must also meet the requirements of the Tank Farm Corrosion Control Program before transferring waste into the Tank 50H.

5.3.8.2 Sodium [Na⁺] Concentration Requirement

The sodium [Na⁺] concentration in Tank 50H will be maintained between 2.5M and 7.0M ($2.5M < [Na^+] < 7.0M$). Prior to transferring waste into Tank 50H, a waste generator will be required to meet the sodium concentration requirement. Sodium will be added to the Tank 50H material balance with the constituents in Saltstone WAC Attachment 8.1 [1]. The Tank 50H material balance will maintain a monthly representation of the chemical/radiological Saltstone WAC concentrations, including [Na⁺]. The Tank 50H material balance will also be updated after the completion of any tank-to-tank transfer.

5.3.8.3 Temperature Requirement

The temperature of the waste transferred to Saltstone will be greater than or equal to 10°C to reduce the probability of exceeding the solubility of salt contaminants and less than or equal to 40°C to enable immediate processing in the SPF. H-Tank Farm will ensure that this requirement is met by requiring, in the transfer procedure from Tank 50H to Saltstone, that a temperature verification be made prior to transferring. [33]

5.3.8.4 Insoluble Solids Requirement

The Total Insoluble Solids in Tank 50H transferred to Saltstone will be maintained below 1.88E+05 mg/L (15 wt %). Prior to transferring waste into Tank 50H, a waste generator will be required to meet the insoluble solids requirement. Total Insoluble Solids will be added to the Tank 50H material balance with the constituents in Saltstone WAC Attachment 8.1 [1]. The Tank 50H material balance will maintain a monthly representation of the chemical/radiological WAC concentrations, including Total Insoluble Solids. The Tank 50H material balance will also be updated after the completion of any tank-to-tank transfer.

5.3.8.5 Homogeneous and Consistent Feed Requirement

The Saltstone Facility requires a homogeneous and consistent feed due to the complexity of the grout formulation. Two approaches to meeting this requirement may be followed. The first is without slurry pumps in operation. The second is with slurry pump operation.

5.3.8.5.1 Approach for Consistency of Feed Without Slurry Pump Operation

NOTE: During Low Isopar L Operation the Isopar L limit is ≤ 11 ppm. While this limit is in effect, transfers to Saltstone without slurry pump operation are not allowed.

If the configuration of slurry pumps described in the following section is not operated during transfers to Saltstone, the homogeneity and consistency of feed to saltstone will be maintained by the following:

- Tank Farm Operations will institute controls to prevent operation of the Tank 50H slurry pumps during transfers to Saltstone.
- A minimum of 12 hours of settling (all Tank 50H slurry pumps inactive) will pass before initiation of transfer to Saltstone. [14]
- Before transition to transfers with slurry pumps operating, the material remaining in Tank 50H will be re-evaluated for compliance with the Saltstone WAC. Transfers without slurry pumps operating concentrate the solids in Tank 50H. Some radionuclides are associated with the solids. Therefore, re-suspending the solids could impact compliance with Saltstone WAC requirements, and needs to be assessed.

5.3.8.5.2 Approach for Consistency of Feed With Slurry Pump Operation

Tank Farm Operations procedures ensure that prior to starting the Tank 50H to Saltstone transfer, a minimum of three slurry pumps, must be operated continuously for at least 2.5 hours with nozzles in rotation. Operating a

minimum of three slurry pumps, with a minimum mixing time of 2.5 hours, is sufficient to ensure complete mixing of solution in Tank 50H. [8, 17, 30]

Alternative 1, Tank Farm Operations procedures ensure that prior to starting the Tank 50H to Saltstone transfer, one slurry pump must be operated continuously for at least 4.4 hours with nozzles in rotation. Operating a slurry pump for a minimum of 4.4 hours is sufficient to ensure complete mixing of solution in Tank 50H. [8, 17]

Alternative 2, Tank Farm Operations procedures ensure that prior to starting the Tank 50H to Saltstone transfer, two slurry pumps must be operated continuously for at least 3.1 hours with nozzles in rotation. Operating two slurry pumps for a minimum of 3.1 hours, is sufficient to ensure complete mixing of solution in Tank 50H. [8, 17]

At Facility Management discretion, slurry pumps may either be operated as described in the following ‘Concurrent Mixing Operation’ section or the ‘Premix Only Operation’ section.

5.3.8.5.3 Concurrent Mixing Operation Description

In addition to the mixing described in 5.3.8.5.2, the required slurry pumps will be run for the duration of the Tank 50H to Saltstone transfer, but may be shutdown temporarily (no longer than 15 minutes) to obtain an accurate level indication. Slurry pumps will be restarted immediately after obtaining level. The transfer will be shutdown if any of the minimum required slurry pumps are out of operation for greater than 15 minutes for any reason. Resumption of transfer with slurry pump(s) operating can occur after another minimum mixing period as described in 5.3.8.5.2.

When changing mixing pump operation options, impact on compliance with Saltstone WAC requirements will be assessed.

5.3.8.5.4 Premixing Only Operation

For this mode of operation, the mixing described in 5.3.8.5.2 is required prior to initiation, within 24 hours, of transfer to Saltstone. Additionally, during the transfer of salt solution to Saltstone, the mixing pumps in Tank 50H are not to be operated.

When changing mixing pump operation options, impact on compliance with Saltstone WAC requirements will be assessed.

5.3.9 Gamma Shielding [*A/C* CST SAC 5.8.2.15]

The Saltstone WAC states that the specific gamma source strength value of $5.82E+00$ mR/hr/gallon shall not be exceeded unless additional Radiological Control Operations (RCO) controls or shielding is added.

Compliance with the Saltstone Gamma Shielding limit will be accomplished by meeting the individual limits/targets, in Attachments 8.3 and 8.4 of the Saltstone WAC [1], for those constituents used to calculate the Gamma Shielding limit (Co-60, Sb-125, Cs-134, Cs-137 and Eu-154). These constituents will also be included in the Tank 50H material balance with the constituents in Attachment 8.3. As Co-60, Sb-125, Cs-134 and Eu-154 are considered TARGETS and do not require update as part of the material balance, the most recent sample result will be provided in the report. Prior to transferring waste into Tank 50H, a waste generator will be required to meet the WAC Shielding concentrations for each of these constituents, in addition to the constituents listed in Attachment 8.3. The Tank 50H material balance report will maintain a periodic representation of the chemical/radiological WAC concentrations, including those used to determine the Gamma Source Strength (Table 5, [1]).

5.3.10 ARP/MCU Processing Requirements

There are two treatment options for the ARP Facility: a monosodium titanate (MST) strike option and a Filter-only option. The two treatment options are dependent on the salt batch characteristics and whether the strontium and actinide concentrations are less than the Saltstone WAC limits. The Filter-Only option may be used when the salt solution batch characteristics (e.g., strontium and actinide concentrations) are less than the Saltstone WAC limits. With the MST-Strike option, the ARP facility removes alpha-emitting and strontium radionuclides from dissolved salt through contacting the salt stream with MST and then removing the precipitated alpha and strontium solids in a crossflow filter at 512-S. For the Filter-Only option, the salt solution is transferred directly from Tank 49 to 512-S and bypasses the MST strike operation at 241-96H. With both options, the resultant filtered salt stream is sent to MCU for cesium removal. After the cesium is removed in MCU, the resultant decontaminated salt solution is transferred to Tank 50H for feed to Saltstone. The determination as to whether MST strike is required is made during the salt batch acceptance process and documented in the salt batch acceptance report.

The following processing requirements are to protect the critical inputs and assumptions that are used to demonstrate compliance to the 2009 Saltstone PA and the Waste Determination.

For the MST-Strike option at ARP:

1. All material passed through the ARP passes through a cross-flow filter (at 512-S) to remove and concentrate the insoluble solids.
2. The concentrated solids heel in the filter feed tank (at 512-S) is washed and filtered to remove soluble sodium salts.
3. If a salt solution is processed through ARP, MST strikes are conducted.
4. MST strike tank contents are to be agitated between 4 and 24 hours. (Procedurally, the minimum strike time will be 4 hours.)

For the Filter-Only option at ARP:

1. All material passed through ARP bypasses 241-96H and passes through a cross-flow filter (at 512-S) to remove and concentrate the insoluble solids.
2. The concentrated solids heel in the filter feed tank (at 512-S) is washed and filtered to remove soluble sodium salts.

5.3.11 Regulatory Criteria

As required by Table 1 in Section 5.1.1, a TCLP sample is required as part of the quarterly Tank 50H WAC sample in order to ensure that the grout made in Saltstone meets the permit requirements. These quarterly TCLP sample results are compared to the Toxicity Characteristic Limits in Table 6 of the Saltstone WAC [1] and will be included in the Tank 50H Material Balance report. The quarterly Toxicity Characteristic measurement is a single data point and therefore has no associated analytical uncertainty.

In order to ensure that Tank 50H will meet the regulatory requirements for mercury, additional requirements are being imposed on the influent streams to Tank 50H. Each WCHT transferred from ETP will be sampled for total mercury to ensure that it is below the Hg stream characterization value currently in WCS. If the Hg result for a WCHT batch comes back above the characterization value, a deviation request will be submitted. For the H-Canyon GPE stream, sampling of each batch is not necessary due to the small volume of the stream into Tank 50H and the extremely low characterization value for Hg (0.5 mg/L [10]).

5.3.12 Tank 50 Temperature Criteria

[*A/C* CST SAC 5.8.2.15]

[*A/C* Saltstone SAC 5.6.2.1]

The temperature of the salt solution transferred to the SPF shall be less than or equal to 40°C, accounting for instrument uncertainty. H-Tank Farm will ensure that this requirement is met by requiring, in the transfer procedure from Tank 50H to Saltstone that a temperature verification be made prior to transferring. [33]

5.3.13 Chemical Resistance of SDU 6 Liner / Coating

Table 7 of the SS WAC provides TARGET values for three cations and eight anions which have been identified as potentially corrosive to the SDU 6 concrete and protective coatings/liners. The chemical resistance constituents will be analyzed in the quarterly Tank 50 WAC sample and the sample results will be compared to the target values as part of the material balance report. As with the Chemical and Radiological Targets (Sections 5.3.6.2 and 5.3.7.2), generators are not required to demonstrate compliance with the Chemical Resistance targets. Compliance will be met in Tank 50. As the targets are not safety related, analytical uncertainty is not required. If quarterly sample results for any Chemical Resistance constituent are above the target value, an evaluation will be performed consistent with SS WAC Section 5.4.15 [1] and must be signed by the Waste Disposal Authority (WDA) group to document the coating/liner will remain chemically resistant.

5.4 Administrative Controls

5.4.1 Waste Forecasts

To assure adequate storage, treatment and disposal capacity will be available for future operation of the Saltstone Facility, the Liquid Waste Planning team will be used to provide projected waste forecasts.

5.4.2 Waste Compliance Plan

This document is the Waste Compliance Plan and serves as the principle agreement between H-Tank Farm Operations and Saltstone Operations to assure that incoming waste compositions comply with the Saltstone WAC.

5.4.3 Documentation

In accordance with the requirements of the Saltstone WAC, TF-FE and/or TF Operations shall:

- Retain auditable records for at least 3 years of any chemical, radiological and/or calculation analyses that are used to prepare documents that describe the composition of waste transferred to the Saltstone Facility.
- Provide a Tank 50H Material Balance update to D&S-FE for any month in which a transfer is made to the Saltstone Facility. The volume(s) and composition(s) of all transfers from Tank 50H to the Saltstone Facility that were made within the month shall be covered by the memo. Sufficient information shall be provided in the memo to demonstrate all individual transfers are in compliance with the acceptance criteria documented in the

WAC. The memo will be independently reviewed and approved by D&S-FE.

- Perform an Isopar L Blend Calculation to specify the allowable total volume of DSS that is authorized for transfer from MCU to Tank 50H to ensure that the Isopar L LIMIT will not be exceeded. Representative batch sampling and analysis at MCU shall occur to support the material balance and blend calculations.
- Assure, prior to each transfer from Tank 50H, that analyses (sampling, calculation, process knowledge or combination) of current Tank 50H contents and applicable uncertainties are available to D&S-FE and Saltstone Operations.
- Assist D&S-FE and Saltstone Operations in obtaining samples from Tank 50H for analysis associated with LIMIT and TARGET acceptance criteria in the Saltstone WAC and the confirmatory samples to fulfill permit requirements for saltstone production and disposal.
- Complete all analyses and/or calculations described in the WCP.
- TF-FE will issue a technical report demonstrating compliance to the Saltstone WAC with independent review and approval by D&S-FE which documents the return to slurry pump operations in Tank 50H prior to transferring while slurry pumps are in operation. This report will include details such as the analytical results and process knowledge which will show compliance with the LIMITS and TARGETS listed in Attachments 8.1 through 8.4 of the Saltstone WAC [1] along with the other Saltstone acceptance criteria.

5.4.4 Waste Characterization Non-Compliance

Saltstone will be notified of any non-compliance with this WCP and the Saltstone WAC. The Site Tracking, Analysis and Reporting (STAR)/Problem Reporting (PR) and SIRIM procedures shall be invoked as appropriate. Liquid Waste Generators will be required to characterize their waste sufficiently prior to transferring into Tank 50H; allowing H-Tank Farm Operations to demonstrate Tank 50H's compliance with the various criteria imposed by the Saltstone WAC. H-Tank Farm Operations will participate in any corrective actions resulting from non-compliance.

5.4.5 Deviations

[*A/C* CST SAC 5.8.2.15]

A deviation request shall be made to Saltstone Operations prior to sending any waste to Saltstone that cannot demonstrate compliance with the Saltstone WAC limits. Deviation request for all Outside Facilities, transferring waste into Tank 50H, will require Tank Farm approval. If a deviation to a Saltstone WAC limit should be discovered after a waste stream has been approved and has been

accepted, either into Tank 50H or Tank 50H to Saltstone, transfer procedures for Tank 50H to Saltstone transfers will be placed on administrative hold until a deviation request is approved. All deviation requests will be accompanied by a basis or justification for why the stream should be acceptable to the Saltstone Facility and shall require the performance of a USQ or equivalent and UWMQ per ENG.46 [29].

6.0 Records

Operating Records, including those pertaining to the generation of the Tank 50H salt feed stream, are saved in completed operating procedures and are retained per Manual 1B MRP 3.31 (Records Management) and Manual 1Q 17-1 (Records Management).

Other significant information related to characterization of the Tank 50H salt feed stream will be documented as correspondence.

7.0 References

1. X-SD-Z-00001, Rev. 18, *Waste Acceptance Criteria for Aqueous Waste Sent to the Z-Area Saltstone Production Facility*, October 2018.
2. X-SD-G-00001, Rev. 42, *Waste Acceptance Criteria for Liquid Waste Transfers to the 241-F/H Tank Farms*, October 2018.
3. Reference Deleted
4. WG08/HLW-WRT
5. WSRC-TR-2002-00327, Rev. 9, *CSTF Corrosion Control Program*, K. Martin, December 2015.
6. X-ESR-H-00052, Rev. 7, *Sampling Methodology for CSTF DSA Administrative Programs*, C. B. Sudduth, May 2016.
7. N-ESR-G-00001, Latest Revision, *High Level Waste Emergency Response Data and Waste Tank Data*.
8. X-ESR-H-00146, Rev. 1, *Impact of Interim MCU Operation on Tank 50H and Saltstone*, T.E. Britt, June 2011.
9. X-ESR-H-00065, Rev. 0, *Request for Deviation to Tank 50 Waste Compliance Plan for Transfers to Saltstone*, April 2006.
10. <http://prod.srs.gov/WCSOnline>
11. S-CLC-H-00640, Rev. 5, *Hazards Assessment Document for the ETP (U)*, J. A. Fishel, January 2014.
12. SW11.1-WTE-7.2, *Waste Tank Equipment Manual*.
13. Reference Deleted
14. X-ESR-H-00113, Rev. 0, *Determination of Solids Settling Characteristics upon Cessation of Slurry Pump Operation in Tank 50 H*, T. E. Britt, December 2007.
15. Reference Deleted
16. Reference Deleted
17. SRNL-STI-2011-00362, Rev. 0, *Assessment of the Ability of Standard Slurry Pumps to Mix Miscible and Immiscible Liquids in Tank 50H*, M. R. Poirier.
18. SRNS-N3100-2011-00032, *Evaluation of the Isopar Biases and Precisions for the Second Quarter 2011*, M. Philips, June 2011.
19. Reference Deleted
20. Reference Deleted
21. X-ESR-H-00151, Rev. 0, *Isopar L Blend Strategy for Tank 50 Compliance to Saltstone WAC Limit*, E. W. Harrison, December 2008.
22. X-WCP-H-00002, Latest Revision, *F/H Effluent Treatment Project Waste Concentrate Waste Compliance Plan*.
23. X-WCP-H-00008, Latest Revision, *Waste Compliance Program for Liquid Waste Transfers from H-Canyon to 241-H Tank Farm*.
24. X-ESR-H-00137, Rev. 0, *Estimated Residual Mass of Potassium Tetrphenylborate in the Heel of Tank 50H*, T. Britt, May 2008.
25. Reference Deleted
26. WSRC-SA-2003-00001, Latest Revision and Amendments, *Saltstone Facility Documented Safety Analysis*.
27. Reference Deleted

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28. Reference Deleted
 29. S4-ENG.46, Rev. 3, *LW Unreviewed Waste Management Question (UWMQ)*.
 30. SW11.1-WTS(50-Z)-1 Section 4.2, *Tank 50 to Z Area Transfer*.
 31. Reference Deleted
 32. S4-ENG.08, *Waste Acceptance Criteria, Waste Compliance Plan, and Special Waste Compliance Plan*.
 33. SW11.1-WTS(50-Z)-1 Sections 4.4, 7.1, *Tank 50 to Z Area Transfer*.
 34. SRNL-L3100-2016-00173, Rev. 0, *Results for the Third Quarter Calendar Year 2016 Tank 50H Salt Solution Sample*, October 2016.
 35. X-WCP-H-00019, latest revision, *Waste Compliance Plan for Tank Farm Transfers to DWPF (U)*.
 36. X-ESR-H-00975, Rev. 0, *Waste Compliance Strategy for Tank Closure Cesium Removal Waste Transfers to Tank 50*, March 2019.
 37. X-ESR-H-00956, Rev. 1, *Evaluation of Tank 50 Influent on Saltstone WAC Revision 18 Limits*, March 2019.