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The Importance of Regulator and Stakeholder Relationships to the Department of Energy’s Liquid Waste Mission at the Savannah River Site – 23257

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Savannah River Mission Completion

ABSTRACT

In the early 2000s, the Liquid Waste (LW) System at the Savannah River Site (SRS) was going through a major shift in establishing the strategies and processes that would be deployed to disposition the existing and future LW stored in the underground tanks located in the SRS tank farms.

To guide the planning and execution of the LW mission, the Department of Energy (DOE), key regulatory agencies and stakeholders jointly developed and agreed upon a set of “Common Goals and Values.” These overarching principles would direct the program’s execution and planning. Since being developed, the set of Common Goals and Values has continued to guide DOE’s planning and execution of the LW mission at SRS and interactions with stakeholders. With the startup of the Salt Waste Processing Facility (SWPF) in 2020 and completion of the initial year of the facility’s operations, the focus of the LW mission has shifted to feeding and operating SWPF as effectively and efficiently as possible. Additionally, a new contractor, Savannah River Mission Completion (SRMC), took over management of the LW program in late February 2022 and management of SWPF in late March 2022. For the first time, a single contractor now has responsibility for all the LW processing facilities required to complete the LW mission at SRS.

With the new contractor also come new ideas, optimization initiatives, and strategies all targeted at driving the safe and efficient completion of the LW mission at SRS. Given the status of SWPF and recent changeover of the LW contractor, it was an opportune time for DOE and the regulatory agencies to revisit the Common Goals and Values and revise them to align with what the parties believe to be most important ideals moving forward. DOE and the regulatory agencies have been working to revisit the list of Common Goals and Values and review the various regulatory permits, agreements, and plans that govern the disposition of the LW, and the removal from service of the waste tanks and supporting ancillary structures. The purpose of the review is to evaluate requirements which have been established in various agreements. The review supports understanding if there are existing requirements that may be impacting the ability to operate the LW facilities as efficiently and effectively as possible. The outcome of this process will be the establishment of new regulatory milestones and a potential reduction in conflicting processing requirements or documentation. This result will guide DOE and the LW contractor in planning and execution of the LW mission in a manner that will support the newly established Common Goals and Values.

INTRODUCTION

Since the early 1950s, the primary mission of SRS had been to produce nuclear materials for national defense and deep space missions. The processes used to recover these nuclear materials from production reactor fuel and target assemblies in the chemical separations areas at SRS generated significant volumes of liquid radioactive waste. This waste is currently stored in F and H Areas near the center of the site. Two of the major components of the LW System at SRS are the F-Area Tank Farm (FTF) and the H-Area Tank Farm (HTF). The FTF and HTF were constructed to receive waste generated by various SRS production, processing, and laboratory facilities. The use of FTF and HTF structures and systems isolated these wastes from the environment, SRS workers, and the public. With FTF and HTF, facilities are in place to pretreat the accumulated sludge and salt solutions (i.e., supernate) to enable the management of

these wastes within other SRS facilities such as the Salt Waste Processing Facility (SWPF), Defense Waste Processing Facility (DWPF), and the Saltstone Production Facility (SPF). These facilities convert the sludge and salt wastes to more stable forms suitable for permanent disposal in a federal repository or the Saltstone Disposal Facility (SDF), as appropriate.

The FTF is a 89,030 m² (22-acre) site consisting of 22 waste tanks, two evaporator systems, six diversion boxes (DBs), one catch tank, a concentrate transfer system (CTS) tank, three pump pits (PPs) each including a pump tank, one CTS PP, and over 13,716 m (45,000 ft) of transfer pipelines including valve boxes and associated leak detection systems (Figure 1).

The HTF is a 182,107 m² (45-acre) site consisting of 29 waste tanks, three evaporator systems, eight DBs, one catch tank, 10 PPs (each has one pump tank except HPP-1 which has none), two CTS PPs, and approximately 22,799 m (74,800 ft) of transfer pipelines including valve boxes and associated leak detection systems (Figure 2).

There are three waste tank design types in FTF and four waste tank design types in HTF. The tanks range in size from 2.8 million liters (750,000 gal) to 4.9 million liters (1.3 million gallons) and have varying degrees of secondary containment and intra-tank interferences, such as cooling coils and roof support columns.

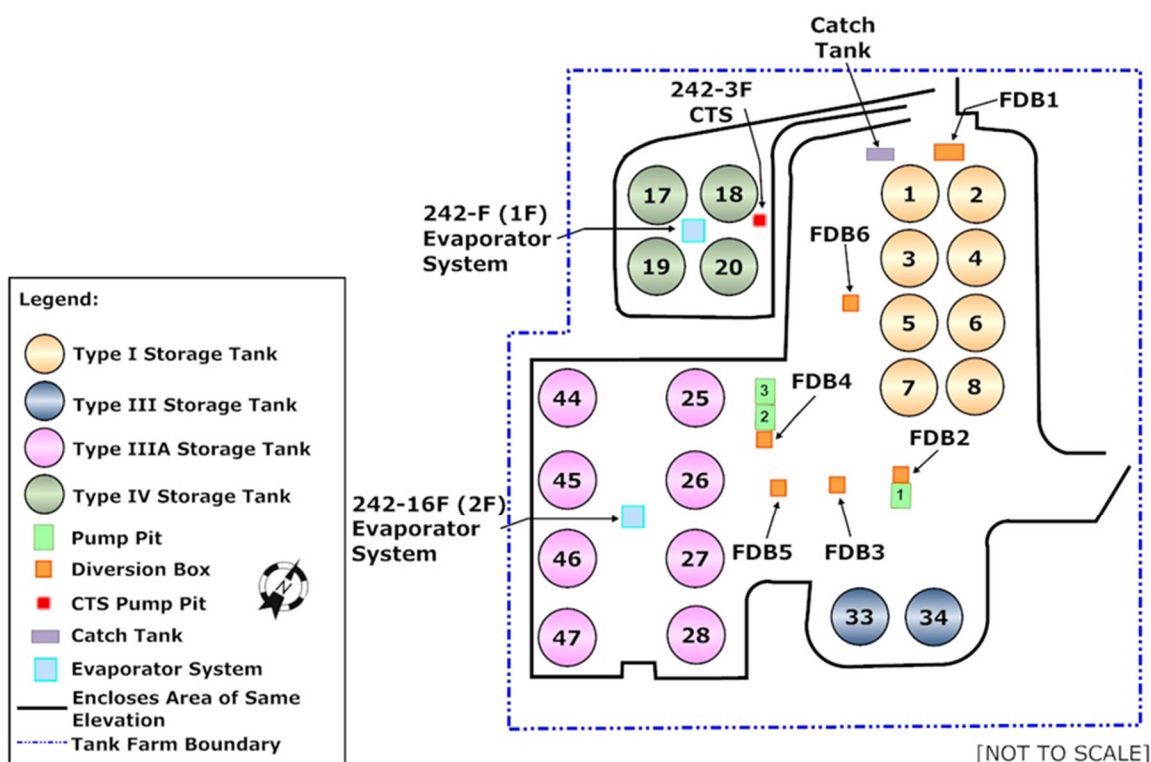


Fig. 1. Layout of the F-Area Tank Farm.

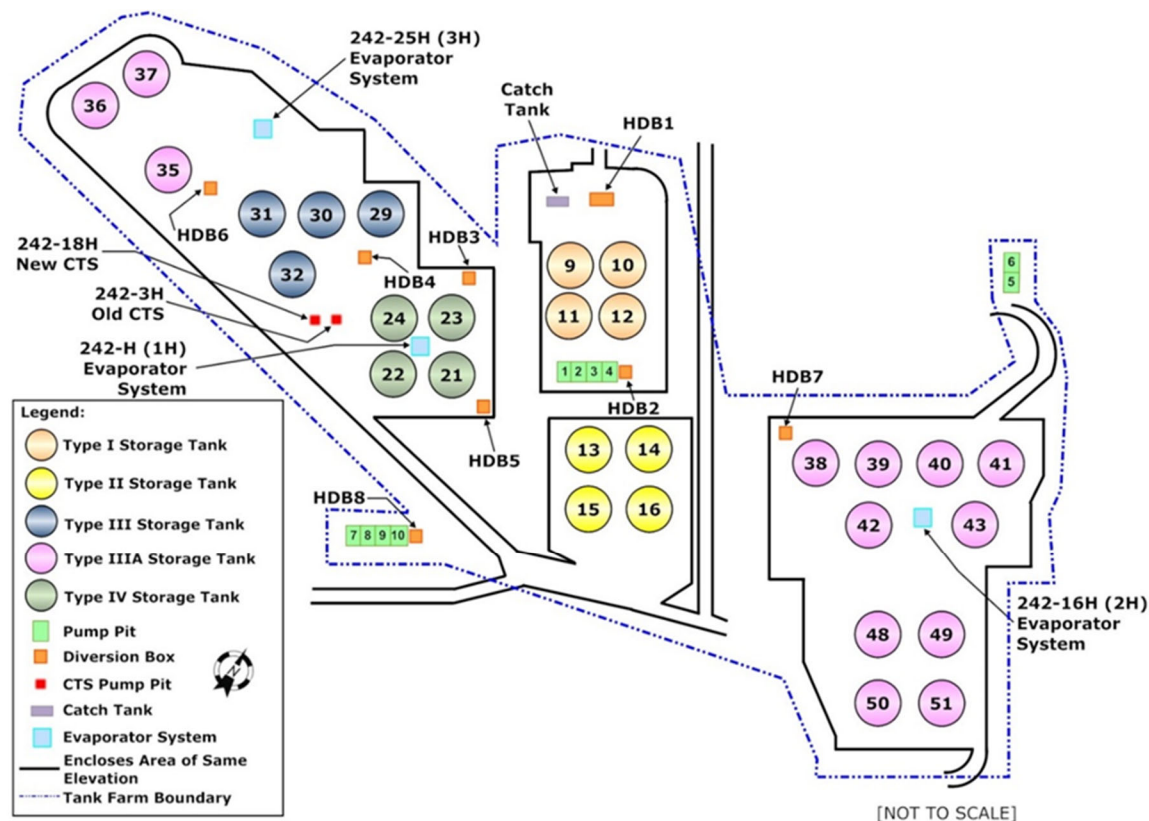


Fig. 2. Layout of the H-Area Tank Farm.

Today, the primary focus at SRS is environmental restoration with the highest priority being removal, treatment, and disposal of the waste in the FTF and HTF. Once the waste is removed, the waste tanks and other supporting ancillary structures will be isolated and stabilized (i.e., filled with grout). To date, six tanks in FTF and two tanks in HTF have completed this process and have been removed from service.

The SRS FTF and HTF waste tanks and ancillary structures are regulated under a South Carolina Department of Health and Environmental Control (SCDHEC) industrial wastewater permit [1] and the SRS Federal Facility Agreement (FFA) [2]. DOE, SCDHEC, and the Environmental Protection Agency (EPA) signed the FFA pursuant to Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Sections 3008(h) and 6001 of the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984 and the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2011. The agreement became effective in August 1993.

Removal of these waste tanks and ancillary structures from service, giving priority to those waste tanks that do not meet the secondary containment standards established in Appendix B of the SRS FFA, will reduce the risk of a leak to the environment and provide a stable form that is protective of human health and environment.

DISCUSSION

In the early 2000s, the LW System at SRS was going through a major shift in establishing the strategies and processes that would be deployed to disposition the existing and future LW stored in the underground

waste tanks and ancillary structures located in FTF and HTF. The processing plan involved separating the salt waste to segregate the low-activity fraction at SRS using a two-phase, three-part process. The first phase involved two parts to treat the lower activity salt waste: a) processing of a minimal amount of the lowest activity salt waste through a process involving deliquification, dissolution, and adjustment (DDA) of the waste; and b) processing of a minimal amount of additional salt waste with slightly higher activity levels using an Actinide Removal Process (ARP) and a Modular Caustic Side Solvent Extraction (CSSX) Unit (MCU), along with deliquification and dissolution of saltcake. The second, and longer-term phase, would be the separation and processing of the remaining (and by far the majority) of the salt waste using SWPF as soon as SWPF was constructed, permitted by the State of South Carolina, and operational. At that time, to guide the planning and execution of the LW mission, DOE, key regulatory agencies and stakeholders jointly developed and agreed upon a set of “Common Goals and Values”. These overarching principles have directed the program’s execution and planning over the past approximately two decades.

In addition, over that same time period DOE, SCDHEC, and EPA, have reached a series of agreements related to waste tank closure milestones within the SRS FFA. The agencies have established the process, which governs how DOE carries out the removal from service for waste tanks and ancillary structures pursuant to issued closure plans under the industrial wastewater permit for FTF and HTF, consistent with the SRS FFA. In addition, DOE and SCDHEC have reached agreements related to, or contained in, the permit governing salt waste disposal at the SDF. These various regulatory permits, agreements, and plans govern the disposition of the LW, and the removal from service of the waste tanks and supporting ancillary structures.

Since being developed, the set of Common Goals and Values, as well as the various agreements, plans and permits, have continued to guide DOE’s planning and execution of the LW mission at SRS. With the startup of SWPF in 2020 and completion of the initial year of the facility’s operations, the focus of the LW mission has shifted to feeding and operating SWPF as effectively and efficiently as possible. Additionally, a new contractor, Savannah River Mission Completion (SRMC), took over management of the LW program in late February 2022 and management of SWPF in late March 2022. For the first time, a single contractor now has responsibility for all the LW processing facilities required to complete the LW mission at SRS.

With the new contractor and available facilities also come new ideas, optimization initiatives, and strategies all targeted at driving the completion of the LW mission at SRS. Given the status of SWPF and recent changeover of the LW contractor, it was an opportune time for DOE and the regulatory agencies to revisit the Common Goals and Values and revise them to align with what the parties believe to be most important ideals moving forward. DOE and the regulatory agencies have been working to revisit the list of Common Goals and Values and review the various regulatory permits, agreements, and plans that govern the disposition of the LW, and the removal from service of the waste tanks and supporting ancillary structures. The purpose of the review is to evaluate requirements which have been established in various agreements. The review supports understanding if there are existing requirements that may be impacting the ability to operate the LW facilities as efficiently and effectively as possible. The outcome of this process will be the establishment of new regulatory milestones and a potential reduction in conflicting processing requirements or documentation. This result will guide DOE and the LW contractor in planning and execution of the LW mission in a manner that will support the newly established Common Goals and Values. The process has advanced over the past months following the steps discussed below.

Processing Plan Overview

The first step in the process was to hold a meeting involving DOE, SCDHEC, EPA and SRMC personnel,

to provide a chance for the new liquid waste contractor to provide an overview of their new ideas, optimization initiatives, and strategies all targeted at driving the completion of the LW mission at SRS within 15 years. The idea was to set aside requirements contained within existing agreements, permits and plans to provide a vision of what SRMC and DOE believe could be accomplished and “what” (e.g., risk reduction, system optimization) should be the focus of the LW mission followed with the best way (e.g., “how”) it could be carried out. This vision would potentially mean changes to some existing agreements, permits, and plans which over time have, in some instances, emphasized the “how” goals would be accomplished over “what” should be accomplished. These discussions included open discussions on current status and performance of SWPF and the technical background/reasoning for the suggested processing path forward. The idea of the meeting was to focus on what SRMC and DOE believe to be the best path forward to accomplish processing goals to set the stage for discussions on what changes, if any, should be made to existing milestones and processing agreements. Some examples of the type of information shared during the meeting are provided in Figure 3.

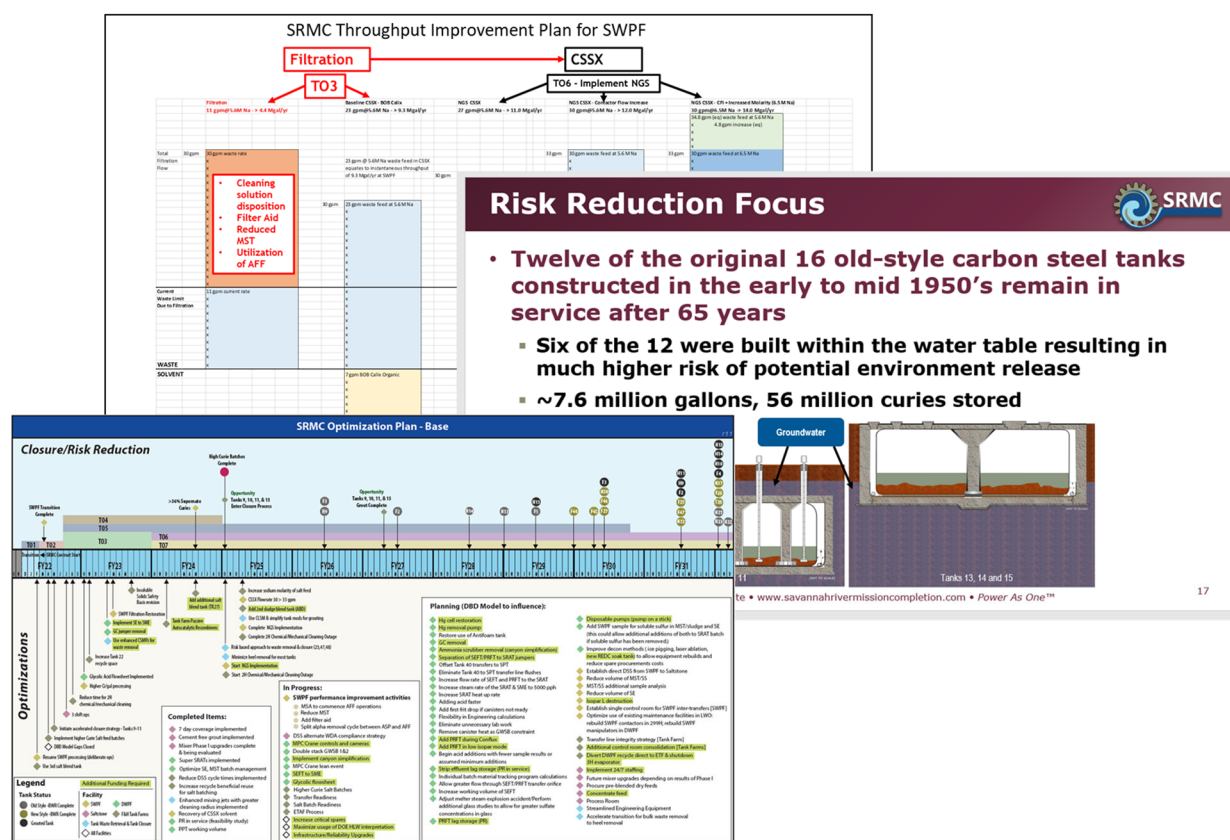


Fig. 3. Examples of Documentation Used to Provide Processing Plan Overview.

Establishment of Update Goals and Values

After providing an overview and vision of the path forward for what DOE and SRMC believed was needed to complete the LW mission in the most effective and efficient manner possible, the next task was to revisit the Common Goals and Values originally established in the early 2000s. Over a series of a meetings, the agencies agreed upon a new set of what are now referred to as the Common Values and Goals. The idea being to separate out those items which are “values” to be followed in guiding decisions and which are “goals” of the program while also providing a priority for those goals. Figure 4 provides the updated set of Common Values and Goals the agencies have agreed will guide the program through

completion of the LW mission.

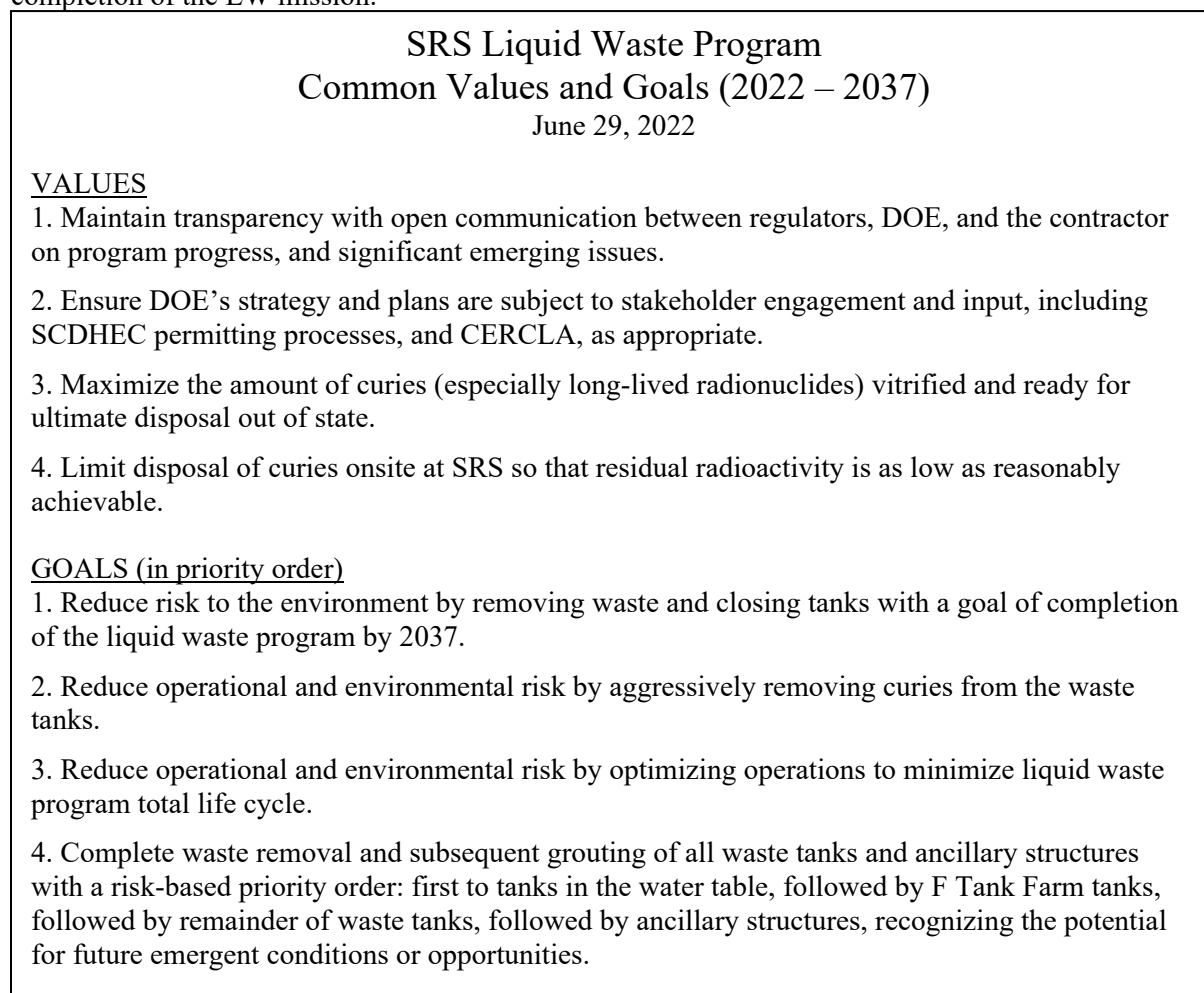


Fig. 4. Newly Established Common Values and Goals.

Overview of Existing Permits/Agreements

As noted earlier, over the previous 15-20 years, a series of agreements related to waste tank closure milestones within the SRS FFA, the process for how DOE carries out the removal from service for waste tanks and ancillary structures, and agreements related to, or contained in, various LW permits, govern the disposition of the LW and the removal from service of the waste tanks and supporting ancillary structures. These various agreements have been reached either between all three agencies (i.e., DOE, SCDHEC and EPA) such as within the SRS FFA or between DOE and SCDHEC in the case of permit related agreements. In most cases, because of the ongoing relationships between the three agencies, as well as quarterly processing updates provided by DOE as required by the FFA, all three agencies are familiar to some extent with the various agreements. However, because of the number of different groups involved, as well as new personnel involved in discussions, it seemed appropriate to provide an overview early in the discussions of the various agreements, permits, plans which govern waste removal activities and to highlight the primary areas of overlap between the documents. The presentation was provided to remind participants of what may need to be taken into consideration, and to avoid, to the extent possible, conflicts between the documents or the newly established Common Values and Goals. Examples of the information discussed between the agencies are shown in Figure 5.

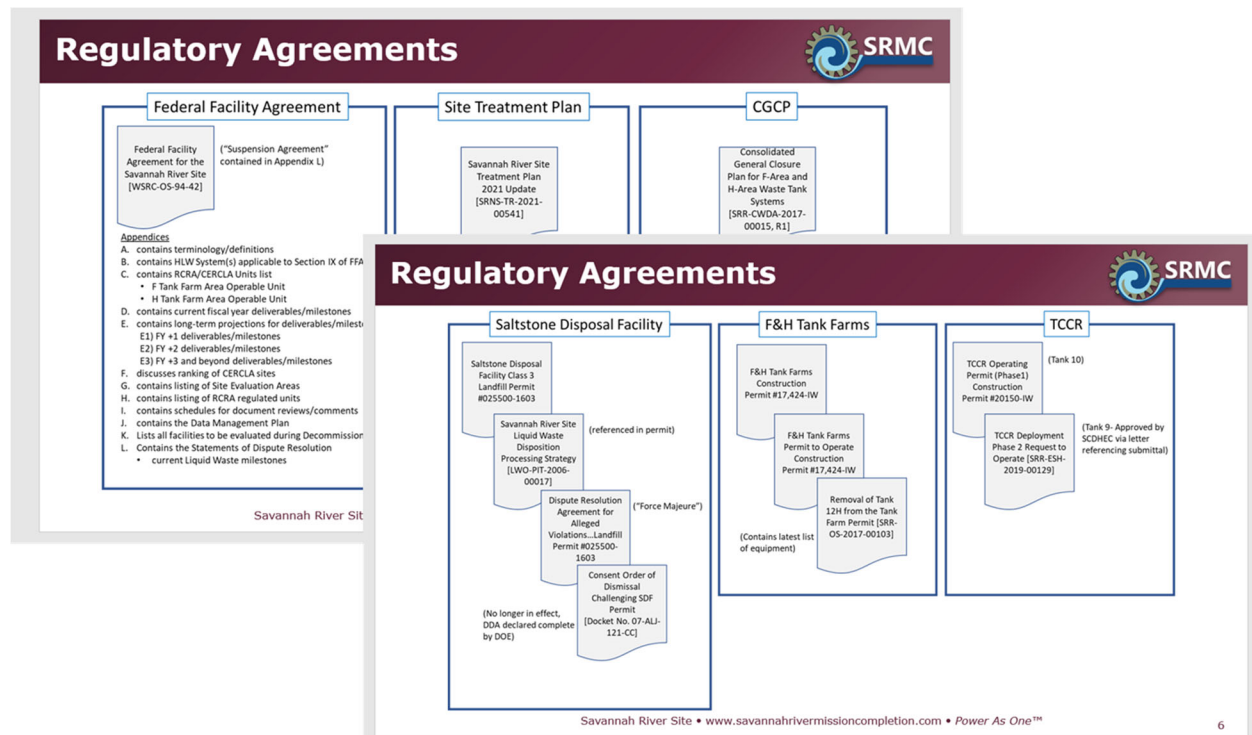


Fig. 5. Examples of Documentation Used to Provide Overview of Agreements, Plans, and Permits.

Negotiation of Milestones/Agreements

The establishment of an agreed upon updated set of Common Values and Goals, the overview of the vision of DOE and SRMC, as the new LW contractor responsible for completion of the LW mission, open discussion on current status of salt waste processing status and the best way to move forward, and a good understanding of the various regulatory agreements, permits, and plans currently in place, set the stage for detailed discussions/negotiations regarding new regulatory milestones and potential changes to existing agreements, permits and plans.

To move forward with discussions, a series of smaller groups were assembled to focus on their areas of expertise. These smaller groups involve personnel from all agencies and the DOE contractor, including programmatic, operations, and legal representatives. The ongoing work has involved individual meetings by the smaller groups with occasional meetings between the overall participants to provide status.

CONCLUSIONS

With the establishment of the updated Common Values and Goals, DOE and the regulators have set the stage for what will guide processing decisions as waste disposition occurs within FTF and HTF until completion of the LW mission at SRS. The Common Values and Goals will guide decisions on what new milestones will be established, the path forward for other agreements, permits, and plans with the potential to simplify these processes and focus work on completing the LW mission as efficiently and effectively as possible.

Work between the agencies has been successfully completed in some areas and continues in others to ensure that the path forward for LW processing remains consistent with the existing agreements, permits, and plans and is in alignment with the newly established Common Values and Goals. The agencies may

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amend/revise existing documentation as needed, or work within the confines of those documents, to align with the Common Values and Goals to achieve the goal of finishing the LW mission in 15 years.

REFERENCES

[1] DHEC_01-25-1993, Sadler, M.F., *Construction Permit #17,424-IW, SRS F/H-Area, Aiken and Barnwell County*, South Carolina Department of Health and Environmental Control, Columbia, SC, January 1993.

[2] WSRC-OS-94-42, *Federal Facility Agreement for the Savannah River Site*, <http://www.srs.gov/general/programs/soil/ffa/ffa.pdf>, Savannah River Site, Aiken, SC, August 1993.