

Memorandum

DATE: May 3, 2010 Audit Report Number: OAS-L-10-04

REPLY TO

ATTN OF: IG-34 (A09SR037)

SUBJECT: Report on "The Interim Treatment of Salt Waste at the Savannah River Site"

TO: Manager, Savannah River Operations Office

On December 8, 2008, the Department of Energy (Department) named Savannah River Remediation, LLC (SRR) as the contractor to manage the radioactive liquid waste operations at the Savannah River Site (SRS). SRR was to take action to treat and dispose of waste stored in 49 underground storage tanks and operate and maintain the equipment and facilities that make up the liquid waste management system. The mission of the SRS Tank Farms is to receive, store, transfer and manage high-level radioactive liquid waste generated at SRS. Currently, approximately 36 million gallons of liquid radioactive waste are stored in the 49 underground tanks. The Salt Waste Processing Facility (SWPF), which is being designed and constructed by a different contractor, is a new SRS facility designed to utilize advanced technologies to treat the salt portion of the liquid radioactive waste inventory. This will allow the resulting waste streams to be disposed of through vitrification at the Defense Waste Processing Facility (DWPF) and by incorporation into grout at the Saltstone Processing Facility, both onsite facilities. However, recent documents show that the SWPF may not begin radioactive operations until December 2015.

In the interim, the Department provided direction to the liquid waste contractor to utilize existing infrastructure to extract the highly radioactive portion of the salt waste from the high-level waste tanks to maximize existing tank farm storage space and support the continued operation of DWPF. Two existing facilities and one newly constructed facility were utilized to form the Integrated Salt Disposition Project (ISDP). The ISDP began radioactive operations in April 2008 and was designed to operate for three years until the full-scale SWPF was originally expected to be operational. Due to its critical role in high-level waste management and disposition, we initiated this audit to determine whether the ISDP is effectively meeting the programmatic goals for treating salt waste.

CONCLUSIONS AND OBSERVATIONS

The Department's ISDP has made significant progress toward meeting the programmatic goals for treating salt waste at SRS. For example, the ISDP has treated approximately 872,000 gallons of highly radioactive salt waste from the high-level waste tanks, the initial step toward relieving the critical shortage of operating space within the high-level waste system. Additionally, with the completion of the initial operational assessment period,

ISDP is poised to begin treating salt waste with increased system throughput and radiological contamination removal rates beyond original expectations. Further, the Department issued the Savannah River Site Salt Waste Processing Facility Technology Readiness Assessment Report on July 13, 2009, that concluded that the ISDP "is successfully utilizing most of the processes that will be employed at the SWPF. The ISDP's Actinide Removal Process (ARP) and Modular Caustic Solvent Side Extraction Unit have successfully demonstrated removal of radioactive constituents from salt waste."

Extended Life Cycle

We noted that the ISDP will likely operate well beyond its three-year design life. This challenge, if not addressed in a proper and timely manner, could make the programmatic goals for treating salt waste more difficult to achieve. The ISDP was originally designed and constructed to operate for three years, or until April 2011. However, a delay in starting up hot operations in the SWPF could result in extending ISDP operations out to 2015. Extending the life of the ISDP becomes more challenging due, in part, to the fact that the facilities were designed with limited access for routine maintenance and repairs to save on initial design and construction costs.

To address this situation, in June 2009, the Department commissioned an ISDP life extension evaluation which concluded that the ISDP will require some active process equipment replacement beginning in 2011, but can likely operate until 2015 before major equipment or infrastructure failure is anticipated. For example, pumps and pump motors are considered active components and installed wiring serving such equipment is considered permanent infrastructure. Both are identified as at risk of failure due to chemical and radiological effects. To mitigate the risks associated with extending operations of the ISDP, the Department plans to implement several recommendations, to include intensifying inspections and maintenance schedules; identifying and procuring spare parts and equipment; and, conducting detailed evaluations on a case by case basis.

Performance Baseline

We also noted during our review that SRR's performance baseline for high-level liquid waste operations was found to be deficient and, as such, was rejected by the Department. In October 2009, a Department team of subject matter experts conducted an independent review of the contractor's baseline. Overall, the team determined the baseline did not contain an adequate basis for assessment against the terms and conditions of the contract and did not meet Department Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets* requirements. Specifically, 592 findings, observations, or concerns were identified, with 316 of them classified as "Major Findings" in the category of baseline cost, scope, and schedule estimating. The team also found that the contractor's proposal would not be capable of supporting successful Earned Value Management System certification or a certification of the baseline, both key project management tools.

In response to this issue, on February 2, 2010, the Savannah River Operations Office Contracting Officer signed a memorandum citing expectations for scope execution for Liquid Waste operations through September 2010, and to concur with the Liquid Waste Scope Description. This document and the Department's scope execution expectations will serve as the basis for measurement of SRR's performance pending completion and approval of the Contract Performance Baseline.

We believe management's actions, if fully implemented, are responsive to mitigating the challenges posed by extending the ISDP's life cycle and will enable SRS to measure the contractor's performance. Therefore, we have no suggestions or recommendations for improvement at this time. We appreciate the cooperation of your staff and the various Departmental elements that provided information or assistance.



Daniel M. Weeber, Director
Environment, Technology, Corporate
and Financial Audits Division
Office of Inspector General

Attachment

cc: Assistant Secretary for Environmental Management, EM-1
Team Leader, Office of Risk Management, CF-1.2
Audit Liaison, Office of Environmental Management, EM-4.1
Audit Liaison, Savannah River Operations Office

SCOPE AND METHODOLOGY

The scope of our audit included a review of the Department's Integrated Salt Disposition Project's (ISDP) progress toward meeting programmatic goals and plans to demonstrate operational technologies in the full-scale Salt Waste Processing Facility (SWPF). The evaluation was performed between July 2009 and March 2010 at the Department of Energy's (Department) Savannah River Site in Aiken, SC. To accomplish the objective, we:

- Obtained and reviewed Departmental guidance and reports and documents addressing technology readiness;
- Reviewed and assessed the ISDP operation, maintenance and management plans;
- Reviewed the Savannah River Site's Liquid Waste Contract with Savannah River Remediation, LLC dated December 8, 2008;
- Reviewed the Savannah River Site's Liquid Waste System Plan approved on January 11, 2010;
- Reviewed the ISDP life extension evaluation; and,
- Held discussions with the Department and contractor officials responsible for the ISDP production operations, technology assessment and exchange, and integration of proven technologies into SWPF.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We also assessed performance measures in accordance with the *Government Performance and Results Act of 1993* and found that the Department has established performance measures specifically related to the Integrated Salt Disposition Project. We did not assess the reliability of computer-processed data since we did not rely on it to accomplish our audit objective.