SRMC-CWDA-2025-00075
Revision 1

SRMC SAVANNAH RIVER MISSION COMPLETION®

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Proposal to Cease Waste Removal Activities in Tank 3 and Enter Sampling and Analysis Phase

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Waste Disposal Authority

September 4, 2025

Presentation Outline

- Meeting Objective
- Summary/Recommendations
- Waste Removal History and Results
- Additional Cleaning Considerations
- Path Forward
- Request for Department of Energy (DOE), South Carolina Department of Environmental Services (SCDES), and Environmental Protection Agency (EPA) Concurrence
- Background

Acronyms

ALT	Alternate
BSL	Bulk Salt Level
CGCP	Consolidated General Closure Plan
CM	Closure Module
CSMP	Commercial Submersible Mixing Pump
DOE	Department of Energy
DSS	Dissolved Salt Solution
DWPF	Defense Waste Processing Facility
EPA	Environmental Protection Agency
FFA	Federal Facilities Agreement
FTF	F Tank Farm
HHW	High Heat Waste
HTF	H Tank Farm
LL	Liquid Level
LTAD	Low Temperature Aluminum Dissolution
LVMJ`	Low Volume Mixing Jet
MCL	Maximum Contaminant Level
LWTRSAPP	Liquid Waste Tank Residuals Sampling and Analysis Program Plan
MCL	Maximum Contaminant Level
S&A	Sampling and Analysis
SCDES	South Carolina Department of Environmental Services[1]
SCDHEC	South Carolina Department of Health and Environmental Control[1]
SPF	Saltstone Production Facility
STD	Standard
STP	Submersible Transfer Pump
SWPF	Salt Waste Processing Facility

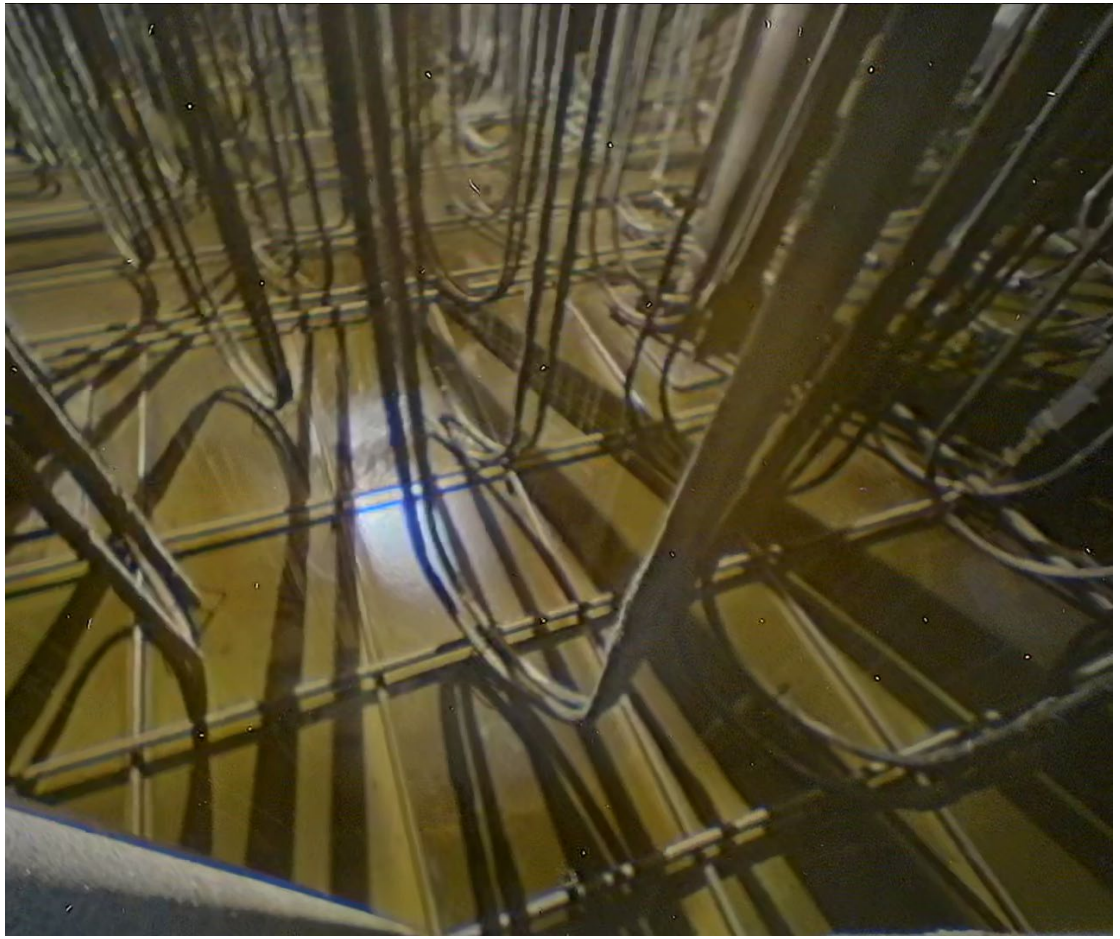
[1]South Carolina Department of Environmental Services (SCDES) was known as South Carolina Department of Health and Environmental Control (SCDHEC) prior to July 1, 2024. Throughout this presentation figures and text reproduced from existing documents may still reflect SCDHEC nomenclature.

Meeting Objective

Obtain mutual agreement among DOE, SCDES, and EPA to:

1. **Suspend waste removal activities in Tank 3; and**
2. **Enter the Sampling and Analysis phase in Tank 3 consistent with the *Consolidated General Closure Plan for F-Area and H-Area Waste Tank Systems* (CGCP) and *Liquid Waste Tank Residuals Sampling and Analysis Program Plan* (LWTRSAPP)**

Tank 3 Primary



Summary

- Approximately 99% of the waste volume in Tank 3 has been removed
- A qualitative assessment indicates that the CGCP performance objectives will not be challenged
- Tank 3 is not a significant contributor to doses in F-Area Tank Farm (FTF) Performance Assessment and additional waste removal would have minimal impact on estimated doses/performance objectives
- Additional waste removal activities in Tank 3 would have a negative impact on other Liquid Waste risk reduction activities
- A quantitative assessment utilizing final residual waste volumes and results of sampling and analysis will be included in the Closure Module covering Tank 3
- A formal discussion on the “practicability” of additional waste removal will be included in the Closure Module covering Tank 3

Performance Objectives

Based on the characteristics and estimated volume of the waste remaining in Tank 3, performance objectives are expected to be met.

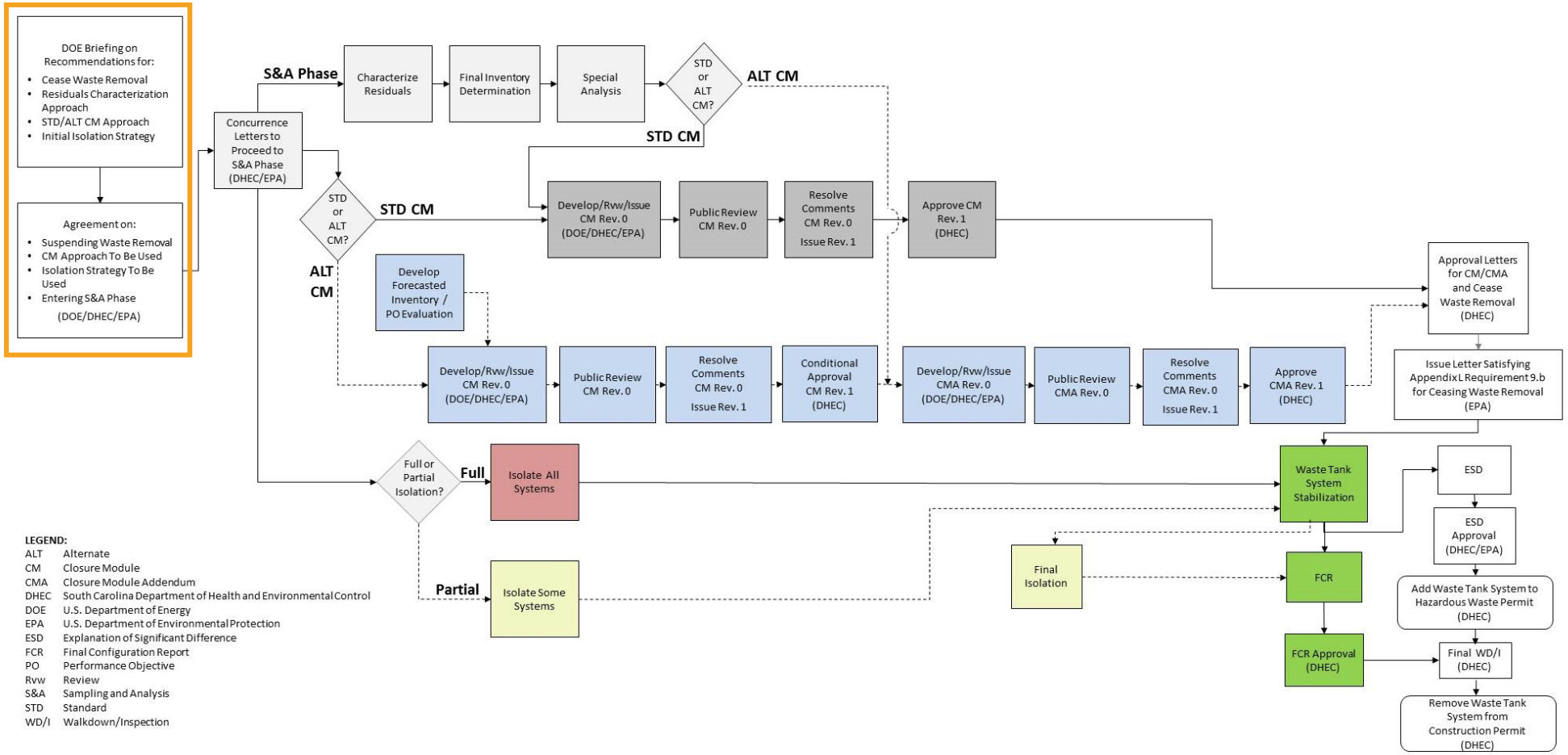
- Anticipate that concentration values in the groundwater for FTF will be below the Maximum Contaminant Level (MCL) values for all the non-radiological inorganic constituents listed in Table 9.2-1 of the CGCP
- Anticipate that concentration values in the groundwater for FTF will be below the MCL values for radionuclides consistent with the State Primary Drinking Water Regulations including:
  - *4 mrem/yr dose for beta- and gamma-emitting nuclides*
  - *15 picocuries per liter (pCi/L) for alpha-emitting nuclides (including Ra-226 but excluding radon and uranium)*
  - *5 pCi/L for radium (Ra-226 plus Ra-228)*
  - *30 micrograms per liter (µg/L) of uranium*

Radiation Dose Perspective

- **Anticipate that the peak dose from Tank 3 alone will be <3 mrem/year during both the 1,000 year and 10,000-year periods after FTF closure[1]**
  - *Tank 3 is not a significant contributor to the peak dose in the FTF Performance Assessment*
    - Tank 3 peak dose not anticipated to coincide with timing and location of overall peak dose within FTF
- **To put this radiological dose into perspective**
  - *Per NCRP-160, the average annual dose to a person in the United States is approximately 620 mrem primarily from:*
    - Approximately 310 mrem from naturally occurring background
    - Approximately 300 mrem from medical procedures

[1] Based on a preliminary estimate of the volume. Final inventories and dose impacts will be included in the Closure Module.

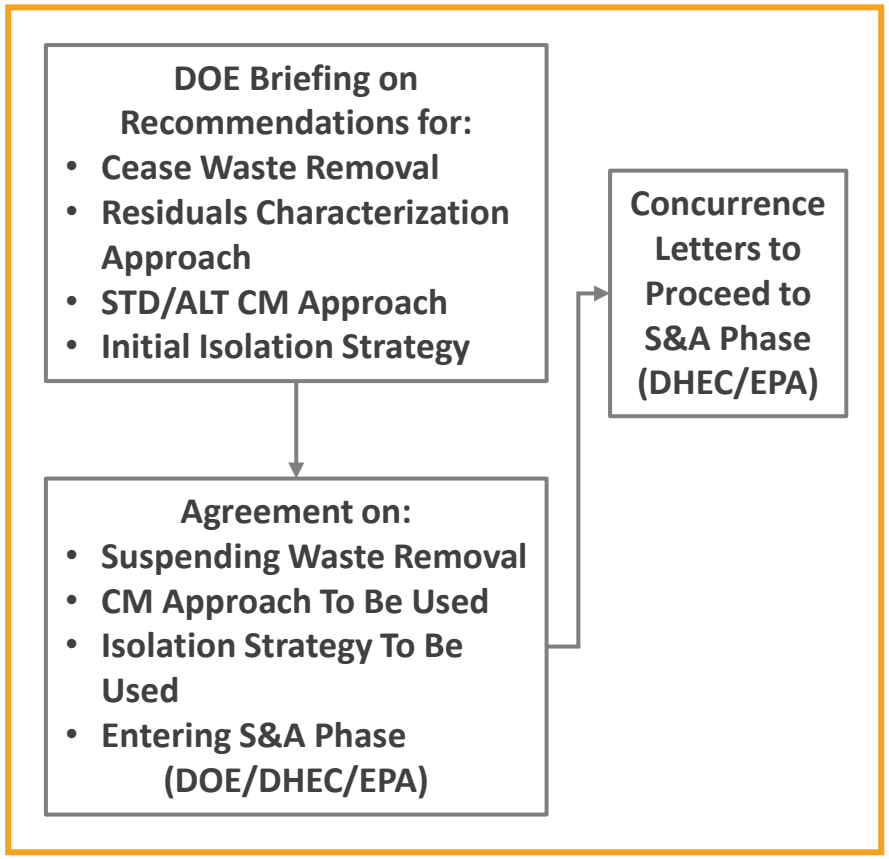
Pathway to Closure



Closure Module Approval and Waste Tank System Removal from Service Process (CGCP Figure 11.4-1)

[SRR-CWDA-2017-00015]

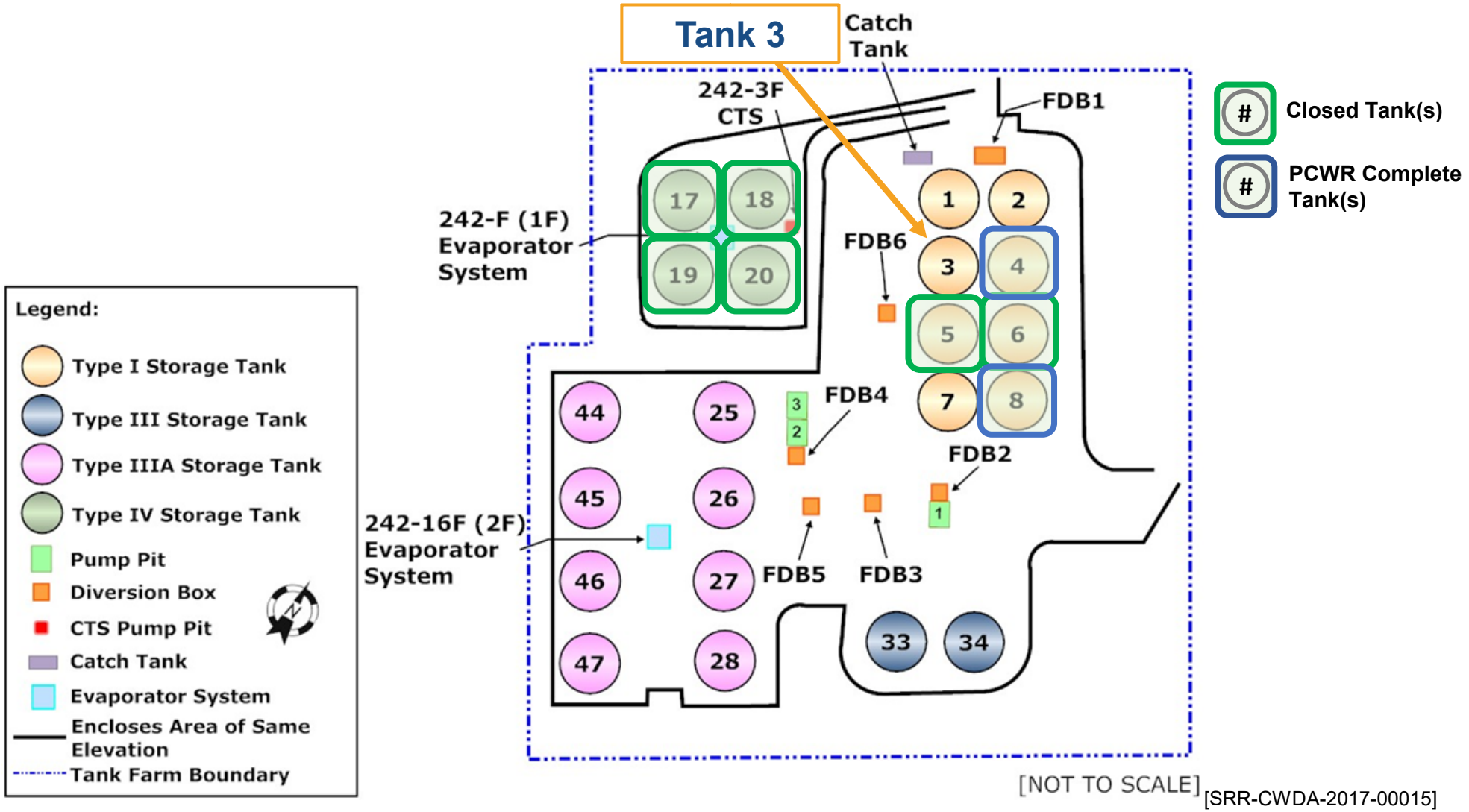
Recommendations



[SRR-CWDA-2017-00015]

1. **Suspending waste removal activities and enter the Sampling and Analysis phase.**
   - *Sampling and analysis to be performed per the LWTRSAPP*
2. **DOE will draft a Closure Module using the *Standard Closure Module* Approach**
3. **The Closure Module will include appropriate isolation and stabilization provisions using the *Partial Isolation* approach**

F-Tank Farm Layout



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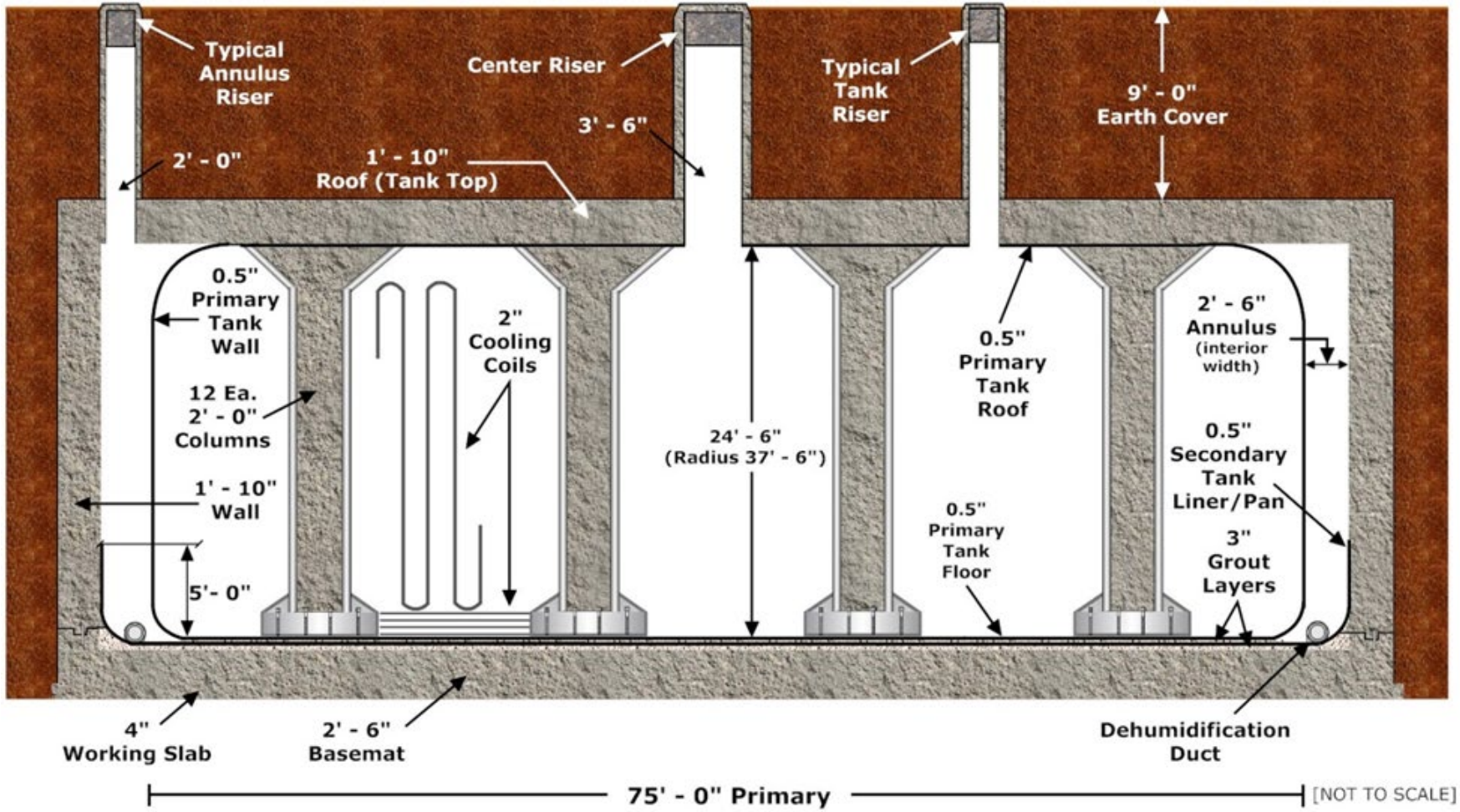
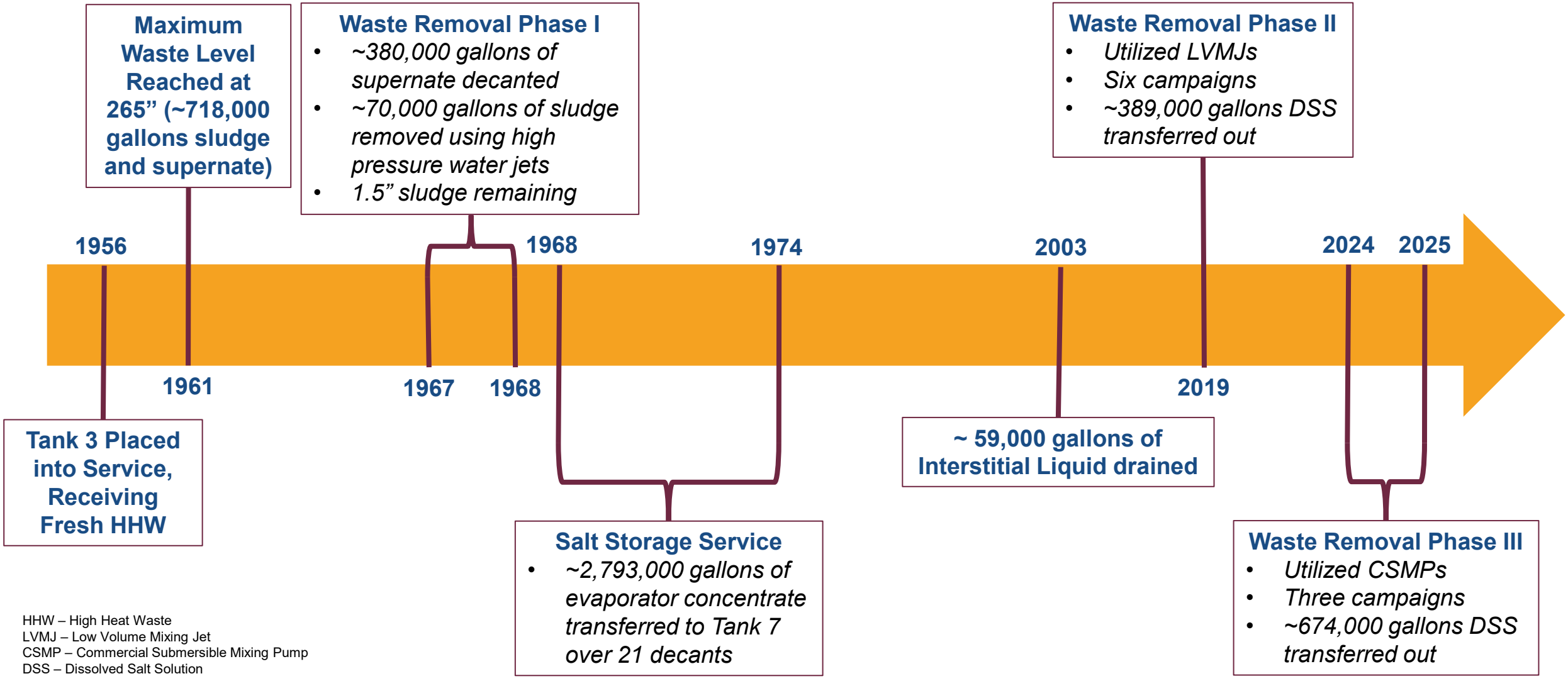
Typical Type I Tank



Nominal working capacity: 750,000 gallons
For a Type I Tank, 1" of waste equals 2,710 gallons

[SRR-CWDA-2017-00015]

Tank 3 Historical Timeline



HHW – High Heat Waste
LVMJ – Low Volume Mixing Jet
CSMP – Commercial Submersible Mixing Pump
DSS – Dissolved Salt Solution

Waste Removal Summary

- **Waste removal from Tank 3 has occurred in several phases, beginning in the 1960s when most of the sludge was removed prior to Tank 3 becoming a salt tank**
- **Waste Removal Phase I:**
  - *Supernate and solids removed to prepare Tank 3 to be an evaporator concentrate receipt tank*
  - *In 1967, ~380,000 gallons of supernate was decanted and transferred to Tank 7*
  - *High pressure water jets were then used to slurry the remaining sludge*
    - 320,000 gallons of water used
    - Approximately 70,000 gallons of sludge were removed
  - *At the conclusion of Waste Removal Phase I, Tank 3 was estimated to have approximately 1.5” of sludge remaining (~4,000 gallons)*
- **In October and November 2003, ~59,000 gallons of interstitial liquid was drained**
  - *Halted first by discovery of a high porosity region just below the visible salt crust, then by loss of cooling coil function*
  - *An estimated 38,000 gallons of interstitial liquid remained*

Waste Removal Summary

- **Waste Removal Phase II:**
  - *Three Low Volume Mixing Jets (LVMJs) were installed in Risers 1, 3, and 6*
  - *One Submersible Transfer Pump (STP) was installed at Riser 5 with suction located 10” from the bottom of the tank*

Waste Removal Phase II								
Campaign	Date	Water Added (gals)	DSS Transferred (gals)	Bulk Salt Level (BSL) After Campaign (inches)	Riser 1 LVMJ Elevation (inches)	Riser 3 LVMJ Elevation (inches)	Riser 6 LVMJ Elevation (inches)	Recirculation?
1	Dec. 2018 – Jan. 2019	73,979	115,202	182	204	Not Utilized	204	No
2	Jan. 2019 – Feb. 2019	30,940	93,630	158	180	180	180	No
3	Feb. 2019 – Mar. 2019	34,962	40,637	150	168	156	156	No
4	Mar. 2019 – Apr. 2019	28,530	61,694	140	156	156	Not Utilized	Yes, ~7 days
5	Apr. 2019 – May 2019	28,504	37,452	138	144	132	132	Yes, ~14 days
6	May 2019 – Jun. 2019	28,057	40,650	133	72	87	Not Utilized	Yes, ~7 days
Total	-	224,972	389,265	-	-	-	-	-

Waste Removal Summary

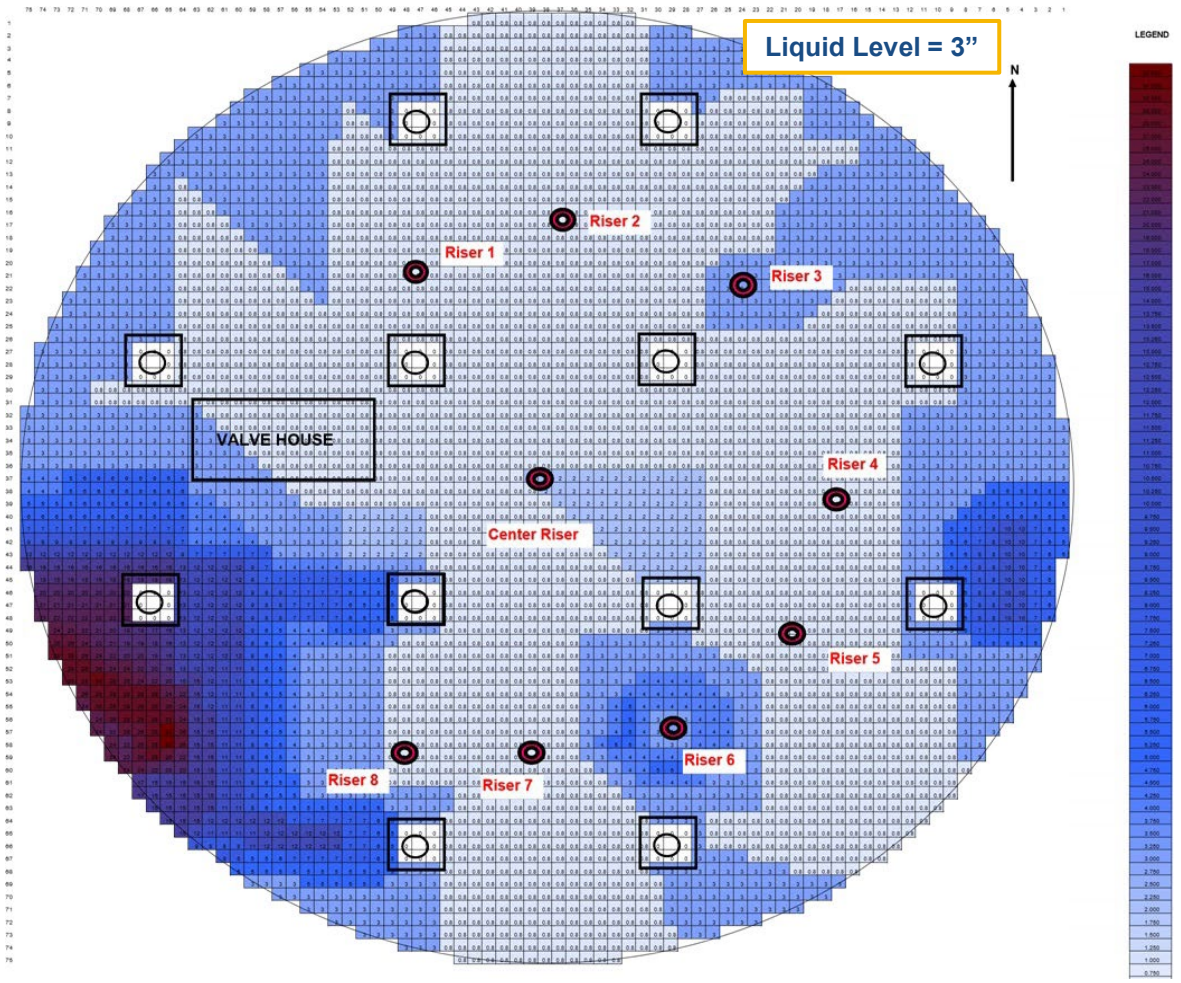
- **Waste Removal Phase III:**
  - *Three LVMJs were replaced with Commercial Submersible Mixing Pumps (CSMPs)*
    - Initially Risers 1 and 6 were operational with Riser 3 CSMP being added during the third campaign
  - *The STP was replaced at Riser 5 with capability to lower suction to 1" from the bottom of the tank*

Waste Removal Phase III						
Campaign	Date	Water Added (Kgals)	DSS Transferred (Kgals)	Riser 1 CSMP Elevation (inches)	Riser 3 CSMP Elevation (inches)	Riser 6 CSMP Elevation (inches)
1	2/2025	70.5	134	111	-	111
2	2/2025 – 3/2025	157	250	111	-	111
3 (A-F)	3/2025 – 7/2025	258	290	81-11[1,2]	11[3]	81-11[1,2]
Total	-	485.5	674	-	-	-

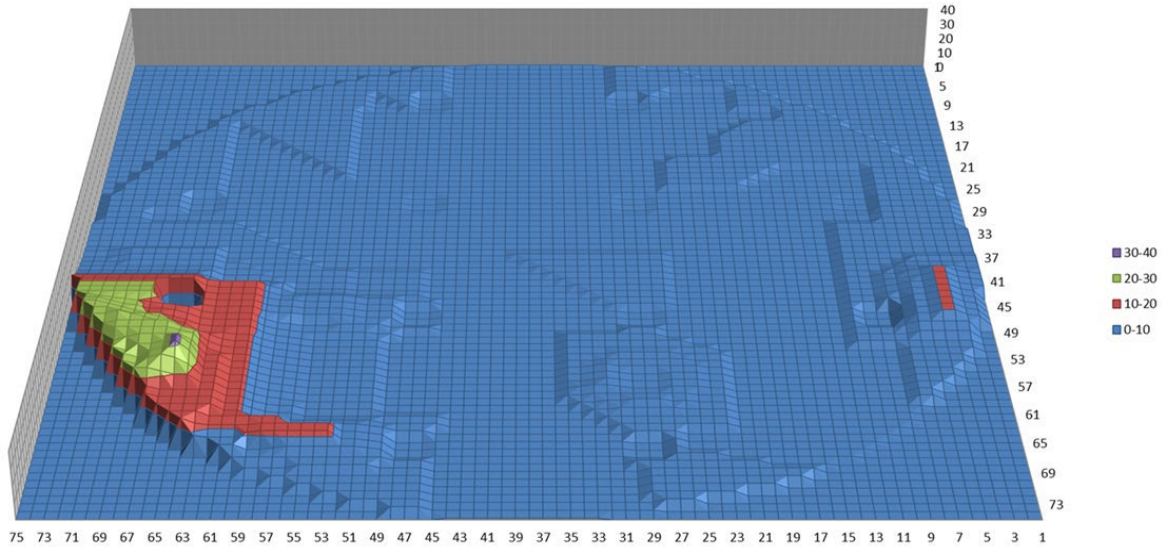
[1]The CMSPs were lowered over six mixing campaigns from 81 to 11" from the tank bottom.
[2]During a walkdown partway through Campaign 3 a discrepancy in actual installation heights of the CSMPs was noticed. As such, the CSMP height during campaigns 3A through 3C are unverifiable.
[3]A third CSMP was installed in Riser 3 and began operation during Campaign 3D

Current Status of Tank 3

Residual Solids Map Plan View



Residual Solids 3-D Model
(height exaggerated to show detail)



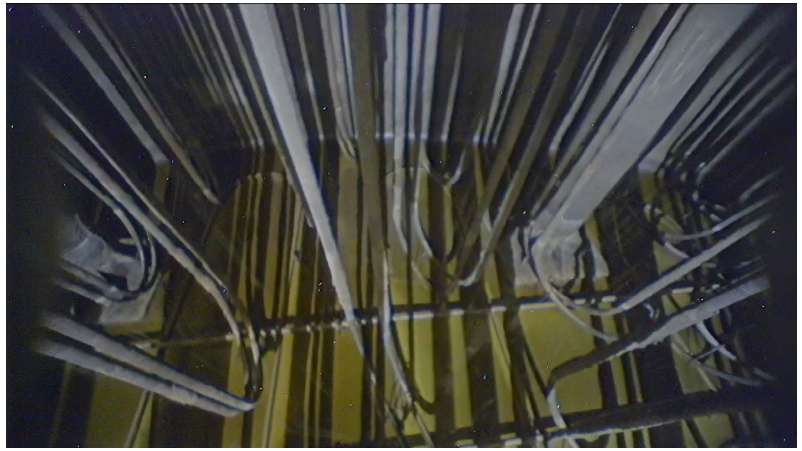
Remaining Solids ~8,070 gallons

[U-ESR-F-00134]

Tank 3 Prior to Waste Removal Phase II

Current Status of Tank 3

North



Northeast

East

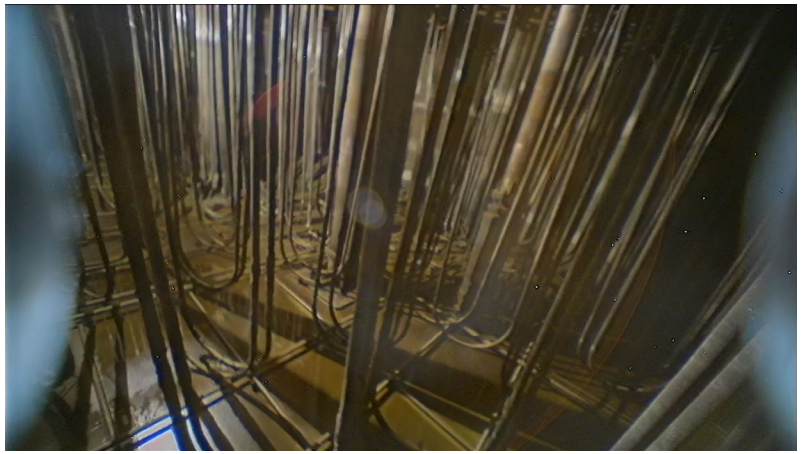
Southeast

South

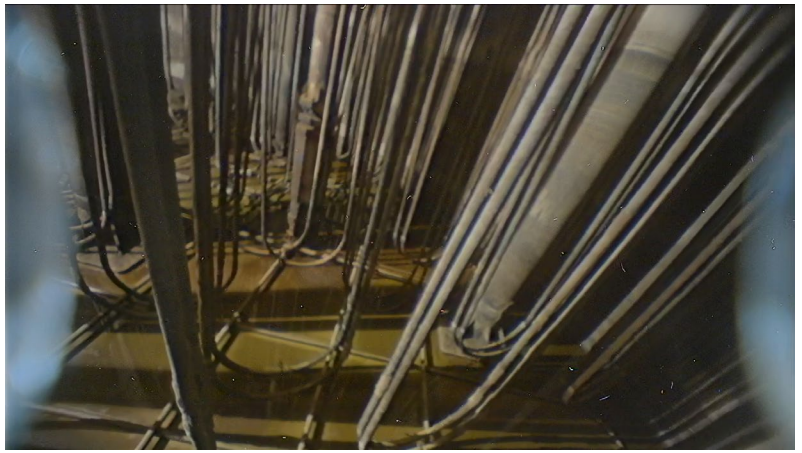
Southwest

Current Status of Tank 3

West



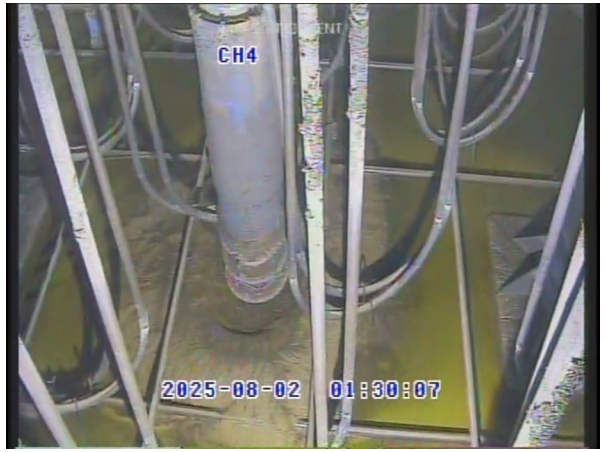
Northwest



Center

East Mound

Mound Below Riser 6



Southwest Mound

Tank 3 Annulus Condition

- **Through November 2024**
  - *No leak sites have been documented and no waste is visible on the annulus floor*
  - *Four annulus risers, North, South, East, and West, are available for inspection and provide a 25% inspection capability*

[SRMC-STI-2024-00076]

Tank 3 Annulus Condition

South Looking West

South Looking East

West Looking North

West Looking South

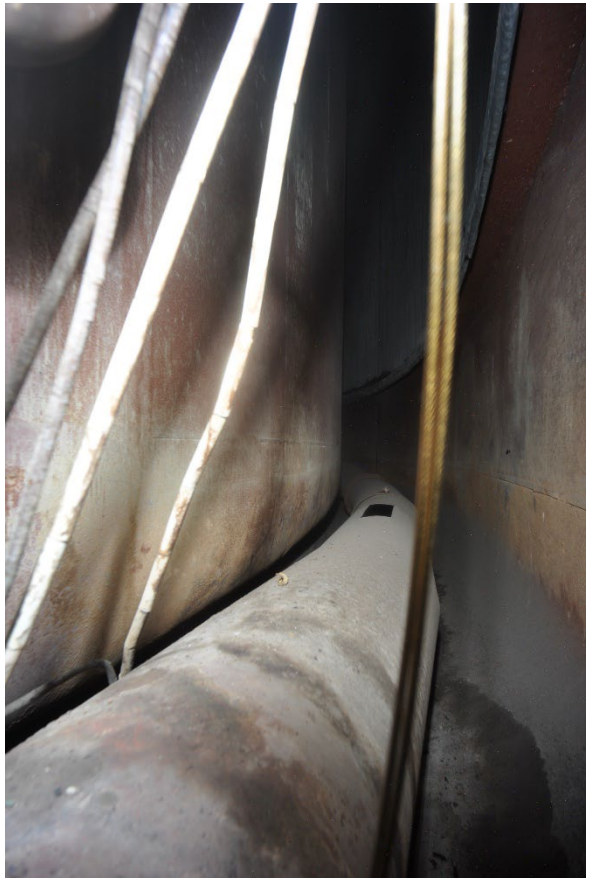
Tank 3 Annulus Condition

East Looking South

East Looking North

North Looking West

North Looking East



Overall Cleaning Results

Maximum Waste Volume (gal)	718,000
Maximum Sludge Volume (gal)	74,000
Total Solids Remaining (gal)	~8,070[1]
Total Waste Remaining (gal)	~8,070[2]

[1] Based on a preliminary estimate of the solids remaining in the primary. Final volume determination will be included in the Closure Module.
[2] Based on a preliminary estimate of the primary plus annulus. Final volume determination will be included in the Closure Module.

Total Percent Waste Removed ~99%

Additional Removal Options

- **Additional mixing campaigns**
  - *Additional mixing campaigns with current configuration in Tank 3 anticipated to have limited impact on additional waste removal*
    - Specific gravity and mixing pump amperage unchanged during last three mixing campaigns, indicating all salt dissolved
    - Residual material located primarily in areas outside of the Effective Cleaning Radius of the CSMPs
  - *Each new mixing campaign requires a minimum of approximately 200-250k gallons of water be added to Tank 3 to allow for sustained mixing pump operation while transferring out slurry, creating additional new waste*
    - Additional new waste must be handled within the Liquid Waste System which is already challenged by available tank space to support Salt Batch compilation/qualification and Sludge Batch compilation/qualification necessary to feed Salt Waste Processing Facility (SWPF) and the Defense Waste Processing Facility (DWPF), respectively
    - Additional new waste must be run through an evaporator or must be processed through SWPF then subsequently DWPF or the Saltstone Production Facility (SPF), resulting in additional costs and impacts (i.e., extension) to the Liquid Waste System life-cycle
  - *Each new mixing or washing campaign would divert resources (i.e., funding and personnel) from other Liquid Waste System risk reduction activities*
    - E.g., impact ongoing waste removal activities in other tanks resulting in delays to waste removal (i.e., risk reduction) within those tanks
    - Waste removal from Tanks 1, 2 and 3 must go through Tank 7. Additional campaign(s) from Tank 3 would fill Tank 7 leading to delays in waste removal from Tanks 1 and 2 until space can be reclaimed in Tank 7
  - *Installation of a fourth CSMP to support additional mixing campaign(s)*
    - Approximately $2.5M – $3.5M for design, D&R and installation
  - *Level of additional waste removal uncertain, but even removing the majority of the remaining material, if possible, would have a minimal impact on final performance objective concentrations and doses*

Additional Removal Options

- **Chemical Cleaning**
  - *Any chemical cleaning campaign would require approximately 200-250k gallons of water/chemicals be added to Tank 3 to allow for mixing pump operation followed by sustained mixing pump operation while transferring out slurry, creating additional new waste*
    - Additional new waste must be handled within the Liquid Waste System which is already challenged by available tank space to support Salt Batch compilation/qualification and Sludge Batch compilation/qualification necessary to feed SWPF and DWPF, respectively
    - Additional new waste must be processed through SWPF then subsequently DWPF or SPF, resulting in additional costs and impacts (i.e., extension) to the Liquid Waste System life-cycle
  - *Each chemical cleaning campaign would divert resources (i.e., funding and personnel) from other Liquid Waste System risk reduction activities*
    - E.g., impact ongoing waste removal activities in other tanks resulting in delays to waste removal (i.e., risk reduction) within those tanks
    - Waste removal from Tanks 1, 2 and 3 must go through Tank 7. Additional campaign(s) from Tank 3 would fill Tank 7 leading to delays in waste removal from Tanks 1 and 2 until space can be reclaimed in Tank 7
  - *Level of additional waste removal uncertain, but even removing the majority of the remaining material, if possible, would have a minimal impact on final performance objective concentrations and doses*
    - Low-Temperature Aluminum Dissolution (LTAD) anticipated to have a minimal impact due to low Aluminum content in Tank 3 sludge
    - Bulk Oxalic Acid Cleaning would also have the adverse impact of introduction of additional oxalates into the system

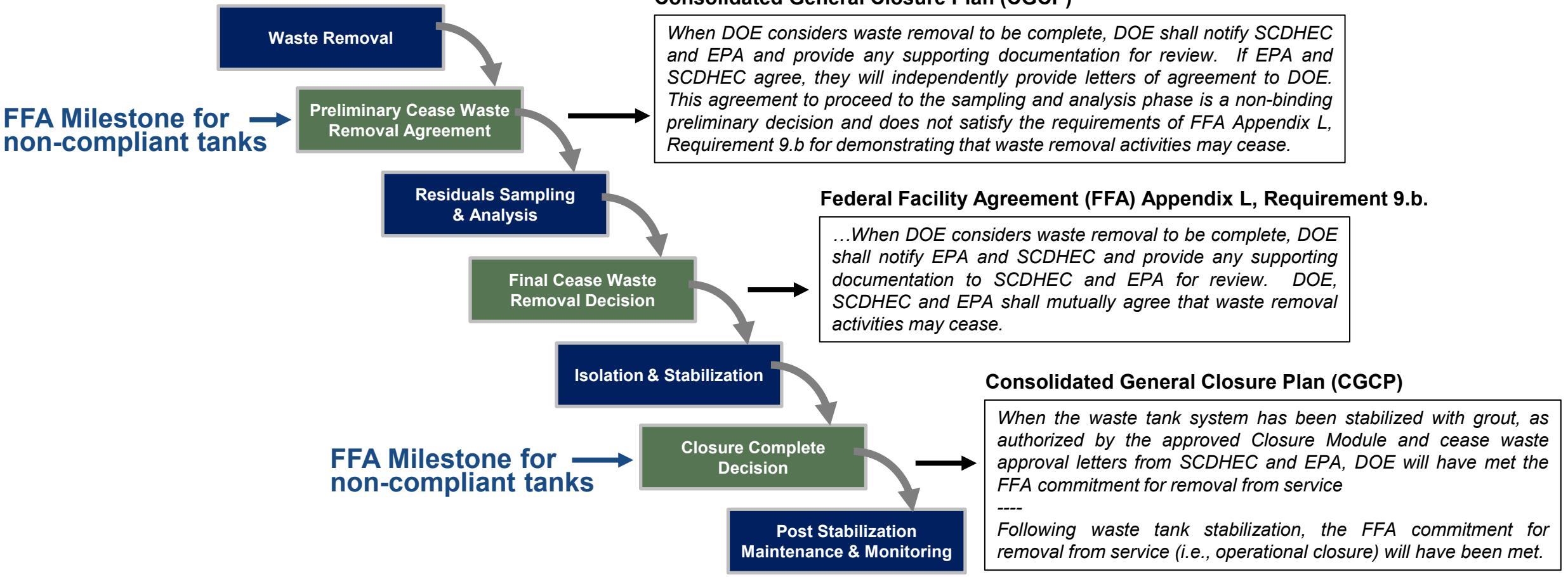
Additional Removal Options

- **Vacuum Technology**
  - *Proven Mantis technology that was utilized in Tanks 18 and 19 cannot be deployed due to in-tank obstructions*
  - *Alternate technology utilizing a smaller robotic platform with vacuum capability would require considerable development*
    - Very limited applicability at the time due to mobility around and over in-tank obstacles and associated tether management
    - Any water added to support removal, if required, would result in new waste and have same impact as previously described for additional mixing campaigns and chemical cleaning
    - Development/deployment of a new vacuum technology would divert resources (i.e., funding and personnel) from other Liquid Waste System risk reduction activities
  - *Level of additional waste removal uncertain, but even removing the majority of the remaining material, if possible, would have a minimal impact on final performance objective concentrations and doses*

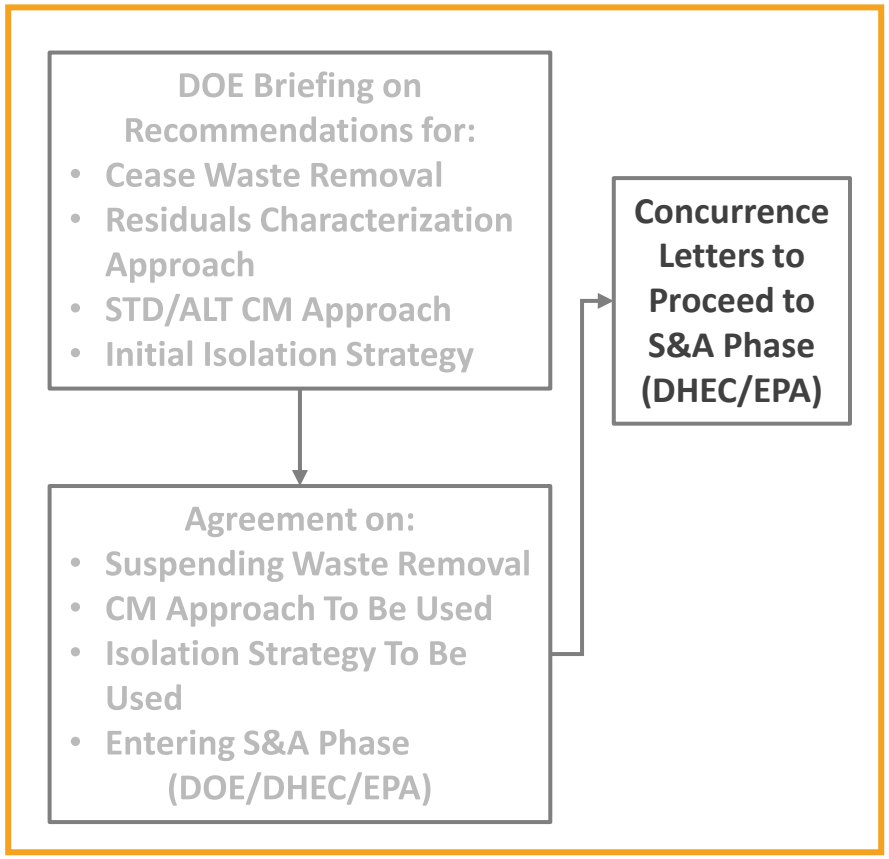
Additional Removal Options

- **Annulus Waste Removal**
  - *Based on results from annulus inspections, Tank 3 has no known accumulated waste on the annulus floor. Water additions/removal campaigns would have no impact on overall doses associated with Tank 3 while adding new waste into the Liquid Waste System.*

Tank Closure Process



Requested Action



[SRR-CWDA-2017-00015]

The three agencies agree that, based upon the described qualitative assessment, there is reasonable assurance that it is appropriate to suspend waste removal activities and enter the Sampling and Analysis phase of the operational closure process for Tank 3.

Next Steps

- **DOE will forward a letter to SCDES and EPA formally requesting concurrence to proceed to the Sampling and Analysis phase in Tank 3**
  - *This presentation will be attached as a primary reference*
  - *The requested action is a non-binding preliminary decision based on the qualitative information available at this time and presented today*
- **DOE and the Liquid Waste Contractor will proceed in developing the regulatory documentation necessary to operationally close Tank 3**
  - *DOE will coordinate with SCDES and EPA to establish a schedule for the development, review and approval of the Closure Module consistent with the approach described in the CGCP*

Common Goals & Values*

Values

1. Maintain transparency with open communication between regulators, DOE, and the contractor on program progress, and significant emerging issues.
2. Ensure DOE's strategy and plans are subject to stakeholder engagement and input, including SCDHEC permitting processes, and CERCLA, as appropriate.
3. Maximize the amount of curies (especially long-lived radionuclides) vitrified and ready for ultimate disposal out of state.
4. Limit disposal of curies onsite at SRS so that residual radioactivity is as low as reasonably achievable.

Goals

1. Reduce risk to the environment by removing waste and closing tanks with a goal of completion of the liquid waste program by 2037.
2. Reduce operational and environmental risk by aggressively removing curies from the waste tanks.
3. Reduce operational and environmental risk by optimizing operations to minimize liquid waste program total life cycle.
4. Complete waste removal and subsequent grouting of all waste tanks and ancillary structures with a risk-based priority order: first to tanks in the water table, followed by F Tank Farm tanks, followed by remainder of waste tanks, followed by ancillary structures, recognizing the potential for future emergent conditions or opportunities.

**From Federal Facility Agreement (FFA) 2022 High Level Waste Tank Milestones Agreement* [WSRC-OS-94-42]

Summary for Closed/PCWR Complete Tanks

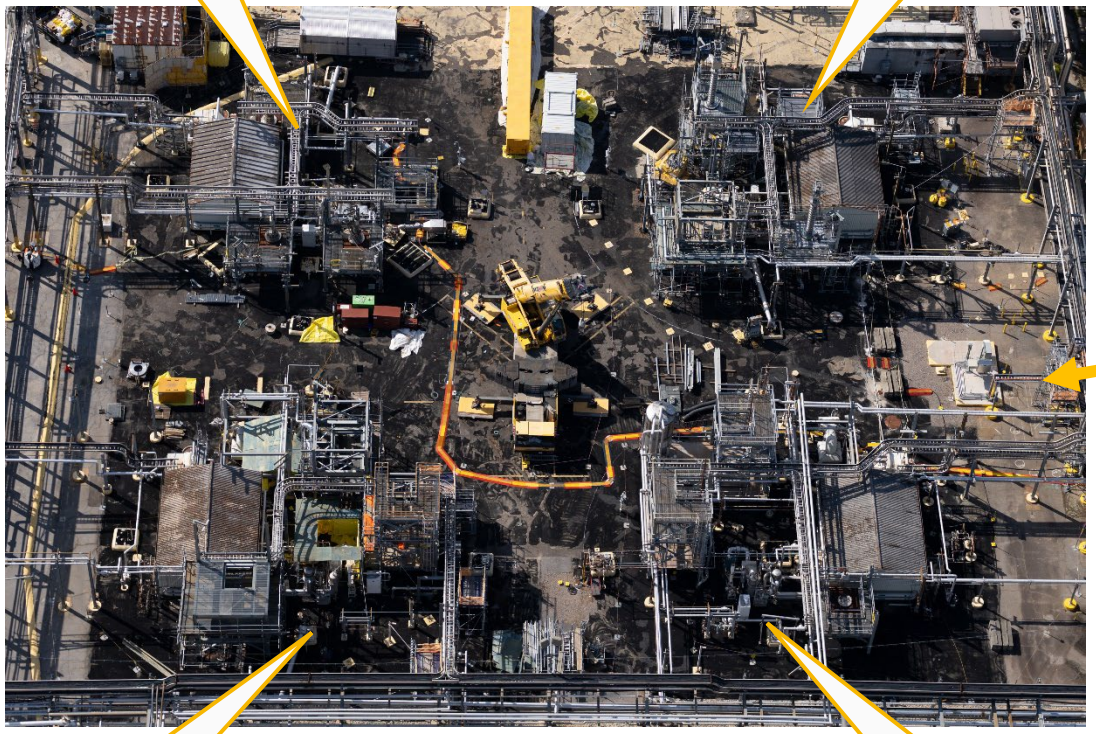
Waste Tank	PCWR Date	Operational Closure Date	Max. Dose within 10,000 years[1] (mrem/yr)	Primary Tank Residual Solids Volume[2] (%)	Primary Tank Residual Solids Volume (Gallons)	Annulus Residual Volume (Gallons)	Annulus Cleaning
4[3]	12/2024	-	<5	<1	<6,000	Negligible	No - negligible
5	11/2010	12/2013	3	0.26	1,900	<15	No – negligible
6	11/2010	12/2013	3	0.41	3,000	<50	Yes ~ 100 gal
8[3]	6/2025	-	<3	<1	<7,100	Negligible	No – negligible
9[3]	10/2024	-	<3	<1	<7,500	Negligible	Yes
10[3]	5/2024	-	<2	<0.40	<3,000	<400	Yes
11[3]	5/2025	-	<4	<1	<8,000	Negligible	No - negligible
12	1/2014	4/2016	6	0.20	1,500	30	No – negligible
15[3]	5/2025	-	<6	<1	<6,000	1,800	Yes
16	4/2013	9/2015	2	0.21	356	1,910	No – not practical
17	N/A	12/1997	3	0.18	2,400	N/A	N/A
18	10/2009	9/2012	3	0.30	3,900	N/A	N/A
19	10/2009	9/2012	3	0.15	2,000	N/A	N/A
20	N/A	7/1997	3	0.08	1,000	N/A	N/A

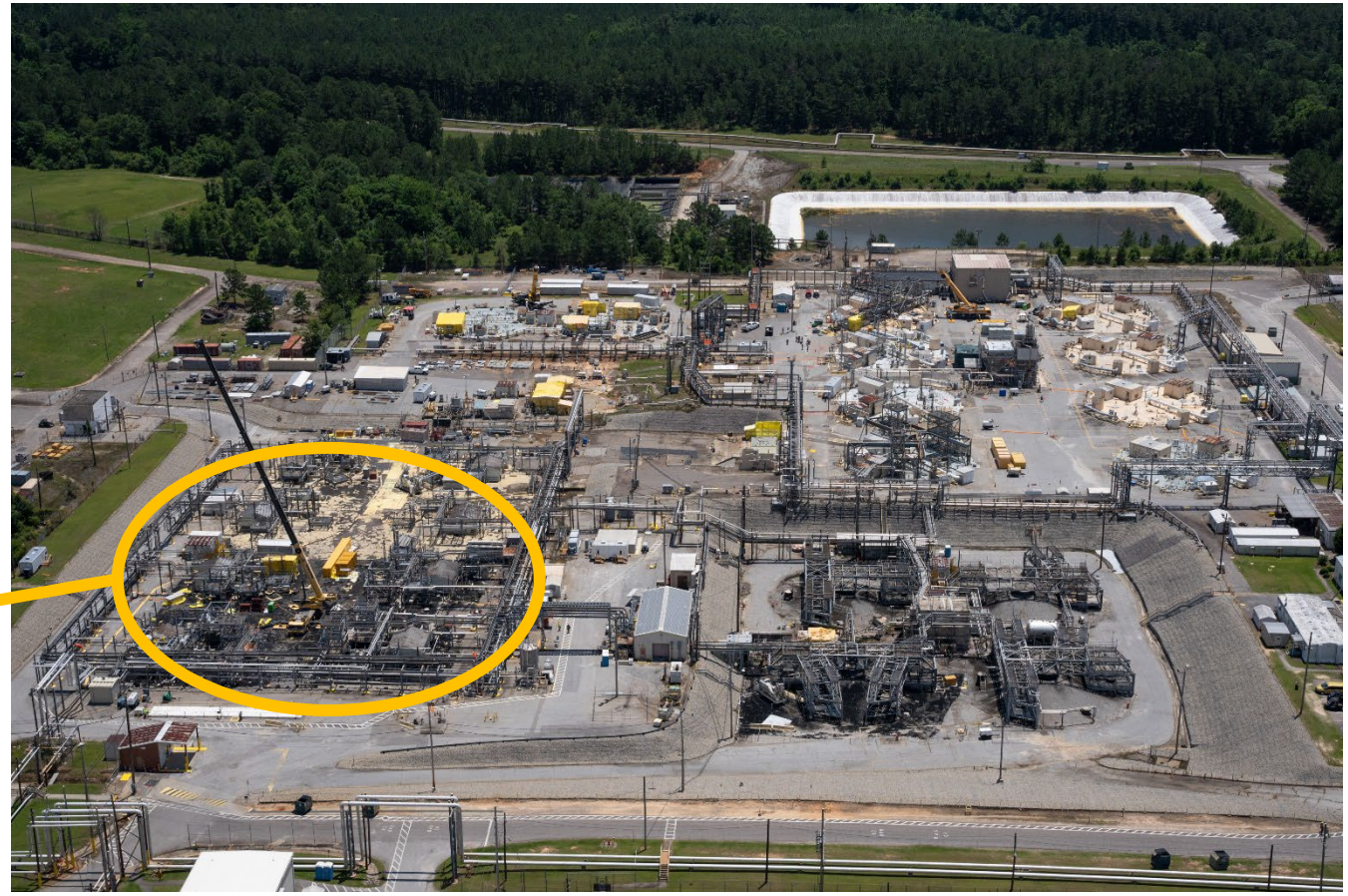
[1] Dose for FTF tanks represents maximum all sources dose utilizing actual inventories for Tanks 5, 6 and 17-20. Dose for HTF tanks represents maximum contribution from individual tanks. [SRR-CWDA-2012-00106, SRR-CWDA-2015-00073, SRR-CWDA-2014-00106]
[2] Based on historic maximum waste volume for each tank. [DOE/SRS-WD-2012-001, DOE/SRS-WD-2014-001]
[3] Tanks 4, 8, 9, 10, 11 and 15 Values based on preliminary information

Tank 3

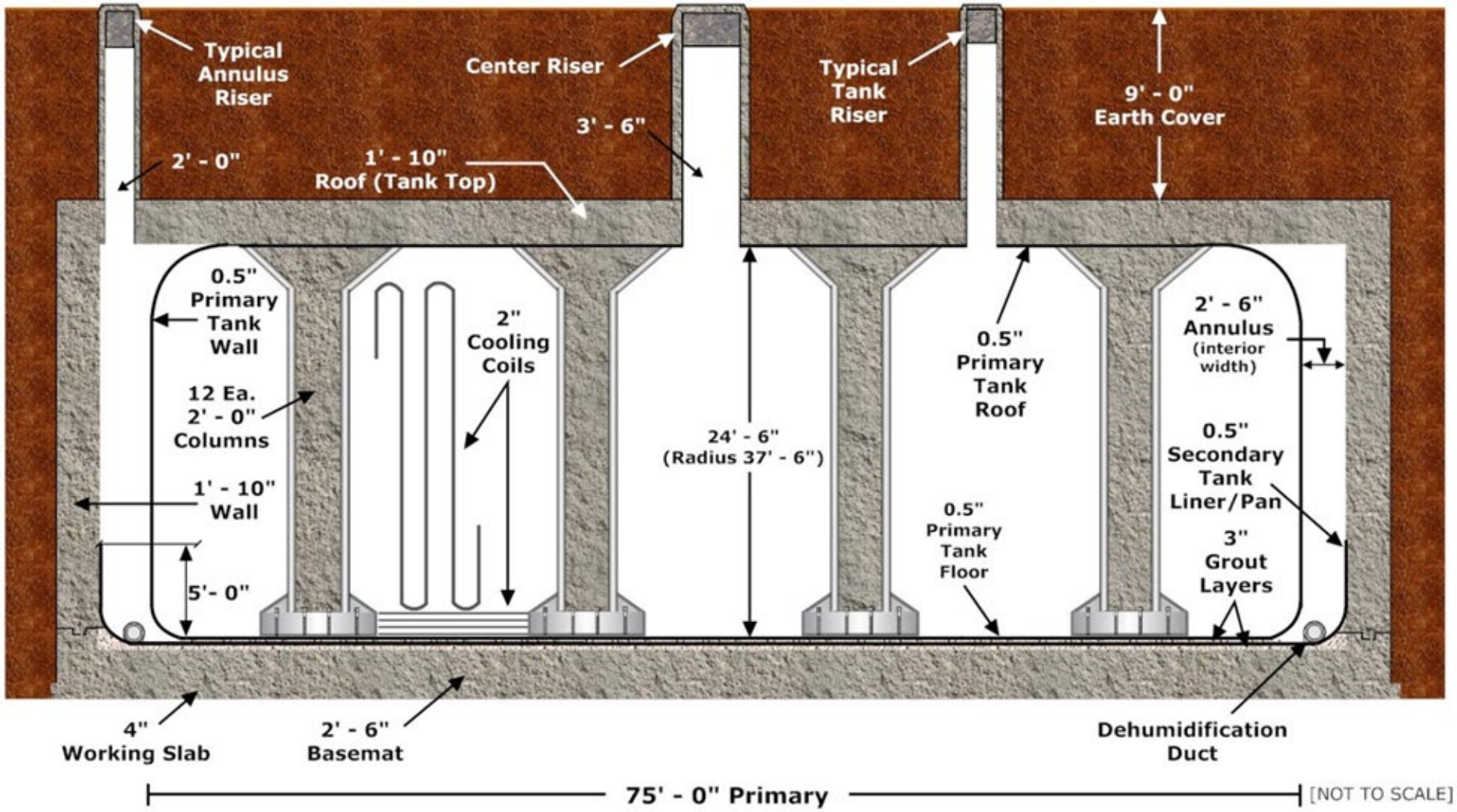
Background Information

Tank 3 Within F-Tank Farm





Typical Type I Tank



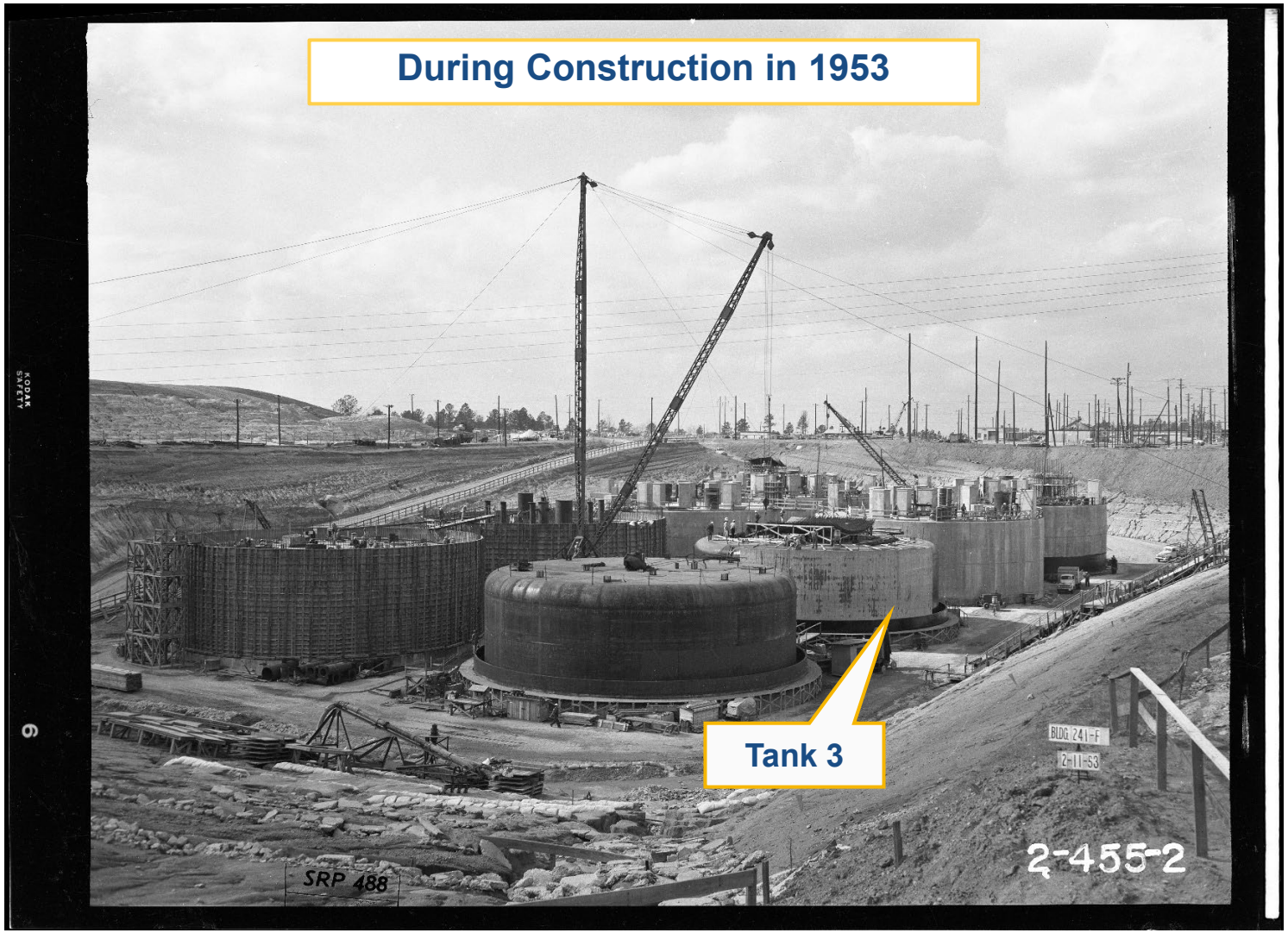
[SRR-CWDA-2017-00015]

Typical Type I Tank

- Carbon steel primary tank and secondary liner (annular pan) all contained in a concrete vault
- Nominal tank capacity: 750,000 gallons
- For a Type I Tank, 1” of waste equals 2,710 gallons
- Primary tank diameter: 75 feet
- Primary tank height: 24.5 feet
- Annular pan diameter: 80 feet
  - *2.5-foot annular space surrounding primary*
- Annular pan height: 5 feet
- 12 interior support column
  - *2-foot diameter*
- 34 vertical cooling coils runs suspended from the ceiling
- 2 horizontal cooling coil runs supported above the floor

[SRR-CWDA-2017-00015]

FTF Type I Tanks

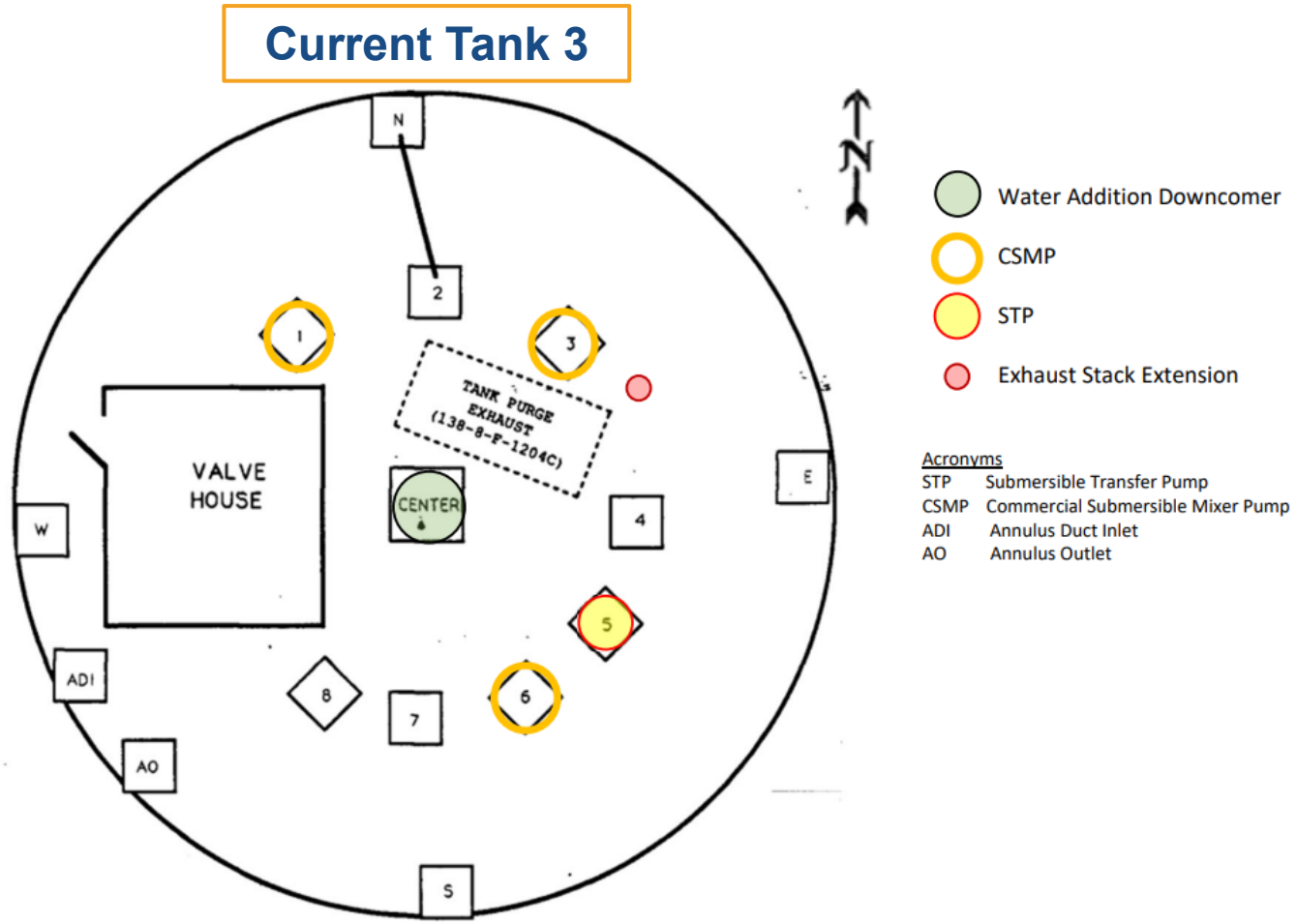


Typical Type I Tank Challenges

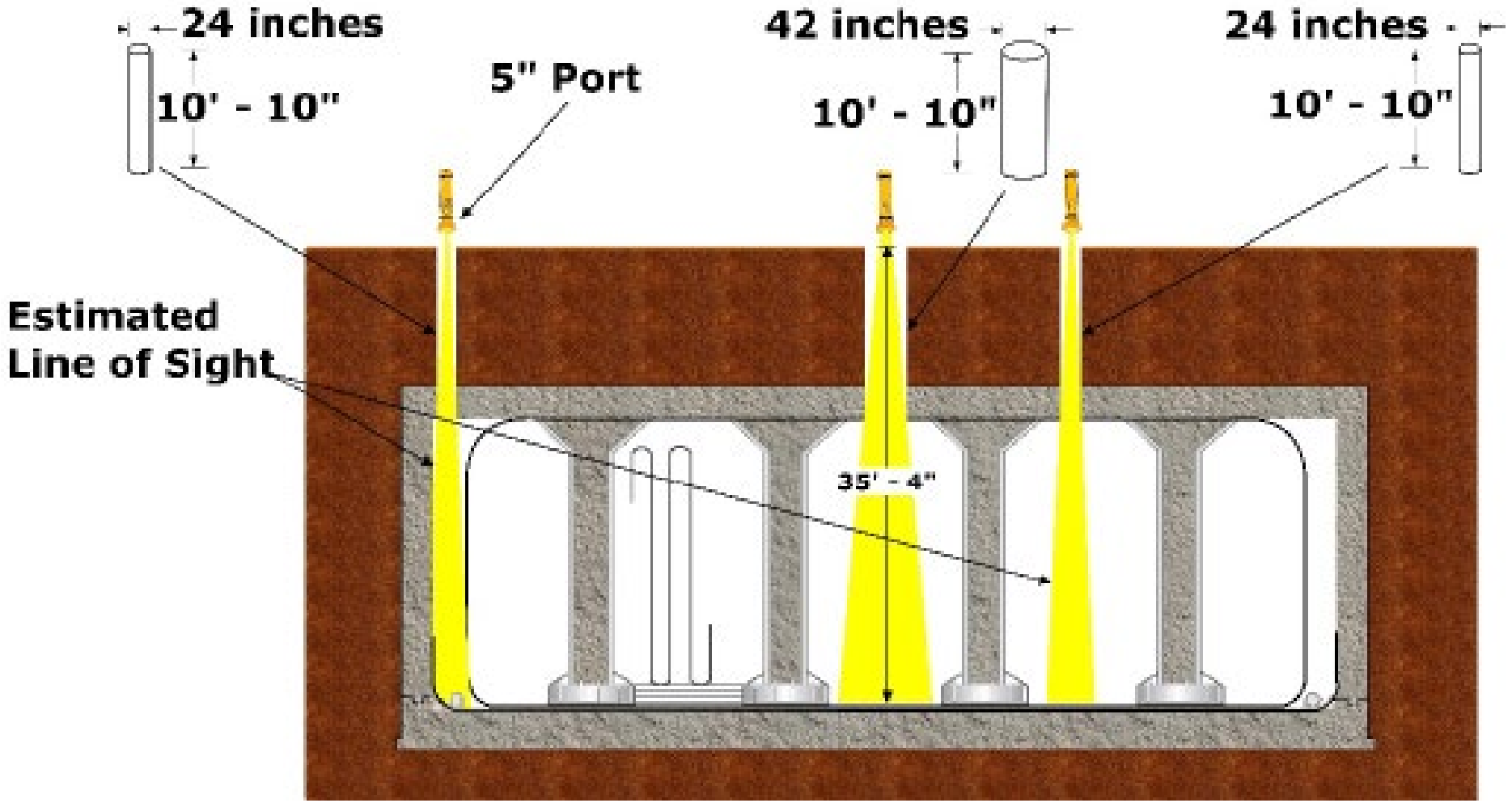
- **Challenges include:**
  - *Limited access ports (risers)*
  - *Presence of roof support columns*
  - *Approximately 22,800 linear feet of 2-inch diameter vertical and horizontal cooling coils*
  - *“Field-to-fit” horizontal cooling coil “fences”*
- **Tanks were not designed with waste removal in mind**

Type I Tank Riser Limitations

- **Primary access**
  - *Eight 24-inch risers*
  - *One 42-inch central riser*
- **Annulus access**
  - *Four 24-inch risers*
- **Limited riser entrances hinder:**
  - *Pump placement*
  - *Cleaning operations*
  - *Camera viewing*
  - *Sampling options*



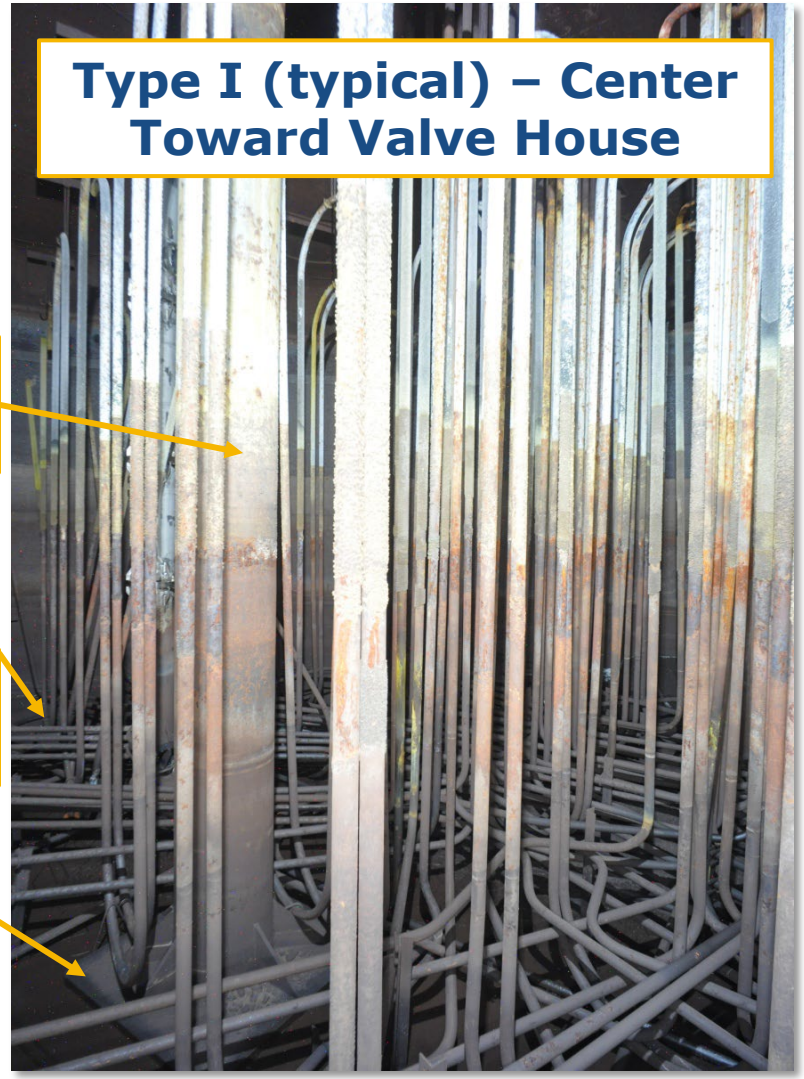
Type I Tank Riser Limitations



[NOT TO SCALE]
[SRR-CWDA-2017-00015]

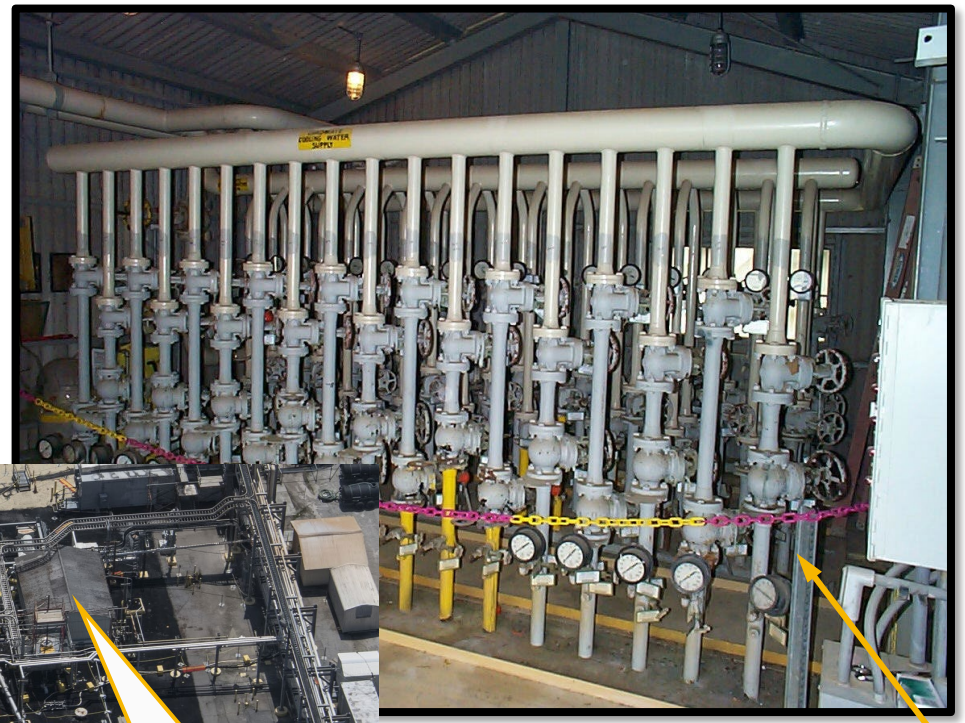
Type I Tank Columns and Cooling Coils

- **A total of 12 support columns in each Type I tank**
  - *Carbon steel filled with concrete*
  - *2-foot diameter*
  - *4.5-foot x 4.5-foot x 4.5-inch base plate*
- **Type I tanks contain approximately 22,800 linear feet of 2-inch diameter cooling coils**
- **Horizontal coils were installed "field-to-fit"**
- **Columns and cooling coils together impact installation and/or operation of waste removal related equipment**
  - *Effective cleaning radius of pumps*
  - *Full installation of pumps*
  - *Sampling device deployment*



Type I Tank Cooling Coil Valve House

Valve House Interior

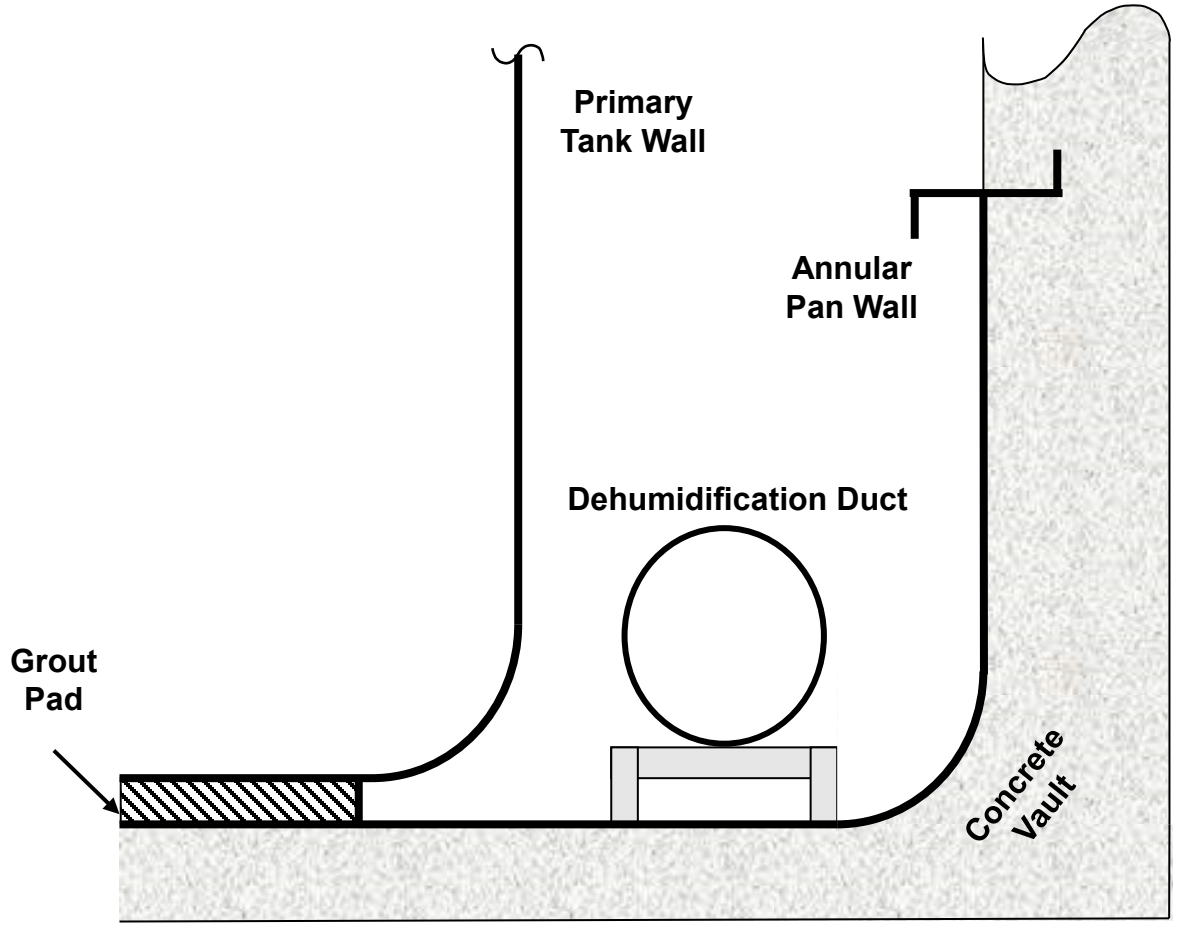


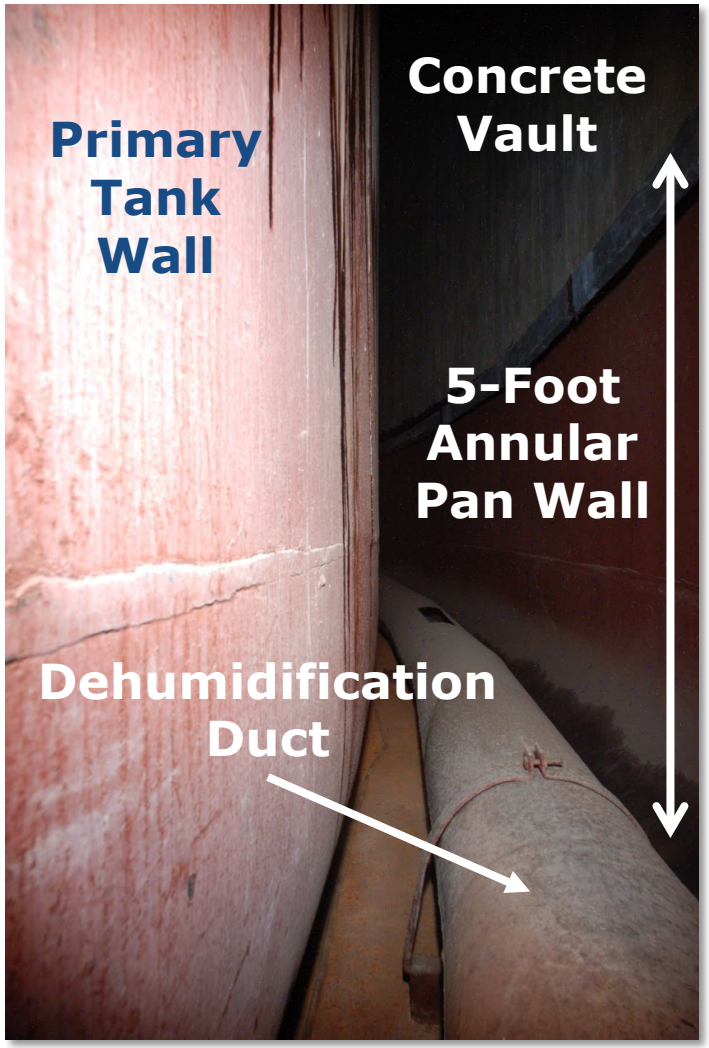
View From Inside Tank (Under the Valve House)

Cooling coil lines entering and exiting waste tank

Type I Tank Annular Region

5-foot high, 80-foot diameter annular pan provides secondary containment



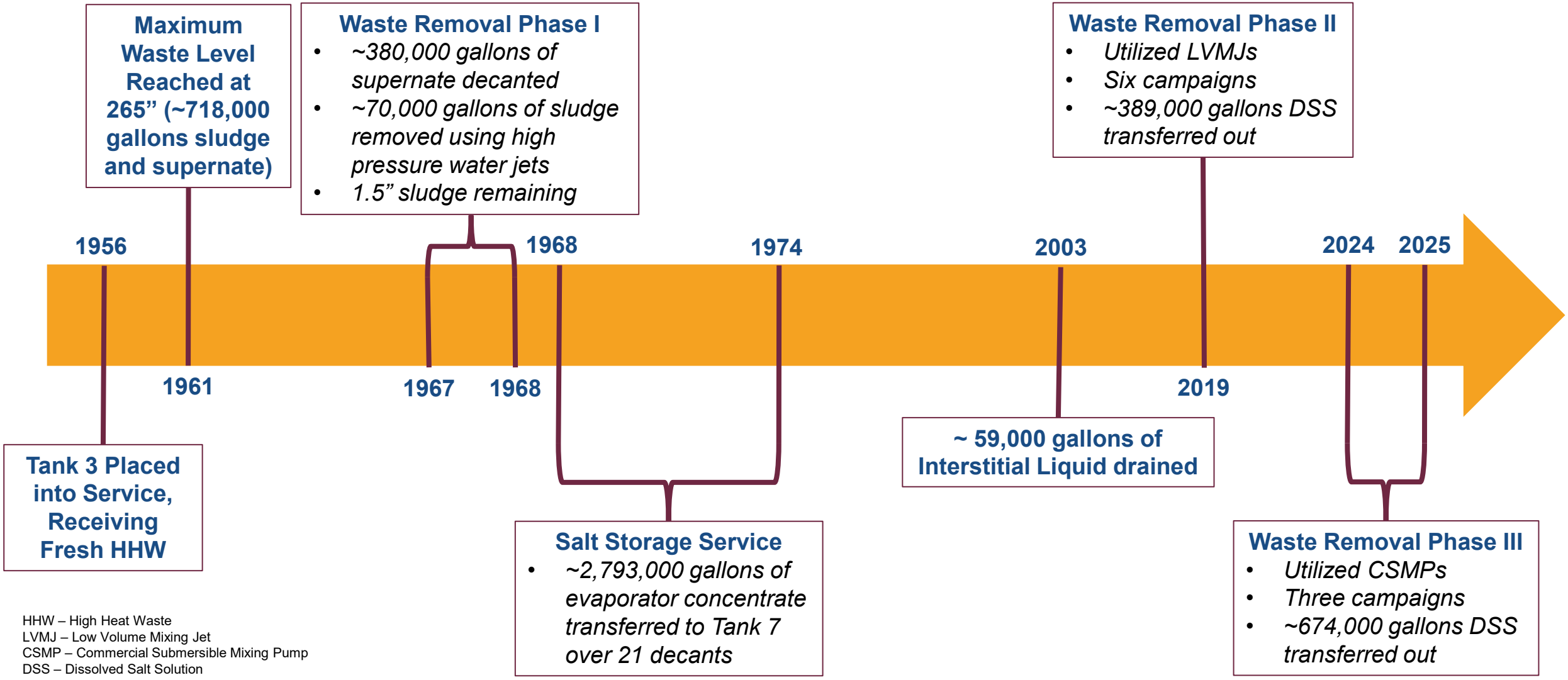


Tank 3 Operational History

- **Constructed between 1951-1953**
- **Beginning in March 1956, Tank 3 received fresh High-Heat Waste (HHW) from the Purex Process until 1961 when it was deemed full at 265”**
- **Supernate was decanted in August of 1967 with 380,000 gallons going to Tank 7**
- **High pressure water jets were used to slurry the remaining sludge and transfer to Tank 7 in June of 1968**
  - *320,000 gallons of water added*
  - *70,000 gallons of sludge moved*
- **The tank was placed in salt storage service with receipt of the first evaporator concentrate in June 1968**
  - *~2,793,000 gallons of evaporator concentrate were transferred out of Tank 3 over 21 decants*
  - *~1.5” of sludge left*
- **Maximum historical waste level in 1961**
  - *265”*

[CBU-SPT-2004-00099; DPSPU 83-11-9; U-ESR-F-00089]

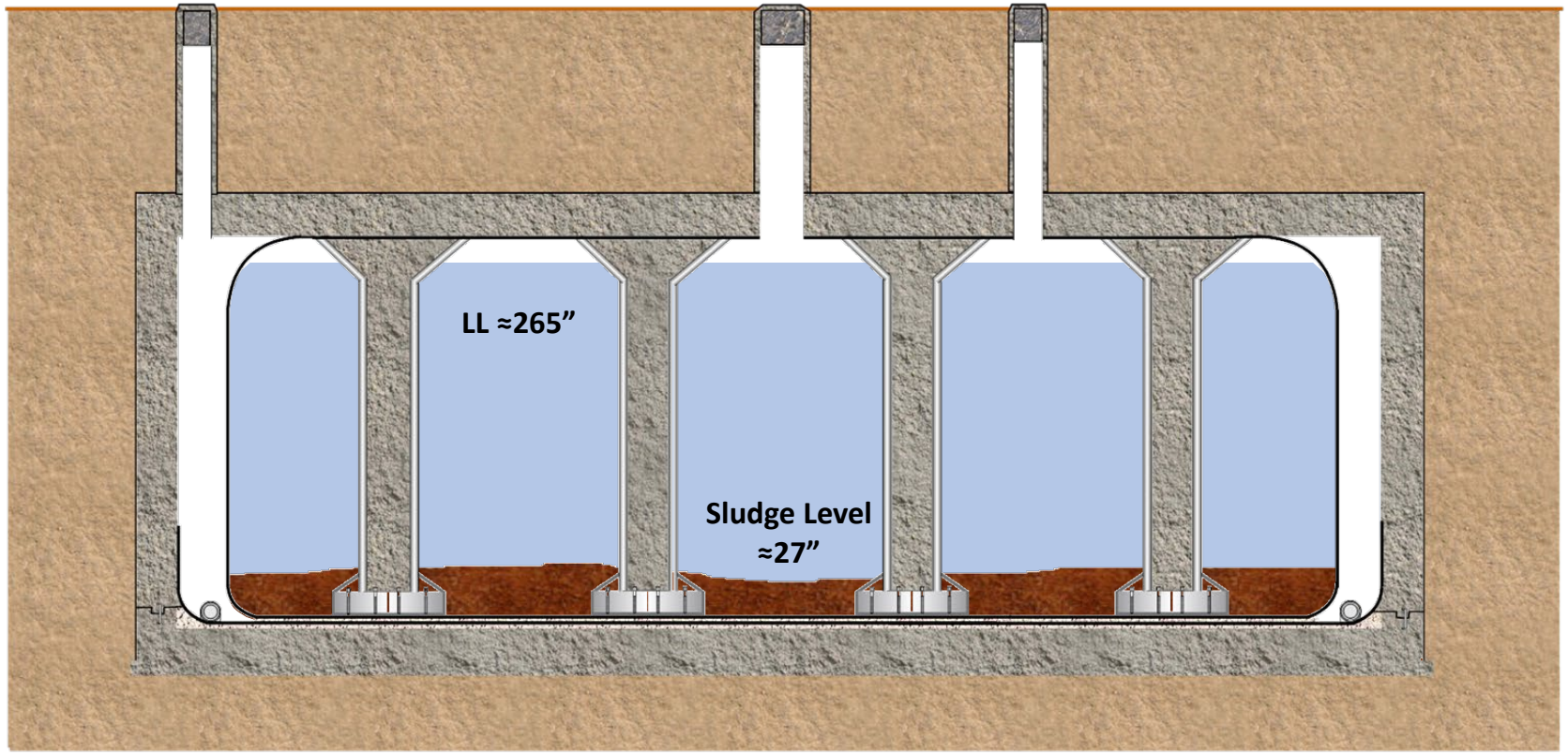
Tank 3 Historical Timeline



HHW – High Heat Waste
LVMJ – Low Volume Mixing Jet
CSMP – Commercial Submersible Mixing Pump
DSS – Dissolved Salt Solution

Waste Removal Phase I

Tank 3 Before the Start of Waste Removal Phase I (1967)



LL - Liquid Level

[DPSPU-83-11-9]

Waste Removal Phase I

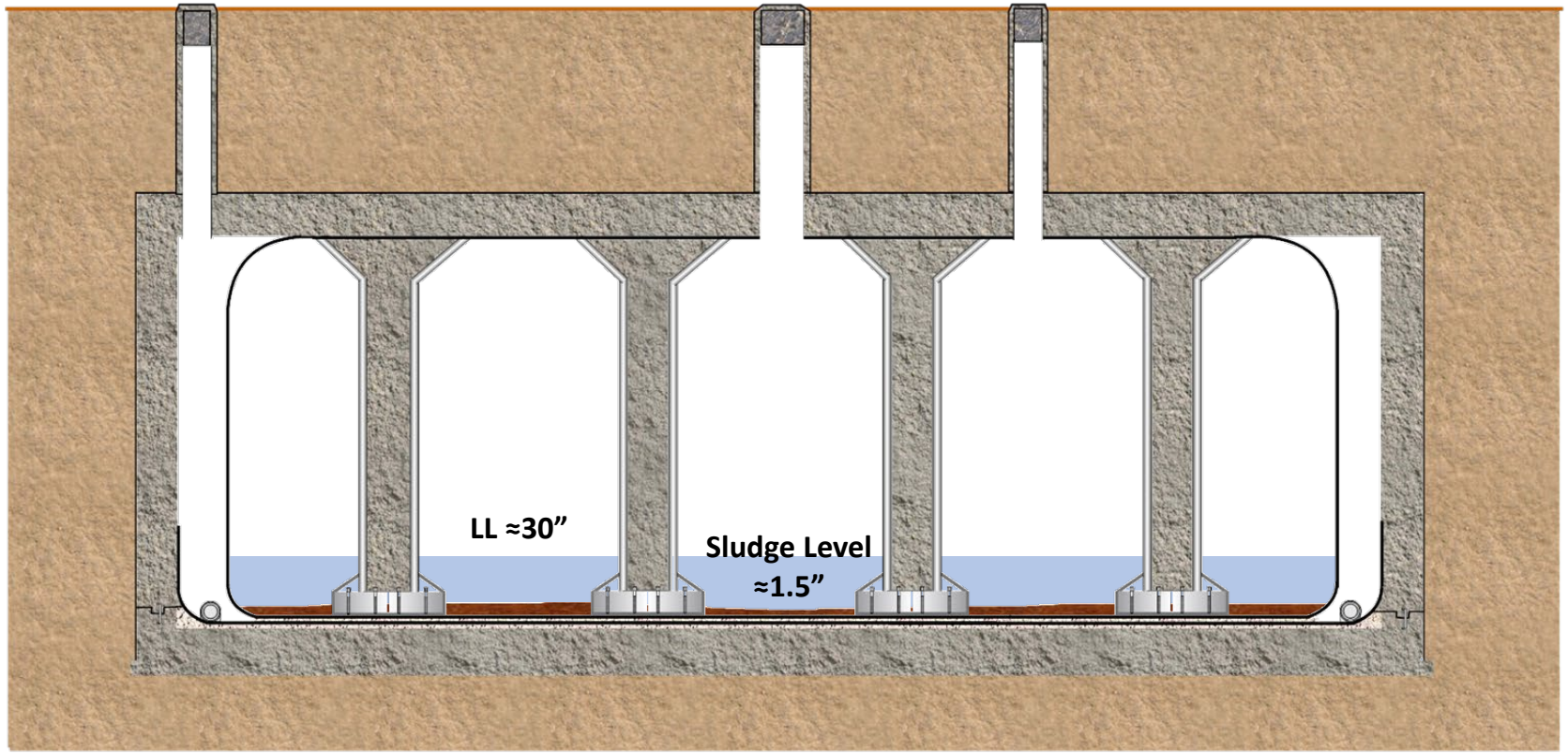
- **Supernate and solids removed to prepare Tank 3 to be an evaporator concentrate receipt tank**
  - *In 1967, ~380,000 gallons of supernate was decanted and transferred to Tank 7*
  - *High pressure water jets were then used to slurry the remaining sludge*
    - 320,000 gallons of water used
    - Approximately 70,000 gallons of sludge were removed
- **At the conclusion of Waste Removal Phase I, Tank 3 was estimated to have approximately 1.5” of sludge remaining (~4,000 gallons)**

High Pressure Water Jet

[DPSP-83-11-9]

Waste Removal Phase I

Tank 3 After Waste Removal Phase I (1968)



LL - Liquid Level

[DPSPU-83-11-9]

Post Waste Removal Phase I

- **Tank 3 was used as a receipt tank for evaporator concentrate from 1968 to 1974**
- **Over this time period, ~2,793,000 gallons of evaporator concentrate passed through Tank 3 to Tank 7 over 21 decants**
- **Tank was left inactive until 2003, during which time the liquid level decreased due to cooling and evaporation**
- **As of 2003, Tank 3 contained:**
  - *~4,000 gallons of sludge (1.5”)*
  - *~536,000 gallons of salt (198”)*
  - *Little visible liquid*

[CBU-SPT-2003-00064, DPSP-83-11-9]

Interstitial Liquid Removal Program

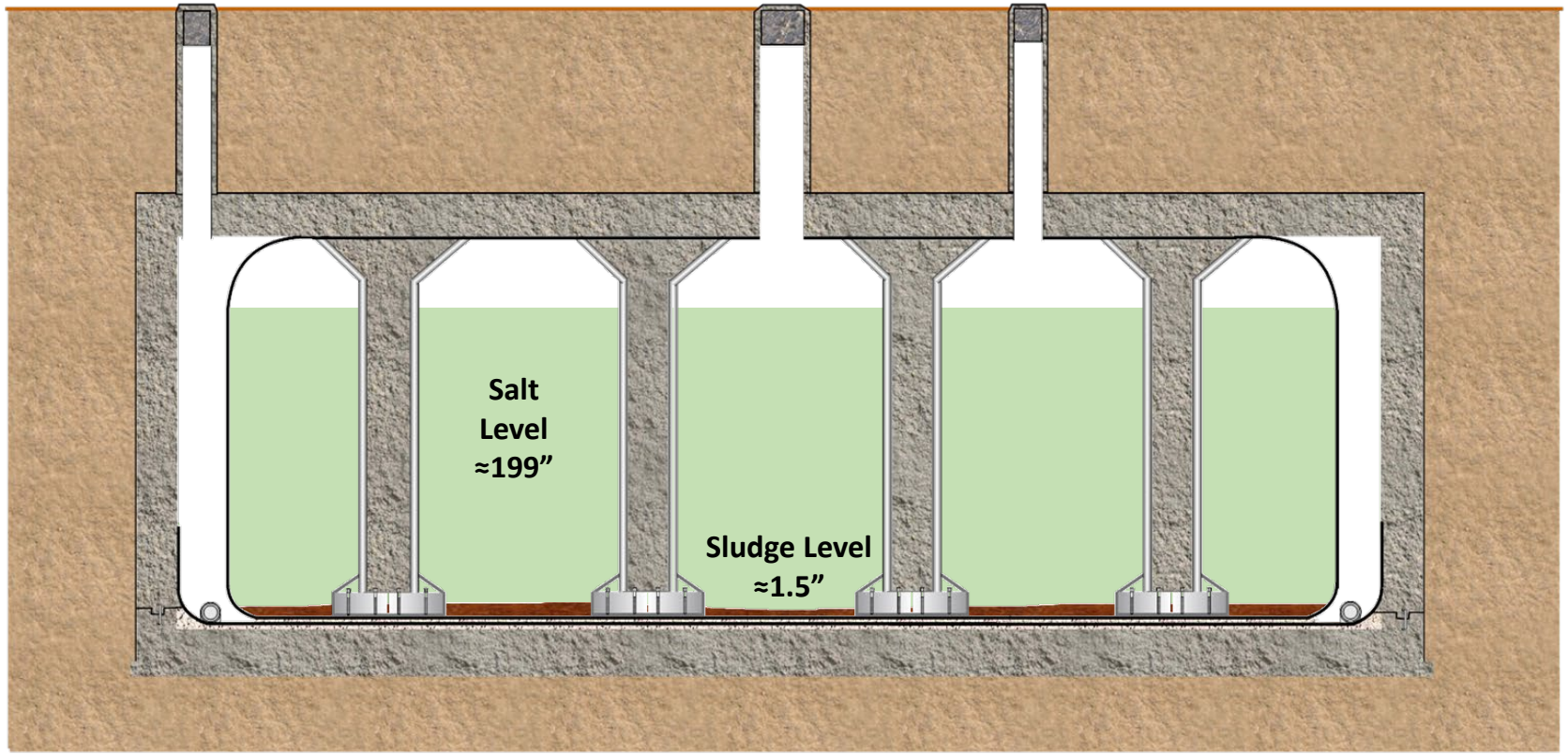
- **In October and November 2003, ~59,000 gallons of interstitial liquid was drained**
  - *Halted first by discovery of a high porosity region just below the visible salt crust, then by loss of cooling coil function*
  - *An estimated 38,000 gallons of interstitial liquid remained*

Tank 3 During Interstitial Liquid Removal

[CBU-SPT-2003-00064, LWO-SPT-2007-00146]

Waste Removal Phase II

Tank 3 Prior to Waste Removal Phase II (2019)

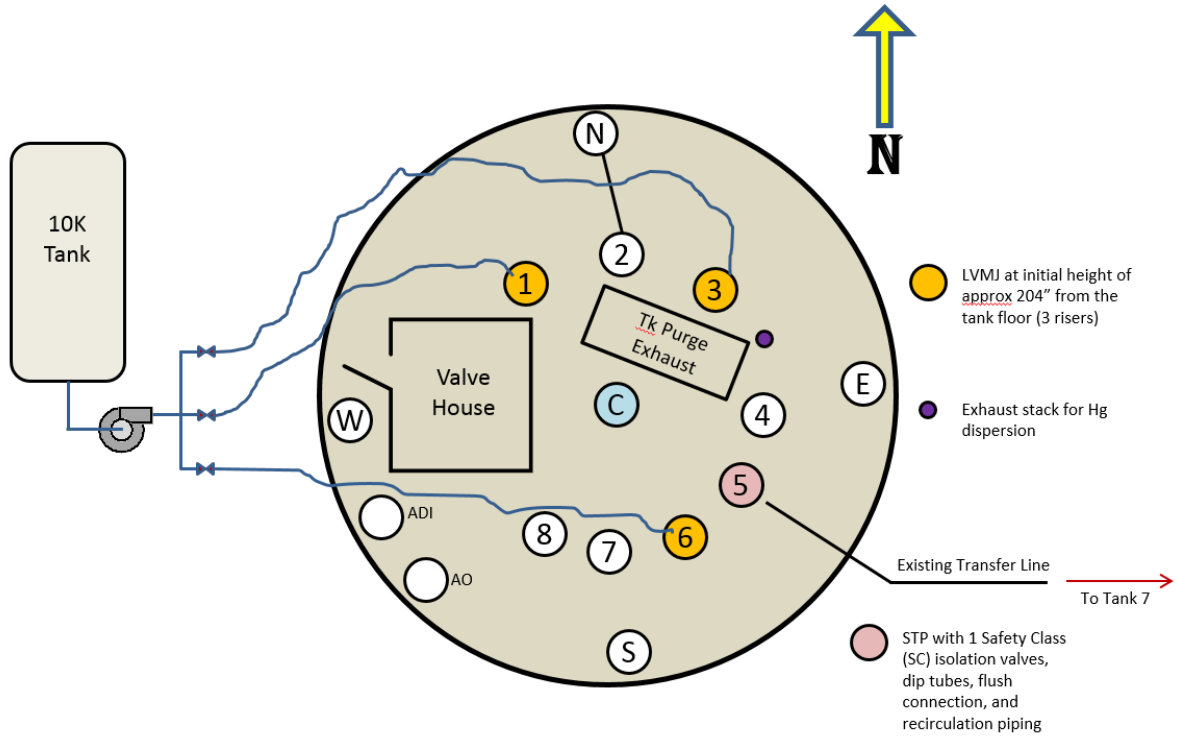


[LWO-SPT-2007-00146; U-ESR-F-00089]

Waste Removal Phase II

- **Starting conditions:**
  - *~540,000 gallons (199”) of salt*
    - Additional salt cake was present on the cooling coils up to approximately 220 inches
  - *~4,000 gallons (1.5”) of sludge*
- **Three LVMJs were installed in Risers 1, 3, and 6**
- **One STP was installed at Riser 5 with suction located 10” from the bottom of the tank**

Waste Removal Phase II Equipment Diagram



[U-ESR-F-00073 Rev. 0]

Waste Removal Phase II

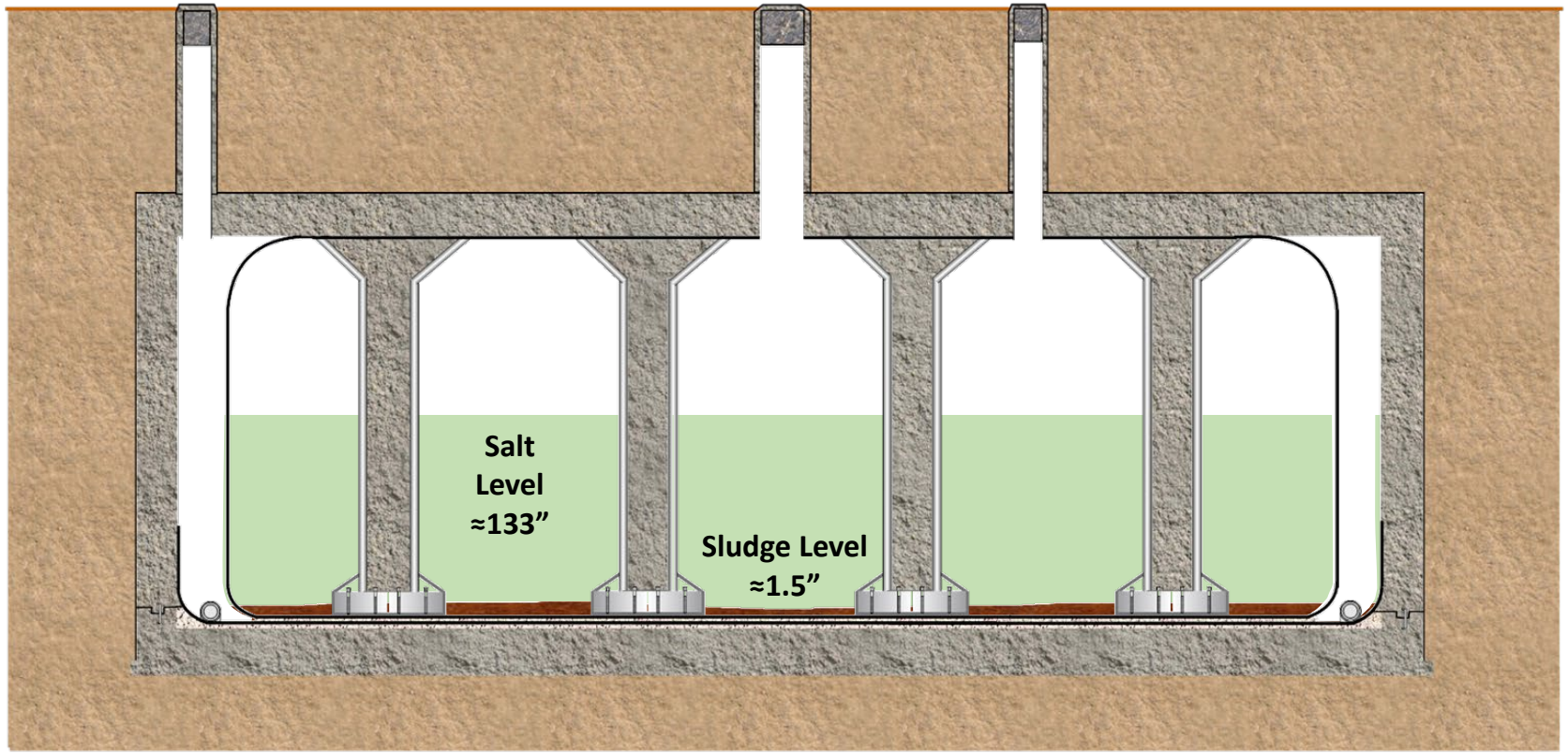
- Water was added to Tank 3 via either the downcomer or a combination of the LVMJs
- Depending on the circumstances of the campaign, the liquid was either left to soak until pump out or was recirculated using the LVMJs
- Initial Campaign targeted the salt built up on the upper cooling coils

Campaign	Date	Water Added (gals)	DSS Transferred (gals)	BSL After Campaign (inches)	Riser 1 LVMJ Elevation (inches)	Riser 3 LVMJ Elevation (inches)	Riser 6 LVMJ Elevation (inches)	Recirculation?
1	Dec. 2018 – Jan. 2019	73,979	115,202	182	204	Not Utilized	204	No
2	Jan. 2019 – Feb. 2019	30,940	93,630	158	180	180	180	No
3	Feb. 2019 – Mar. 2019	34,962	40,637	150	168	156	156	No
4	Mar. 2019 – Apr. 2019	28,530	61,694	140	156	156	Not Utilized	Yes, ~7 days
5	Apr. 2019 – May 2019	28,504	37,452	138	144	132	132	Yes, ~14 days
6	May 2019 – Jun. 2019	28,057	40,650	133	72	87	Not Utilized	Yes, ~7 days

[U-ESR-F-00089]

Waste Removal Phase II

Tank 3 After Waste Removal Phase II (2019)

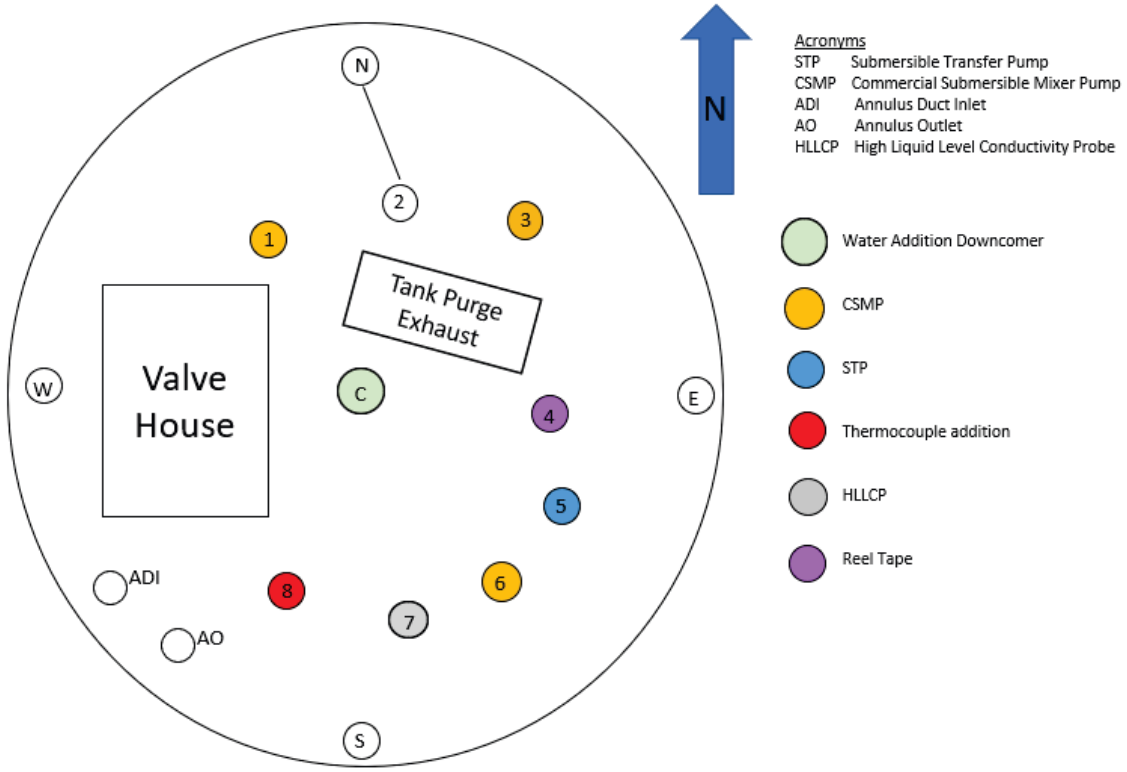


[U-ESR-F-00089]

Waste Removal Phase III

- **Starting conditions:**
  - *~82,000 gallons (30”) of free supernate*
  - *~282,000 gallons (104”) of salt[1]*
  - *~4,000 gallons (1.5”) of sludge*
    - An estimated 2.38 inches of insoluble Aluminum solids may have accumulated in the tank (calculated, not measured)
- **Three LVMJs were replaced with CSMPs**
  - *Initially Risers 1 and 6 were operational with Riser 3 CSMP being added during the third campaign*
- **The STP was replaced at Riser 5 with capability to lower suction to 1” from the bottom of the tank**

Waste Removal Phase III Equipment Diagram



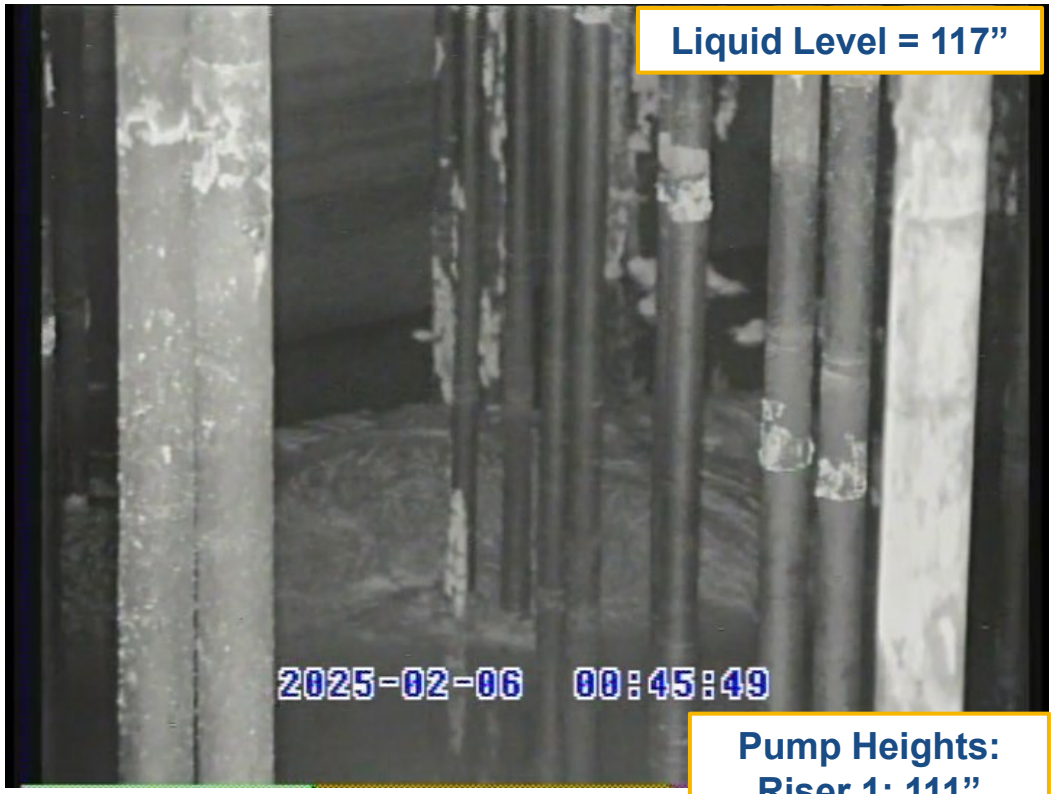
[1]Transfers in and out of Tank 3 occurred between Waste Removal Phase II and Phase III as part of ongoing Tank Farm operations, that while not target dissolution campaigns, did result in the reduction in the salt level.

[U-ESR-F-00073 Rev. 2]

Waste Removal Phase III – Campaign 1

- **~69,000 gallons water added**
- **Two CSMPs in Risers 1 and 6 operated in oscillation mode for ~6 days**
  - *Operated at full speed for the first two days, before reducing to half speed for the remainder of the campaign*
- **Transfer of ~134,000 gallons DSS to Tank 7 completed on February 5, 2025**
- **DSS transferred had a specific gravity of 1.38 indicating very good salt dissolution**
- **BSL estimated to be reduced to 117”**

Mound Between Riser 8 and the Valve House



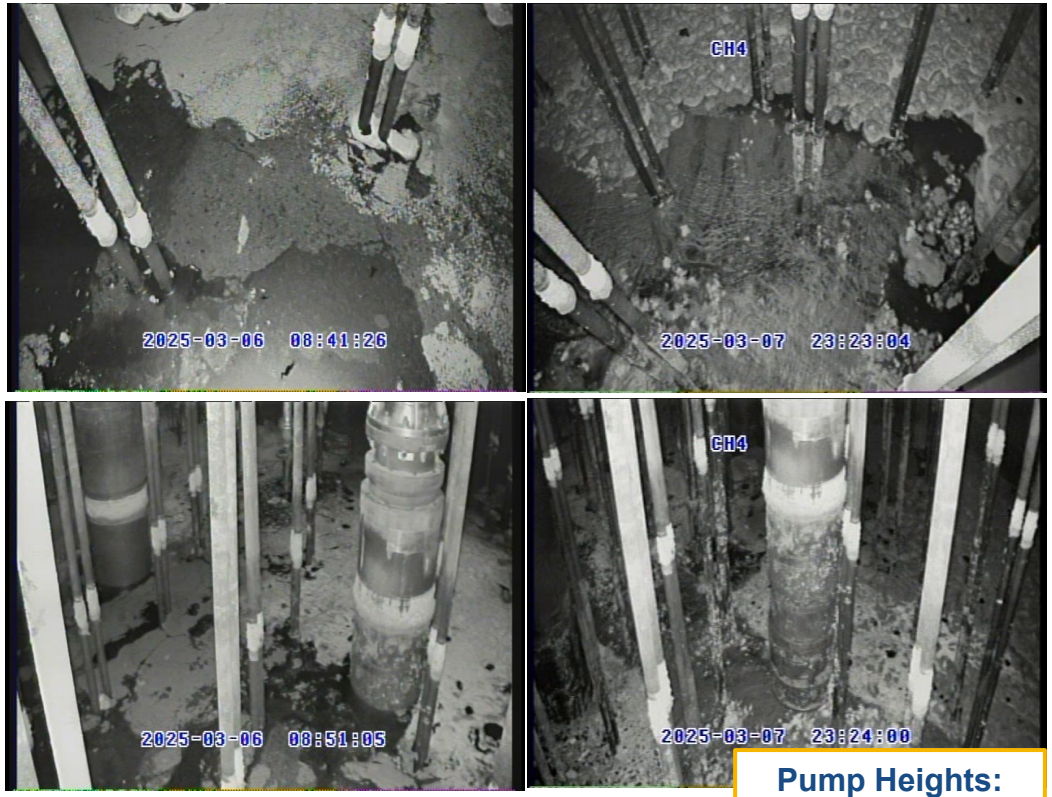
Pump Heights:
Riser 1: 111”
Riser 6: 111”
Riser 5 (STP): 61”

[SW11.1-WTE-7.2 Rev. 167 IPC-2, U-ESR-F-00073, Rev 2 Add. 1]

Waste Removal Phase III – Campaign 2

- **~156,000 gallons water added**
- **Two CSMPs in Risers 1 and 6 operated for ~5 days**
  - *CSMP in Riser 6 indexed towards the mound observed by Riser 8 while Riser 1 remained in oscillation mode*
  - *Operated at full speed until temperature controls required reducing to half speed for the last nine hours of the campaign*
- **After salt was uncovered at a height of 89”, the transfer continued and Interstitial Liquid Removal was performed, bringing the liquid level to an estimated 71”**
- **Transfer of ~250,000 gallons DSS to Tank 7 completed on March 7, 2025.**
- **DSS transferred had a specific gravity of 1.35 indicating very good salt dissolution**
- **BSL estimated to be reduced to 89”**

Before Interstitial Liquid Removal	After Interstitial Liquid Removal



Pump Heights:
Riser 1: 111”
Riser 6: 111”
Riser 5 (STP): 61”

[SW11.1-WTE-7.2 Rev. 167 IPC-2, U-ESR-F-00073, Rev 2 Add. 1, U-ESR-F-00073 Rev. 2 Add. 2]

Waste Removal Phase III – Campaign 3A

- ~258,000 gallons water added
- CSMPs were lowered before the campaign was initiated
- Two CSMPs in Risers 1 and 6 operated in oscillation mode for ~10 days
  - *Operated at full speed for the first five days, before reducing to half speed due to temperature concerns*
  - *A pause in mixing was required on Day 6 due to a ventilation alarm*
- DSS had a specific gravity of 1.207 indicating salt dissolution below the target for the campaign
- The decision was made to lower the CSMPs and mix again in an effort to dissolve more salt
- BSL estimated to be reduced to 31”

Pump Heights:
Riser 1: 81” [1]
Riser 6: 81” [1]
Riser 5 (STP): 25”

[1]The CMSPs were believed to be at 81” from the tank bottom. However, a walkdown during Campaign 3C revealed a discrepancy in actual installation heights. As such, the CSMP height during campaign 3A is unverifiable.

[SW11.1-WTE-7.2 Rev. 168 IPC-2, U-ESR-F-00073, Rev 2 Add. 2]

Waste Removal Phase III – Campaign 3B

- No additional water was used
- CSMPs were lowered before the campaign was initiated
- Two CSMPs in Risers 1 and 6 operated in oscillation mode for ~4 days
  - *Operated at full speed for the first day, before reducing to half speed due to temperature concerns*
- DSS had a specific gravity of 1.22 indicating salt dissolution below the target for the campaign
- The decision was made to lower the CSMPs and mix again in an effort to dissolve more salt
- BSL was not estimated at this point

Pump Heights:
Riser 1: 31”[1]
Riser 6: 31” [1]
Riser 5 (STP): 25”

[1]The CMSPs were believed to be at 31” from the tank bottom. However, a walkdown during Campaign 3C revealed a discrepancy in actual installation heights. As such, the CSMP height during campaign 3B is unverifiable.

[SW11.1-WTE-7.2 Rev. 168 IPC-2, U-ESR-F-00073, Rev. 2 Add. 2]

Waste Removal Phase III – Campaign 3C

- No additional water was used
- Two CSMPs in Risers 1 and 6 operated in oscillation mode for ~5 days
  - *Operated at half speed due to temperature concerns*
- During the walkdown before initiation of transfer to Tank 7, it was discovered the CSMPs were not installed at the heights previously believed
- The decision was made to lower the CSMPs to the correct position and mix again before transfer
- DSS had a specific gravity of 1.24 indicating salt dissolution below the target for the campaign
- BSL was not estimated at this point

Pump Heights:
Riser 1: 41”[1]
Riser 6: 41”[1]
Riser 5 (STP): 25”

[1]Riser 1 and Riser 6 CMSPs were originally believed to be at 11” and 1”, respectively, from the tank bottom. The actual heights were found to be 41” from the tank bottom during a walkdown after mixing.

[SW11.1-WTE-7.2 Rev. 168 IPC-2, U-ESR-F-00073, Rev 2 Add. 2]

Waste Removal Phase III – Campaign 3D

- **No additional water was used**
- **A third CSMP was added in Riser 3**
- **Three CSMPs in Risers 1, 3, and 6 operated in oscillation mode for ~4 days**
  - *Operated at full speed for the first two days, before reducing to half speed due to temperature concerns*
- **Density was not taken and the decision was made to lower the pumps and complete another mixing campaign**
- **BSL was not estimated at this point**

Pump Heights:
Riser 1: 31”
Riser 3: 11”
Riser 6: 31”
Riser 5 (STP): 8”

[SW11.1-WTE-7.2 Rev. 169 IPC-2, U-ESR-F-00073, Rev 2 Add. 2]

Waste Removal Phase III – Campaign 3E

- **No additional water was used**
- **Three CSMPs in Risers 1, 3, and 6 operated in oscillation mode for ~6 days**
  - *Operated at full speed for the first half day, before reducing to half speed due to temperature concerns*
- **DSS had a specific gravity of 1.25 and the decision was made to lower the pumps and complete another mixing campaign**
- **BSL was not estimated at this point**

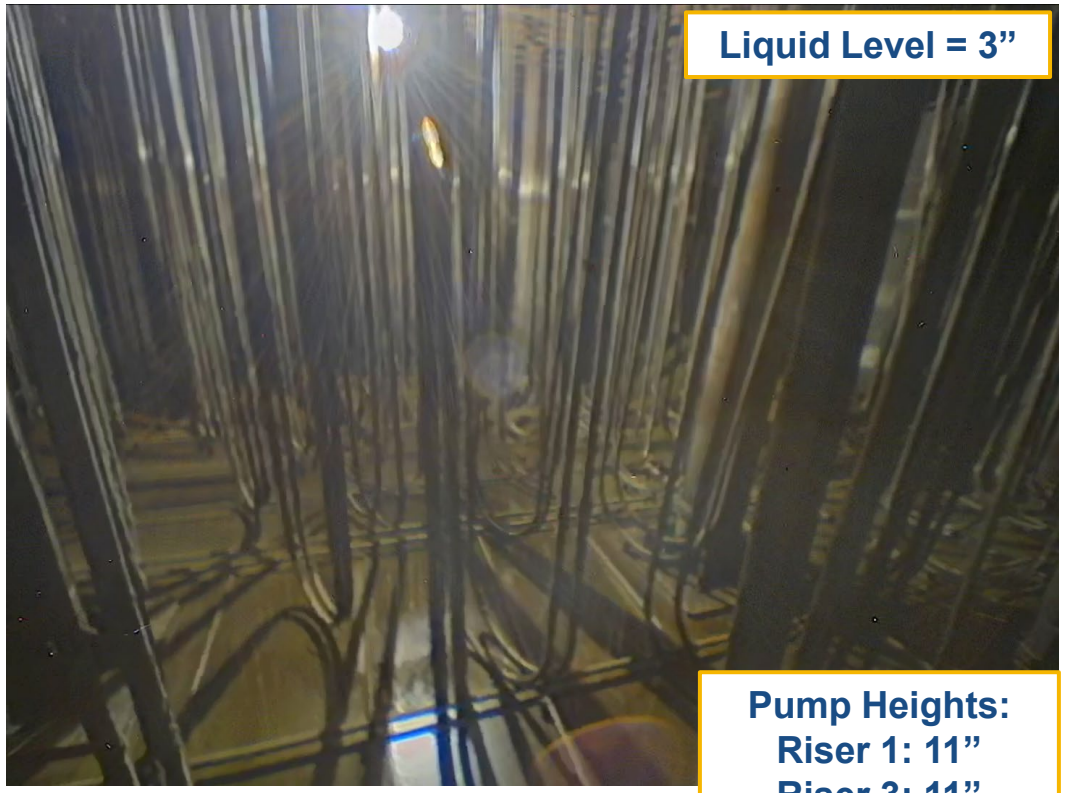
Pump Heights:
Riser 1: 21”
Riser 3: 11”
Riser 6: 11”
Riser 5 (STP): 8”

[SW11.1-WTE-7.2 Rev. 169 IPC-2, U-ESR-F-00073, Rev 2 Add. 3]

Waste Removal Phase III – Campaign 3F

- No additional water was used
- Riser 1 CSMP was run alone at full speed for the first day of the campaign, after which all three CSMPs in Risers 1, 3, and 6 operated in oscillation mode for ~3 days
  - *Operated at full speed for the first eight hours, before reducing to half speed due to temperature concerns*
- STP faulted during the transfer and required replacement
- CSMPs operated during the transfer to Tank 7 until shutdown due to reaching the minimum liquid level for operation
- Transfer of ~290,000 gallons DSS to Tank 7 completed on July 23, 2025.
- DSS had a specific gravity of 1.244, indicating further salt dissolution was not taking place
- Video monitoring was carried out during the transfer to allow for a tank mapping and residual waste volume estimation

Tank Following Transfer



[SW11.1-WTE-7.2 Rev. 171 IPC-2, U-ESR-F-00073, Rev 2 Add. 3]

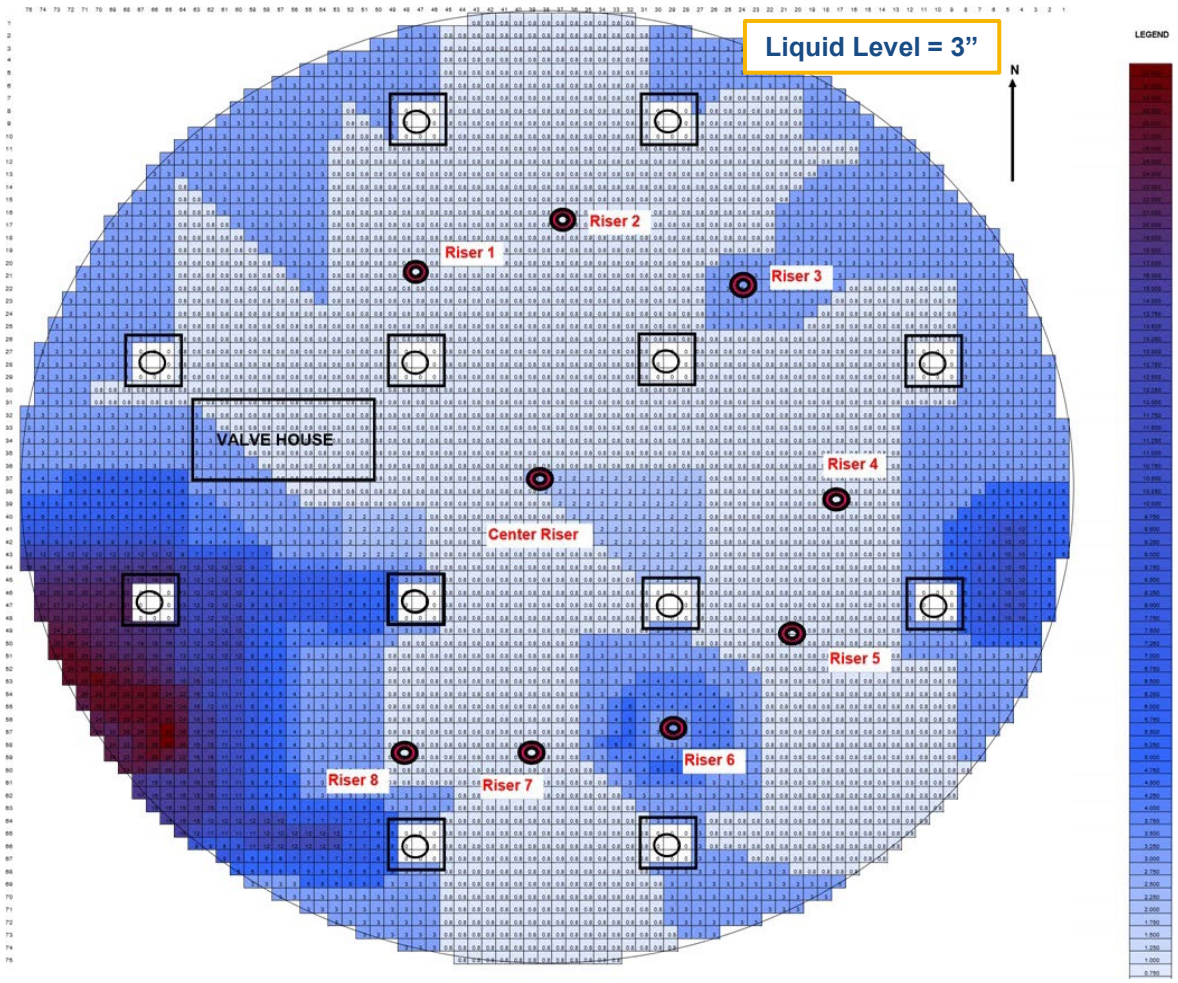
Waste Removal Phase III

- **Video inspection of the primary tank was carried out in three risers: Riser 7, Riser 2, and the Center Riser and a map of the estimated remaining solids was created**
  - *Estimated ~8,070 gallons of solids*
  - *One large mound was seen near Riser 8 and the valve house, where solids accumulations had been seen during previous inspections*
  - *Two smaller mounds were also seen: one southwest of Riser 4 and another surrounding the Riser 6 CSMP*
  - *A minimum solids height of 0.8125” was assumed where the lower horizontal cooling coil was visible*

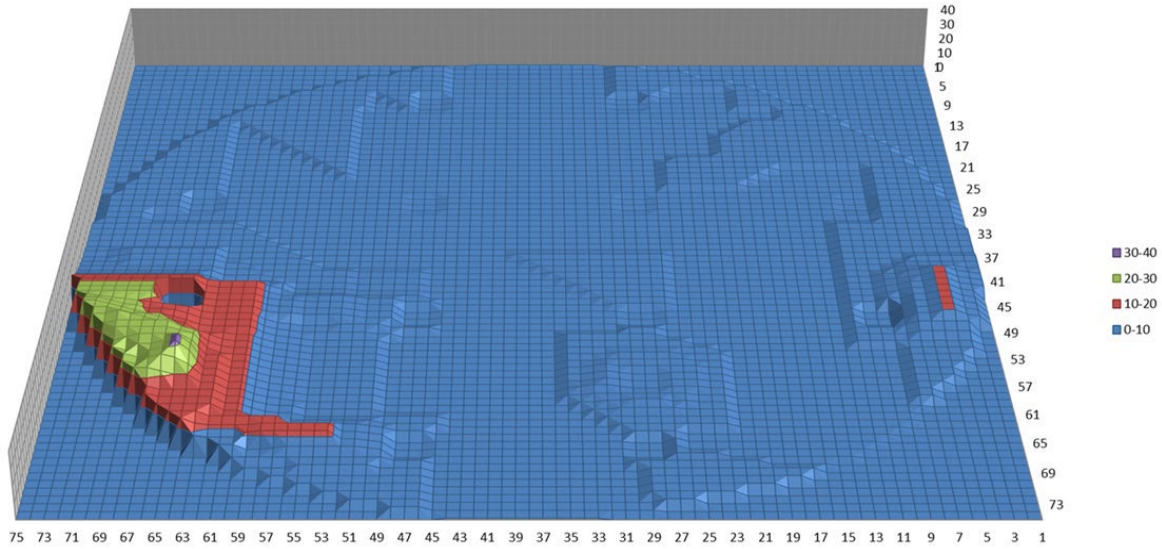
[U-ESR-F-00134]

Current Status of Tank 3

Residual Solids Map Plan View



Residual Solids 3-D Model (height exaggerated to show detail)

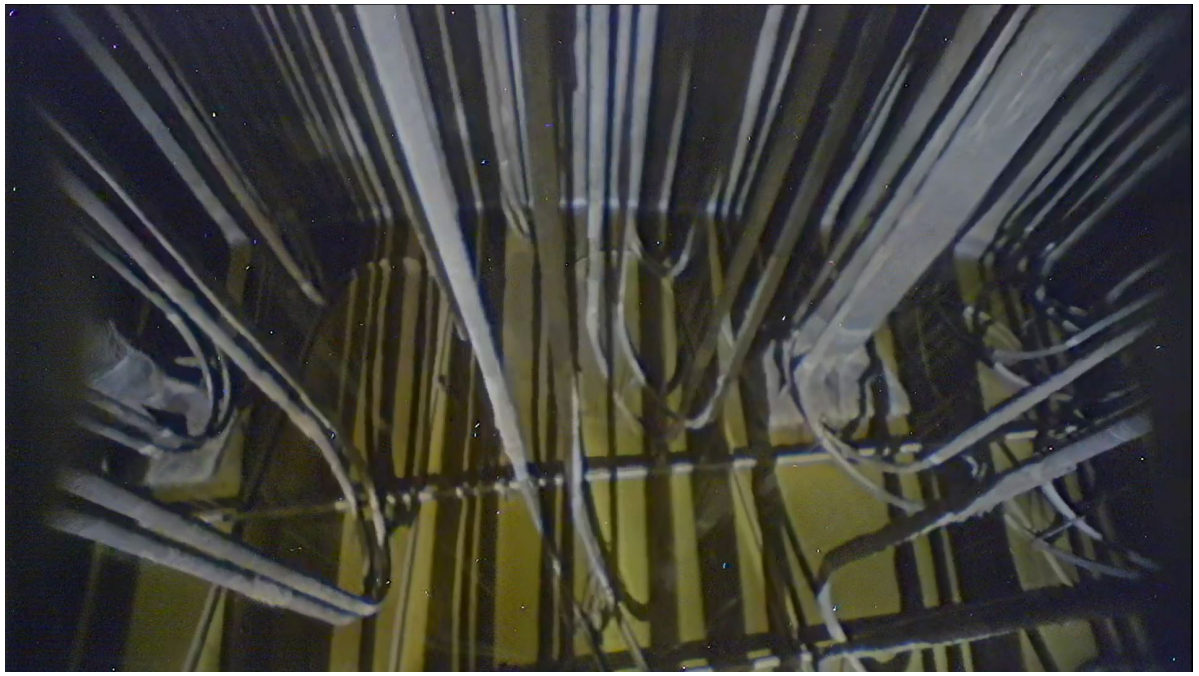


Remaining Solids ~8,070 gallons

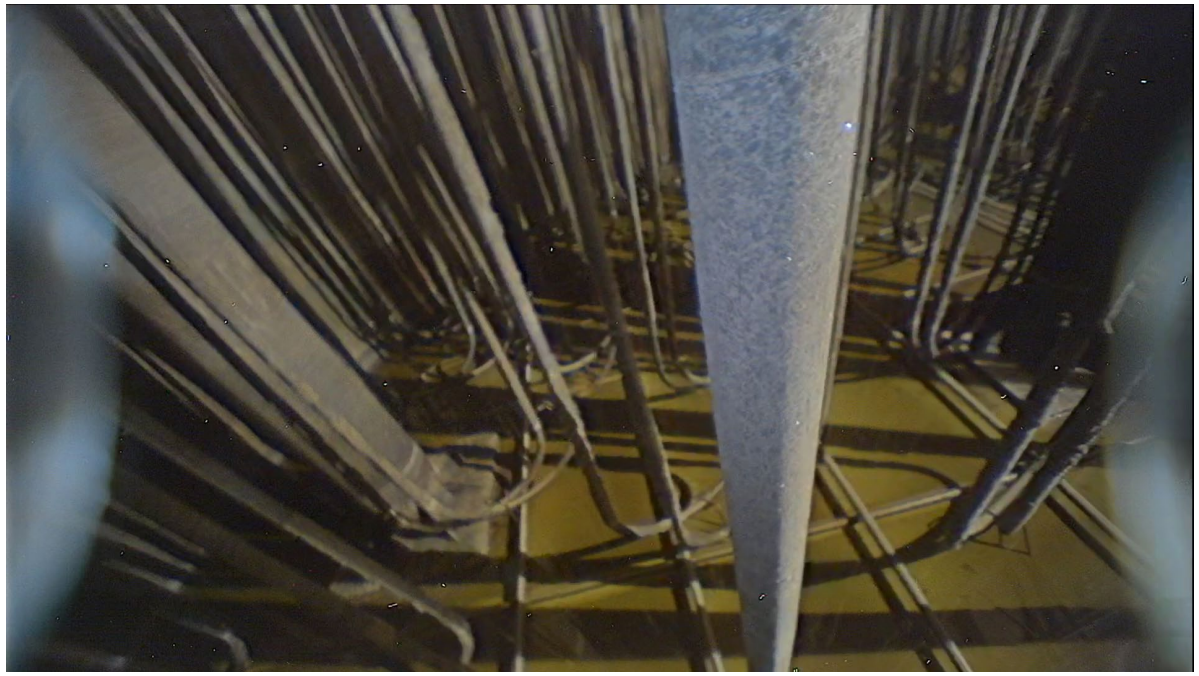
[U-ESR-F-00134]

Current Status of Tank 3 – From Camera Inspection

North



Northeast



Current Status of Tank 3 – From Camera Inspection

East

East Mound from Center Riser

Current Status of Tank 3 – From Camera Inspection

East Mound from Riser 7

East Mound Close Up

Current Status of Tank 3 – From Camera Inspection

Southeast

South

Current Status of Tank 3 – From Camera Inspection

Mound Below Riser 6

Mound Below Riser 6 Close Up

Current Status of Tank 3 – From Camera Inspection

Southwest

Southwest Mound from Riser 7

Current Status of Tank 3 – From Camera Inspection

Southwest Mound from Center Riser

Southwest Mound Close Up

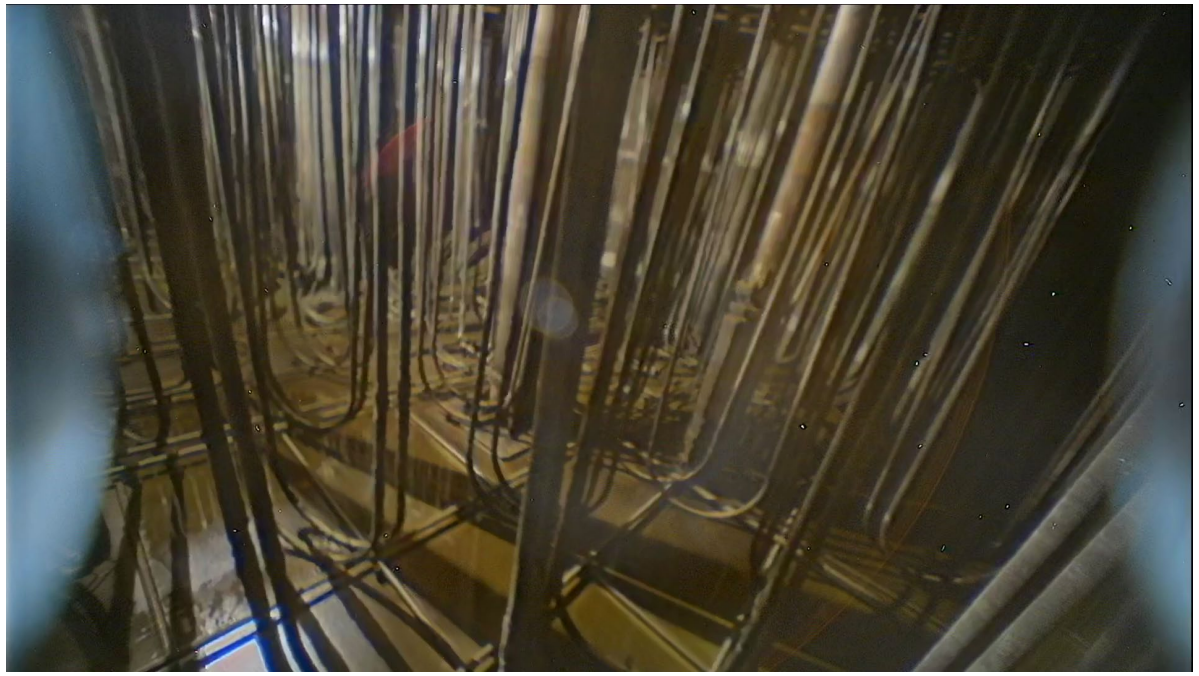
Current Status of Tank 3 – From Camera Inspection

Southwest Mound Close Up

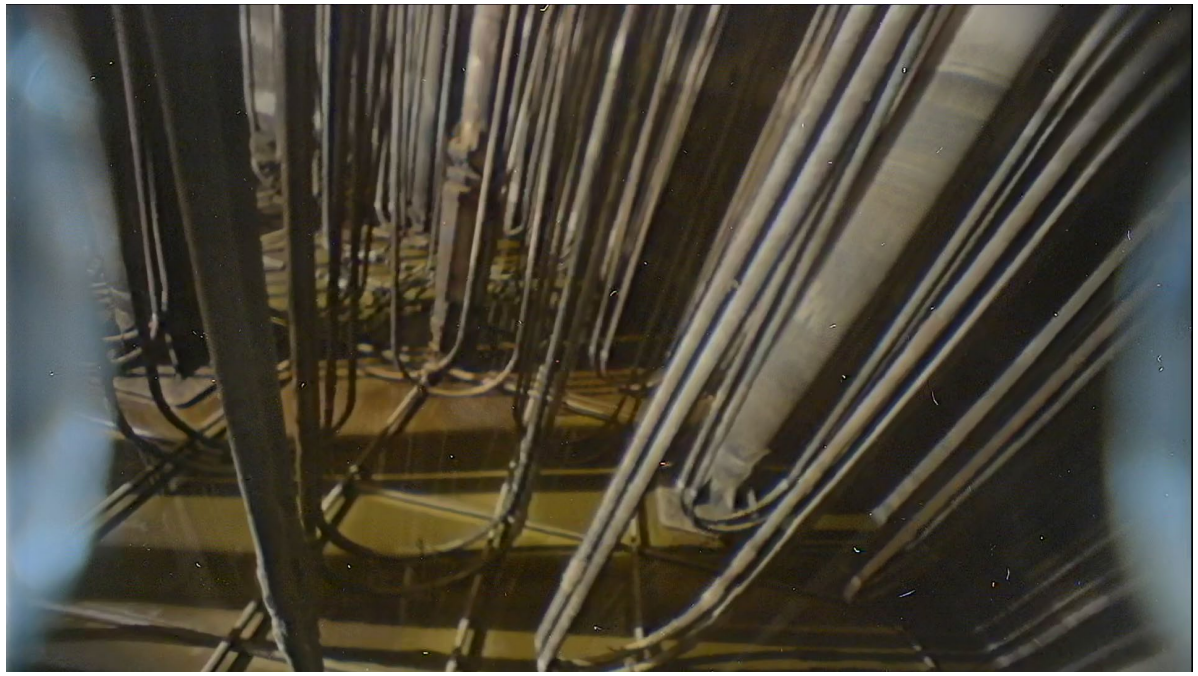
Southwest Mound Toward Center

Current Status of Tank 3 – From Camera Inspection

West

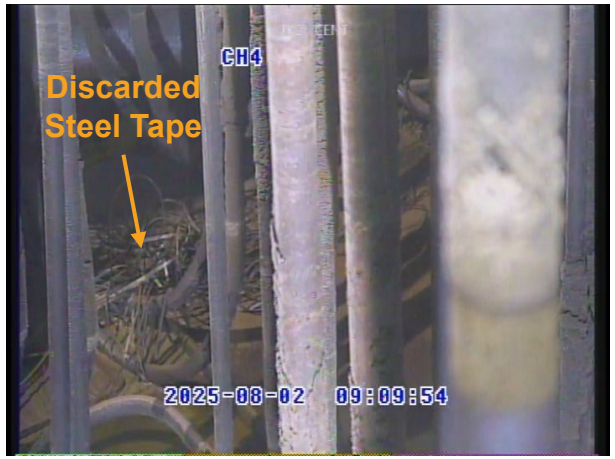


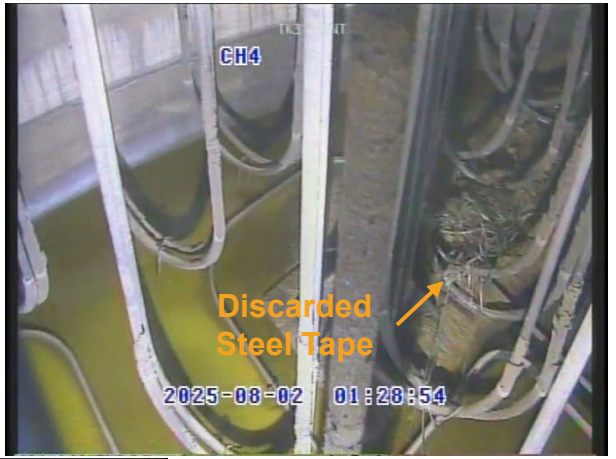
Northwest



Obstructions

- **Discarded Steel Tape was noted in and around both the East and Southwest Mounds**





Tank 3 Annulus Condition

- **Through November 2024**
  - *No leak sites have been documented and no waste is visible on the annulus floor*
  - *Four annulus risers, North, South, East, and West, are available for inspection and provide a 25% inspection capability*

[SRMC-STI-2024-00076]

Tank 3 Annulus Condition

South Looking West

South Looking East

West Looking North

West Looking South

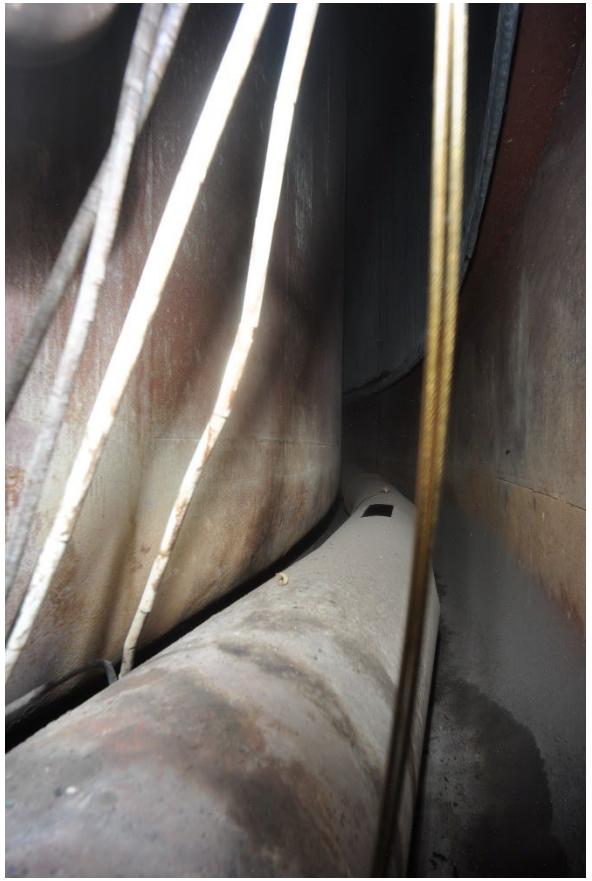
Tank 3 Annulus Condition

East Looking South

East Looking North

North Looking West

North Looking East



Summary for Closed/PCWR Complete Tanks

Waste Tank	PCWR Date	Operational Closure Date	Max. Dose within 10,000 years[1] (mrem/yr)	Primary Tank Residual Solids Volume[2] (%)	Primary Tank Residual Solids Volume (Gallons)	Annulus Residual Volume (Gallons)	Annulus Cleaning
4[3]	12/2024	-	<5	<1	<6,000	Negligible	No - negligible
5	11/2010	12/2013	3	0.26	1,900	<15	No – negligible
6	11/2010	12/2013	3	0.41	3,000	<50	Yes ~ 100 gal
8[3]	6/2025	-	<3	<1	<7,100	Negligible	No – negligible
9[3]	10/2024	-	<3	<1	<7,500	Negligible	Yes
10[3]	5/2024	-	<2	<0.40	<3,000	<400	Yes
11[3]	5/2025	-	<4	<1	<8,000	Negligible	No - negligible
12	1/2014	4/2016	6	0.20	1,500	30	No – negligible
15[3]	5/2025	-	<6	<1	<6,000	1,800	Yes
16	4/2013	9/2015	2	0.21	356	1,910	No – not practical
17	N/A	12/1997	3	0.18	2,400	N/A	N/A
18	10/2009	9/2012	3	0.30	3,900	N/A	N/A
19	10/2009	9/2012	3	0.15	2,000	N/A	N/A
20	N/A	7/1997	3	0.08	1,000	N/A	N/A

[1] Dose for FTF tanks represents maximum all sources dose utilizing actual inventories for Tanks 5, 6 and 17-20. Dose for HTF tanks represents maximum contribution from individual tanks. [SRR-CWDA-2012-00106, SRR-CWDA-2015-00073, SRR-CWDA-2014-00106]
[2] Based on historic maximum waste volume for each tank. [DOE/SRS-WD-2012-001, DOE/SRS-WD-2014-001]
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