QC-96-0005
DRAFT 8/6

Savannah River Operations Office

U.S. Department of Energy

Ten Year Plan

Dr. Mario P. Fiori, Manager

July 1996

Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

AUG 0 8 1996

Dear Stakeholder:

SUBJECT: Savannah River Operations Office Draft Ten Year Plan

I am pleased to provide you the Department of Energy-Savannah River Operations Office (DOE-SR) draft Ten Year Plan. This plan is a DOE initiative lead by Mr. Alvin L. Alm, DOE's Assistant Secretary for Environmental Management (EM), that focuses the EM program toward cleanup of most weapons complex sites by 2006. This vision can be expected to drive budget decisions and priorities throughout the DOE complex. The enclosed draft plan includes details on how Savannah River Site (SRS) proposes to support the accelerated cleanup objective.

We are very interested in receiving your input on the enclosed draft Ten Year Plan. Your comments will help us better understand stakeholders' issues and concerns as well as help us prepare a better plan. With the submittal of the final SRS Ten Year Plan scheduled for late September, I would like to invite you to submit any comments you may have on this draft plan by September 13, 1996.

While we are currently planning opportunities in hopes that you can discuss the Ten Year Plan with us first-hand, we presently do not have specifics on public meeting opportunities. We have tentatively set August 27, 1996, as a date for a public meeting in the local SRS area. Assistant Secretary Alm is scheduled to visit SRS on that date and would like to talk with stakeholders about the EM Ten Year Plan. More information regarding this meeting will be sent to you at a later date, as the meeting details are finalized.

I encourage you to submit questions or comments regarding the Ten Year Plan to Virginia Gardner at (803) 725-5752 or to Mary Flora at (800) 249-8155.

Sincerely,

Ernie Chaput
Deputy Manager

Enclosure
SR Ten Year Plan

DOE F 1325.8

United States Government | Department of Energy (DOE)

memorandum

Savannah River Operations Office (SR)

DATE: July 30, 1996

REPLY TO ATTN OF: AMSTBD (Borup (803)/725-1579)

SUBJECT: Savannah River Site Ten Year Strategic Plan

TO: A. L. Alm, Assistant Secretary for Environmental Management (EM-1), HQ

The Savannah River Operations Office input to the Environmental Management Ten Year Plan is a bold departure from past site planning assumptions and contributes significantly to the acceleration of DOE progress toward clean up of EM sites within 10 years. The most significant features are as follows.

- Accelerates the elimination of the most urgent risks, achieving this goal for all the highest risks by the year 2006. This is accomplished through:

  Completing in-field remediation activities on all high risk environmental restoration projects (acceleration of 5 years)

  Removing high level liquid wastes from all 24 high risk waste tanks (acceleration of 15 years for removal from high risk tanks and overall program acceleration of 10 years)

  Stabilizing and placing in long-term storage all materials at risk as determined in the Interim Nuclear Materials Environmental Impact Statement and the Defense Nuclear Facility Safety Board recommendation 94-1 (not accelerated)

- Provides new aggressive mortgage reduction activities to promptly and significantly reduce the surveillance and maintenance costs for the Savannah River Site (SRS) canyon facilities upon completion of their programmatic mission.

- Develops innovative proposals for privatization which offset near-term budgetary shortfalls and permit acceleration of longer-term risk and mortgage reduction objectives. One significant example is the immediate privatization of the new Transfer and Storage Facility required for the Spent Nuclear Fuel Program which will defer over $240 million of near-term budget requirements.

- Significant acceleration of highly visible clean-up objectives, demonstrating value returned to the American taxpayer. This will be done through:

  A success-oriented program to sort and reduce shipments of transuranic waste (TRU) to the Waste Isolation Pilot Plant, aggressive pursuit of cost-effective treatment mechanisms, and maximizing "road-ready" shipments.

The complete closure of 20 high level waste tanks and closures of significant portions of the SRS waste tank farms (acceleration of 15 years).

The completion of all Environmental Restoration Assessment activities and submittal of Records of Decision to Regulators

- Identification of significant opportunities for SRS assets and capabilities to provide cost-effective support to the early achievement of programmatic objectives at other EM sites. For example:

  Capabilities exist at SRS for the stabilization and disposition of Rocky Flats plutonium and similar materials from other EM and DOE sites.

  Capabilities exist at SRS for the storage of plutonium and other materials from other EM and DOE sites.

- Continued program efficiencies, including reduced cost of current activities, re-engineering of processes and expanded use of commercial or privatization opportunities.

We believe that this plan fully meets your objective for achieving the maximum cost-effective program accomplishment within the ten year planning window. It is "success oriented" and will challenge all to stretch in its achievement. Bold visions must be executed with bold actions, and we are excited to be part of this historic effort.

Our ability to execute this plan is critically dependent upon the following four factors:

- Shifting approximately $300 million in new facility costs from 1998-2001 to later years by privatization efforts.

- Success in the assumed constant dollar funding profile which provides the opportunity for approximately $600 million in program accelerations starting in the year 2000. (The attached chart graphically depicts (1) our program baseline costs without acceleration, (2) the shifting of costs from peak years through privatization efforts and (3) the timing and extent of program accelerations included in this 10 Year Plan.)

- The ability of policy-makers, regulators and other stakeholders to act in a timely manner on program proposals and support an increased program workload (regulators have stated their desire to meet these accelerated schedules).

- Successful resolution of outstanding near term program issues, most significantly work force restructuring in 1997 and the remaining $50 million shortfall for 1998.

We have reviewed the basic provisions of this plan with regulators (EPA-IV and SCDHEC) and stakeholders (Citizens Advisory Board and general public). In general, all support the basic tenant to accelerate completions. All agree that the first priorities for program acceleration should be high risk Environmental Restoration and High Level Waste vitrification activities. All agree that additional attention needs to be directed towards TRU wastes to establish a "high confidence" path forward. Several significant stakeholders have expressed concern about the planned and potential receipt at SRS of materials from other locations. We will be providing copies of this plan to our stakeholders, and we have committed to provide them with additional opportunities for input during the next several months.

We look forward to the opportunity to review this plan with you and your staff. There are many inherent flexibilities in the SRS programmatic capabilities and assumptions, and we stand ready to work with you on the all-important site integration activities as the overall department Ten Year Plan is prepared.

Mr. Chuck Borup (803) 725-1579 is the SR point of contact for this plan. Please feel free to contact either me or Mr. Borup regarding any aspect of this Plan. I also encourage our respective program managers to review, discuss and fully understand all aspects and issues (both HQ and field) in their areas of responsibility.

SR appreciates the opportunity you have provided to participate substantively in the development of your 10 Year Plan, and we look forward to your on-site review.

Cl Chapat

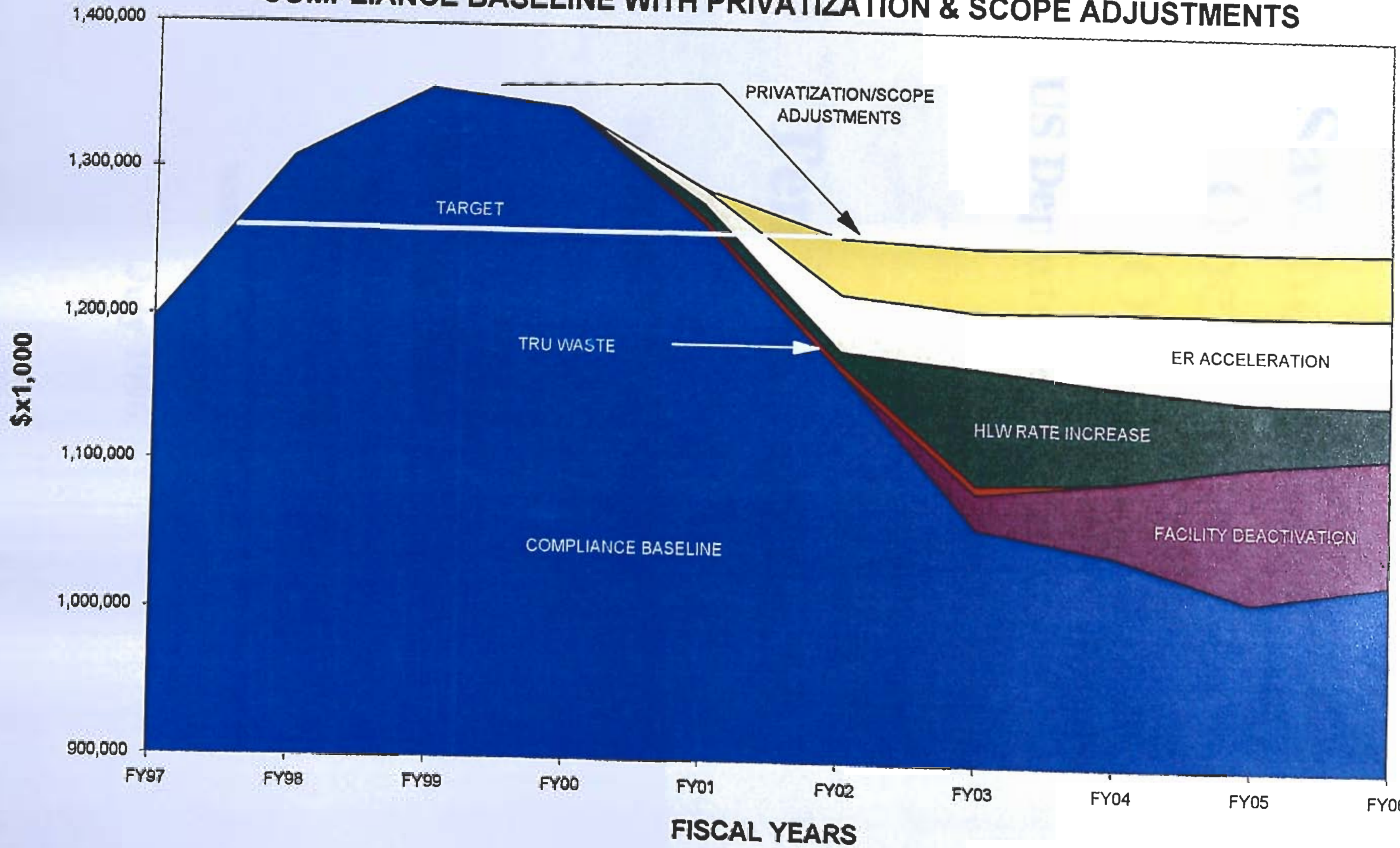
for

Mario P. Fiori
Manager

Attachment

QC-96-0005

COMPLIANCE BASELINE WITH PRIVATIZATION & SCOPE ADJUSTMENTS



7/23/96 Baseline Balance

Savannah River Operations Office

US Department of Energy

Ten Year Plan

Dr. Mario P. Fiori, Manager

Contacts
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July 1996

Savannah River Site Ten Year Plan

Table of Contents

Executive Summary

In the *Draft Savannah River Site (SRS) Environmental Management (EM) 10 Year Plan*, SRS proposes dramatic improvement over the pre-10 Year Plan program baselines, resulting in substantial risk, mortgage and life cycle cost reduction. Most notably, by 2006 SRS plans to:

- complete remediation of **all** high risk Environmental Restoration sites
- removal of high-level waste from **all** 24 high risk tanks
- and stabilization of **all** SRS "at risk" legacy nuclear materials.

The Plan meets or exceeds all current regulatory and Defense Nuclear Facilities Safety Board (DNFSB) commitments, embodies Assistant Secretary Alm's guiding principles and is consistent, within estimating tolerances, with the "flat funding" total program budget target for SRS. This will be accomplished through continued productivity improvement, especially in the support arena, and proposed implementation of innovative business and technology approaches, most notably new facility privatization. Furthermore, *The Plan* identifies opportunities for further DOE and EM program enhancement, both at SRS and across the complex, recognizing that SRS possesses a fully integrated and comprehensive materials stabilization and waste management capability. SRS believes this plan will provide a solid framework for EM planning, budgeting and work execution for the future.

The benefits of the approach recommended in *The Plan* can be evaluated in terms of ***risk reduction*** and ***mortgage/life cycle cost reduction*** relative to the EM program's four key missions:

1) treatment/disposal of legacy and newly generated waste **(Waste Treatment & Disposal)**

2) remediation of contaminated sites **(Environmental Restoration)**

3) stabilization of legacy nuclear materials considered "at risk" in their current state **(Materials Stabilization and Safe Storage)**

4) deactivation and eventual decommissioning of surplus facilities **(Facility Deactivation)**

The following table summarizes the program risk reduction and mortgage/life cycle cost reduction performance in the EM mission areas over the ten year planning period. As can be seen, by 2006 SRS will have accomplished dramatic progress toward meeting the Assistant Secretary's vision.

Savannah River Site's Ten Year Performance Objectives

Mission Area	Risk Reduction	Mortgage/Life Cycle Cost Reduction
Waste Management	• Removed waste from the 24 "high-risk" waste tanks. These "high risk" tanks include the 11 that have leak sites, 12 that are situated in the water table and currently store over 160 million curries of waste • The HLW program will have filled 2200 of the estimated 6000 glass canisters, which safely immobilizes over 37% of the currently stored tank waste • The SRS Citizens Advisory Board considers HLW storage to be the site's "greatest risk to the public, workers and the environment" • Accelerate treatment and/or disposal of legacy solid waste • Accelerate deployment of technology needed to prepare transuranic waste for disposal	• 10 year plan allows completion of all waste immobilization by 2018, a 10 year improvement over previous schedules • Expedites tank closures: by investing $64 Million before 2006, the future surveillance and maintenance cost is reduced by $27 Million per year beginning in FY2008 • Provides a $3.3 billion life cycle cost reduction and a 18% internal rate of return on investment • SRS Citizens Advisory Board has stated that the HLW program should have the "highest funding priority by DOE"
Environmental Restoration	• Remediation complete for all high risk sites • Remediation will be complete, on-going or no further action status received for 415 of approximately 451 sites, representing >90% of the significant environmental risk • Continued reduction in contaminated discharge from groundwater sites, improving Savannah River water quality	• Deployment of innovative technologies (e.g. viscous barrier, in-situ remediation, use of geosynthetics vacuum extraction of solvents) • Implementation of streamlined regulatory approaches and other cost efficiencies resulting in a 20-25% improvement, allowing more funding to be applied to remediation

Mission Area	Risk Reduction	Mortgage/Life Cycle Cost Reduction
Materials Stabilization & Safe Storage	• Complete stabilization of all "at risk" SRS materials (e.g. Pu solutions, Am/Cm) • Reduction of world-wide nuclear threat through return of foreign and domestic spent reactor fuel • Ability to make spent fuel "road ready" for shipment to repository • SRS stabilization capability available to accelerate other site materials disposition	• Development of state-of-the-art technology for spent fuel management • Implementation of proposed privatization approach for the spent fuel Transfer and Storage Facility • Use of SRS capabilities to lower DOE complex-wide funding needs
Facilities Deactivation	• Stabilization and/or removal of residual contaminates to essentially benign state	• Accelerated deactivation of material stabilization facilities; including P, C, R, K, L, M, D and H Area facilities; F Area facility deactivation in progress. Reduces surveillance and maintenance costs to about \$1M/yr. for most facilities • Consolidation of heavy water and unirradiated uranium resulting in \$10 million over the life of the 10 year plan. This will be available for other work beginning in 2002

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How the Draft SRS Ten Year Plan Was Developed

Planning Assumptions

SRS undertook development of the Ten Year Plan recognizing that fundamentally different approaches to managing business, technology and work sequencing would be required to meet the aggressive expectations of the Assistant Secretary's vision. The following assumptions underlie the plan's development:

- Target funding for the SRS EM program is $1,250 million per year beginning in fiscal year 1998, and assumes constant buying power (FY98 constant dollars).
- SRS privatization proposals are supported and implemented.
- Program flexibility exists for minor year-to-year scope sequencing to align resource needs with available funding.
- Successful implementation of planned productivity enhancements, many of which challenge current business practices.
- Support of technology needs from the nationally-managed Office of Science and Technology Program (SRS needs are identified in this plan; funding is reflected in HQ plan).
- Success in deployment of innovative technologies.
- Regulatory (Environmental Protection Agency and South Carolina Department of Health and Environmental Control) capacity to support acceleration, particularly Environmental Restoration

Planning Approach

The SRS Environmental Management Program is composed of five major programs:

- High-Level Waste
- Waste Management/Site Treatment Plan
- Environmental Restoration
- Nuclear Materials Stabilization
- Spent Nuclear Fuel

Various support and program direction functions provide assistance to these "line" programs including, Technology Development, Infrastructure and Program Direction.

Chart One shows the pre-10 Year Plan program "baseline" new budget authority needs for these major programs from fiscal year 1997 through fiscal year 2006. These baselines, which represent the SRS "compliance case", are the starting point for development of the 10 Year Plan. It should be noted that the baselines include aggressive productivity enhancement assumptions and represent SRS's "bottom line" need to meet compliance and other program requirements.

The first issue to be addressed was how to manage the projected shortfall in the early years between the forecasted funding requirement and available target funding. This is graphically illustrated in *Chart Two.*

As can be seen, a short fall exists for 1998 and 1999 totaling $295 million balanced by a surplus in the later years. To resolve this issue, SRS proposes to "privatize" the Spent Nuclear Fuel **Transfer and Storage Facility**. The total project cost for this facility is estimated at over $240 million. Privatizing means that DOE will enter into a contract with private industry to provide this capability. DOE will pay for services such as receiving and making spent fuel "road ready" as they are performed. This innovative approach offers the following advantages: 1) private industry provides the up-front capital needed to construct the facilities, and 2) the cost of providing the service is generally lower. The privatization concept has been piloted successfully at SRS for electrical power and steam production services. By expanding the privatization approach to other functions, significant progress is made toward solving the funding shortfall in FY98 and FY 99. The balance of the shortfall will be addressed through resequencing of work during the more detailed annual planning and budgeting processes. Addressing the shortfall issue in this manner effectively shifts funding requirements into the later years consistent with the 10 Year Budget target without deferral of critical work.

The next step in the planning process was to use available resources in the later years to accelerate accomplishment of program objectives consistent with the 10 year vision. SRS used the Assistant Secretary's principles in selecting what work to accelerate, focusing on maximizing risk reduction and mortgage/life cycle cost reduction. Key accelerations include:

- Complete remediation of 415 of 451 Environmental Restoration sites, including all high risk sites, by 2006; complete assessment activities for site.
- Ramp up of the high-level waste processing rate from 200 to 300 canisters per year allowing removal of waste from all 24 high risk tanks by 2006 and completion of the vitrification program by 2018, 10 years earlier than planned in the established baseline and saving over $3.3 billion in life cycle cost.
- Accelerating closure of HLW tanks resulting in a total of 20 tanks closed by 2006.
- Acceleration of deployment of technology to prepare transuranic waste for disposal.
- Acceleration of deactivation of materials stabilization facilities to significantly lower annual surveillance and maintenance costs (deactivation may be delayed if a decision is made to use SRS stabilization capabilities for additional materials to lower total DOE risk and cost).

CHART 1
COMPLIANCE BASELINE WITHOUT PRIVATIZATION OR SCOPE ADJUSTMENTS

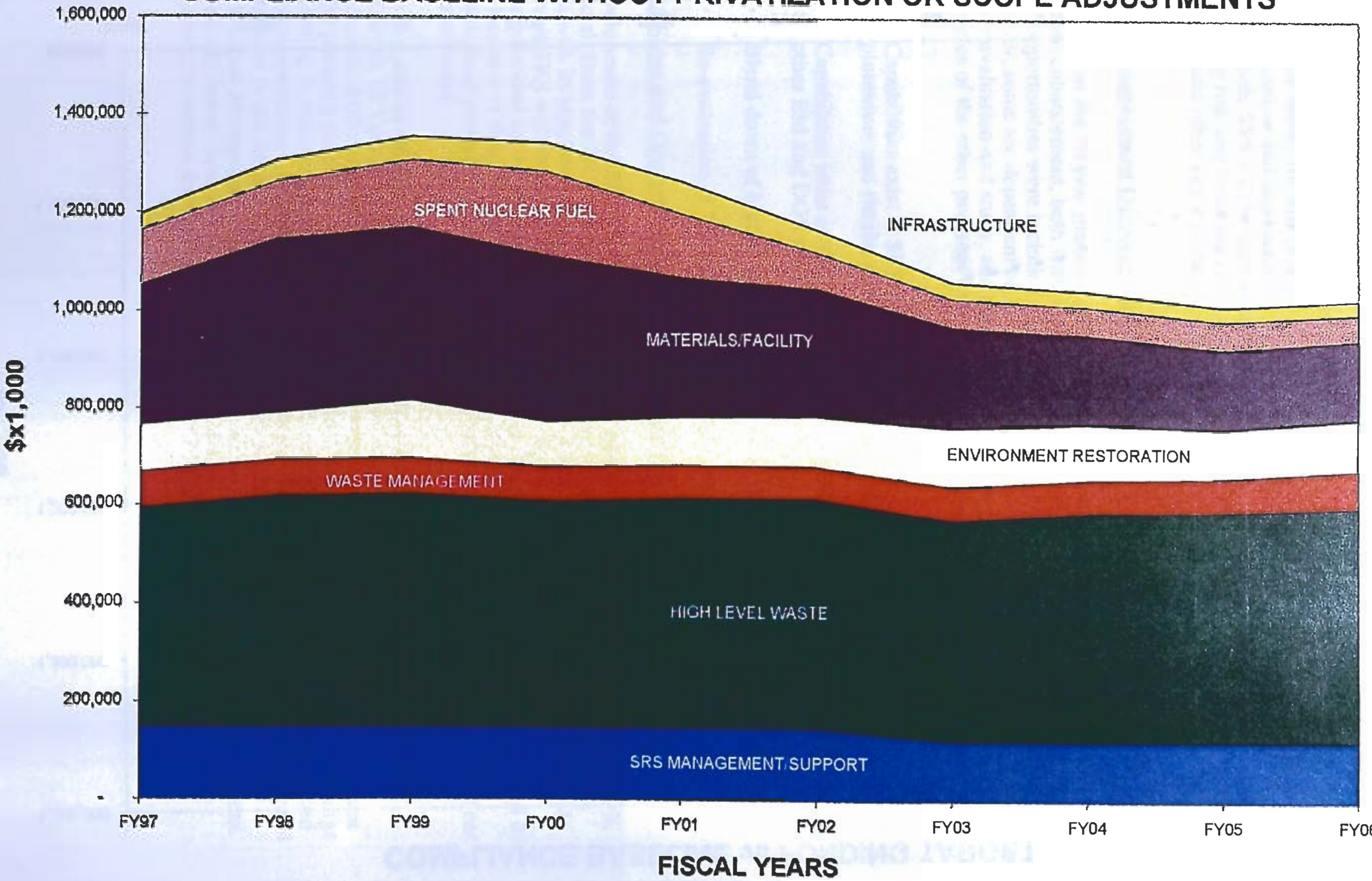
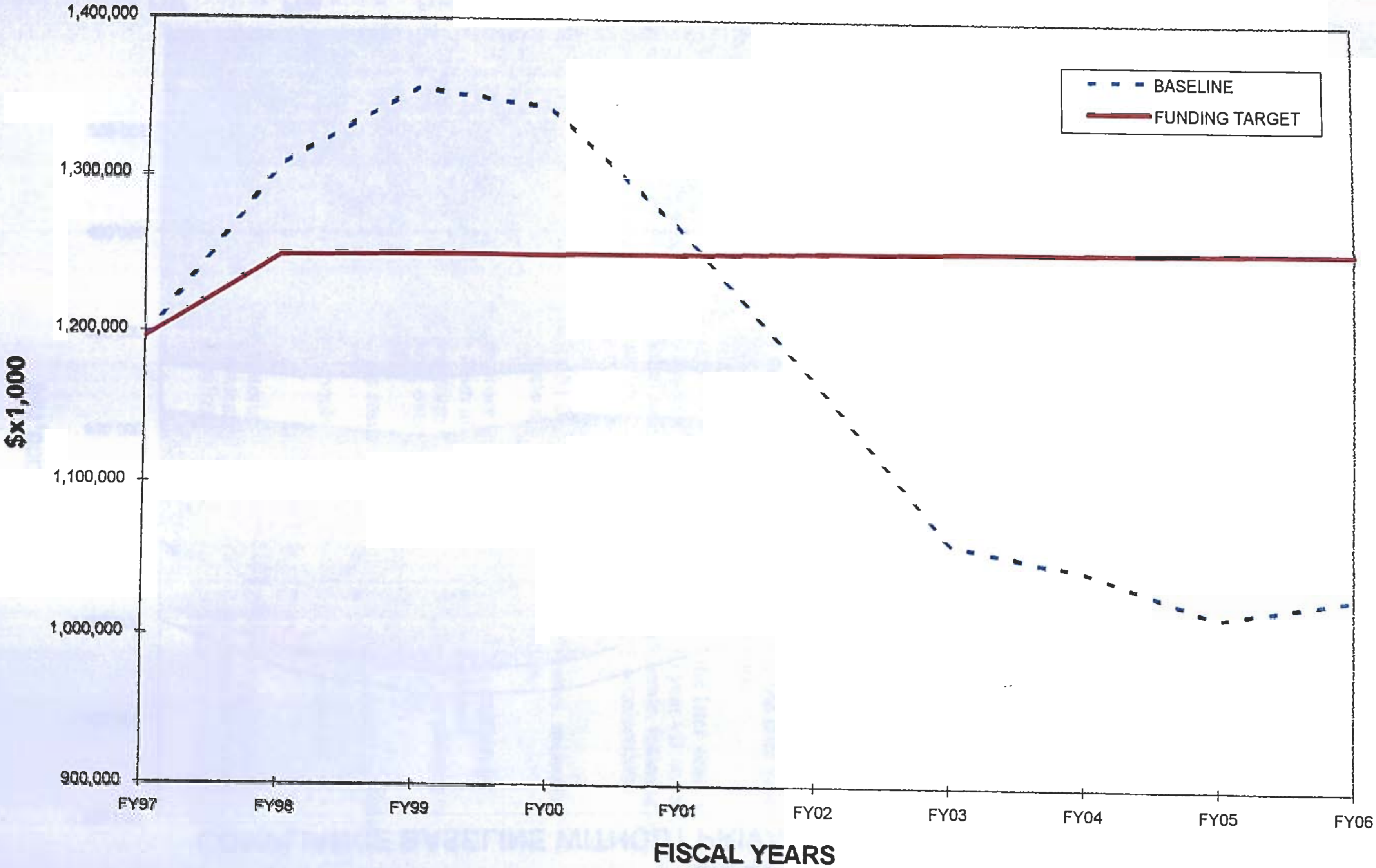


CHART 2
COMPLIANCE BASELINE vs FUNDING TARGETS



7/29/96 Baseline Balance

Chart Three shows the effect of the privatization, leveling and program accelerations on the SRS baseline and represents SRS's proposed 10 Year Plan requirements. Through this approach, SRS will be able to make significant improvement over the previous plan in reducing risk and lowering cost to the taxpayer. More details on each of the five major programs and other key elements are provided in a later section of the 10 Year Plan Summary.

Other Enhancement Opportunities

Through-out the 10 year planning process, SRS identified numerous opportunities for program enhancement, both within SRS and across the DOE complex. Where possible, these opportunities were included in the development of the SRS plan described above. However, some are dependent on national decisions. Others, while good ideas, require further evaluation and study, and therefore, are inappropriate to plan for at this time. Examples of the other program enhancement opportunities identified in the plan are listed below.

- Capabilities exist at SRS for the stabilization and disposition of Rocky Flats plutonium and similar materials from other EM and DOE sites.
- Capabilities exist at SRS for the storage of plutonium and other materials from other EM and DOE sites.
- Blend down of highly enriched uranium for commercial sale.
- Re-evaluation of TRU shipping and WIPP acceptance criteria.

Next Steps and Opportunities for Stakeholder Involvement

Development of the SRS Draft 10 Year Plan began in late June 1996. During July 1996, officials from the SRS outlined the vision, principles and objectives of the EM 10 Year Plan with its regulators and other stakeholders. These stakeholders were encouraged to provide SRS with input on the 10 year Plan strategies and planning assumptions. The input provided by the stakeholders was carefully evaluated and considered, as reflected in the issuance of this SRS Draft 10 Year Plan. Stakeholders suggested that efforts to include their perspectives in DOE's planning process continue until the final SRS 10 Year Plan is issued.

The first step in continuing to involve regulators and other stakeholders is to issue the SRS Draft 10 Year Plan to them during the first week of August and solicit their comments. Following this effort, SRS will provide opportunities for public involvement in the planning process in a variety of ways. SRS intends to have several public meetings beginning in mid-August. These meetings will be held in several communities impacted by SRS operations. Additionally, the SRS Citizens Advisory Board (CAB) has expressed an interest in the development of the 10 Year Plan. As such, SRS will meet with the CAB's Risk Management and Future Use Subcommittee in an open forum to discuss and solicit additional input in late August. Input provided to SRS will be used by site and national planners to develop the comprehensive EM 10 Year Plan.

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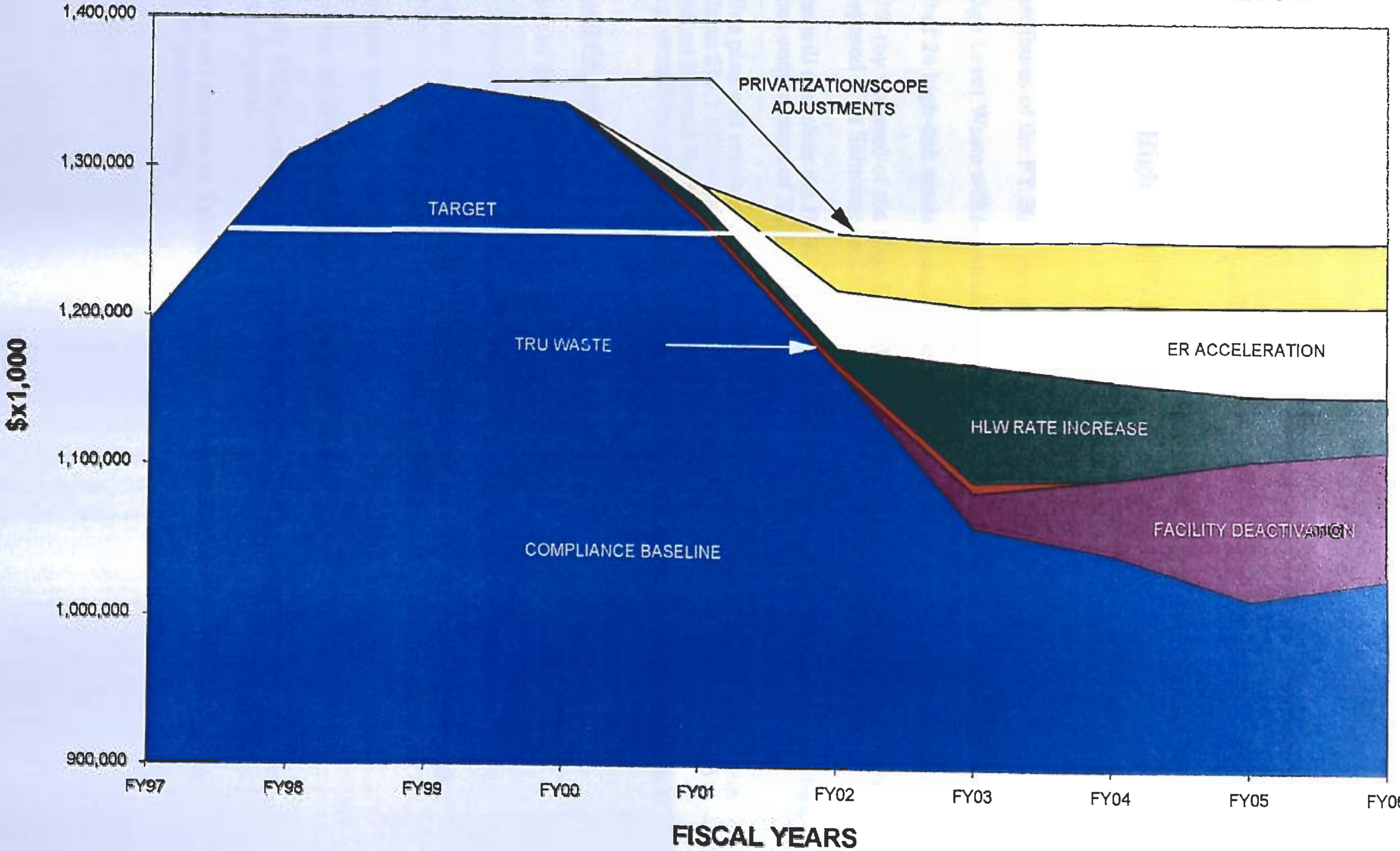
CHART 3
COMPLIANCE BASELINE WITH PRIVATIZATION & SCOPE ADJUSTMENTS



Major Program Summaries

Provided below are 10 Year Plan summaries for key SRS Environmental Management programs. These have been developed to provide the reader with a concise description of each program's objectives, planned 2006 state and other pertinent information. Additional detail is available in applicable Plan sections.

High Level Waste Program Summary

Summary

The key attributes of the FY 2006 vision for the High Level Waste Program are that:

- High Level Waste will be removed from the 24 high-risk waste storage tanks.
- 20 of 24 high-risk waste storage tanks will be closed.
- 37% (by volume) of the High Level Waste will be pretreated and then vitrified or disposed of as Saltstone grout.

This vision will complete the HLW program at SRS in 2018, which is 10 years earlier than the previous commitment of 2028.

The baseline plan will result in a reduction in the life cycle cost for the High Level Waste Program from $14.1 billion to $10.8 billion, a savings of $3.3 billion in constant FY98 dollars with an Internal Rate of Return of 18%. In addition to the favorable mortgage reduction potential the plan also significantly reduces the risk of environmental releases at the site.

Mission and Objectives

The mission of the SRS High Level Waste Program is to:

- Safely store the Site's existing inventory of High Level Waste (HLW).
- Support other critical Site production and cleanup missions by ensuring that tank space is available to receive newly generated waste.
- Volume reduce and thereby stabilize HLW by evaporation.
- Pretreat HLW for subsequent treatment and disposal.
- Vitrify HLW, and then store and ship the canisters to the Federal Repository for final disposal.
- Treat and dispose as Saltstone grout (the low level waste fraction resulting from HLW pretreatment).

- Close HLW tanks per regulatory approved approach.

- Ensure that risks to the environment and human health and safety from HLW operations are eliminated or reduced to acceptable levels.

Completion of this mission will result in the permanent disposal of the 34 million gallons of HLW currently stored in 51 interim underground waste storage tanks. The high level fraction of the removed waste will be processed into an estimated 6,000 borosilicate glass canisters which will be temporarily stored onsite until the year 2015, the forecasted date that the Federal Repository will be available. The low level fraction will be processed into Saltstone grout and disposed of onsite. After waste is removed from each waste storage tank, the tank will be closed to reduce surveillance and maintenance costs. At the completion of the HLW program, similar closure activities will be completed for the HLW processing facilities.

Assumptions

This plan is based on the following assumptions:

- The Site Treatment Plan regulatory commitment to produce an average of 200 canisters of waste per year will be met or exceeded.

- The Federal Facility Agreement commitments on waste removal from the 24 high-risk waste tanks by 2028 will be met or exceeded.

- The SRS Separations facilities will complete the DNFSB 94-1 stabilization mission by FY 2003.

- A Federal Repository will be available to accept approximately 500 canisters per year beginning in FY 2015. The SRS cost for shipment of each canister is assumed to be $100,000 in FY96 dollars.

- All HLW facilities will be de-inventoried, stabilized and left in a low maintenance mode.

- The institutional care and further environmental remediation actions required for these facilities after the end of the HLW program mission were not included in the cost baseline.

Final End State

The final end state for the HLW program is that all HLW will be removed from the 51 waste storage tanks and the low level fraction disposed of onsite as Saltstone grout. The waste storage tanks will be water washed and filled with a stabilizing material, possibly grout. The high level fraction will be vitrified into borosilicate glass canisters which will be transferred to a Federal Repository. All HLW remaining facilities will be de-inventoried, stabilized and left in a low maintenance mode.

FY 2006 Vision

The 2006 baseline plan has incorporated three HLW program options that provided significant risk reduction and cost savings for the site:

1. All High-Risk Tanks Emptied

   The HLW Program will have removed waste from the 24 high-risk waste tanks by 2006. These high-risk tanks include the 11 tanks that currently have inactive leak sites and 12 tanks that are situated in the water table. These tanks store over 160 million curies of High Level Waste. The removal of HLW from these substandard tanks will significantly reduce the risk of environmental releases at the site.

2. 20 of 24 High-Risk Tanks Closed

   Additional funding of $64 million in total over the 10 year plan period will allow 20 of the 24 high-risk waste tanks to be closed and filled with a stabilizing material, possibly grout. This will allow the closure of large sections of the H and F Tank Farm areas in FY 2007, reducing the continuing surveillance and maintenance costs and resulting in savings of approximately $27 million per year in constant FY98 dollars beginning in FY 2008. The other four high-risk tanks will remain in use for storage of very dilute wash water which presents no significant environmental risk.

3. Increased Canister Production

   The fixed cost of maintaining the various HLW facilities in a state of full readiness is approximately $400 million per year. The total cost (variable plus fixed) of producing 200 canisters per year is approximately $450 million per year. For an additional $26 million per year, the canister production rate can be increased to 300 canisters per year which would accelerate the completion of the HLW program by eight years from FY 2026 to FY 2018. By FY 2006, the HLW Program will have filled 2,200 of the estimated 6,000 glass canisters (37% of the currently stored tank waste).

The combination of these three options have been incorporated into the baseline 10 year plan and will reduce the life cycle costs for the High Level Waste Program from $14.1 billion to $10.8 billion, a savings of $3.3 Billion in constant FY98 dollars with an Internal Rate of Return of 18%.

In addition to the favorable mortgage reduction potential that these options provide, they also significantly reduce the risk of environmental releases at the site. The SRS Citizens Advisory Board stated in their Recommendation #12 that:

> "...the greatest risk to the public, workers and the environment are the chemical reprocessing wastes stored in the high-level waste tank farms. Outside of operational safety, the discharge of this obligation should have the highest funding priority by DOE."

The acceleration of the removal of waste from high-risk tanks, tank closure and canister production will reduce the above risks by immobilizing the waste into glass and grout thereby essentially eliminating the risk of future environmental damage.

Program Outputs

The High Level Waste Program outputs are:

- Direct support for other SRS production and stabilization programs
- Production of an estimated 6,000 borosilicate glass canisters and shipment to a Federal Repository for final disposal
- Disposal of the low level fraction onsite as Saltstone grout
- Closed storage tanks and processing facilities that will only require institutional-type surveillance and maintenance.

Options and Opportunities

Many of the HLW improvements have been incorporated into the baseline plan, however due to sitewide funding shortfalls in FY97 - FY 2002:

- Tank Closures are limited in the FY97 - 2003 time frame and
- Canister Production levels are not increased above 200 canisters until 2004.

Increased funding levels in FY97 - FY 2002 would allow improvements and would result in additional life cycle cost savings and risk reductions.

Solid Waste Program Summary

Summary

The mission of the Solid Waste Program is to safely store, treat, and dispose of SRS Low Level, Transuranic, Hazardous, Mixed, and Sanitary wastes. This is to be done in accordance with applicable regulations and the Site Treatment Plan.

It is the objective of Solid Waste to aggressively reduce the volumes of legacy waste in storage while managing waste from continuing missions to significantly reduce the risk to personnel and the environment. By 2006, Low Level Waste, Hazardous Waste and Sanitary Waste will be in steady-state operations (with the possible exception of long-lived Low Level Waste). Additional LLW and Hazardous Waste disposal capacity will be added in the outyears as needed to support on-going site missions. Management of legacy TRU waste will continue beyond 2006. Shipment of TRU to the Waste Isolation Pilot Plant will be underway. An effective treatment process for high activity Pu-238 TRU waste will be defined with implementation proceeding. Legacy Mixed waste will be significantly reduced with steady-state operations by 2011. Need for on-site disposal capability for Mixed waste will be resolved.

A key asset in the Solid Waste program is the capability of the Consolidated Incineration Facility (CIF) to treat Mixed, Hazardous, and Low Level wastes. Currently, excess capacity is available to treat off-site waste, subject to regulatory review and approval.

Mission and Objective

The mission of the Solid Waste Program is to safely store, treat and dispose of SRS waste, as well as some relatively small waste volumes from other DOE and Federal facilities. Waste types include Low Level, Transuranic, Hazardous, Mixed, and Sanitary wastes. To a significant extent, the program is regulated by the South Carolina Department of Health and Environmental Control. Most significantly, the Site Treatment Plan (STP) Consent Order defines regulatory requirements and compliance schedules for Mixed waste storage and treatment, including mixed TRU waste. Over the last several years, the Solid Waste program has been in transition from waste receipt, storage and disposal (Low Level waste only) operation to a full service operation to treat and/or disposition all waste suitable for disposal. This requires addressing significant quantities of "legacy" wastes which have been in storage. Development and implementation of treatment processes to manage the legacy wastes is key thrust of the current program.

The key programmatic objectives of the program are to:

- protect the worker, public and environment
- meet all regulatory requirements and terms of the STP
- provide capacity to manage waste from on-going site activities
- reduce the risk of "legacy" waste through timely and effective disposition
- foster waste minimization and pollution prevention initiatives

Assumptions

This plan is based on the following assumptions:

1. Waste Management of newly non-EM generated waste beyond FY 2000 funded by the Generator.

2. The Site Treatment Plan for mixed wastes commitments are met.

3. Minimal waste will be generated by D&D activities over the 10 year period.

4. Stabilized CIF ash / blowdown will meet criteria for shallow land disposal.

5. The Waste Isolation Pilot Plant (WIPP) will be operational by 1999.

Final End-State

The final end-state for the Solid Waste Program is that all legacy waste is dispositioned and the facilities and methods, or contracts, are available to safely treat, and dispose of all newly generated wastes.

2006 Vision

Low Level Waste

Low Level Waste will be in steady-state operations, except for possibly long-lived LLW; there is: 1) no legacy stored waste; 2) capability and capacity in place to treat and/or dispose of newly generated wastes.

This will be accomplished by: 1) performing or contracting appropriate treatment methods and 2) either developing or contracting appropriate disposal.

Additional funding may be required post 2006 to provide for adequate disposal capability in the out-years.

Transuranic Waste

Transuranic Waste will not be in fully steady-state operations by 2006. However, 1) there will be capability and capacity to treat and/or dispose of newly generated PU 239 wastes by 2005, 2) retrieval of TRU drums currently stored in earthen mounds will be complete, and 3) treatment/disposition methods for high activity Pu 238 TRU will be selected/implemented; disposition of TRU legacy waste will be underway.

This will be accomplished by: 1) commencing shipments of certified TRU waste to the WIPP in 1999; 2) segregating Low Level and Low Level Mixed Waste currently stored as TRU by 2001 (approximately 5000 cubic meters); 3) identifying and developing or contracting appropriate treatment for legacy waste and for TRU waste not meeting the WIPP WAC, prior to shipping to the WIPP, and 4) aggressively pursuing near-term alternatives and options for the characterization and treatment of TRU wastes.

Additional funding will be required post 2006 to provide for implementation of appropriate TRU treatments in the out-years.

Mixed Waste

Mixed Waste (non-TRU) will not be in fully steady-state operation by 2006. However, 1) incinerable mixed waste will be treated by the Consolidated Incineration Facility, 2) the program will be in RCRA Land Disposal Restriction (LDR) compliance and 3) all Site Treatment Plan commitments will be met; treatment methods for all Mixed Wastes will not be not implemented until 2011.

This will be accomplished by: 1) identifying and either developing or contracting appropriate treatment methods to meet the commitments of the SRS Site Treatment Plan (STP) and 2) either developing or contracting appropriate disposal.

Additional funding may be required post 2006 to provide for implementation of appropriate Mixed Waste treatments and for required storage and/or disposal facilities in the out-years.

Hazardous Waste

Hazardous Waste will be in steady-state operation by 2006, in that 1) the program will be in RCRA Land Disposal Restriction (LDR) compliance, 2) there is no legacy stored waste; and 3) there is capability and capacity to treat hazardous waste; however, there is not an on-site disposal capability.

This will be accomplished by identifying and either developing or contracting appropriate sampling, analysis, treatment and disposal.

Additional funding may be required post 2006 to provide for required storage and/or disposal facilities in the out-years.

Sanitary Waste

Sanitary waste will be in steady-state operation with subcontracted recycling and disposal.

Program Outputs

The program outputs for Solid Waste are that all wastes are safely stored / treated / and disposed and that the volume of waste in storage has been significantly reduced.

Options and Opportunities

Opportunities for program enhancements which are being evaluated for implementation are listed below. Potential Savings will be estimated as the opportunities are further evaluated.

1. *Relaxation of the WIPP Waste Acceptance Criteria and Shipping Requirements.* This would allow larger containers of TRU waste to be accepted by WIPP and TRU waste with higher heat loads to be shipped to WIPP.

2. *Downgrading of Pu238 from TRU to LLW or Legislative Relaxation in Shipping Requirements.* This would allow the acceleration of TRU disposition and significant risk reduction by allowing more of the existing TRU to be dispositioned.

3. *Use of Commercial Facility for TRU Waste Processing.* This would allow modification and use of existing facilities rather than designing and constructing a new facility.

4. *Use of Commercial Facility for Processing Contaminated Equipment.* This would allow modification and use of existing facilities rather than designing and constructing a new facility.

5. *Relaxation of Burial Ground Land Use Classification.* This would expand the use of shallow land burial and avoid capital costs associated with construction of additional vaults

6. *Combine Mixed Waste Treatment and Disposal with other Site(s).* This would require receipt of off-site shipments for processing, but allows operating / disposal efficiencies to be realized depending on implementation strategy.

7. *Allow Treated Waste to Exit RCRA for Disposal.* This requires influencing regulations to allow immobilized HW/MW and vitrified waste forms to exit RCRA for disposal.

8. *Sort Tritium for Decay.* This would require development of storage facilities that would allow sufficient time for the tritium in tritiated waste to decay. This avoids capital expenditures for treatment and disposal.

Issues Affecting Performance

1. Treatment technologies for long-lived waste need to mature.

2. Shipment / Disposal criteria for TRU appear to be over conservative.

3. Treatment technologies / methodologies for some Mixed Waste streams need to mature.

4. Assessment technologies for characterization of waste need to mature to ensure appropriate treatment and disposal is specified.

5. Changing missions and technologies at operating facilities can significantly influence performance in affected waste storage / treatment / disposal actions, especially related to the volume of waste generated.

Environmental Restoration Program Summary

Summary

The environmental and public risk posed by inactive waste sites and groundwater contamination will have been significantly reduced with a five year acceleration of remedial actions on the 57 highest risk sites. Of the 451 known sites in the program, 415 sites will be either remediated or receive no further action status. All sites currently in the program will have been fully characterized and recommendations to both federal and state regulators will have been submitted.

Through a focus on planning and implementing safe and cost-effective in-field environmental restoration at an accelerated rate, we will achieve the cleanup of additional waste units, increase the completion of records of decisions, and increase calculated risk reductions. Therefore, the ER mission of risk reduction will be completed many years sooner.

Mission and Objectives

The ER mission is to reduce risk to human health and the environment by remediating inactive waste units and groundwater which are contaminated with radioactive, hazardous, and mixed waste.

The objectives of the ER Program at SRS are to (1) reduce public, SRS worker and environment exposure to hazardous substances, (2) reduce levels of contamination, (3) conduct remediation in the most cost-effective and responsible manner possible, (4) return the site to an appropriate configuration for future use, (5) comply with federal and state statutes, laws, and regulations, (6) develop a strong partnership between DOE and its stakeholders, and (7) to promote the development and transfer of remediation treatment technologies.

These objectives are consistent with the Citizen's Advisory Board recommendations.

Assumptions

There are approximately 451 sites in the program, of which 111 will have been completed by the end of FY 96. The ten year plan assumes 75% of the sites in the Site Evaluation Program (initial screening) will proceed to no-further-action status. The plan also assumes 80% of the sites needing further action after the screening from the Site Evaluation Program will proceed through a formal assessment process. The assessment process for these sites require 3 years to secure a record of decision. By accelerating work previously planned for post-FY 2006, worker, public, and environmental risks will be further reduced by quickly addressing the highest risk sites.

Acceleration requires:

- Risk based ER funding and remedial actions directed toward protecting human health and the environment
- Completion of currently scheduled regulatory milestones

- A collaborative relationship with EPA and SCDHEC (regulators respond and support)

- continued public participation in the environmental decision making process

Final End State

The final end-state for the ER program is that all environmental restoration high risk sites will be remediated. (High risk sites are those which could have a major impact on workers or the environment within one to ten years.) All medium and low risk sites will be assessed and a Record of Decision issued for remedial action, institutional control, or no further action. Most medium and low risk sites will be remediated. (Medium and low risk sites are defined as those which could have moderate impacts to workers or the environment within one to ten years or beyond.)

2006 Vision

Remedial construction activities will have been completed at all high risk sites. Records of Decision for sites in the program will have been requested from the federal and state regulators. The program acceleration will have remediated 12 high risk units, completed assessments for an estimated remaining 49 low/medium risk units, and completed remediation of 13 of an estimated remaining 49 low/medium risk units. Groundwater remediation operations will continue at high risk plume sites beyond the year 2006. Remediation will continue at medium and low risk sites in progress until closure. Maintenance and monitoring will continue at closed sites.

No decommissioning activities are included in the ten year plan for ER.

Program Outputs

Through program acceleration in the ten year plan, out of the approximately 450 sites to address, the following are ER program outputs:

(1) All high risk sites assessed and remediated (12 through acceleration)

(2) All medium and low risk sites assessed and a record of decision issued for remedial action, institutional control, or no further action (49 through acceleration)

(3) 247 low/medium risk sites remediation completed (13 through acceleration)

Options and Opportunities

The ten year plan provides an opportunity to remediate high risk waste sites and groundwater at accelerated rates since funding is steady over a longer period of time. Cost savings can also be achieved through further regulatory acceptance of streamlining initiatives. Future land use decisions could also result in opportunities to reduce cost.

Issues Affecting Program Performance

The overall SRS ER Program is designed to complete all high risk remediation in concert with regulatory agreement and stakeholder input. The key issues are:

- To continue development and implementation of lessons learned from the commercial sector that are appropriate for environmental restoration work

- To work with regulators in streamlining decision document requirements

Resolutions to improve program performance therefore are to minimize duplication between RCRA and CERCLA requirements, collaborate on the integration of regulator and DOE teams to expedite field work, apply commercial standards to ER activities, determine land use designations (to help define cleanup standards), and to adopt a ten year plan that will bring more certainty to the funding issue.

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Nuclear Material Stabilization Program Summary

Summary

This program provides for the stabilization of existing on-site nuclear materials into stable forms for safe long term storage pending final disposition via future Material Disposition decisions.

The baseline program will meet the Defense Nuclear Facilities Safety Board (DNFSB) 94-1 Implementation Program milestones to stabilize Savannah River Site's (SRS) at risk material. Ongoing Department of Energy (DOE) stabilization and disposition studies are considering beneficial use of affected SRS facilities to meet DNFSB 94-1 Implementation Plan milestones for at-risk materials currently at other sites and as viable alternatives in various Material Disposition (MD) studies for surplus fissile materials. If these SRS facilities are selected for additional programs, the stabilization mission may increase in scope and duration, and eventually directly link and transition into disposition activities (potential applications are discussed in the Work for Others/New Mission Program Summary). If not selected, facility deactivation projects will be initiated to reduce surveillance and maintenance cost to a minimum pending future Decommissioning and Decontamination (D&D).

Mission and Objectives

Nuclear Materials Stabilization operations will execute decisions recorded in the Interim Management of Nuclear Materials (IMNM) EIS and meet commitments contained in the Secretary of Energy's DNFSB 94-1 Implementation Plan, as well as the Plutonium (Pu) and Highly Enriched Uranium (HEU) Vulnerability Assessments.

The mission of the SRS Nuclear Material Stabilization (NMS) Program is: (1) to provide safe long term storage for spent nuclear fuels (Mk16, Mk22), irradiated target assemblies (Mk31), in-process solutions (Pu239, Pu242, Np237, HEU, Am/Cm), and residues (scrap, SS&C, turnings and sweepings) now stored in various SRS facilities; (2) to conduct stabilization operations to transform these at-risk materials into forms suitable for long term storage in accordance with DOE product and storage standards pending disposition decisions; and (3) to deinventory and stabilize surplus facilities not needed to execute future material disposition decisions. These materials are currently in working inventories in F-Canyon/FB-Line, H-Canyon/HB-Line, 235-F, Receiving Basin for Offsite Fuels (RBOF), K-Reactor Basin and L-Reactor Basin.

The guiding principles of the NMS Program are to manage and eliminate the most serious risks posed by the nuclear materials currently stored at SRS; protect worker health and safety during the execution of these stabilization projects; minimize generation of waste; create a collaborative relationship between DOE and its regulator and stakeholders; focus technology development on cost and risk reduction; and strengthen management and financial control.

Assumptions

This plan is based on the following assumptions, each having significant influence on major elements of the plan, including schedule and cost:

1. The baseline plan is limited to stabilization of at-risk nuclear materials in inventory at SRS as defined in the DNFSB 94-1 Implementation Plan.

2. The cost and schedule impact for stabilization of Environmental Management (EM) materials now at other sites, or for the disposition of Material Disposition (MD) materials, will be incremental to the defined baseline program if processing at SRS is directed for these materials.

3. The seismic evaluation of the F and H Canyon facilities will be successfully resolved in FY96.

4. The existing and future HEU solutions resulting from stabilization of SNF will be isotopically diluted to 5% Low Enriched Uranium (LEU) and stored as liquid until disposition by MD.

5. Np solution will be transferred from H-Canyon to F-Canyon and vitrified into a Loffler glass composition similar to that used for Am/Cm. If a different glass formulation is desired to meet DOE Office of Nuclear Energy (NE) needs, additional funding for process and/or project modifications will be necessary.

6. The Actinide Packaging and Storage Facility (APSF) project is completed and all of the stabilized product forms will be consolidated into this facility pending disposition.

7. The Pu solution in H-Canyon will be transferred to F-Canyon and stabilized to a metal form for storage.

8. The IMNM Phase III Record of Decision (ROD) will be issued to confirm Np storage in a vitrified product form and this form will meet the APSF acceptance criteria.

Final End-State

The final end-state for the NMS Program is that all of the on-site at-risk materials will be stabilized into a form suitable for long term storage. Solid materials will be stored either in the APSF or in other facilities suitable for long term storage. Stabilized HEU will be stored as a liquid on site pending MD disposition. If SRS is not selected for alternative missions beyond the baseline program, the facilities will be deinventoried and facility deactivation projects will be initiated to reduce surveillance and maintenance cost to a minimum pending future D&D. If these SRS facilities are used, facility operations may be significantly extended. In this case, the deinventory and initiation of facility deactivation projects for the impacted facilities will occur after the alternative mission programs are completed.

2006 Vision

In the baseline case, the Nuclear Material Stabilization Program will be completed. All on-site nuclear materials identified at risk in the IMNM Environmental Impact Statement (EIS) will be stabilized and stored per DOE Std 3013-94 or other acceptable DOE storage criteria or shipped offsite pending programmatic need. LEU solutions will be dispositioned by MD via conversion to LEU oxide for commercial use. The APSF will be operating as the on-site storage facility for the stabilized nuclear materials and materials are consolidated into APSF for long term storage. The facilities will be deinventoried and facility stabilization projects will have been initiated. The baseline plan funding provides for facility deactivation of H-Area facilities into a low cost surveillance and maintenance mode, while deactivation of F-Area facilities is underway with completion ~2008.

Program Outputs

The baseline Nuclear Materials Stabilization Program outputs are:

1. Pu-239 stored onsite per DOE Standard 3013-94 or other acceptable DOE storage criteria
2. Pu-242 and Pu-238 shipped to Los Alamos National Laboratory (LANL).
3. Am/Cm stored as glass for future programmatic requirements.
4. Np stored as glass for future programmatic requirements.
5. 5% LEU sold as liquid for commercial use.
6. Facilities deinventoried and deactivation projects initiated. H-Area facilities in low cost Surveillance and Maintenance (S&M). F-Area facility deactivation approximately 60% complete with completion ~2008.

Options and Opportunities

There are four subprojects which offer potential for significant cost-savings in the ten-year period covered by this plan.

1. **Beneficial use of SRS facilities to stabilize at-risk materials from offsite sources**

   This project will use SRS facilities for stabilization of at-risk materials currently stored off-site. EM Trade Studies have been conducted which address Pu residues (alloy, salt and sand, slug and crucible) currently stored at Hanford and Rocky Flats. The SRS facilities are scheduled to stabilize similar SRS materials. The SRS facilities are operating and have fully trained and qualified staff and capacity to stabilize these additional materials. The trade studies concluded that use of SRS facilities to stabilize these materials is a lower cost and higher confidence approach to managing these materials than startup of similar treatment capability at other sites or performing extensive treatment and waste qualification activities necessary for Waste Isolation Pilot Plant (WIPP) disposal.

   This $187M program ($75M at SRS), to be completed during the period FY98 through FY02, will result in estimated life cycle savings of $474M.

2. **Beneficial re-use of SRS facilities for MD Disposition of HEU by blenddown**

   The HEU blenddown project would dissolve unirradiated fuel tubes and ingots stored at SRS and Y12, dilute it to 5% LEU with existing Depleted Uranium (DU) solutions and make it available for beneficial re-use as commercial nuclear power plant fuel. This disposition would effectively address non-proliferation issues associated with surplus fissile material in a cost effective manner. The use of the large capacity chemical processing capability at SRS is very cost effective to complete the program.

   This $266M program to be completed during the period from FY97 through FY05, will result in estimated life cycle savings of $70M.

3. **Beneficial re-use of SRS facilities for MD Disposition of Plutonium**

The Pu Disposition project would involve beneficial re-use of SRS facilities either for fabrication of mixed-oxide fuel for use in commercial nuclear power reactors or vitrification of Pu (including Pu residues) into glass logs for long term storage. The functional large scale Pu handling and processing capability at SRS is the only such facility in the country capable of providing the common front-end PU treatment capability to supply feed to either (or both) leading disposition technologies. Combined with the SRS-developed unique can-in-canister technology for PU immobilization, SRS capabilities can be extended to MD programs with resultant dramatic cost-saving potential.

This $1,700M program to be completed during the 10 year period, will result in estimated life cycle savings of $2,800M.

4. **Expansion of Actinide Packaging and Storage Facility for consolidation of Plutonium Storage**

The Actinide Packaging and Storage Facility is being developed to accommodate modular expansion for additional objectives. Two scenarios are expansion for relocating plutonium materials from Rocky Flats Environmental Technology Site (RFETS) for long term storage until MD disposition and expansion for storage of all surplus weapons plutonium. Both scenarios show major cost advantages over alternatives by leveraging the support capability provided by the baseline APSF and the SRS plutonium infrastructure.

This $225M program for one additional 5,000 position storage module, to be implemented during the 10 year period, will result in estimated life cycle savings of $1,000M. Similar savings can be realized with additional expansion to provide storage for other materials.

Facilities Program Summary

Summary

The Facilities program will safely manage excess facilities and ready them for final disposition. This program involves disposal or long-term storage of material inventories and deactivation of facilities no longer needed for site missions. Materials destined for disposal or long-term storage include heavy water, depleted and enriched uranium, natural and enriched lithium, depleted uranium oxide, and spent fuel left over from defense materials production. To the extent possible and profitable, materials (primarily heavy water) and equipment will be sold commercially. The remainder will be placed in long-term storage.

Facilities in P, C, R, K, L, M, and D will be deactivated by the year 2006 with the exception of the 105-L reactor building. L Reactor will be deinventoried and partially deactivated by that year, with full deactivation planned for FY2007. The Facilities program does not include a CERCLA program as required by the 1997 Program Execution Guidance (PEG). Per DOE's priority list, this activity is not funded. Allocating significant resources to D&D is not cost justifiable in light of the low yield in risk reduction or S&M cost reduction.

Facilities in F and H Areas will be deinventoried and facility stabilization projects will have been initiated. The baseline plan funding completes deactivation of H Area facilities into a low cost S&M mode by FY2006, while deactivation of F Area facilities will still be underway with an estimated completion date of FY2008.

Mission and Objectives

The mission of the facilities program is to safely manage excess facilities and ready them for final disposition. This activity includes disposition of materials such as heavy water, enriched and depleted uranium, and lithium. In addition, the program will reduce expenditures for surveillance and maintenance (S&M), leaving facilities in a low cost S&M state until such time as they can be fully decontaminated. Concurrently with reductions in S&M costs, risks to public safety and the environment will be reduced commensurate with available funding.

Final End-State

The facilities in P, C, R, K, L, M, and D Areas will be emptied of material inventories and deactivated. The following activities will be completed:

1. Disposal of Material Inventories: Depleted uranium and lithium currently stored in M Area will be sold, stored elsewhere for future use, or disposed of as waste. Inventories of enriched lithium also stored in M Area will be returned to Oak Ridge. Highly Enriched Uranium (HEU) ingots and assemblies currently stored in K Area will be relocated to another storage location or recovered in a process facility. Depleted uranium oxide (DUO) currently stored in the 105-R assembly area will remain in place.

   Approximately 750 metric tons of heavy water will be sold commercially. The remaining stocks of heavy water in P, C, R, K, and D Areas will be consolidated in L Area, utilizing both tank and drum storage.

   All reactor disassembly basins will be deinventoried. All SRS spent fuel located in the K and L basins will be shipped to the 200 Areas for processing. Foreign and domestic research reactor fuel imported into the L disassembly basin during the ten year window will be removed and placed in interim storage in the Spent Nuclear Fuel program's Transfer and Storage Facility.

2. Deactivation of Facilities: Facilities in D and M Areas will be decontaminated to the extent feasible, or dismantled and removed. M Area facilities will be made available for other site missions, new site missions, or privatization initiatives. Administrative facilities in these areas will be turned over to site infrastructure organizations for disposition.

Deactivation of the 105 reactor buildings will involve draining of small process lines and removal of disassembly basin water and sludge. Contaminated facilities and equipment outside of the 105 reactor buildings will be decontaminated, removed, or stabilized. With this deactivation complete, S&M costs for each deinventoried reactor building will be less than $1 million per year.

Facilities in F and H Areas will be deinventoried, deactivated, and placed in a low cost S&M mode.

FY 2006 Vision

Most of the facilities in P, C, R, K, L, D, M, and H Areas will have been deactivated by FY2006. The 105-L building will be deinventoried but only partially deactivated, with full deactivation planned for FY2007. Similarly, F Area will have been deinventoried but will not be fully deactivated until FY2008.

Program Outputs

Outputs for the facilities management program include:

Deinventory and Deactivation of Facilities: Deactivating facilities in P, R, C, K, L, M, and D Areas will involve disposal of significant low-level radioactive waste, roughly estimated at 2,000 cubic feet of sludge and deionizer resins, four million gallons of contaminated water, and 100,000 cubic feet of job-control and other wastes.

Options and Enhancement Opportunities

Facility program options and enhancement opportunities include:

Heavy Water Sale: Sale of specification heavy water to private utilities is expected to generate $75 million in revenue for the Department of Energy. Heavy water destined for sale includes all stocks currently stored in C and P Areas. Removal of heavy water from these areas will allow the SRS to avoid approximately $4 million in surveillance and maintenance costs, and a concomitant reduction in risk to the environment and public safety. Similar benefits would accrue from additional sales of the remaining heavy water stocks.

Issues Affecting Program Performance

The 1997 Program Execution Guidance (PEG) requires WSRC to "pursue a proactive CERCLA program for facilities that are no longer operational nor needed to serve the former nuclear material production mission" of the site. Per DOE's priority list, this activity is currently not funded under the facilities program. Allocating significant site resources to extensive D&D would not be justified as any reduction in risk or S&M cost would be very small compared to necessary investment.

Spent Nuclear Fuel Program Summary

Summary

The Spent Nuclear Fuel Program will safely receive and store (for an interim period) some 30,000 aluminum-clad fuel assemblies from foreign and domestic research reactors. The fuel receipts will continue until FY 2035. Initially, the SNF will be received and wet-stored in the disassembly basin of L-Reactor and the Receiving Basin for Offsite Fuel (RBOF). A new Transfer & Storage Facility (TSF) will be constructed and begin operation in FY 2002, receiving SNF from offsite, and receiving SNF deinventoried from L-Basin and RBOF. Assuming that the Nuclear Regulatory Commission accepts the direct disposal option, the SNF will be packaged at the TSF--"road ready" for shipment to the federal repository. Privatization of construction and, possibly operation of the TSF could offer substantial relief to SRS budgetary pressures in the early part of the ten-year period covered by the plan. However, privatization may delay schedules which have been previously communicated to stakeholders, and would add complexity to the program in the later years. Also, if direct disposal is not viable then an additional Treatment Facility ($100 M construction; $15 M annual operating) will be required before the SNF can be considered road ready.

Mission and Objectives

The mission of the SRS Spent Nuclear Fuel (SNF) Program is to safely manage spent nuclear fuel at the Site, including aluminum-clad spent fuel received from Foreign Research Reactors (FRR), Domestic Research Reactors (DRR), and Idaho National Engineering Laboratory (INEL), but not including fuels used in the SRS reactors (covered in the Nuclear Material Stabilization Program. Part of the SNF mission is to safely maintain the facilities in which the SNF is received, stored, and prepared for ultimate disposition -- L-Reactor, the Receiving Basin for Off-site Fuels (RBOF), and the (future) Transfer and Storage Facility (TSF). This mission is being executed per DOE's Record of Decisions related to the Environmental Impact Statements on and Foreign Research Reactor Fuel (DOE/EIS-0218F, February 1996) and the planned SRS SNF EIS.

The objectives of the SNF Program are to (1) reduce the threat of nuclear weapon proliferation, (2) maintain the risks to the public, to Site employees, and to the environment from the SNF at acceptably low levels, and (3) package (and treat, as necessary) the fuel, making it "road ready" for ultimate disposition in a geologic repository.

Assumptions

This plan is based on the following assumptions, each having significant influence on major elements of the plan, including timing and cost:

1. FRR, DRR, and INEL SNF assemblies are received from 1997 through 2035.
2. The program will be successful obtaining Nuclear Regulatory Commission (NRC) approval of a "Direct Disposal" waste form, wherein the SNF need only be packaged in repository-compatible canister, with no other treatment required. If NRC approval is not obtained, then an additional Treatment Facility will be required.
3. F-Canyon or H-Canyon or another processing facility is available until at least 2008 to process any SNF posing a health and safety threat (i.e., no facility to disposition such fuel is planned as part of the SNF Program - see issue no. 2 below).

4. DOE will elect not to blend-down and sell unirradiated Highly Enriched Uranium (HEU) fuels, and will elect to retain at least a portion of the existing tritiated Heavy Water (HW) on Site, resulting in a desire for co-location of these materials with the SNF in order to reduce S&M costs (especially safeguards and security costs).

Final End-State

The final end-state for the SNF program is that all SNF is made road ready for the repository and shipped to the repository (or to a near-repository interim storage facility). Current facilities associated with the SNF program will be deinventoried, deactivated, and decontaminated to the extent necessary to meet the guidelines for a nuclear industrial zone. (To the extent that SNF facilities may be used to cost-effectively store HEU or HW beyond the SNF mission, the responsibility for such facilities will be transferred to the programs responsible for those materials.)

2006 Vision

A Transfer and Storage Facility will be constructed and begin operation by FY2002. Operation of the TSF will include receipt of all shipments of FRR, DRR and INEL SNF after that point in time, as well as receipt of SNF being deinventoried from L-Reactor.

Conceptual design of the TSF is not complete as of the date of this plan, but the current expectation is that TSF receipt capacity will be such that L-Reactor will be completely deinventoried in the period 2002 through 2006. L-Reactor will be partially deactivated prior to 2006, but final deactivation will come after all nuclear materials are deinventoried; i.e., after 2006.

Deinventory of RBOF will be about to begin in 2006.

Fuel assemblies so damaged or degraded at their source reactor, in transport, or during storage that they are perceived to be a threat to health and safety, will be stabilized in an SRS canyon or other appropriate facility (outside of this program). Fuel types that will be exceedingly difficult or expensive to prepare for direct disposal will also be stabilized in one the canyons on site or in another appropriate facility.

Operation of TSF will include characterization of the SNF per repository requirements, and packaging as necessary for a Direct Disposal approach to ultimate disposition (REF; "Technical Strategy for the Treatment, Packaging, and Disposal of Aluminum-Based Spent Nuclear Fuel' June 1996). If, ultimately, it is determined that additional treatment (e.g., "Melt and Dilute" or "Press and Dilute") is necessary to satisfy requirements for safe disposal in an underground repository, then elements such as an additional treatment facility would be added to this plan.

Program Outputs

SNF Program Outputs are:

1. SNF in road ready condition -- first stored in the TSF, then (no sooner than 2015) shipped to a federal repository; 30,000 assemblies; 62 metric tonnes U; 255 cubic meters.

2. SNF facilities (L Reactor and RBOF) deinventoried and deactivated (no sooner than 2014). Deactivating these facilities will involve disposal of significant low-level radioactive waste, roughly estimated at 2000 cubic feet sludge and deionizer resins, 4 million gallons contaminated water, and 400,000 cubic feet job-control and other waste.

Options and Opportunities

There are two program options which offer potential for significant cost-savings in the ten year period covered by this plan:

1. Privatize the design, construction, and operation of the Transfer and Storage Facility (TSF). The cost for design and construction of TSF is roughly estimated to total $240 Million in the years FY1998 through FY2002. This cost would be deferred and "amortized" in the initial ten years of facility operation, currently projected to begin in FY2002. Privatization, while deferring costs, involves issues such as potential schedule delays inconsistent with stake holder expectations, possible loss of operating flexibility with corresponding operating cost increases, possible difficulties in future SNF program integration, and complications to performance and liability relationships. To proceed with this option, the "market" for such privatization must be proven and an RFP must be issued in FY1997.

2. Combine the TSF with the second (and later?) Glass Waste Storage Building(s). These two (or more) facilities both are to store road ready wastes destined for the federal repository. Combining the facilities may offer the potential for significant savings through elimination of duplicate costs for design, site preparation, canister handling equipment, cask handling facilities and equipment, ventilation systems, monitoring systems, and operating infrastructure (management, procedures, safety programs, etc.). A very rough estimate of potential cost savings in the ten-year period of interest is $50 Million.

Issues Affecting Program Performance

Two issues, mentioned briefly above, have potential to significantly impact the SNF Program:

1. NRC approval of the direct disposal approach for aluminum-clad fuels in the federal repository is crucial for the program as presented in this plan. Although dialog to date with NRC has revealed no "show stopper," the process of obtaining NRC approval of the direct disposal waste-form has not begun.

   The low melting temperature, corrosion potential and high enrichment of the aluminum-clad fuels are dramatically different from the attributes of commercial spent nuclear fuels which have been addressed by the Waste Management programs at DOE and NRC over the past decade. Achieving NRC approval of direct disposal will take significant effort, both for DOE and its contractors, for NRC, and stakeholders. Direct disposal may also be at odds with other stakeholder expectations. The effect of failure to achieve NRC approval will be the necessity to construct and operate a Treatment Facility not currently included in the plan. The design and construction cost for this facility is estimated to be on the order of $100 Million, with annual operating costs of $15 to $20 million. If required, operation would continue for at least ten years, beginning about FY2005.

2. DOE's Record of Decision on Foreign Research Reactor SNF includes the plan to process any damaged/degraded SNF, as necessary to eliminate unacceptable health and safety risks. This processing is to be accomplished in the SRS canyon(s). However, the baseline plan for the canyons calls for deactivation of the canyons prior to 2006. SNF will not be shipped to the federal repository until at least 2015, and SRS will continue to receive SNF from off-site generators until 2035. Thus, there is some risk that damaged or degraded fuels will need to be processed to eliminate health and safety risks in the period after canyon deactivation. This plan makes no provision for a facility or operation to accomplish this processing. Any risk will be slow to develop, there are options and opportunities that involve extended canyon operation, and there will be ample time to modify the program as necessary to deal with any such risk. Thus, the current plan is considered adequate, without specific provisions to deal with this issue.

Work For Others/New Mission Program Summary

Summary

Programs are proposed for the storage and disposition of Plutonium and Uranium materials. Feed materials include both SRS inventories and materials from locations elsewhere in the DOE complex. Final disposition decisions from DOE Office of Material Disposition (MD) will establish the specific technologies to be incorporated.

On-going DOE storage and disposition studies have included input from SRS related to utilization of facilities and infrastructure available and relevant to objectives. Some of the mission activities can be completed by the year 2006. Other missions would have substantial scope completed including any appropriate facility upgrades.

Missions and Objectives

The new missions identified would be in accordance with the U.S. non-proliferation efforts to include a focus on the assurance of safe, secure, long-term storage and disposition of surplus fissile materials. The attention is responsive to President Clinton and Russia's President Yeltsin "Joint Statement Between the United States and Russia on Nonproliferation of Weapons of Mass Destruction and Means of their Delivery" issued in January 1994. The proposed actions would enable DOE to achieve its objectives in a safe and cost effective manner.

The guiding vision of the proposed new missions is to leverage and utilize the unique assets of SRS including its workforce, facilities and infrastructure. All specific tasks and activities will reflect our attention to safety and excellence in conduct of operations. Health and safety and environmental protection will be key attention areas. Technology utilization to accomplish cost savings and risk reduction will be high priority. In addition, the Savannah River Site enjoys widespread support from citizens, citizens groups (e.g., CAB, SARDI, CNTA) and congressional representatives regarding pursuit of future missions.

Assumptions

This activity has not been included in the 10 year plan baseline.

The details of the proposed new missions will need to be finalized in the near future, however, some basic assumptions are as follows:

1. Cost and schedule impact will be incremental to the defined baseline achieving stabilization and safe interim storage of all Site inventories of nuclear materials by 2002. (identified elsewhere in this plan)

2. The Actinide Packaging and Storage Facility (APSF) project is completed at its baseline size of 2000 positions.

3. By the year 1999 decisions on disposition technology and siting at SRS have been reached by DOE.

End States

All nuclear materials managed at SRS will be treated (if necessary) to achieve recognized interim safe storage criteria. In late 1996, DOE's Office of Material Disposition will determine the technologies and site specific programs necessary to transition these materials to product or disposable waste forms.

2006 Vision

For the proposed new missions, an expanded capacity in the APSF (5,000 or 40,000 positions) can be utilized to stabilize and consolidate storage of excess plutonium materials. Plutonium disposition programs (immobilization or MOX) will be beginning to remove inventory from the APSF. Blenddown of 25MT of highly enriched uranium materials to commercially usable LEU will be complete and the capability for additional blenddown will be available.

Program Outputs

The outputs of the proposed new missions would include:

1. Pu metal, oxide, etc., from other sites stabilized and stored per DOE Standard 3013-94 or other acceptable DOE storage criteria.

2. Nuclear material (Pu and HEU) disposition programs established and making significant progress in eliminating DOE's inventories of excess weapons usable fissile materials.

Attachment II

Summary Budget Projections

ATTACHMENT II
SUMMARY BUDGET PROJECTIONS

The budget projections in this attachment are presented on a budget authority (BA) basis in constant 1998 dollars for fiscal year (FY) 1998 and beyond. The budget projections are structured by program and phase for the 10 year period of the plan and, where available, projections are presented to complete the scope beyond FY-2006.

Attachment II
Summary Budget Projections
(In Thousands of 1998 Dollars)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
I High Level Waste												
A Storage (Prior to treatment)	145,234	144,242	143,663	134,940	136,773	133,457	123,267	123,207	123,146	123,085	1,331,014	968,525
B Treatment	266,030	290,552	291,034	285,961	301,609	295,868	347,426	324,845	295,585	331,646	3,030,556	3,225,332
C Long-term Storage	1,000	1,100	1,175	1,255	1,340	1,431	11,546	36,695	46,825	11,879	114,246	777,835
II Transuranic Waste												
A Storage (Prior to treatment)	14,690	14,004	12,413	11,678	7,600	7,618	7,657	7,631	8,003	7,165	98,459	250,000
B Treatment	448	394	5,521	3,346	5,788	6,774	8,287	2,632	4,172	17,261	54,623	779,750
C Disposal	4,296	3,782	489	528	565	560	556	554	545	488	12,363	
III Mixed Low Level Waste												
A Storage (Prior to treatment)	7,451	6,658	7,185	7,610	8,477	8,416	8,616	8,616	8,616	8,616	80,261	0
B Treatment	13,325	13,811	12,564	13,758	14,572	15,125	15,325	16,047	15,825	16,125	146,477	0
C Disposal												
D Post-Project Completion	10	10	10	10	10	21	21	21	21	21	155	
IV Low Level Waste												
A Storage (Prior to treatment)	1,409	1,218	1,254	1,221	1,262	1,182	872	1,171	1,217	1,319	12,125	
B Treatment	35,552	37,433	35,681	36,684	38,913	38,191	38,225	37,568	37,690	38,216	374,153	251,878
C Disposal	18,035	20,241	25,363	25,494	26,136	33,780	36,390	34,648	33,995	30,017	284,099	227,655
D Post-Project Completion	21	21	21	21	21	21	21	21	21	21	210	
V Hazardous Waste												
A Storage (Prior to treatment)	3,856	3,268	3,371	3,273	3,338	3,224	3,176	3,150	3,127	3,518	33,301	
B Treatment	1,350	1,317	1,354	1,390	1,390	1,390	1,590	1,780	2,160	2,310	16,031	
C Disposal	3,615	2,883	3,132	2,085	247	234	231	613	628	685	14,353	
D Post-Project Completion	10	10	10	10	10	21	21	21	21	21	155	
VI Sanitary Waste												
C Disposal	1,687	675	692	699	717	697	687	683	700	763	8,000	
D Post-Project Completion	21	21	21	21	21	21	21	21	21	21	210	
IX Remedial Action (Release Sites)												
A Assessments	24,108	35,978	44,944	28,749	27,746	45,166	44,056	38,928	40,728	36,977	367,380	
B Cleanup Complete	57,923	44,167	55,966	47,110	66,073	81,271	100,805	110,703	102,671	110,739	777,428	278,806
C Post-Project Completion	14,633	17,798	17,952	18,059	17,105	16,460	17,037	17,518	18,631	19,407	174,600	612,079
X Decommissioning (Facilities)												
B Cleanup Complete	4,400	3,700	3,700	3,600	3,700	3,700	0	0	0	0	22,800	0
XI Nuclear Materials												
A Pre-Stabilization Storage	52,645	50,745	44,845	31,945	19,745	20,173	0	0	0	0	220,098	0
B Stabilization	237,090	302,355	288,800	270,641	233,341	208,802					1,541,029	
C Storage for Long Term	10,400	17,700	35,017	38,258	26,516	28,425	29,726	22,900	21,259	21,150	251,351	

Attachment II
Summary Budget Projections
(In Thousands of 1998 Dollars)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
XII Spent Nuclear Fuel												
A Pre-Stabilization Storage	60,800	57,600	53,500	45,900	50,000	42,000	36,600	36,600	36,600	31,600	451,200	0
B Stabilization	18,000	31,000	62,000	104,700	63,300	33,000	22,000	21,000	21,000	21,000	397,000	0
C Storage for Long Term	6,996	6,996	6,996	6,996	5,864	6,398	6,398	6,398	6,398	6,398	65,838	
XIII Facilities												
A Pre-Deactivation Monitoring	14,500	12,000	12,000	8,500	6,000	6,000	5,000	5,000	5,000	5,000	79,000	0
B Deactivation	21,109	19,945	19,271	24,606	24,910	17,186	194,485	200,414	227,534	218,531	967,991	202,000
C Long-term Monitoring	0	0	0	3,000	7,600	7,600	8,300	8,300	8,300	8,300	51,400	0
XIV Site Infrastructure (Landlord Program)												
A Projects	21,143	20,282	24,786	37,435	52,084	32,399	19,299	19,195	17,094	16,663	260,380	
B Operational Activities	61,081	74,022	74,675	72,716	66,344	65,059	59,428	58,839	58,263	57,702	648,129	
C Grants & External Support	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	59,650	
XV All Other												
A Program Direction	64,762	61,110	61;110	61,110	61,110	61,110	61,110	61,110	61,110	61,110	614,752	
B Program Support	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	59,650	
Total Savannah River Site	1,199,560	1,308,968	1,362,445	1,345,239	1,292,157	1,234,710	1,220,109	1,218,759	1,218,836	1,219,684	12,620,467	7,573,860

Attachment IID

Summary Budget Projections by Project

Not a required Format
Supplied to Facilitate Analysis

Attachment IID

Detail Summary Budget Projections by Project

(In Thousands of 1998 Dollars)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
I High Level Waste												
A Storage (Prior to treatment)												
1 H-Tank Farm	95,728	89,976	86,919	80,984	82,054	80,082	74,500	74,470	74,439	74,409	813,561	660,842
2 F-Tank Farm	49,506	54,266	56,744	53,956	54,719	53,375	48,767	48,737	48,707	48,676	517,453	307,683
Storage (Prior to treatment) TOT	145,234	144,242	143,663	134,940	136,773	133,457	123,267	123,207	123,146	123,085	1,331,014	968,525
B Treatment												
3 Waste Removal Activities	27,912	38,565	33,007	35,416	45,700	49,592	89,945	68,847	52,025	77,492	518,501	411,848
4 ITP/ESP Operations	83,931	84,756	87,944	83,145	87,789	86,431	85,804	83,170	86,363	88,039	857,372	900,334
5 Vitrification Operations	154,187	167,231	170,083	167,400	168,120	159,845	171,677	172,828	157,197	166,115	1,654,683	1,913,150
Treatment TOT	266,030	290,552	291,034	285,961	301,609	295,868	347,426	324,845	295,585	331,646	3,030,556	3,225,332
C Long-term Storage												
7 Glass Waste Storage	1,000	1,100	1,175	1,255	1,340	1,431	11,546	36,695	46,825	11,879	114,246	777,835
Long-term Storage TOT	1,000	1,100	1,175	1,255	1,340	1,431	11,546	36,695	46,825	11,879	114,246	777,835
High Level Waste TOT	412,264	435,894	435,872	422,156	439,722	430,756	482,239	484,747	465,556	466,610	4,475,816	4,971,692
II Transuranic Waste												
A Storage (Prior to treatment)												
8 Transuranic (TRU) Waste	14,690	14,004	12,413	11,678	7,600	7,618	7,657	7,631	8,003	7,165	98,459	250,000
Storage (Prior to treatment) TOT	14,690	14,004	12,413	11,678	7,600	7,618	7,657	7,631	8,003	7,165	98,459	250,000
B Treatment												
9 Transuranic (TRU) Waste	448	394	5,521	3,346	5,788	6,774	8,287	2,632	4,172	17,261	54,623	779,750
Treatment TOT	448	394	5,521	3,346	5,788	6,774	8,287	2,632	4,172	17,261	54,623	779,750
C Disposal												
10 Transuranic(TRU) Waste	4,296	3,782	489	528	565	560	556	554	545	488	12,363	
Disposal TOT	4,296	3,782	489	528	565	560	556	554	545	488	12,363	
Transuranic Waste TOT	19,434	18,180	18,423	15,552	13,953	14,952	16,500	10,817	12,720	24,914	165,445	1,029,750
III Mixed Low Level Waste												
A Storage (Prior to treatment)												
11 Mixed Low Level Waste	7,451	6,658	7,185	7,610	8,477	8,416	8,616	8,616	8,616	8,616	80,261	0
Storage (Prior to treatment) TOT	7,451	6,658	7,185	7,610	8,477	8,416	8,616	8,616	8,616	8,616	80,261	0
B Treatment												
12 Mixed Low Level Waste	13,325	13,811	12,564	13,758	14,572	15,125	15,325	16,047	15,825	16,125	146,477	0
Treatment TOT	13,325	13,811	12,564	13,758	14,572	15,125	15,325	16,047	15,825	16,125	146,477	0

Attachment IID
Detail Summary Budget Projections by Project
(In Thousands of 1998 Dollars)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
C Disposal												
13 Mixed Low Level Waste												
Disposal TOT												
D Post-Project Completion Surveillance												
14 Post-Project Completion	10	10	10	10	10	21	21	21	21	21	155	
Post-Project Completion TOT	10	10	10	10	10	21	21	21	21	21	155	
Mixed Low Level Waste TOT	20,786	20,479	19,759	21,378	23,059	23,562	23,962	24,684	24,462	24,762	226,893	0
IV Low Level Waste												
A Storage (Prior to treatment)												
15 Low Level Waste Storage	1,409	1,218	1,254	1,221	1,262	1,182	872	1,171	1,217	1,319	12,125	
Storage (Prior to treatment) TOT	1,409	1,218	1,254	1,221	1,262	1,182	872	1,171	1,217	1,319	12,125	
B Treatment												
16 Effluent Treatment Facility	21,525	21,942	22,360	22,267	22,496	22,237	22,315	22,315	22,315	22,315	222,087	251,878
17 Low Level Waste Treatment	14,027	15,491	13,321	14,417	16,417	15,954	15,910	15,253	15,375	15,901	152,066	
Treatment TOT	35,552	37,433	35,681	36,684	38,913	38,191	38,225	37,568	37,690	38,216	374,153	251,878
C Disposal												
19 Saltstone Facility	9,927	11,765	16,455	16,446	15,232	23,026	25,743	24,670	24,670	25,301	193,235	227,655
20 Low Level Waste Disposal	8,108	8,476	8,908	9,048	10,904	10,754	10,647	9,978	9,325	4,716	90,864	
Disposal TOT	18,035	20,241	25,363	25,494	26,136	33,780	36,390	34,648	33,995	30,017	284,099	227,655
D Post-Project Completion Surveillance												
21 Post-Project Completion	21	21	21	21	21	21	21	21	21	21	210	
Post-Project Completion TOT	21	21	21	21	21	21	21	21	21	21	210	
Low Level Waste TOT	55,017	58,913	62,319	63,420	66,332	73,174	75,508	73,408	72,923	69,573	670,587	479,533
V Hazardous Waste												
A Storage (Prior to treatment)												
22 Hazardous Waste Storage	3,856	3,268	3,371	3,273	3,338	3,224	3,176	3,150	3,127	3,518	33,301	
Storage (Prior to treatment) TOT	3,856	3,268	3,371	3,273	3,338	3,224	3,176	3,150	3,127	3,518	33,301	
B Treatment												
23 Hazardous Waste Treatment	1,350	1,317	1,354	1,390	1,390	1,390	1,590	1,780	2,160	2,310	16,031	
Treatment TOT	1,350	1,317	1,354	1,390	1,390	1,390	1,590	1,780	2,160	2,310	16,031	
C Disposal												
24 Hazardous Waste Disposal	3,615	2,883	3,132	2,085	247	234	231	613	628	685	14,353	
Disposal TOT	3,615	2,883	3,132	2,085	247	234	231	613	628	685	14,353	

Attachment IID

Detail Summary Budget Projections by Project

(In Thousands of 1998 Dollars)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
D Post-Project Completion Surveillance												
25 Post-Project Completion	10	10	10	10	10	21	21	21	21	21	155	
Post-Project Completion TOT	10	10	10	10	10	21	21	21	21	21	155	
Hazardous WasteTOT	8,831	7,478	7,867	6,758	4,985	4,869	5,018	5,564	5,936	6,534	63,840	
VI Sanitary Waste												
C Disposal												
26 Sanitary Waste Disposal	1,687	675	692	699	717	697	687	683	700	763	8,000	
Disposal TOT	1,687	675	692	699	717	697	687	683	700	763	8,000	
D Post-Project Completion Surveillance												
27 Post-Project Completion	21	21	21	21	21	21	21	21	21	21	210	
Post-Project Completion TOT	21	21	21	21	21	21	21	21	21	21	210	
Sanitary WasteTOT	1,708	696	713	720	738	718	708	704	721	784	8,210	
IX Remedial Action (Release Sites)												
A Assessments												
28 Assessment Projects	24,108	35,978	44,944	28,749	27,746	45,166	44,056	38,928	40,728	36,977	367,380	
Assessments TOT	24,108	35,978	44,944	28,749	27,746	45,166	44,056	38,928	40,728	36,977	367,380	
B Cleanup Complete												
29 Cleanup Projects	57,923	44,167	55,966	47,110	66,073	81,271	100,805	110,703	102,671	110,739	777,428	278,806
Cleanup Complete TOT	57,923	44,167	55,966	47,110	66,073	81,271	100,805	110,703	102,671	110,739	777,428	278,806
C Post-Project Completion Surveillance												
30 Operations Projects	14,633	17,798	17,952	18,059	17,105	16,460	17,037	17,518	18,631	19,407	174,600	612,079
Post-Project Completion TOT	14,633	17,798	17,952	18,059	17,105	16,460	17,037	17,518	18,631	19,407	174,600	612,079
Remedial Action (ReleaseTOT	96,664	97,943	118,862	93,918	110,924	142,897	161,898	167,149	162,030	167,123	1,319,408	890,885
X Decommissioning (Facilities)												
B Cleanup Complete												
31 HWCTR	4,400	3,700	3,700	3,600	3,700	3,700	0	0	0	0	22,800	0
Cleanup Complete TOT	4,400	3,700	3,700	3,600	3,700	3,700	0	0	0	0	22,800	0
Decommissioning (Facilities)TOT	4,400	3,700	3,700	3,600	3,700	3,700	0	0	0	0	22,800	0
XI Nuclear Materials												
A Pre-Stabilization Storage												
82 94-1 Storage	32,900	31,000	25,100	12,200	0	0	0	0	0	0	101,200	0
100.2 Wackenhut Separations	19,745	19,745	19,745	19,745	19,745	20,173	0	0	0	0	118,898	

Attachment IID

Detail Summary Budget Projections by Project

(In Thousands of 1998 Dollars)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Pre-Stabilization Storage TOT	52,645	50,745	44,845	31,945	19,745	20,173	0	0	0	0	220,098	0
B Stabilization												
33 F-Area Material Stabilization	145,733	192,863	156,928	147,433	131,299	121,458					895,714	
34 H-Area Material Stabilization	91,357	109,492	131,872	123,208	102,042	87,344					645,315	
Stabilization TOT	237,090	302,355	288,800	270,641	233,341	208,802					1,541,029	
C Storage for Long Term												
35 Actinide Packaging &	10,400	17,700	35,017	38,258	26,516	28,425	22,080	17,304	16,683	16,610	228,993	
36 Depleted Uranium Oxide							4,042	1,992	972	936	7,942	
100.3 Wackenhut Separations	0	0	0	0	0	0	3,604	3,604	3,604	3,604	14,416	
Storage for Long Term TOT	10,400	17,700	35,017	38,258	26,516	28,425	29,726	22,900	21,259	21,150	251,351	
Nuclear Materials TOT	300,135	370,800	368,662	340,844	279,602	257,400	29,726	22,900	21,259	21,150	2,012,478	0
XII Spent Nuclear Fuel												
A Pre-Stabilization Storage												
38 L-Reactor	38,600	35,500	30,600	23,100	28,000	23,500	21,300	21,300	21,300	16,300	259,500	0
39 RBOF	22,200	22,100	22,900	22,800	22,000	18,500	15,300	15,300	15,300	15,300	191,700	0
Pre-Stabilization Storage TOT	60,800	57,600	53,500	45,900	50,000	42,000	36,600	36,600	36,600	31,600	451,200	0
B Stabilization												
40 Alternate Treatment	18,000	11,000	7,000	2,000	2,000	1,000	1,000	0	0	0	42,000	0
41 Transfer and Storage Facility	0	20,000	55,000	102,700	61,300	32,000	21,000	21,000	21,000	21,000	355,000	0
Stabilization TOT	18,000	31,000	62,000	104,700	63,300	33,000	22,000	21,000	21,000	21,000	397,000	0
C Storage for Long Term												
100.1 Wackenhut Reactor Support	6,996	6,996	6,996	6,996	5,864	6,398	6,398	6,398	6,398	6,398	65,838	
Storage for Long Term TOT	6,996	6,996	6,996	6,996	5,864	6,398	6,398	6,398	6,398	6,398	65,838	
Spent Nuclear Fuel TOT	85,796	95,596	122,496	157,596	119,164	81,398	64,998	63,998	63,998	58,998	914,038	0
XIII Facilities												
A Pre-Deactivation Monitoring												
44 M-Area	3,000	3,000	2,500	2,500	0	0	0	0	0	0	11,000	0
45 Reactor Projects	9,800	7,800	8,300	6,000	6,000	6,000	5,000	5,000	5,000	5,000	63,900	0
47 Heavy Water Processing	1,700	1,200	1,200	0	0	0	0	0	0	0	4,100	0
Pre-Deactivation Monitoring TOT	14,500	12,000	12,000	8,500	6,000	6,000	5,000	5,000	5,000	5,000	79,000	0
B Deactivation												
51 M Area	1,500	1,000	5,000	4,000	0	0	0	0	0	0	11,500	0
52 Reactor Projects	0	0	2,000	6,500	13,500	7,000	2,000	0	0	0	31,000	2,000

Attachment IID
Detail Summary Budget Projections by Project
(In Thousands of 1998 Dollars)

		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
53 D Area		0	0	500	3,500	1,000	0	0	0	0	0	5,000	0
54 Heavy Water Processing		13,800	14,800	7,300	0	0	0	0	0	0	0	35,900	0
55 H Area					3,000	3,000	3,000	96,080	96,417	110,433	107,777	419,707	
56 F Area					4,000	4,000	4,000	93,363	101,147	114,352	108,093	428,955	200,000
57 247-F		5,809	4,145	4,471	3,606	3,410	3,186	3,042	2,850	2,749	2,661	35,929	
Deactivation	TOT	21,109	19,945	19,271	24,606	24,910	17,186	194,485	200,414	227,534	218,531	967,991	202,000
C Long-term Monitoring													
58 M Area		0	0	0	0	500	500	500	500	500	500	3,000	0
59 Reactor Projects		0	0	0	2,000	6,000	6,000	6,700	6,700	6,700	6,700	40,800	0
60 D Area		0	0	0	0	100	100	100	100	100	100	600	0
61 Heavy Water Storage		0	0	0	1,000	1,000	1,000	1,000	1,000	1,000	1,000	7,000	0
Long-term Monitoring	TOT	0	0	0	3,000	7,600	7,600	8,300	8,300	8,300	8,300	51,400	0
Facilities	TOT	35,609	31,945	31,271	36,106	38,510	30,786	207,785	213,714	240,834	231,831	1,098,391	202,000
XIV Site Infrastructure (Landlord Program)													
A Projects													
65 Plantwide Fire Protection		2,227	1,553	500								4,280	
66 Operations Support Facility		12										12	
67 Plant Maintenance &		216	58									274	
68 Domestic Water Upgrades		2,025	299									2,324	
69 Building Chillers		10,119	10,990	10,836	9,577	12,908	527					54,957	
70 Radio Trunking System		150	149									299	
71 Site Road Infrastructure		142	150	150	150							592	
72 High Level Drain Lines		455										455	
73 Health Physics Support		1,660	4,370	10,550	1,710							18,290	
74 Environmental Monitoring				2,750	6,030	18,500	4,880	290				32,450	
101.9 DOE-Non WSRC		4,137	2,713	0	0	0	0	0	0	0	0	6,850	
79 Infrastructure Line Items		0	0	0	19,968	20,676	26,992	19,009	19,195	17,094	16,663	139,597	
Projects	TOT	21,143	20,282	24,786	37,435	52,084	32,399	19,299	19,195	17,094	16,663	260,380	
B Operational Activities													
75 Operational Activities		15,362	24,708	21,528	20,144	12,836	12,701	12,843	12,468	12,105	11,753	156,448	
76 Waste Minimization		2,460	2,363	1,944	1,372	1,373	1,379	1,379	1,379	1,379	1,379	16,407	
100.4 Wackenhut Landlord		21,259	25,951	28,584	28,584	29,716	28,754	23,196	23,196	23,196	23,196	255,632	
101.5 Forest Service		11,800	10,500	10,553	10,522	10,492	10,462	10,361	10,260	10,160	10,062	105,172	

Attachment IID
Detail Summary Budget Projections by Project
(In Thousands of 1998 Dollars)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
101.6 Ecology Lab	10,200	10,500	12,066	12,094	11,927	11,763	11,649	11,536	11,423	11,312	114,470	
Operational Activities TOT	61,081	74,022	74,675	72,716	66,344	65,059	59,428	58,839	58,263	57,702	648,129	
C Grants & External Support												
101.7 DOE Other Program Support	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	59,650	
Grants & External SupportTOT	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	59,650	
Site InfrastructureTOT	88,189	100,269	105,426	116,116	124,393	103,423	84,692	83,999	81,322	80,330	968,159	
XV All Other												
A Program Direction												
101.1 DOE Federal Salaries/Benefits	64,762	61,110	61,110	61,110	61,110	61,110	61,110	61,110	61,110	61,110	614,752	
Program Direction TOT	64,762	61,110	61,110	61,110	61,110	61,110	61,110	61,110	61,110	61,110	614,752	
B Program Support												
101.8 DOE Other Program Support	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	59,650	
Program Support TOT	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	59,650	
All OtherTOT	70,727	67,075	67,075	67,075	67,075	67,075	67,075	67,075	67,075	67,075	674,402	
Total Savannah River Site	1,199,560	1,308,968	1,362,445	1,345,239	1,292,157	1,234,710	1,220,109	1,218,759	1,218,836	1,219,684	12,620,467	7,573,860

Attachment III

Quantity Data

ATTACHMENT III
QUANTITY DATA

The quantity data in this attachment are summations of performance metrics for individual projects presented in Attachment IV. Typically, waste volumes are presented in cubic meters, nuclear materials in metric tons, facility deactivation in terms of square feet, and environmental restoration in terms of waste areas completed. Classified materials are addressed in a separate addendum to this attachment in terms of percent of total inventory.

Attachment III
Quantity Data

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006 TOTAL	2007 to Complete
I High Level Waste cubic meters												
A Storage (Prior to treatment)	121,290	117,488	112,530	109,557	104,896	101,533	95,595	89,693	89,502	85,102	1,027,186	
B New Waste	462	653	1,207	1,115	956	1,030	160	59	59	59	5,760	
C Treatment	10,409	10,795	13,596	10,061	11,798	10,673	12,419	14,278	15,032	18,641	127,702	
D Long-term Storage	131	256	381	506	631	756	881	1,037	1,193	1,380	7,152	
II Transuranic Waste cubic meters												
A Storage (Prior to treatment)	11,125	11,250	11,026	10,803	10,579	10,354	10,115	9,875	9,636	9,376	104,139	
B New Waste	0										0	
C Treatment												
D Disposal	0	0	251	251	251	251	251	251	251	251	2,008	6,769
III Mixed Low Level Waste cubic meters												
A Storage (Prior to treatment)	2,713	3,049	3,087	3,340	3,592	4,033	4,427	4,872	5,265	5,655	40,033	0
C Treatment	983	344	118	118	118	207	184	209	184	183	2,648	
D Disposal												0
IV Low Level Waste cubic meters												
A Storage (Prior to treatment)	5,000	5,154	5,136	5,117	4,746	4,516	4,348	4,406	4,391	4,022	46,836	747
B New Waste	0										0	
C Treatment	74,932	79,619	79,473	80,026	78,725	78,109	78,142	77,745	77,813	79,101	783,685	3,019
D Disposal	13,955	17,179	19,877	18,813	17,165	17,160	18,215	21,447	18,741	25,738	188,290	1,159
V Hazardous Waste cubic meters												
A Storage (Prior to treatment)	978	943	857	859	844	1,055	1,423	1,430	1,552	1,596	11,537	0
B New Waste	0										0	
C Treatment	605	85	58	104	96	211	291	106	165	126	1,847	0
D Disposal	232	204	203	205	205	211	215	206	209	207	2,097	1,596
VI Sanitary Waste cubic meters												
D Disposal	29,380	29,380	29,380	29,380	29,380	29,380	29,380	29,380	29,380	29,380	293,800	
IX Remedial Action (Release Sites) release sites												
A Assessments	30	86	72	50	11	21	20	21	18	11	340	0
B Cleanup Complete	30	69	53	51	11	14	8	23	15	30	304	36
XI Nuclear Materials kg												
A Pre-Stabilization Storage												
B Stabilization												
C Storage for Long Term												

Attachment III
Quantity Data

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006 TOTAL	2007 to Complete
XII Spent Nuclear Fuel cubic meters												
A Pre-Stabilization Storage	25	25	25	11	11	11	11	11	11	11	149	
B Stabilization						30	30	30	30	30	149	
XIII Facilities square ft.												
A Pre-Deactivation												
B Deactivation	160,113	113	114	251,000	1,056,000	1,004,000	755,000			430,000	3,656,340	500,000
C Long-term Monitoring												

OUTPUT / MATRICES F-AREA MATERIAL STABILIZATION

PROJECT # 33

% Completion based on quantities listed

NMSP 10 YEAR PLAN MEASURES				% COMPLETE									
Material Description	Area	Quantity	Approx Units	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Pu-239 metal	F	containers	174						100				
Pu-239 oxide	F	containers	950						100				
Pu-239 (dissolve SS&C) residues	F	containers	173	20	85	100							
Am/Cm solution	F	liters	14400		10	100							
Np-237 solution	F	liters	6000			10	50	100					
Irradiated Mk-31 targets	F	MTHM	147	100									
SNF (Mk16/22)	F	MTHM	1.1	20	100								
Failed TRR/EBR II fuel	F	containers	82	100									
Mk-18 (Am/Cm)	F	items	239		100								

OUTPUT / MATRICES H-AREA MATERIAL STABILIZATION

PROJECT # 34

% Completion based on quantities listed

NMSP 10 YEAR PLAN MEASURES				% COMPLETE									
Plutonium solutions	H	liters	34,000					60	100				
Pu-239 (dissolve others) residues	H	containers	1043	5	15	30	60	90	100				
Pu-242 solution	H	liters	13300	100									
HEU solutions	H	liters	230,000	100									
SNF (Mk16/22)	H	MTHM	6.2			50	100						
misc. fuel/targets	H	items	900				50	100					
Mk-53 (Neptunium)	H	targets	9				100						

Attachment IV

Supporting Data

ATTACHMENT IV
SUPPORTING DATA

The supporting data comprise the scope, cost projections, schedule, and performance metrics for individual projects within a program. Both operating and capital (construction) costs are identified for each project. in addition, the relative maturity/quality of the cost and quantity estimate is defined.

Attachment IV

High Level Waste

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name H-Tank Farm Project Number 1

Type of Project I-A Storage (Prior to treatment) (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility High Level Waste

Project Definition/Work Scope Description

This project scope includes all activities required to safely store and manage an inventory of 17,000,000 gallons of liquid high level radioactive waste in 23 underground storage tanks. The continued management and storage of waste in these tanks is required until it is removed as part of the overall waste removal program which is scheduled to conclude by the end of FY'18. Activities include: • Routine surveillance and monitoring of key parameters such as explosive gas generation, liquid level, temperature, and ventilation system operation • Remote tank integrity examinations • Maintenance and repair of those systems required for safe storage including tank monitoring instruments and waste transfer systems and pumps that would be required to move waste to another tank in the event of a leak. • Completion of the Replacement High Level Waste Evaporator which is required to reduce the volume of waste stored in these underground tanks to maintain enough working tank space to allow continued removal, processing, and vitrification of the waste. • The operation and maintenance of two high level waste evaporators and associated waste transfer systems. • Upgrades to tanks farm services and support systems (steam, air, water, cooling water, storm water monitors). Many of these systems have been in service for over 40 years. Due to their age and continued deterioration they require frequent repairs which result in an increasing numbers of forced outages. These old service lines are 10-30 feet underground and therefore usually require extensive efforts to repair. These upgrades will be necessary for the tank farm to continue it's mission in a safe manner for the next 22 years while the waste is being removed from the storage facilities.

Milestone/ Schedule Information

FY97 - Operate and Maintain 23 Active Waste Storage Tanks
FY98 - FY02 - Operate and Maintain 22 Active Waste Storage Tanks and 1 Closed Waste Storage Tanks
FY03 - Operate and Maintain 20 Active Waste Storage Tanks and 3 Closed Waste Storage Tanks
FY04 - Operate and Maintain 19 Active Waste Storage Tanks and 4 Closed Waste Storage Tanks
FY05 - Operate and Maintain 16 Active Waste Storage Tanks and 7 Closed Waste Storage Tanks
FY06 - Operate and Maintain 15 Active Waste Storage Tanks and 8 Closed Waste Storage Tanks

11/98 - Startup of RHLWE

FY97 - FY98 Annual Evaporator Space Gain of 1,000,000 gal
FY99 - FY04 Annual Evaporator Space Gain of 2,000,000 gal
FY05 - FY06 Annual Evaporator Space Gain of 3,000,000 gal

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

H-Tank Farm											1997-2006	2007-Complete
Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006		
Construction	22,693	14,476	11,093	5,403	5,818	5,968	182	182	182	182	66,179	34864
Operations	73,035	75,500	75,826	75,581	76,236	74,114	74,318	74,288	74,257	74,227	747,382	625978
Other												
Total Cost	95,728	89,976	86,919	80,984	82,054	80,082	74,500	74,470	74,439	74,409	813,561	660842

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	69,160	65,821	64,431	63,958	59,854	57,974	55,569	50,648	49,690	44,671	581,776	
New Waste	27	207	771	360	127	432	127	26	26	26	2,129	
NA												

Discussion
The quality of this estimate is High. It is based on 30+ years of operating experience and incorporates aggressive cost reduction strategies. HLW production planning is based on the High Level Waste System Plan which summarizes key planning bases, assumptions, limitations, strategies and schedules for HLW facility operations. This System Plan is updated twice each year, in support of the current AOP and FYP.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name F-Tank Farm **Project Number** 2

Type of Project I-A Storage (Prior to treatment) (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO **SR-Program Responsibility** High Level Waste

Project Definition/Work Scope Description

This project scope includes all activities required to safely store and manage an inventory of 14,000,000 gallons of liquid high level radioactive waste in 22 underground storage tanks. The continued management and storage of waste in these tanks is required until it is removed as part of the overall waste system plan which is scheduled to conclude by the end of FY'13. Activities include: • Routine surveillance and monitoring of key parameters such as explosive gas generation, liquid level, temperature, and ventilation system operation • Remote tank integrity examination • Maintenance and repair of those systems required for safe storage including tank monitoring instruments and waste transfer systems and pumps that would be required to move waste to another tank in the event of a leak. • The operation and maintenance of a high level waste evaporator and associated waste transfer systems to reduce the volume of waste stored in these underground tanks to maintain enough working tank space to allow continued removal, processing, and vitrification of the waste. • Upgrades to tanks farm services and support systems (steam, air, water, cooling water, storm water monitors). Many of these systems have been in service for over 40 years. Due to their age and continued deterioration they require frequent repairs which result in an increasing numbers of forced outages. These old service lines are 10-30 feet underground and therefore usually require extensive efforts to repair. These upgrades will be necessary for the tank farm to continue it's mission in a safe manner for the next 19 years while the waste is being removed from the storage facilities.

Milestone/ Schedule Information

FY97 - Operate and Maintain 19 Active Waste Storage Tanks and 3 Closed Waste Storage Tanks
FY98 - FY00 - Operate and Maintain 18 Active Waste Storage Tanks and 4 Closed Waste Storage Tanks
FY01 - FYO2 - Operate and Maintain 17 Active Waste Storage Tanks and 5 Closed Waste Storage Tanks
FY03 - Operate and Maintain 16 Active Waste Storage Tanks and 6 Closed Waste Storage Tanks
FY04 - Operate and Maintain 15 Active Waste Storage Tanks and 7 Closed Waste Storage Tanks
FY05 - Operate and Maintain 13 Active Waste Storage Tanks and 9 Closed Waste Storage Tanks
FY06 - Operate and Maintain 10 Active Waste Storage Tanks and 12 Closed Waste Storage Tanks

FY98 - Complete Closure of the First Tank Group (Tanks 17-20F)

FY97 - FY98 Annual Evaporator Space Gain of 1,000,000 gal
FY99 - FY06 Annual Evaporator Space Gain of 500,000 - 1,000,000 gal

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

F-Tank Farm

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	1,851	3,563	7,013	4,421	4,760	4,883	149	149	149	149	27,087	28525
Operations	47,655	50,703	49,731	49,535	49,959	48,492	48,618	48,588	48,558	48,527	490,366	279158
Other												
Total Cost	49,506	54,266	56,744	53,956	54,719	53,375	48,767	48,737	48,707	48,676	517,453	307683

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	52,130	51,667	48,099	45,599	45,042	43,559	40,026	39,045	39,812	40,431	445,410	
New Waste	435	446	436	755	829	598	33	33	33	33	3,631	
NA												

Discussion

The quality of this estimate is High. It is based on 30+ years of operating experience and incorporates aggressive cost reduction strategies. HLW production planning is based on the High Level Waste System Plan which summarizes key planning bases, assumptions, limitations, strategies and schedules for HLW facility operations. This System Plan is updated twice each year, in support of the current AOP and FYP.

Attachment IV

Waste Management

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Waste Removal Activities **Project Number** 3

Type of Project I-B Treatment (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO **SR-Program Responsibility** High Level Waste

Project Definition/Work Scope Description

This project scope includes the Line Item operating and capital activities associated with outfitting HLW tanks with waste removal equipment and the necessary support facilities. Activities include installation of 3 or 4 long shaft slurry pumps in each tank, installation of electrical and bearing water supplies to each pump, construction of instrument and motor control centers in each Tank Farm and testing and startup activities associated with the new equipment. Also included are the waste removal activities involved with removing salt and sludge from the HLW tanks after the tanks are turned over from the Line Item project to Operations. The activities are water addition for salt dissolution or sludge suspension, operation of slurry pumps, sampling waste as required, adding corrosion inhibiters as required, transferring slurried/dissolved waste to ITP/ESP, lowering slurry pumps as waste removal proceeds, annulus cleaning for those tanks with contaminated annuli, water washing tanks after waste removal is complete and performance of all surveillance and maintenance activities on the waste removal equipment.

This project scope also includes closure of HLW tanks after waste removal and water washing is completed. Closure activities include development of a tank-specific Performance Evaluation, development of a tank-specific Closure Module, negotiating and obtaining Regulatory approval to close the tank, adding the various grout mixtures to the tank, cutting/capping/disconnecting connections to other facilities and equipment, disassembly and removal of non-necessary equipment and leaving the tank in a safe, low maintenance condition.

Milestone/ Schedule Information

- Complete closure of Tank 20 by 12/31/96
- Complete closure of Tank 17 & 19 by 9/30/97
- Complete closure of Tanks 16 & 18 by 9/30/98
- Complete closure of Tank 8 by 9/30/01
- Complete closure of Tanks 4, 11 & 12 by 9/30/03
- Complete closure of Tanks 6 & 14 by 9/30/04
- Complete closure of Tanks 1, 5, 9, 13 & 15 by 9/30/05
- Complete closure of Tanks 2, 3, 7 & 10 by 9/30/06

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Waste Removal Activities

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	19,677	23,385	23,782	25,855	32,552	40,212	67,968	50,499	22,597	35,576	342,103	178621
Operations	8,235	15,180	9,225	9,561	13,148	9,380	21,977	18,348	29,428	41,916	176,398	233227
Other												
Total Cost	27,912	38,565	33,007	35,416	45,700	49,592	89,945	68,847	52,025	77,492	518,501	411848

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	4,561	4,455	6,166	4,088	5,617	4,394	6,098	5,961	7,180	7,907	56,427	

Small heels of residual waste left in the HLW tanks will be classified as "Incidental Waste" by the NRC and disposed in place.

Discussion

The quality of the estimate for waste removal operations is high. Estimates for waste removal operations are based on historical data from waste removal from several HLW tanks over the past 16 years and on the High Level Waste System Plan which summarizes key planning bases, assumptions, limitations, strategies and schedules for HLW facility operations. This System Plan is updated twice each year, in support of the current AOP and FYP.

Estimates for tank closure is based on one preliminary cost estimate for Tank 20 closure. The quality of this estimate is low. Within one year, when Tank 20 is closed the quality of the estimate can be improved.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name ITP/ESP Operations Project Number 4

Type of Project I-B Treatment (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility High Level Waste

Project Definition/Work Scope Description

This project scope includes all operating expense funded activities associated with the operation of the In-Tank Precipitation (ITP) and Extended Sludge Processing (ESP) facilities in the H-Area Tank Farm as well as a future Line Item project to refurbish the ITP facility starting in FY00. These two facilities pretreat all waste that is disposed at Saltstone or vitrified at DWPF. ITP activities include surveillance and maintenance of three 1.3 million gallon HLW tanks, receipt of 1-2 million gallons of salt solution per year, addition of process chemicals, operation of a large high hazard microfiltration facility, operation of two large stripper columns, storage of 2 million gallons of pretreated salt solution, and feeding about 4 million gallons of waste per year to the DWPF and Saltstone facilities. ESP activities include the surveillance and maintenance of three additional 1.3 million gallon HLW tanks, receipt of sludge transfers from the other HLW tanks, washing the sludge with 2-3 million gallons of water per year, dissolving the aluminum present in the sludge, storing the pretreated sludge after aluminum dissolution/washing, and feeding the sludge to DWPF.

Milestone/ Schedule Information

- ITP/ESP will provide pretreated feed to DWPF to produce 150 canisters in FY97
- ITP/ESP will provide pretreated feed to DWPF to produce 200 canisters in FY98
- ITP/ESP will provide pretreated feed to DWPF to produce 250 canisters in FY04
- ITP/ESP will provide pretreated feed to DWPF to produce 300 canisters in FY06

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

ITP/ESP Operations

Costs	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**1997-2006**	**2007-Complete**
Construction	0	0	0	1,546	5,411	3,334	0	0	0	0	10,291	0
Operations	83,931	84,756	87,944	81,599	82,378	83,097	85,804	83,170	86,363	88,039	847,081	900334
Other												
Total Cost	83,931	84,756	87,944	83,145	87,789	86,431	85,804	83,170	86,363	88,039	857,372	900334

Output/Metrics	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**1997-2006**	**2007-Complete**
Amounts in												
cubic meters	5,014	5,059	6,149	4,692	4,900	4,998	5,040	6,716	6,251	8,813	57,632	

The ITP salt precipitate and ESP washed sludge will be vitrified at DWPF, temporarily stored in the SRS Glass Waste Storage Building, and eventually disposed at a Federal Repository. The ITP decontaminated salt solution will be disposed at SRS as saltstone grout.

Discussion

The quality of this estimate is operating activities is High. HLW production planning is based on the High Level Waste System Plan which summarizes key planning bases, assumptions, limitations, strategies and schedules for HLW facility operations. This System Plan is updated twice each year, in support of the current AOP and FYP.

The estimate for the ITP Line Item project is conceptual and is therefore of low quality. This estimate will be improved as operating experience is gained in the ITP facility and the scope becomes better defined.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Vitrification Operations Project Number 5

Type of Project I-B Treatment (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility High Level Waste

Project Definition/Work Scope Description

The Late Wash Facility and the Defense Waste Processing Facility (DWPF) are an integral part of the SRS HLW Processing System. HLW's In-Tank Precipitation (ITP) facility transfers its highly radioactive precipitate waste stream to Late Wash , where excess nitrite is removed. DWPF then combines the washed precipitate with sludge and glass formers, vitrifies the resulting mixture, and pours the glass waste into stainless steel canisters. These facilities operate on a five-shift, 24-hour per day basis. Ongoing operating tasks include waste processing, equipment maintenance, laboratory analyses, erosion/corrosion evaluations, maintenance of the Safety Analysis Report (SAR), personnel qualification and training, maintenance of 55 system operating manuals, environmental emissions oversight, waste minimization, and emergency preparedness drills and exercises. General Plant Projects are needed to maintain continued safe operations of the facility, and include failed equipment replacement, utility tie-ins, and others. Failed Equipment Storage Vaults (FESVs) are specially designed for the long-term storage of spent DWPF glass melters and other equipment, which are too contaminated to dispose in the site's Burial Ground. Additional FESVs will be needed. DWPF cannot operate unless storage vaults are available to handle failed equipment. Because vitrification melters have a projected life of two years regardless of canister fill rate, FESVs must be built on a regular basis.

Milestone/ Schedule Information

DWPF production rates will ramp up from 60 canisters in FY96 to 150 canisters in FY97, 200 canisters in FY98-FY03, 250 canisters in FY04-FY05, and 300 canisters in FY06. Current planning bases indicate that the 34 million gallons of liquid HLW stored at SRS will be solidified in approximately 6000 canisters, and will be completed in 2018.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Vitrification Operations

Costs	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**1997-2006**	**2007-Complete**
Construction	0	5,327	7,616	2,368	2,146	0	15,521	15,520	0	7,852	56,350	50875
Operations	154,187	161,904	162,467	165,032	165,974	159,845	156,156	157,308	157,197	158,263	1,598,333	1862275
Other												
Total Cost	154,187	167,231	170,083	167,400	168,120	159,845	171,677	172,828	157,197	166,115	1,654,683	1913150

Output/Metrics	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**1997-2006**	**2007-Complete**
Amounts in cubic meters	834	1,281	1,281	1,281	1,281	1,281	1,281	1,601	1,601	1,921	13,643	

No streams are stored or disposed by Late Wash. The canisters of vitrified waste produced by DWPF will be stored on site in the Glass Waste Storage Building pending availability of a Federal Repository for permanent storage, which may be available in 2015. FESVs will store spent melters and other equipment containing high level waste.

Discussion

The quality of this estimate is High. HLW production planning is based on the High Level Waste System Plan which summarizes key planning bases, assumptions, limitations, strategies and schedules for HLW facility operations. This System Plan is updated twice each year, in support of the current AOP and FYP.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Glass Waste Storage Building **Project Number** 7

Type of Project I-C Long-term Storage (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO **SR-Program Responsibility** High Level Waste

Project Definition/Work Scope Description

The highly radioactive, glass-filled, stainless steel canisters produced by the Defense Waste Processing Facility (DWPF) will be temporarily stored on-site in Glass Waste Storage Buildings (GWSBs), pending availability of a Federal Repository. The canisters are stored in a seismically-qualified, below-grade concrete vault. A standard construction building is built over the vault to provide weather protection. A forced-air ventilation system is provided to remove decay heat, and HEPA filters are included. A unique Shielded Canister Transporter is used to move the 5,000 lb canisters, one at a time, from the Vitrification building to the GWSB. GWSB#1 has a capacity of 2,286 canisters. GWSB#2 to be completed by FY06 will have a capacity of 2,286 and GWSB#3 will have a capacity of 600 canisters. This project will initiate the shipment of 500 canisters per year in FY15 when the federal repository is assumed to be available. This will allow all canisters to be removed from the site by FY26. Alternate shipping schedules can be utilized to expedite the completion of this task.

Milestone/ Schedule Information

GWSB#1 began storing radioactive canisters in April 1996. At current production rates, it will be filled in FY06. A second Glass Waste Storage Building, GWSB#2, will be designed and built in FY02-06 and be ready to start filling in FY06 in order to support continuous operation of the DWPF. A third Glass Waste Storage Building, GWSB#3, will be designed and built in FY09-13 and be ready to start filling in FY14 in order to support continuous operation of the DWPF. Approximately 6,000 canisters will be produced over the life of the HLW program, which will end in 2018.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Glass Waste Storage Building

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	10,018	35,063	45,082	10,018	100,181	42496
Operations	1,000	1,100	1,175	1,255	1,340	1,431	1,528	1,632	1,743	1,861	14,065	735339
Other												
Total Cost	1,000	1,100	1,175	1,255	1,340	1,431	11,546	36,695	46,825	11,879	114,246	777835

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	131	256	381	506	631	756	881	1,037	1,193	1,380	7,152	

DWPF's radioactive, glass-filled canisters will be stored in the Glass Waste Storage Buildings until a Federal Repository is available.

Discussion

The quality of this estimate is High except for the canister shipment cost increased in 2015-2026. HLW production planning is based on the High Level Waste System Plan which summarizes key planning bases, assumptions, limitations, strategies and schedules for HLW facility operations. This System Plan is updated twice each year, in support of the current AOP and FYP.

The cost estimate for GWSB#2 and GWSB#3 is based on the actual cost of GWSB#1.

The cost estimated used for canister shipment is $100,000 per canister. This estimate is very weak and HQ guidance is needed to firm up this estimate. However, it does not impact the estimates in the 10 year window.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ **Project** ☐ **Level of Effort Activity**
Project Name Transuranic (TRU) Waste Storage **Project Number** 8
Type of Project II-A Storage (Prior to treatment) **(select one from the Attachment II categories)**
Managing or Funding Program (check one or more) ☒ **WM** ☐ **ER** ☐ **TD** ☐ **NM** ☐ **SO** **SR-Program Responsibility** Solid Waste

Project Definition/Work Scope Description

Storage occurs in three kinds of facilities: on pads without covers, on pads within weather covers and on earthen-covered pads. Storage of waste on permitted TRU Pads 1-19 is projected through the year 2033. Storage includes retrieval of 9000 earthen-covered drums by FY2000 from TRU Pads 2-6. Two additional Pads will be available by FY99. Storage activities will continue beyond FY2006 but funding for storage of newly-generated non-EM waste beyond FY2000 is by the waste generator.

Segregation of waste drums from TRU to Low-Level Waste will continue through FY2005. A new Waste Certification Facility (relocated) is required by FY98 because existing facility interferes with closure cap for old burial ground..

Milestone/ Schedule Information

Two additional TRU Storage pads; one pad will be constructed and operational in FY98; the other in FY99 ($120K in FY97, $600K in FY98, $500K in FY99).

Retrieval Operations (un-earth drums, vent and purge, and place waste-drums in safe/inspectable storage) will be implemented as follows: complete retrieval of Pad 6 in FY97, complete Pad 4 in FY98, Pad 2 in FY99, Pad 3 in FY2000 and Pad 5 in FY2000.

A Waste Certification Facility will be constructed and operational in FY1999 ($500K in each FY97,98) to support continuation of waste segregation (TRU to Low-Level).

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Transuranic (TRU) Waste Storage

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	1,000	1,000									2,000	
Operations	13,690	13,004	12,413	11,678	7,600	7,618	7,657	7,631	8,003	7,165	96,459	250000
Other												
Total Cost	14,690	14,004	12,413	11,678	7,600	7,618	7,657	7,631	8,003	7,165	98,459	250000

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	11,125	11,250	11,026	10,803	10,579	10,354	10,115	9,875	9,636	9,376	104,139	
New Waste	0										0	

TRU Waste will be disposed of at the WIPP.

Discussion

Planning. References used include Solid Waste Management Plan, Out-Year-Budget and Baseline Environmental Management Report. Costs include Program Management costs spread over the waste streams. Costs in FY97-00 include drum retrieval.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Transuranic (TRU) Waste Treatment **Project Number** 9

Type of Project II-B Treatment **(select one from the Attachment II categories)**

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

Treatment of some Transuranic (TRU) waste-types will be required to meet shipping and disposal requirements. The Waste Characterization and Processing Building will provide means for processing/certifying waste for shipment to WIPP for disposal. The high-activity Plutonium-238 (Pu-238) waste exceeds the wattage limits specified for transportation and currently cannot be economically shipped. Pu-238 represents approximately 30 percent of the TRU waste volume at SRS, and 81 percent of total curies. There are currently no existing treatment facilities for TRU at SRS. Treatment activities will continue beyond FY2006 but funding for treatment of newly-generated non-EM waste beyond FY2000 is by the waste generator.

The Characterization/Process Facility in this scenario is a $50M structure (Shell) to house equipment and be a location for waste processing by a vendor, possibly using mobile equipment. No processing equipment is included as current philosophy is to utilize vendors/equipment.

Technology Development:

Other alternatives to be reviewed include on-site disposal of Pu-238. This could significantly reduce the time-frame required and probably cost. Also, thermal and chemical processes are to be investigated.

Milestone/ Schedule Information

TRU Waste Characterization and Processing Building Line Item has an operational date in FY2009

Treatment begins FY2009 and continues through FY2033.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Transuranic (TRU) Waste Treatment

Costs	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**1997-2006**	**2007-Complete**
Construction	240	250	4,000	1,900	950	950	1,450	1,750	2,750	10,750	24,990	23750
Operations	208	144	1,521	1,446	838	824	837	882	1,422	6,511	14,633	756000
Other					4,000	5,000	6,000				15,000	
Total Cost	448	394	5,521	3,346	5,788	6,774	8,287	2,632	4,172	17,261	54,623	779750

Output/Metrics	**1997**	**1998**	**1999**	**2000**	**2001**	**200?**	**2003**	**2004**	**2005**	**2006**	**1997-2006**	**2007-Complete**
Amounts in												
cubic meters												

TRU Waste will be disposed of at the WIPP.

Discussion

Planning. References used include Solid Waste Management Plan, Out-Year-Budget and Baseline Environmental Management Report. Costs include Program Management costs spread over the waste streams.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name Transuranic(TRU) Waste Disposal Project Number 10
Type of Project II-C Disposal (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

TRU waste with greater than 100 nanocuries per gram will be shipped to WIPP for final disposal. Before shipment of TRU Waste to WIPP, each package will be certified to meet the WIPP waste acceptance criteria. Delays in waste shipment to WIPP may have an impact on compliance with the Federal Facilities Compliance Act.

A TRUPACT II Loading Facility is required to support disposal shipments to WIPP.

Shipment of TRU Waste to WIPP begins in FY99 and continues through FY2033.

Milestone/ Schedule Information

TRUPACT II Loading Facility will be operational in FY99 to support TRU Waste shipments to WIPP.

Initial shipment FY99.

The shipments to WIPP continue through FY2033.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Transuranic(TRU) Waste Disposal

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	2,000	2,000									4,000	
Operations	2,296	1,782	489	528	565	560	556	554	545	488	8,363	
Other												
Total Cost	4,296	3,782	489	528	565	560	556	554	545	488	12,363	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	0	0	251	251	251	251	251	251	251	251	2,008	6769

TRU Waste will be disposed of at the WIPP.

Discussion

Planning. References used include Solid Waste Management Plan, Out-Year-Budget and Baseline Environmental Management Report. Costs include Program Management costs spread over the waste streams.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Mixed Low Level Waste Storage **Project Number** 11

Type of Project III-A Storage (Prior to treatment) **(select one from the Attachment II categories)**

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO **SR-Program Responsibility** Solid Waste

Project Definition/Work Scope Description

Storage of Mixed Low Level Waste (MW) will continue until treatment and disposal options are available. Sufficient Permitted Storage exists at SRS for MW. Steady state condition for Mixed Waste will occur by FY2011. Treatment technology is undetermined. Storage/characterization activities will continue beyond FY2006, but storage of newly-generated non-EM waste beyond FY2000 is funded by the waste generator.

Milestone/ Schedule Information

Storage facilities are adequate. No additional projects required for new facilities.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Mixed Low Level Waste Storage

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	00
Operations	7,451	6,658	7,185	7,610	8,477	8,416	8,616	8,616	8,616	8,616	80,261	
Other												
Total Cost	7,451	6,658	7,185	7,610	8,477	8,416	8,616	8,616	8,616	8,616	80,261	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	2,713	3,049	3,087	3,340	3,592	4,033	4,427	4,872	5,265	5,655	40,033	0

Disposal off-site, on-site vault.

Discussion

Planning. References used include Solid Waste Management Plan, Out-Year-Budget and Baseline Environmental Management Report.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Mixed Low Level Waste Treatment Project Number 12

Type of Project III-B Treatment (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

CIF is to be operational in FY97. A Containment Building is needed for preparing waste for treatment, sorting and segregating waste, and treatment of waste, and is currently planned to be operational by FY2008. Macro encapsulation could be achieved in the containment building and/or through a vendor. Location of an Amalgamation Facility is yet-to-be determined, with one option being the SRS containment building.

The treatment options are being developed in accordance with the latest information provided in the Site Treatment Plan. This plan, along with DOE National Program direction and public involvement, will provide the basis for future direction. DOE has signed SCDHEC Consent Order, 95-22-HW, committing to compliance with the Site Treatment Plan.

Treatment technology remains undetermined for some waste streams.

Treatment activities will continue beyond FY2006 but treatment of newly-generated non-EM waste beyond FY2000 is funded by the waste generator.

Milestone/ Schedule Information

CIF will be operational in FY97.

A FY99 New Start Line Item for a Containment Building is being initiated. Validation is planned for March 1997.

Steady state condition for Mixed Waste will occur by FY2011.

Storage, treatment and disposal of MW will continue at SRS beyond FY2006.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Mixed Low Level Waste Treatment

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	459	159	798	1,193	1,270	1,312	1,312	1,312	1,312	1,312	10,439	0
Operations	12,866	13,652	11,766	12,565	13,302	13,813	14,013	14,735	14,513	14,813	136,038	0
Other												
Total Cost	13,325	13,811	12,564	13,758	14,572	15,125	15,325	16,047	15,825	16,125	146,477	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	983	344	118	118	118	207	184	209	184	183	2,648	

Off Site or on-site vault.

Discussion

Planning. References used include Solid Waste Management Plan, Out-Year-Budget and Baseline Environmental Management Report.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name Mixed Low Level Waste Disposal **Project Number** 13
Type of Project III-C Disposal (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO **SR-Program Responsibility** Solid Waste

Project Definition/Work Scope Description

A proposed RCRA Disposal Facility will be constructed, but will not be operational in FY2006.

Efforts are currently underway to determine the most equitable and best technical location for disposal of mixed waste generated complex-wide. A RCRA Part B Permit Application was submitted to SCDHEC in 1990. The first set of Notices of Deficiency (NODs) were received in January 1993. Design is complete on these vaults and awaiting approval of the Part B Permit from SCDHEC to begin the procurement and construction efforts (Project No. 89-D-175). The WM EIS currently forecasts that the vaults will be operational in approximately fiscal year 2002.

Commercial disposal facilities and other DOE disposal facilities may also be used. There are no funds for disposal prior to FY2006. Therefore, treated Mixed Low Level Waste will have to be stored.

Disposal/shipment activities will continue beyond FY2006, but disposal/shipment of newly-generated non-EM waste beyond FY2000 is funded by the waste generator.

Milestone/ Schedule Information

Construction is planned for mixed waste vaults to accept the Consolidated Incineration Facility stabilized ashcrete and blowdown, as well as other treatment residuals. A permit application was submitted to South Carolina Department of Health and Environmental Control in 1990. The facility operational plans are beyond FY2006.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Mixed Low Level Waste Disposal

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations												
Other												
Total Cost												

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters												0

Hazardous waste/mixed waste vaults to accept the Consolidated Incineration Facility stabilized ashcrete and blowdown and other treatment residuals.

Discussion
Planning. References used include Solid Waste Management Plan, Out-Year-Budget and Baseline Environmental Management Report.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Post-Project Completion S&M Project Number 14

Type of Project III-D Post-Project Completion Surveillance and Maintenance (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

The mixed waste storage, treatment and disposal facilities will remain operational beyond FY2006, with steady state operations by FY2011. Surveillances and monitoring activities are on-going or will initiate as a facility becomes operational. Activities in this project include but are not limited to general facility maintenance, maintenance of boundary fences, markings and notices, inspection and data collection at sumps and wells, and the maintenance of the associated records.

Milestone/ Schedule Information

S&M continues beyond FY2006.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Post-Project Completion S&M

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	10	10	10	10	10	21	21	21	21	21	155	
Other												
Total Cost	10	10	10	10	10	21	21	21	21	21	155	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												
	0	0	0	0	0	0	0	0	0	0	0	0

Not Applicable.

Discussion
Planning.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name Low Level Waste Storage Project Number 15
Type of Project IV-A Storage (Prior to treatment) (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

At the Savannah River Site, low-level waste is segregated into five categories to facilitate proper treatment, storage, and disposal. These categories include: (1) low-activity waste, (2) intermediate-level waste, (3) intermediate-level tritium waste, (4) long-lived waste, and (5) suspect soil.

The current LLW plan calls for continued storage of special waste-forms while awaiting development of treatment and/or disposal options. These waste streams include: CIF ashcrete/blowcrete, Heat exchangers, Reactor deionizers, Large equipment and Naval reactor components. These waste streams are currently placed in interim storage above ground on gravel pads.

The Consolidated Incineration Facility ashcrete and stabilized blowdown will also be placed in interim storage until completion of a composite performance assessment and development of operational procedures for final trench disposal. Actual disposal in shallow land trenches is not expected until at least fiscal year 1997.

There are 68 out-of-service heat exchangers stored in reactor facilities awaiting development of reuse and recycle alternatives.

Currently no disposal method exists for the long-lived waste. It is either being kept by the generator or stored on pads in the existing Solid Waste Disposal Facility until treatment and/or disposal technologies can be developed.

Naval Rx core barrels and other large equipment are stored on gravel pads awaiting results of composite PA required as part of DNFSB 94-2 follow-up for shallow land disposal. Large equipment will continue to be stored until completion and implementation of the Savannah River Site large equipment disposal plan.

Milestone/ Schedule Information

A Line Item Project for second-generation LAW and ILW Vaults will be completed and operational by FY2012.

LLW storage would continue through TRU and Environmental Restoration efforts (FY2033 and beyond). Storage activities will continue beyond FY2006 but funding for storage of newly-generated non-EM waste beyond FY2000 is by the waste generator.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Low Level Waste Storage

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	1,409	1,218	1,254	1,221	1,262	1,182	872	1,171	1,217	1,319	12,125	
Other												
Total Cost	1,409	1,218	1,254	1,221	1,262	1,182	872	1,171	1,217	1,319	12,125	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	5,000	5,154	5,136	5,117	4,746	4,516	4,348	4,406	4,391	4,022	46,836	747
New Waste	0											
On-Site disposal in vaults/trenches.											0	

Discussion

Planning. References used include Out-Year-Budget and Baseline Environmental Management Report.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name Effluent Treatment Facility Project Number 16
Type of Project IV-B Treatment (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility High Level Waste

Project Definition/Work Scope Description

This project scope includes the activities associated with the operation of the Effluent Treatment Facility (ETF). All low level wastewater generated in the Separations and Tank Farm areas is processed in the ETF and released to a permitted outfall. Operation of the ETF directly supports the SRS vitrification and defense missions. Activities include surveillance and maintenance of a vast wastewater collection system including two 32,000 gallon pumping stations, two 2 million gallon high activity rubber-lined retention basins, two 6 million gallon rubber-lined low activity retention basins, and two 450,000 gallon collection tanks. Also included is the operation of a large wastewater treatment plant that includes pH adjustment, ultrafiltration, ion exchange, organic removal, mercury removal, evaporation and sampling and release of 18 million gallons of treated water per year. The two 2 million gallon basins are reserved to contain a postulated Canyon cooling water accident.

Milestone/ Schedule Information

- The ETF will treat all influents for release to a permitted outfall. Influents are projected to average 18 million gallons per year.
- The ETF will remain available to receive a high activity release from the F and H-Area Separations facilities in the event of an accident

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

Effluent Treatment Facility

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	21,525	21,942	22,360	22,267	22,496	22,237	22,315	22,315	22,315	22,315	222,087	251878
Other												
Total Cost	21,525	21,942	22,360	22,267	22,496	22,237	22,315	22,315	22,315	22,315	222,087	251878

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	70,250	70,496	70,340	71,041	70,234	70,287	70,791	70,581	70,699	72,451	707,170	

Of the 18 million gallons per year of influent, all but 0.3 million gallons is released to the environment via a permitted outfall. The balance is disposed as saltstone grout.

Discussion

The quality of this estimate is High. This estimate is based on 8 years of actual expenses for this relatively stable mission: HLW production planning is based on the High Level Waste System Plan which summarizes key planning bases, assumptions, limitations, strategies and schedules for HLW facility operations. This System Plan is updated twice each year, in support of the current AOP and FYP.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Low Level Waste Treatment Project Number 17

Type of Project IV-B Treatment (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

All treatment facilities are operational to-date except the Consolidated Incineration Facility (CIF), operational in FY97, and treatment for long-lived waste and large equipment. Storage/characterization and disposal/shipment of newly-generated non-EM waste beyond FY2000 is funded by the waste generator. Treatment and disposal activities will continue through the period of SW Environmental Restoration and TRU Waste treatment (FY2033).

Improved volume reduction capabilities are essential in optimizing utilization of existing disposal capacity. A Request for Proposal (RFP) has resulted in selection of a commercial vendor for volume reducing SRS wastes. Volume reduction ratios are reasonably expected to reach or exceed 8:1.

Project No. 83-D-148 (S-2787) provided funding to design and construct the Consolidated Incineration Facility (CIF), which will incinerate hazardous, mixed, and low-level radioactive wastes. CIF could incinerate up to five million pounds of LLW per year. CIF is currently in the start-up test mode.

Contingent on new waste treatment capacities and their associated physical, chemical and radionuclide capabilities, operation of onsite compactors will be phased-out.

Milestone/ Schedule Information

The CIF will be operational in FY97. CIF and other treatment processes continue operation through TRU and Environmental Restoration efforts (FY2033 and beyond). Treatment activities will continue beyond FY2006 but funding for the treatment of newly-generated non-EM waste beyond FY2000 is by the waste generator.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Low Level Waste Treatment

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	14,027	15,491	13,321	14,417	16,417	15,954	15,910	15,253	15,375	15,901	152,066	
Other												
Total Cost	14,027	15,491	13,321	14,417	16,417	15,954	15,910	15,253	15,375	15,901	152,066	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	4,682	9,123	9,133	8,985	8,491	7,822	7,351	7,164	7,114	6,650	76,515	3019

On-Site disposal in vaults/trenches.

Discussion

Planning. References used include Out-Year-Budget and Baseline Environmental Management Report.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Saltstone Facility Project Number 19

Type of Project IV-C Disposal (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility High Level Waste

Project Definition/Work Scope Description

The Saltstone facility is an integral part of the SRS HLW System. Its mission is to receive the low level, aqueous waste streams generated by the In-Tank Precipitation Facility, Late Wash and the Effluent Treatment Facility; combine this waste with a dry mixture of cement, slag and flyash; and pump the resulting grout to above-grade, engineered disposal vaults where the grout solidifies as saltstone. Key facility components include an underground, inter-area waste transfer line; the Salt Solution Hold Tank; dry material storage silos; a horizontal twin screw mixer; an analytical laboratory, and disposal vaults. Each 6-cell vault measures approximately 100 feet wide by 25 feet high by 600 feet long, and can contain approximately 6.6 million gallons of salt solution. The facility operates on day-shift, 5 days per week. The facility will go to a two shift per day operation in FY04 to support increased HLW system attainment.

Milestone/ Schedule Information

FY97-FY03 - Process 3,000,000 gallons of salt solution annually.
FY04-FY06 - Process 4,500,000 gallons of salt solution annually.
The Saltstone Facility began Radioactive Operations in June 1990. Approximately 3.3 million gallons of low level salt solution have been stabilized and disposed to date. Vault #1 has 6 cells, of which approximately 3 cells are filled. Vault #4 has 12 cells, 11 of which are available for grout disposal. Filling of Vault #4 is expected to begin in FY97. Additional vaults must be constructed to support salt solution processing and disposal. Subsequent vaults will be built with 6 cells each.
Vault #2 will be built in FY99 to support the start of filling in FY00.
Vault #3 will be built in FY01 to support the start of filling in FY02.
Vault #5 will be built in FY02 to support the start of filling in FY03.
Vault #6 will be built in FY04 to support the start of filling in FY05.
Vault #7 will be built in FY05 to support the start of filling in FY06.
Vault #8 will be built in FY06 to support the start of filling in FY07.
A total of 15 six cell vaults are planned by the end of the HLW program in 2018.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Saltstone Facility

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	413	877	5,570	5,570	4,357	12,201	13,943	12,200	12,200	12,200	79,531	83370
Operations	9,514	10,888	10,885	10,876	10,875	10,825	11,800	12,470	12,470	13,101	113,704	144285
Other												
Total Cost	9,927	11,765	16,455	16,446	15,232	23,026	25,743	24,670	24,670	25,301	193,235	227655

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	11,431	12,937	15,643	14,648	13,255	13,550	14,818	18,121	15,443	22,682	152,528	

The Saltstone Facility stabilizes low level, liquid waste as a grout, which is disposed in Saltstone Vaults.

Discussion

The quality of this estimate is High. HLW production planning is based on the High Level Waste System Plan which summarizes key planning bases, assumptions, limitations, strategies and schedules for HLW facility operations. This System Plan is updated twice each year, in support of the current AOP and FYP.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Low Level Waste Disposal Project Number 20

Type of Project IV-C Disposal (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

Disposal facilities are operational except the second-generation vault disposal facilities. Disposal activities will continue beyond FY2006 but funding for disposal of newly-generated non-EM waste beyond FY2000 is by the waste generator.

The E Area Vault facility (EAV) became operational in September 1994 for the disposal and storage of certified, low-level waste. The EAV facility currently consists of a Low Activity Waste (LAW) vault, an Intermediate-Level Non-Tritium (ILNT) vault, an Intermediate-Level Tritium (ILTV) vault, a Long-Lived Waste Storage Building, and slit trenches for contaminated soil and rubble. All Low level wastes are being disposed as they are generated with the exception of CIF ashcrete/blowcrete, Heat exchangers, Reactor deionizers, Large equipment and Naval reactor components., which are being stored.

The LAW vault is an above ground concrete vault approximately 650 feet long by 150 feet wide by 30 feet tall. The LAW vault provides engineered barrier disposal capacity for approximately 33,981 cubic meters of LLW. Currently, only compacted waste is being placed into the LAW vault for final disposal. Non-compacted waste is being segregated in separate LAW cells, awaiting further volume reduction before final disposal. The life expectancy of this facility is totally dependent on waste minimization efforts and successful implementation of treatment processes.

The Intermediate-Level Non-Tritium (ILNT)vault is a subgrade concrete vault approximately 200 feet long by 50 feet wide and 28 feet deep. The ILNT vault is subdivided into seven cells providing a combined disposal capacity of approximately 5,664 cubic meters of ILW.

The Intermediate-Level Tritium (ILTV) vault cells have the same dimensions as the non-tritium vaults. However, the ILTV has only two cells. One of the cells is designed with 140 concrete-formed silos to accept crucible waste-forms. The other ILTV cell has a volume of approximately 834 cubic meters and accepts miscellaneous boxed tritiated wastes. The ILNT and ILTV serve only as disposal facilities and are not utilized for storage of waste for future treatment.

There are three different categories of soils currently disposed in the SWDF. Suspect soils are currently used as back-fill and are not counted in waste generation volumes. Slightly

Milestone/ Schedule Information

Disposal includes construction and start-up of a second-generation vault facility by FY2012. Treatment and disposal activities will continue through the period of SW Environmental Restoration and TRU Waste treatment (FY2033). LLW is at steady state in FY2006 (with additional disposal facility (s) required).

Attachment IV
Project /Level of Effort Activity Funding Table
(In **Thousands** of 1998 Dollars)

Low Level Waste Disposal

Costs	**1997**	**1998**	**1999**	**2000**	2001	**2002**	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	8,108	8,476	8,908	9,048	10,904	10,754	10,647	9,978	9,325	4,716	90,864	
Other												
Total Cost	8,108	8,476	8,908	9,048	10,904	10,754	10,647	9,978	9,325	4,716	90,864	

Output/Metrics	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	2005	2006	1997-2006	2007-Complete
Amounts in												
cubic meters	2,524	4,242	4,234	4,165	3,910	3,610	3,397	3,326	3,298	3,056	35,762	1159

On-Site disposal in vaults/trenches.

Discussion

Planning. References used include Out-Year-Budget and Baseline Environmental Management Report.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Post-Project Completion S&M Project Number 21

Type of Project IV-D Post-Project Completion Surveillance and Maintenance (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

Low level waste storage, treatment and disposal facilities remain operational beyond FY2006. Surveillances and monitoring activities are on-going or will initiate as a facility becomes operational. Activities in this project include but are not limited to general facility maintenance, maintenance of boundary fences, markings and notices, inspection and data collection at sumps and wells, and the maintenance of the associated records.

Milestone/ Schedule Information

S&M will continue beyond FY2006.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Post-Project Completion S&M

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	21	21	21	21	21	21	21	21	21	21	210	
Other												
Total Cost	21	21	21	21	21	21	21	21	21	21	210	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in	0	0	0	0	0	0	0	0	0	0	0	0

On-Site disposal in vaults/trenches.

Discussion

Planning.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Hazardous Waste Storage Project Number 22

Type of Project V-A Storage (Prior to treatment) (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

Sufficient storage facilities currently exist at SRS.

Storage/characterization activities will continue beyond FY2006, but the storage of newly-generated non-EM waste beyond FY2000 is funded by the waste generator.

Hazardous waste is stored on site in RCRA regulated storage facilities until it can be sent offsite for treatment and/or disposal.

Hazardous wastes generated at various site facilities are stored at buildings 645-N, 645-4N, 710-B, and the solid waste storage pads (SWSP) located adjacent to Building 645-N. These facilities are permitted for storage of HW and are collectively referred to as the Hazardous Waste Storage Facilities (HWSF). These facilities store wastes until acceptable treatment and disposal methods can be implemented.

PCBs without hazardous constituents are stored in Building 741-1N in the N-area, which is limited to storage of TSCA materials. PCBs containing hazardous constituents are stored in the HWSF.

Milestone/ Schedule Information

The Department of Energy issued a moratorium between 1991 and 1995 on off-site shipment of hazardous waste that was potentially contaminated with radioactivity. When the moratorium was lifted on April 20, 1995, approximately 500 drums of Land Disposal Restriction (LDR) hazardous waste were in storage. Additionally, SRS has approximately 1400 containers of pre-LDR hazardous waste in storage. These containers are called Legacy Hazardous Waste and are being sampled and shipped for treatment and disposal.

This plan assumes that all Legacy Hazardous Waste will be shipped per treatment and disposal by the end of FY2006; however, hazardous waste storage facilities would continue operation beyond FY2006.

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

Hazardous Waste Storage

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	3,856	3,268	3,371	3,273	3,338	3,224	3,176	3,150	3,127	3,518	33,301	
Other												
Total Cost	3,856	3,268	3,371	3,273	3,338	3,224	3,176	3,150	3,127	3,518	33,301	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	978	943	857	859	844	1,055	1,423	1,430	1,552	1,596	11,537	0
New Waste	0										0	

On-Site and Off-Site disposal.

Discussion

Planning. References used include Out-Year-Budget and Baseline Environmental Management Report.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name Hazardous Waste Treatment Project Number 23
Type of Project V-B Treatment (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

Treatment activities will continue beyond FY2006 but funding for the treatment of newly-generated non-EM waste beyond FY2000 is by the waste generator. Environmental Restoration generated waste is expected to increase in the outyears.

Commercial off-site treatment is the only option currently available for hazardous waste. Resolution of radioactivity screening issues will reduce the inventory of hazardous waste in storage for greater than one year by 100 percent by 2001, which will provide additional storage capacity for continued hazardous waste receipt.

Offsite shipments of Radiological Materials Management Area (RMMA) HW are being made in accordance with the WSRC Release Program.

Management of hazardous waste is also governed by the requirements contained in the Record of Decision (ROD) issued by DOE on September 22, 1995. The ROD announced the DOE's intention to implement the moderate treatment configuration alternative identified in the Savannah River Site (SRS) Waste Management Final Environmental Impact Statement (WMEIS). The ROD requirements for Hazardous Waste are: Continue to treat and dispose of hazardous waste offsite until the CIF is operational, then treat wastes, including filters, paint waste, organic and aqueous liquids, organics and inorganic sludges, and up to 50% of organic and inorganic heterogeneous debris, in the CIF. Continue offsite treatment and disposal for wastes such as polychlorinated biphenyls, organic debris, inorganic debris, heterogeneous debris, metal debris, bulk equipment, glass debris, soils, and lead. Continue to recycle some hazardous wastes, including solvents, fluorocarbons, lead, silver (from spent photographic fixatives), and sell excess chemicals and lead/acid batteries.

Milestone/ Schedule Information

This plan assumes that all hazardous waste which has been in storage for greater than one year will be shipped to treatment and disposal facilities by FY2006, however, storage, treatment, and disposal operations would continue beyond FY2006.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Hazardous Waste Treatment

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	1,350	1,317	1,354	1,390	1,390	1,390	1,590	1,780	2,160	2,310	16,031	
Other												
Total Cost	1,350	1,317	1,354	1,390	1,390	1,390	1,590	1,780	2,160	2,310	16,031	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	605	85	58	104	96	211	291	106	165	126	1,847	0

On-Site and Off-Site disposal.

Discussion
Planning. References used include Out-Year-Budget and Baseline Environmental Management Report.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name Hazardous Waste Disposal Project Number 24
Type of Project V-C Disposal (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

Off-Site disposal and re-cycling are currently on-going. The proposed RCRA Disposal Facility (Project No. 24, Line Item 89-D-175) would need to be funded and constructed. Current strategy would be the use of commercial offsite disposal facilities.

Disposal activities will continue beyond FY2006, but disposal of newly-generated non-EM waste beyond FY2000 is funded by the waste generator.

The current plan for treatment and disposal of hazardous waste is shipment off site to commercial vendors.

Offsite treatment and disposal will continue. As onsite treatment capacity becomes available, it will be used where it is cost effective. Where offsite treatment is employed, offsite disposal will be pursued.

The HW/MW Disposal Vaults described in Project No. 24 (Line Item 89-D-175) may be used for disposal of hazardous waste meeting LDR requirements.

Solid Waste will continue routine offsite shipments of PCBs for disposal in order to comply with federal regulations which require disposal within one year of their out-of-service date.

Milestone/ Schedule Information

A disposal facility would be planned. Steady state operations in FY2006 using offsite disposal facilities until the disposal vaults are operational near the year 2006.

Attachment IV
Project./Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Hazardous Waste Disposal

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	3,615	2,883	3,132	2,085	247	234	231	613	628	685	14,353	
Other												
Total Cost	3,615	2,883	3,132	2,085	247	234	231	613	628	685	14,353	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	232	204	203	205	205	211	215	206	209	207	2,097	1596

On-Site and Off-Site disposal.

Discussion
Planning. References used include Out-Year-Budget and Baseline Environmental Management Report.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Post-Project Completion S&M   Project Number 25

Type of Project V-D Post-Project Completion Surveillance and Maintenance (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO   SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

The hazardous waste storage, treatment and disposal facilities will remain operational beyond FY2006. Surveillances and monitoring activities are on-going or will initiate as a facility becomes operational. Activities in this project include but are not limited to general facility maintenance, maintenance of boundary fences, markings and notices, inspection and data collection at sumps and wells, and the maintenance of the associated records.

Significant funding change in FY2002 is due to forecasted waste volume increase.

Milestone/ Schedule Information

S&M will continue beyond FY2006.

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

Post-Project Completion S&M

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	10	10	10	10	10	21	21	21	21	21	155	
Other												
Total Cost	10	10	10	10	10	21	21	21	21	21	155	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												
	0	0	0	0	0	0	0	0	0	0	0	0

On-Site and Off-Site disposal.

Discussion

Planning.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Sanitary Waste Disposal Project Number 26

Type of Project VI-C Disposal (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

Disposal facilities/methods are operational, except the regional disposal facility, which is to be operational by FY97, resulting in closure of the Interim Sanitary Landfill (ISL). Operation of the facilities will continue beyond FY2006. Disposal/shipment of newly-generated non-EM waste beyond FY2000 is funded by the waste generator.

Savannah River Site operates a landfill facility (Burma Road Landfill) that is permitted to accept uncontaminated soil, rock (stone), concrete rubble, inert construction wastes, and brush. This material is typically generated during site preparation and demolition activities. The Burma Road Landfill receives demolition and construction debris, which is also used on-site for erosion control and backfill, where possible.

The current disposal method for Savannah River Site (SRS) municipal solid waste is at a commercial municipal landfill (Hickory Hill Landfill and Recycling Center located in Jasper County, South Carolina).

Milestone/ Schedule Information

Disposal operations continue beyond FY2006, as any operation(s) on-site will continue to produce sanitary waste.

Significant reduction in operational costs in FY1998 due to regional facility coming into operation.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Sanitary Waste Disposal

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	1,687	675	692	699	717	697	687	683	700	763	8,000	
Other												
Total Cost	1,687	675	692	699	717	697	687	683	700	763	8,000	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in cubic meters	29,380	29,380	29,380	29,380	29,380	29,380	29,380	29,380	29,380	29,380	293,800	

Off-site and on-site disposal.

Discussion

Planning. References used include Out-Year-Budget and Baseline Environmental Management Report.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Post-Project Completion S&M **Project Number** 27

Type of Project VI-D Post-Project Completion Surveillance and Maintenance (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO **SR-Program Responsibility** Solid Waste

Project Definition/Work Scope Description

The sanitary disposal facilities will remain operational beyond FY2006. Surveillances and monitoring activities are on-going or will initiate as a facility becomes operational. Activities in this project include but are not limited to general facility maintenance, maintenance of boundary fences, markings and notices, inspection and data collection at sumps and wells, and the maintenance of the associated records.

Milestone/ Schedule Information

S&M will continue beyond FY2006.

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

Post-Project Completion S&M

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	21	21	21	21	21	21	21	21	21	21	210	
Other												
Total Cost	21	21	21	21	21	21	21	21	21	21	210	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Off-site and on-site disposal.

Discussion

Planning.

Attachment IV

Environmental Restoration

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Assessment Projects Project Number 28

Type of Project IX-A Assessments (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☒ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Environmental Restoration

Project Definition/Work Scope Description

Assessment Projects within the Savannah River Site Environmental Restoration Program (ER) identify , prioritize, and recommend a selected remediation alternative for all potential sources of contamination at individual locations on this site. The scope of work includes evaluation of existing data, field characterization, determination of nature and extent of contamination and associated risk, and evaluation and selection of remedies with stakeholder involvement. All steps in this process require review and approval by federal and state regulatory agencies. Prior to FY97, of the 451 sites at SRS, 111 had completed this process. By FY06, ER will complete all known remaining sub-project assessments listed in FFA Appendices C.1, G, and H by submission of appropriate regulatory documents, generally culminating in submission of the ROD. This is based on the completion of the 211 preliminary assessments of the "fast track" Site Evaluation Program. Approximately 50 evaluations per year will be performed of the sites listed in Appendix G. [The 10 Year Plan assumes 75% of the sites in the Site Evaluation Program will proceed to no-further-action status. The plan also assumes 80% of the sites needing further action after the Site Evaluation Program screening will proceed to remediation.] Assessment Projects are associated with the following program areas: A/M, Central Shops, Burial Ground Complex, Reactor units, Separations (F/H), TNX and D-area, Miscellaneous units, and Site Evaluation units. Additional assessment sites may be found on the Savannah River Site; these are not in the basis of the 10 Year Plan.

Milestone/ Schedule Information

Milestones

Milestones for the ER Program are driven by the regulatory commitments contained in the Federal Facilities Agreement (FFA) and RCRA Part B Permit. Currently for the years FY96 - FY98 there are approximately 130 regulatory milestones with an additional 100 regulatory projections through the year FY08. Regulatory projections are commitment dates for outyears based on current schedules. 206 of these milestones and regulatory projections are directly related to Assessment Projects (e.g., RI Field Start, Proposed Plan Submittal, RFI/RI Workplan). With the "fast track" Site Evaluation Program, ER will deliver a NFA request on approximately 158 sites in FY97 - FY01. Twenty five percent or 53 sites would be recommended for Remedial/Removal Action in FY97 - FY01.

Schedules

Assessment work (i.e., submission of RODs) will be 100% complete by FY2006

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Assessment Projects

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	24,108	35,978	44,944	28,749	27,746	45,166	44,056	38,928	40,728	36,977	367,380	
Other												
Total Cost	24,108	35,978	44,944	28,749	27,746	45,166	44,056	38,928	40,728	36,977	367,380	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												
release sites	30	86	72	50	11	21	20	21	18	11	340	0

Costs for disposal of waste are included and waste will be disposed of in approved SRS waste depositories.
Waste includes mixed waste, sample generated waste (both liquid and solid) and low level waste, and hazardous waste.

Discussion

1. Cost estimates were derived from the Environmental Restoration Life Cycle Cost Estimate (LCCE) which was used for the FY98 Out Year Budget (OYB) de-escalated to FY98 constant dollars. This data generally represents a more current appraisal of scope, cost & schedule of regulatory requirements than does the FY96 BEMR.
2. With a few exceptions, the ER program includes only currently inactive sites. (An example of an exception is the Coal Pile Run-Off Basins.) This plan does not include the potential assessment and remediation of most currently active sites at SRS. The organizations currently responsible for operating active facilities are assumed to be responsible for including ultimate disposition costs in their estimates for the facility sites.
3. It is assumed that there are no future use (e.g., storage of foreign fuel) of the Reactor Disassembly Basins.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Cleanup Projects **Project Number** 29

Type of Project IX-B Cleanup Complete (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☒ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility Environmental Restoration

Project Definition/Work Scope Description

Initiation of cleanup projects results from a conclusion formed during the assessment phase that remediation of a particular site is required. The scope of work includes design and construction of the selected remedy. The 10 Year Plan assumes that of the 451 sites, approximately forty percent will require some cleanup activity. The 57 remaining high risk sites will be remediated first. (This conservative percentage includes institutional control remedies.) Savannah River Site Environmental Restoration Program (ER) will complete 304 of the estimated 340 post-FY96 cleanup sub-projects by FY06, including the remediation of all high risk sites. It is estimated that remediation of the remaining 36 medium/low risk sites could be completed within the period 2007 to 2011. Previous interim removal actions have been undertaken to reduce risks. Cleanup activities are associated with the following program areas: A/M, Central Shops, Burial Ground Complex, Reactor units, Separations (F/H), TNX and D-area, and Miscellaneous units.

Milestone/ Schedule Information

Milestones
Milestones for the ER Program are driven by the regulatory commitments contained in the Federal Facilities Agreement (FFA) and RCRA Part B Permit. Currently for the years FY96 - FY98 there are approximately 130 regulatory milestones with an additional 100 regulatory projections through the year FY08. 66 of these milestones and regulatory projections are directly related to Cleanup Projects (e.g., Remedial Action Start).

Schedules
All cleanup work as defined by 10 year plan will be completed by FY2006 except as noted in scope description. (92% of the total sites complete)

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Cleanup Projects Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	57,923	44,167	55,966	47,110	66,073	81,271	100,805	110,703	102,671	110,739	777,428	278806
Operations												
Other												
Total Cost	57,923	44,167	55,966	47,110	66,073	81,271	100,805	110,703	102,671	110,739	777,428	278806

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in release sites	30	69	53	51	11	14	8	23	15	30	304	36

Costs for disposal of waste are included and waste will be disposed of in approved SRS waste depositories.
Waste includes mixed waste, sample generated waste (both liquid and solid) and low level waste, and hazardous waste.

Discussion

1. Cost estimates were derived from the Environmental Restoration Life Cycle Cost Estimate (LCCE) which was used for the FY98 Out Year Budget (OYB) de-escalated to FY98 constant dollars. This data generally represents a more current appraisal of scope, cost & schedule of regulatory requirements than does the FY96 BEMR.
2. With a few exceptions, the ER program includes only currently inactive sites. (An example of an exception is the Coal Pile Run-Off Basins.) This plan does not include the potential assessment and remediation of most currently active sites at SRS. The organizations currently responsible for operating active facilities are assumed to be responsible for including ultimate disposition costs in their estimates for the facility sites.
3. It is assumed that there are no future use (e.g., storage of foreign fuel) of the Reactor Disassembly Basins.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☐ Level of Effort Activity

Project Name Operations Projects **Project Number** 30

Type of Project IX-C Post-Project Completion Surveillance and Maintenance (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☒ ER ☐ TD ☐ NM ☐ SO **SR-Program Responsibility** Environmental Restoration

Project Definition/Work Scope Description

The scope of Operations Projects includes the performance of inspections, maintenance, and data validation and operation of groundwater treatment facilities until acceptable risks are achieved. The end state is achieved when these actions are no longer required to protect human health and the environment. The majority of post FY06 activities will involve ground water clean up (pump & treat). Currently, the removal of solvents via air strippers is the major operation. ER estimates that 15 groundwater and/or vadose zone operations will in place by FY06. These operations require round-the-clock shift support and include maintenace of hydraulic controls and the full support of site infrastructure/utilities. Other activities will be S&M of protective "caps" placed on remediated sites. Approximately 12 caps, requiring periodic inspection and data evaluation, should be in place at FY end 2006. Post FY06, the maintenance of these "caps" and financial responsibility will be turned over to a site infrastructure maintenance group. Operations Projects are associated with with the following program areas: A/M, Central Shops, Burial Ground Complex, Reactor units, Separations (F/H), TNX and D-area, and Miscellaneous units.

Milestone/ Schedule Information

Milestones

Milestones for the ER Program are driven by the regulatory commitments contained in the Federal Facilities Agreement (FFA) and RCRA Part B Permit. Currently for the years FY96 - FY98 there are approximately 130 regulatory milestones with an additional 100 regulatory projections through the year FY08.

Schedules

Operation of ground water treatment units will likely continue through FY2035, and possibly beyond.

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

Operations Projects												
Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations												
Other	14,633	17,798	17,952	18,059	17,105	16,460	17,037	17,518	18,631	19,407	174,600	612079
Total Cost	14,633	17,798	17,952	18,059	17,105	16,460	17,037	17,518	18,631	19,407	174,600	612079

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Costs for disposal of waste are included and waste will be disposed of in approved SRS waste depositories.
Waste includes mixed waste, sample generated waste (both liquid and solid) and low level waste, and hazardous waste.

Discussion

1. Cost estimates were derived from the Environmental Restoration Life Cycle Cost Estimate (LCCE) which was used for the FY98 Out Year Budget (OYB) de-escalated to FY98 constant dollars. This data generally represents a more current appraisal of scope, cost & schedule of regulatory requirements than does the FY96 BEMR.
2. With a few exceptions, the ER program includes only currently inactive sites. (An example of an exception is the Coal Pile Run-Off Basins.) This plan does not include the potential assessment and remediation of most currently active sites at SRS. The organizations currently responsible for operating active facilities are assumed to be responsible for including ultimate disposition costs in their estimates for the facility sites.
3. It is assumed that there are no future use (e.g., storage of foreign fuel) of the Reactor Disassembly Basins.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name HWCTR **Project Number** 31

Type of Project X-B Cleanup Complete (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☒ ER ☐ TD ☐ NM ☐ SO **SR-Program Responsibility** EF&RFS

Project Definition/Work Scope Description

The Heavy Water Components Test Reactor (HWCTR) commenced operation in 1961, was shutdown in 1964 and has not operated since. The Facility's primary function was to test fuel for potential uses of heavy water moderated reactors in commercial power generation. Ten fuel failures were experienced during the HWCTR tests and it is anticipated that residual quantities of fission products and transuranic wastes will be encountered in the primary reactor systems. All facilities outside of the seventy foot diameter containment building (and connected utility lines) have been removed. Detailed characterization of HWCTR was completed in FY96. The remaining D&D workscope includes:

- D&D of reactor building, including removal and disposal of all systems and equipment.
- Containment building and contaminated concrete will be removed to below grade.
- Clean foundation and some below grade, clean, wall structures will remain in place. The area will be backfilled and seeded.
- "Free Release" is the currently envisioned endstate pending final recommendations of required D&D alternative studies.

Milestone/ Schedule Information

- Removal of process equipment (steam generators, tanks, filters, primary piping) - FY1998
- Removal of reactor and any remaining primary system items - FY1999
- Removal of reactor building to below grade - FY2000
- Backfill below grade remnant of reactor building - FY2001

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

HWCTR

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	4,400	3,700	3,700	3,600	3,700	3,700	0	0	0	0	22,800	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	4,400	3,700	3,700	3,600	3,700	3,700	0	0	0	0	22,800	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion
Characterization is currently underway. Estimates of waste volume by type will be available in early FY1997 after facility characterization is complete.

Attachment IV

Nuclear Materials

Attachment IV

Nuclear Materials

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name *94-1 Storage* Project Number 82

Type of Project XI-A Pre-Stabilization Storage (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

This project covers the storage and shipping of current Spent Nuclear Fuel (SNF) generated by SRS Reactors currently stored in L, and K disassembly basins to 200 Area for processing. The current inventory of SRS generated SNF is as follows:

K - Basin MK-22's 1260 assemblies MK-16's 33 assemblies
L - Basin MK-31's 6237 assemblies MK-16's 516 assemblies

Also included in the shipping of "At Risk TRR & ERB Reactors Fuel" currently located in RBOF to the 200 Areas for processing.

Milestone/ Schedule Information

- Ship MK-31 assemblies from 105-L to 200 Areas - FY1997
- Ship TRR and EBR fuel from RBOF to 200 Areas - FY1998
- Begin shipping MK-22 assemblies from 105-K to 200 Areas - FY1998
- Complete deinventory of 105-K disassembly basin - FY1999
- Complete shipping of SRS fuel from 105-L to 200 Areas - FY1999

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

94-1 Storage

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	32,900	31,000	25,100	12,200	0	0	0	0	0	0	101,200	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	32,900	31,000	25,100	12,200	0	0	0	0	0	0	101,200	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in kg												

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity
Project Name Wackenhut Separations Support 97-02 Project Number 100.2
Type of Project XI-A Pre-Stabilization Storage (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility DOE-Savannah River

Project Definition/Work Scope Description

The work scope for this level of activity pertains to the protective force services reqired for the protection of Special Nuclear Material, classified matter, government property, and employees within the Separations Areas to include FB-Line, 235-F, F Area Facilities, HB-Line, and H Area Facilities. These services are mandated by DOE orders, Facility Description and Operational Plans, Vulnerability Assessments, and Master Safeguards and Security Agreements.

Milestone/ Schedule Information

1st Qtr FY02 - Establish protective force posts in new Actinice Packaging and Storage Facility
3rd Qtr FY 02 - Remove protective force posts from HB-Line
4th Qtr FY02 - Remove protective force posts from 235-F
4th Qtr FY02 - Remove protective force posts from FB-Line
4th Qtr FY02 - Remove protective force posts from F Area Facilities
4th Qtr FY02 - Remove protective force posts from H Area Facilities

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Wackenhut Separations Support 97-02

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	19,745	19,745	19,745	19,745	19,745	20,173	0	0	0	0	118,898	
Other												
Total Cost	19,745	19,745	19,745	19,745	19,745	20,173	0	0	0	0	118,898	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion

This information assumes that all SNM stored within 235-F and FB-Line will be removed by the end of FY02 and stored in the new Actidinde Packaging and Storage Facility (APSF) which will become operational by the end of FY01. There will be a period of one year in which all of the facilities in F area (235-F, FB-Line, and APSF) will require protective force staffing until all material can be relocated to APSF. Additionally, it is assumed that all SNM will be removed from HB-Line by the third quarter of FY02. It is projected that no safeguard and security interests will remain in F or H areas and that the area will become a Property Protection Area.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name F-Area Material Stabilization **Project Number** 33
Type of Project XI-B Stabilization (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO **SR-Program Responsibility** Nuclear Materials Stabilization

Project Definition/Work Scope Description

Nuclear materials determined to be at risk as identified in the Interim Management of Nuclear Materials (IMNM) EIS, the Plutonium Vulnerability Assessment and in the DOE's Implementation Plan which is in response to the DNFSB's 94-1 Recommendation will be transformed into safe, stable forms suitable for long-term interim storage awaiting final disposition. The SRS (Nuclear Materials Stabilization) Revised Baseline Plan includes the following materials for stabilization in F Area: 1. Plutonium solutions processed to metal 2. Plutonium oxide or metal treated and packaged in accordance with DOE standard DOE STD-3013-94 3. Uranium solutions blended down to low enrichment, and stored (5% LEU) or dispositioned commercially as low enriched uranium (5%) solution 4. Failed targets and Spent Nuclear Fuels stored at SRS processed to oxide or metal, the plutonium and/or uranium recovered would meet the end states defined for plutonium and uranium solutions 5. Plutonium (mixed) residues characterized and processed or packaged to meet either DOE storage criteria or waste form requirements 6. Receipt of Pu-239 and Np-237 solutions from H-Area for stabilization as plutonium metal or vitrified neptunium 7. Americium/Curium will be stabilized in a glass matrix, stored in shielded arrays awaiting shipment off site for use as programmatic nuclear materials. Material stabilization is scheduled to be complete in FY02, potential expanded EM mission (Rocky Flats Plutonium stabilization) are defined in the Mortgage Reduction Inter-Site section of the SRS 10 Year Plan. If not needed for additional missions, surplus facilities would be transitioned to Deactivation Projects.

Milestone/ Schedule Information

Complete Mk-31 dissolving (IP-3.6-002)	Jan.-97
Complete F Area dissolution Mk-16/22	Sep-98
Complete Am/Cm stabilization (IP-3.4-016)	Dec-98
Complete vitrification on neptunium solutions	Sep-01
Complete dissolving of SS&C and misc. metal scrap	Feb-02
Complete all metal production in FB Line	Mar-02

Quantities of materials that will be stabilized may be classified, details on reporting project progress are being evaluated by DOE-SR and WSRC. In addition, materials awaiting stabilization are currently identified as gallons (solution of plutonium, HEU, neptunium...), metric tons (spent fuels and targets), containers and grams (plutonium 239, 238, 242). See addendum for matrix showing completion by percentage.

Stabilization of all F Area nuclear materials should be 100% complete in FY02.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

F-Area Material Stabilization

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	6,000	2,300	7,470	4,610	4,460	0					24,840	
Operations	139,733	190,563	149,458	142,823	126,839	121,458					870,874	
Other												
Total Cost	145,733	192,863	156,928	147,433	131,299	121,458					895,714	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												
kg												

Output/matrices are provided as an addendum table and expressed as percent completion by material type.

Discussion

This project is a revised baseline estimate for the stabilization of nuclear materials in F Area based upon work completed for the submission of the FY98 OYB. This option has eliminated the startup of FA Line and includes the stabilization of plutonium and neptunium solutions that were transported from H Area. The quality of the estimate is high, detailed work activities and bottoms-up estimating was used to develop the FY98 OYB. Area support, G&A and other overhead burdens were distributed to the F Area facilities.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name H-Area Material Stabilization **Project Number** 34
Type of Project XI-B Stabilization (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO **SR-Program Responsibility** Nuclear Materials Stabilization

Project Definition/Work Scope Description

Nuclear materials determined to be at risk as identified in the Interim Management of Nuclear Materials (IMNM) EIS, the Plutonium Vulnerability Assessment and in the DOE's Implementation Plan which is in response to the DNFSB's 94-1 Recommendations will be transformed into safe, stable forms suitable for long-term interim storage awaiting final disposition. The SRS (Nuclear Material Stabilization) Revised Baseline Plan includes the following materials for stabilization in H Area: 1. Plutonium-242 solutions will be transformed to oxide; 2. Selected plutonium and mixed residues(vault materials transferred from F Area) will be dissolved and resulting plutonium-239 solutions will be transported to F Area for processing to metal; 3. Spent Nuclear Fuels stored at SRS processed , the uranium and neptunium recovered would meet the end states defined for uranium and neptunium solutions; 4. Neptunium solutions will be transported to F Area for stabilization through a vitrification process; 5. Existing HEU (highly enriched uranium) solutions blended down to low enrichment, dispositioned commercially as low enriched uranium (5%) solution. Material stabilization is scheduled to be complete in FY02. Potential expanded MD mission (HEU blend down 25 MTHM) is defined in the Mortgage Reduction Inter-Site section of the SRS 10 Year Plan.

Milestone/ Schedule Information

Complete UNH Load/Unload Project (IP-3.5-008)	Jul-96
Complete Pu-242 stabilization (IP-3.4-018)	Jan-97
Begin processing of Mk-16/22 in H Area	Oct-98
Complete processing of Mk-16/22 and misc. fuels in H Area	Dec-00
Completion of HEU dilution and storage in H Area	Sep-01
Complete all dissolution of Pu-239 residues in HB Line	Dec-01
Complete H-Canyon Pu-239 and Np-237 solutions to F Area	Jan-02

Quantities of materials that will be stabilized may be classified, details on reporting project progress are being evaluated by DOE-SR and WSRC. In addition, materials awaiting stabilization are currently identified as gallons (solution of plutonium, HEU, neptunium...), metric tons (spent fuels and targets), containers and grams (plutonium 239, 238, 242). Stabilization of all H Area nuclear materials should be 100% complete in FY02. See addendum for matrix showing completion by percentage.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

H-Area Material Stabilization

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	6,100	2,300	2,620	90	90	0					11,200	
Operations	85,257	107,192	129,252	123,118	101,952	87,344					634,115	
Other												
Total Cost	91,357	109,492	131,872	123,208	102,042	87,344					645,315	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in kg												

Output/matrices are provided as an addendum table and expressed as percent completion by material type.

Discussion

This project is a revised baseline estimate for the stabilization of nuclear materials in H Area based upon work completed for the submission of the F98 OYB. This option has eliminated the startup of HB-Line Phase II and includes the transportation of plutonium and neptunium solutions to F Area for stabilization. The quality of the estimate is high, detailed work activities and a bottoms-up estimating was used to develop the FY98 OYB. Area support, G&A and other overhead burdens were distributed to the H Area facilities. The FY97 data include scope and costs based upon recent guidance provided to WSRC by DOE-SR for the inclusion of H Canyon HM startup preparation.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name Actinide Packaging & Interim Storage Facility Project Number 35
Type of Project XI-C Storage for Long Term (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility Nuclear Materials Stabilization

Project Definition/Work Scope Description

Construction of a new Actinide Packaging and Storage Facility will be complete by 2001. This facility will provide latest technology in treatment and packaging of Plutonium (Pu-239) to meet the DOE Standard DOE STD-3013-94, for the interim storage of plutonium.

Special Nuclear Materials from F Area vaults will be transferred to the APSF for consolidation, materials will be treated/packaged as necessary to meet interim storage requirements awaiting final disposition as determined by the DOE Office of Material Disposition. This repackaging and storage of all SRS identified materials should be complete by the end of FY03.

The repackaging effort in the APSF should be complete in FY2002 after which IAEA potentially taking oversight responsibilities for certain materials in a section or sections of the 2000 unit storage vault.

The actual date and form of material for final disposition is unknown; therefore this facility will continue to operate past the year 2006 to maintain safe storage (monitoring, testing and repackaging) of SNM stored materials until final disposition is complete.

Milestone/ Schedule Information

Startup New APSF / Vault initiate storage of plutonium (IP-3.2-026)	Oct-01
Plutonium metal and oxide packaged to standard (IP-3.2-013)	May-02
Complete the stabilization of all remaining plutonium residues (IP-ES-032)	May-02
Store Np in new vault (IP-3.4-020)	Sept-03

The project management plan will outline specific reportable milestones during the design and construction stages of the project. Repackaging, stabilization and storage of all materials should be complete by the end of 2003.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Actinide Packaging & Interim Storage Facility

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	10,400	17,700	35,017	38,258	26,516						127,891	
Operations						28,425	22,080	17,304	16,683	16,610	101,102	
Other												
Total Cost	10,400	17,700	35,017	38,258	26,516	28,425	22,080	17,304	16,683	16,610	228,993	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in kg												

Discussion

This project is a revised baseline estimate for the construction and operation of a new Actinide Packaging and Storage Facility that is scheduled to be constructed in F Area based upon work completed for the submission of the F98 OYB. The quality of the estimate is high, detailed detailed cost estimating has been completed on the Line Item Project in support of the FY98 OYB. Area support, G&A and other overhead burdens were distributed to the APSF facilities after construction has been completed.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ *Project* ☐ *Level of Effort Activity*

Project Name Depleted Uranium Oxide Project Number 36

Type of Project XI-C Storage for Long Term (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility Nuclear Materials Stabilization

Project Definition/Work Scope Description

Depleted uranium has been a by-product of the SRS plutonium production cycle for approximately 30 years. There are approximately 36,000 drums of depleted uranium trioxide in 55 gallon drums stored in buildings across the site. Some of this inventory may be required through the year 2002 to dilute highly enriched uranium to low enrichment uranium as HEU inventories are stabilized. A recent engineering study, completed (1995) by a sub-contractor, Carolina Metals, Inc., had evaluated the storage of depleted uranium at the Savannah River Site. The recommendation included repackaging all the material into a newly designed container, and construction of a new storage building with cranes for ease of handling and inspection. In addition the facility would provide repackaging and decontamination capabilities. This facility would provide interim storage (40 years) while potential final disposition options for the DU are evaluated.

Note this is a 40 year estimate for storage of depleted uranium

Milestone/ Schedule Information

Construction is planned to begin/complete in FY03-FY04 with repackaging to be completed by FY06.
To support this construction schedule, a new Line Item Project would be required to be validated by FY01
Routine inspection and maintenance of the facilities would be an on going activity for 40 years (facility life cycle) or until a final disposition is identified

There are no other estimated performance measurements for this project at this time, since there is no approval to proceed with the project for DU storage.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Depleted Uranium Oxide

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction							4,042	1,992			6,034	
Operations									972	936	1,908	
Other												
Total Cost							4,042	1,992	972	936	7,942	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												
kg												

Discussion

Engineering study completed by sub-contractor in 1995, Carolina Metals, Inc., Barnwell SC under contract by DOE-SR; report included costs for building construction, repackaging of all depleted uranium oxide currently in storage, relocation and monitoring costs associated with the operation of the facility.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ *Project* ☒ *Level of Effort Activity*

Project Name Wackenhut Separations Support-2003 Project Number 100.3

Type of Project XI-C Storage for Long Term (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility DOE-Savannah River

Project Definition/Work Scope Description

The work scope for this level of activity pertains to the protective force services required for the protection of Special Nuclear Material, classified matter, government property, and employees within the new Actinide Pacakaging and Storage Facility (APSF). These services are mandated by DOE Orders, Facility Description and Operational Plans, Vulnerability Assessments, and Master Safeguards and Security Agreements.

Milestone/ Schedule Information

1st Qtr FY02 - Establish protective force posts in new APSF
1st Qtr FY03 - Reconfigure protective force operations in F area to support new APSF

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

Wackenhut Separations Support-2003

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations												
Other	0	0	0	0	0	0	3,604	3,604	3,604	3,604	14,416	
Total Cost	0	0	0	0	0	0	3,604	3,604	3,604	3,604	14,416	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion

This information assumes that the new APSF will become operational by the end of FY01 and that all SNM stored within 235-F and FB-Line will be removed by the end of FY02 and stored in the new facility. There will be a period of one year in which all of the facilities in F Area (235-F, FB-Line, and APSF) will require protective force staffing until all material can be relocated to APSF. It is projected that no safeguard and security interests will remain in F or H Areas and that the areas will become Property Protection Areas.

Attachment IV

Spent Nuclear Fuel

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

L-Reactor

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	38,600	35,500	30,600	23,100	28,000	23,500	21,300	21,300	21,300	16,300	259,500	
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	38,600	35,500	30,600	23,100	28,000	23,500	21,300	21,300	21,300	16,300	259,500	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												
cubic meters	25	25	25	11	11	11	11	11	11	11	149	
MTHM												

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name RBOF **Project Number** 39

Type of Project XII-A Pre-Stabilization Storage (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO **SR-Program Responsibility** EF&RFS

Project Definition/Work Scope Description

The Receiving Basin for Offsite Fuels Facility (RBOF) consists principally of a 0.5 million gallon fuel storage pool with associated cask handling and fuel handling facilities. Also contained in RBOF is a large deionizer resin regeneration facility. This facility services both the deionizers at RBOF and deionizers for the Reactor areas. RBOF currently stores approximately 6,000 fuel assemblies of offsite research reactor fuel and will receive up to 1,000 more assemblies. Eventually (after 2006), the spent nuclear fuel that is in storage in RBOF will be transferred to the new Transfer & Storage Facility for interim storage. The Pre-Stabilization Storage Project for RBOF includes the following workscope:

- Surveillance and Maintenance of fuel receiving and storage facility, including contained inventory of spent nuclear fuel (SNF).
- Surveillance and Maintenance of deionizer regeneration system; regenerate RBOF-FD and other deionizer resins.
- Safely receive and store foreign and domestic research reactor SNF.

Milestone/ Schedule Information

None - continuing activity

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

RBOF

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	22,200	22,100	22,900	22,800	22,000	18,500	15,300	15,300	15,300	15,300	191,700	
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	22,200	22,100	22,900	22,800	22,000	18,500	15,300	15,300	15,300	15,300	191,700	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												
cubic meters												
MTHM												

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Alternate Treatment Technology Project Number 40

Type of Project XII-B Stabilization (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

Examine, evaluate, and develop, as appropriate, alternative treatment and/or packaging technologies necessary to prepare future foreign research reactor SNF receipts for emplacement in a geologic repository. This will include trade studies, bench-scale modeling and/or pilot scale operations, waste form development, and conceptual design of packaging and storage systems. Examples of technologies which are under consideration include:
- Direct SNF disposal options, such as: Disposal of intact SNF in small canisters and co-disposal with DWPF glass canisters,
- Process which physically change the SNF, such as: melting and diluting with depleted uranium, pressing with depleted uranium, and dissolving and vitrifying with depleted uranium, and
- Conventional chemical separation processes with dilution of separated fissile uranium.

NOTE: The objective of this alternative technology development effort is to characterize a thorough spectrum of available technologies, develop, select, and be in a position to implement by 2000, if possible, (i.e., select optimum technology by 1999 and authorize a Major System Acquisition by 2000 for design and construction new facilities).
- Initiate preconceptual project activities appropriate to support the implementation of: 1) Phase I - New Transfer Facility to be authorized as early as first quarter FY98, and include functions for receipt of off-site SNF, characterize, package and prepare for temporary storage; and 2) Phase II - (if required) a colocated Treatment Facility to further condition SNF for "Road Ready" interim Storage Repository disposal. This task includes preconceptual design studies and preparation of cost estimates and value engineering studies, manpower and equipment requirements, and site selection criteria.

Milestone/ Schedule Information

- Submit CD-2 request for Transfer and Storage Facility - 1Q FY1998

- Select preferred treatment technology - FY1999

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Alternate Treatment Technology

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0		0	0	0	0
Operations	18,000	11,000	7,000	2,000	2,000	1,000	1,000	0	0	0	42,000	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	18,000	11,000	7,000	2,000	2,000	1,000	1,000	0	0	0	42,000	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												
cubic meters												
MTHM												

Discussion

No performance indicator data is given as this is a study only.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Transfer and Storage Facility   Project Number 41

Type of Project XII-B Stabilization   (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO   SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

The functions of the transfer facility include receipt and unloading of shipping casks and transfer of spent nuclear fuels to interim storage. It would be sized to receive projected shipments of offsite domestic and foreign research reactor spent nuclear fuels and to deinventory existing Site wet storage basins. Integral to the transfer facility would be some lag storage (dry) which would be modular in design to permit expansion, as required. Activities under this project include:

- Design, build, and operate a spent nuclear fuel (SNF) transfer and storage facility.

- Begin receipt of SNF from offsite and from the 105-L disassembly basin.

Milestone/ Schedule Information

- Complete construction of transfer and storage facility - FY2001

- Begin receipt of SNF - FY2002

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Transfer and Storage Facility

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	20,000	55,000	102,700	57,300	5,000	0	0	0	0	240,000	0
Operations	0	0	0	0	4,000	27,000	21,000	21,000	21,000	21,000	115,000	
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	0	20,000	55,000	102,700	61,300	32,000	21,000	21,000	21,000	21,000	355,000	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												
cubic meters						30	30	30	30	30	149	
MTHM												

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name Wackenhut Reactor Support Project Number 100.1

Type of Project XII-C Storage for Long Term (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility DOE-Savannah River

Project Definition/Work Scope Description

The work scope for this level of activity pertains to the protective force services required for the protection of Special Nuclear Material, classified matter, government property, and employees within the Reactor Areas to include K-Reactor and L-Reactor. These services are mandated by DOE Orders, Facility Description and Operational Plans, Vulnerability Assessments and Master Safeguards and Security Agreements.

Milestone/ Schedule Information

1st Qtr FY01 - Remove protective force posts from K-Reactor
1st Qtr FY01 - Establish additional protective force posts in L-Reactor
1st Qtr FY02 - Establish protective force posts in new Transfer and Storage Facility

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Wackenhut Reactor Support

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	6,996	6,996	6,996	6,996	5,864	6,398	6,398	6,398	6,398	6,398	65,838	
Other												
Total Cost	6,996	6,996	6,996	6,996	5,864	6,398	6,398	6,398	6,398	6,398	65,838	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion

This information assumes that all SNM currently stored in K-Reactor is removed by the end of FY00 and transferred to L-Reactor for long term storage. It also assumes that the new Transfer and Storage Facility will be operational in FY02 for receipt and storage of Spent Nuclear Fuel and that minimal protective force staffing will be required.

Attachment IV

Facilities

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity
Project Name M-Area **Project Number** 44
Type of Project XIII-A Pre-Deactivation Monitoring (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

This activity includes all programmatic and physical support efforts associated with maintaining buildings 313-M, 320-M, 321-M, 322-M, and ancillary facilities in a safe and environmentally sound manner until transition to a decontamination & decommissioning (D&D) status is achieved. This activity will provide all operational, technical, regulatory, and maintenance support required to maintain 300-M Area facilities in a safe and environmentally sound manner through a continuing Surveillance and Maintenance program. The Surveillance program will be used to maintain facilities and support equipment for fire protection, habitability, and environmental protection; housekeeping and safety activities will be conducted to comply with OSHA requirements; support, oversight, and guidance in meeting laws, regulations, DOE Orders, and WSRC requirements in the areas of radiological controls, hazardous material shipments, occupational safety and health, environmental protection, and quality assurance will be provided. The Maintenance program will provide the required preventive and corrective maintenance for electrical, mechanical, monitoring, and HVAC equipment associated with habitability, life safety, ventilation, fire protection, and environmental protection. Radioactive, hazardous, and mixed wastes generated as a result of operations will be collected, segregated, packaged, and shipped for disposal.

Milestone/ Schedule Information

- Transition to long term monitoring - FY2001

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

M-Area

Costs	**1997**	**1998**	**1999**	**2000**	**2001**	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	3,000	3,000	2,500	2,500	0	0	0	0	0	0	11,000	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	3,000	3,000	2,500	2,500	0	0	0	0	0	0	11,000	0

Output/Metrics	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities												

Discussion
Performance indicators are not applicable for this activity.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name Reactor Projects Project Number 45

Type of Project XIII-A Pre-Deactivation Monitoring (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

Surveillance & Maintenance activities on the 105-P, 105-C, 105-R, and ancillary facilities ensure that the facility continues to pose acceptable risk to the environment, site workers, and the general public; maintaining the facility in accordance with the safety basis requirements; and activities necessary for cost effective management, planning, and oversight. Activities under this project include:
- Surveillance and maintenance of support equipment required for fire protection, habitability, and environmental protection.
- Maintenance of operating procedures.
- Operator training.
- Support for housekeeping.
- Waste handling including mixed, radioactive and hazardous, and waste minimization.
- Environmental engineering.
- Corrective maintenance.

Milestone/ Schedule Information

- Transition to long term monitoring as follows:
  - R Area: FY2001
  - P Area: FY2002
  - C Area: FY2003

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Reactor Projects

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	9,800	7,800	8,300	6,000	6,000	6,000	5,000	5,000	5,000	5,000	63,900	
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	9,800	7,800	8,300	6,000	6,000	6,000	5,000	5,000	5,000	5,000	63,900	0

Output/Metrics	1997	1998	1999	2000	2001	20^2	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities												

Discussion
Performance indicators are not applicable for this activity.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity
Project Name Heavy Water Processing Project Number 47
Type of Project XIII-A Pre-Deactivation Monitoring (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

Surveillance & Maintenance includes the following activities toensure the facility continues to pose acceptable risk to the environment, site workers, and the general public; maintaining the facility in accordance with the safety basis requirements; and activities necessary for cost effective management, planning, and oversight. The predeactivation monitoring project for heavy water includes the following activities:

- Shift Operations required to maintain operations within Technical Standards, Basis for Interim Operations, and procedure requirements.
- Surveillance of support equipment required for fire protection, habitability, and environmental protection
- Maintenance of operating procedures
- Operator training
- Support for housekeeping
- Safety initiatives to comply with OSHA
- Waste handling including mixed, radioactive and hazardous, and waste minimization
- Environmental engineering
- Preventive and corrective maintenance
- Site support services that provide steam, water, fire protection water and sanitary waste treatment
- Maintain Heavy Water monitoring equipment until water is removed from the storage buildings

Milestone/ Schedule Information

- Transition to long term storage - FY2000

This project includes the surveillance and maintenance of D-Area facilities, heavy water storage facilities (105-13P, 105-13K, & 122-R) and the transfer of specification heavy water from D, and C Area to K and/or L Area.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Heavy Water Processing

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	1,700	1,200	1,200	0	0	0	0	0	0	0	4,100	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	1,700	1,200	1,200	0	0	0	0	0	0	0	4,100	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities												

Discussion
Performance indicators are not applicable for this activity.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name M Area Project Number 51

Type of Project XIII-B Deactivation (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

Deactivate the buildings in the 300-M Area and make them available for leasing, to support existing future SR missions, or for D&D. General activities will include removing and disposing of process related equipment not required to support mission requirements; preparation of transition and NEPA documentation; decontamination of facilities where feasible, or dismantlement and removal; asbestos identification; disposition of excess hazardous materials, chemicals, and equipment; environmental and radiological characterization; and gross clean out of residual hazardous and radioactive materials. The Facility Deactivation Phase involves clean out, flushing, deinventory and disposition of chemicals and hazardous materials (including depleted uranium and lithium). Equipment and facility clean-out and flushing is also required to remove residual radiological and hazardous materials to an acceptable level, survey/assess residual levels, and manage in accordance with regulatory requirements. This task is considered a prudent use of resources and is necessary to complete while the effluent treatment facilities are available. These activities will be completed in stages for each system and building as deinventory tasks are completed. Radiological surveys of process facilities must be performed and documented.

Milestone/ Schedule Information

- Complete D&D - FY2000

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

M Area

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	1,500	1,000	5,000	4,000	0	0	0	0	0	0	11,500	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	1,500	1,000	5,000	4,000	0	0	0	0	0	0	11,500	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities				251,000							251,000	

Number of contaminated buildings to be deactivated by FY2000: 12

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Reactor Projects   Project Number 52

Type of Project XIII-B Deactivation (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO   SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

Facility Stabilization: This activity includes all programmatic and physical support efforts related to deinventory and deactivation required for cost effective overall management required to maintain the Reactors in the cold shutdown condition with no capability for restart. The activities include decontamination where feasible, or dismantlement and removal, of contaminated facilities and equipment outside of the 105 buildings; and activities necessary for cost effective management, planning, and oversight. The current stabilization mission for the 100-Areas includes support required to remove surplus materials, chemicals, supplies, declassified materials and to stabilize contamination including the removal of hazardous, mixed and radioactive wastes. These actions also include support Moderator Management, waste handling and removal and facility deactivation. The following activities will reduce long-term S&M costs.

- Draining small process lines (P, L, R, C)
- Clean out of basin sludge (K, P, R, C)
- Removal of disassembly basin water (K, P, R, C)
- Grouting of 106 and 109 buildings (K, P, L, R, C)
- D&R of distillation towers and hazardous material removal (K)

Milestone/ Schedule Information

- Complete area deactivation as follows:

  - K Area: FY2001
  - R Area: FY2001
  - P Area: FY2002
  - C Area: FY2003
  - L Area: (after 10 year window)

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Reactor Projects

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	0	0	2,000	6,500	13,500	7,000	2,000	0	0	0	31,000	2000
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	0	0	2,000	6,500	13,500	7,000	2,000	0	0	0	31,000	2000

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities					1,018,000	1,004,000	755,000				2,777,000	

Number of contaminated buildings to be deactivated by FY2000: 8; by FY2002: 4; by FY2003: 7.

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name D Area Project Number 53
Type of Project XIII-B Deactivation (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

The activity includes all programmatic and physical support efforts related to deinventory and deactivation required for cost effective overall management required to maintain the area in the cold shutdown condition with no capability for restart. The activities include decontamination where feasible, or dismantlement and removal, to reduce risks and avoid disposal costs; and activities necessary for cost effective management, planning, and oversight. The current stabilization mission includes support required to remove surplus materials, chemicals, supplies, declassified materials and to stabilize contamination including the removal of hazardous, mixed and radioactive wastes. These actions also include support for waste handling and removal and facility deactivation. These activities will reduce long-term S&M costs. "Clean" facilities will be turned over to landlord organizations.

Milestone/ Schedule Information

- Complete D Area D&D - FY2001

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

D Area

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	0	0	500	3,500	1,000	0	0	0	0	0	5,000	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	0	0	500	3,500	1,000	0	0	0	0	0	5,000	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities					38,000						38,000	

Number of contaminated buildings to be deactivated by FY2001: 7

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Heavy Water Processing Project Number 54

Type of Project XIII-B Deactivation (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

Process heavy water to be sold and stored through the following processes:

The Heavy Water (HW) Program will continue to operate to upgrade the current inventory of degraded heavy water for storage and/or sale to an offsite vendor. Surplus HW Processing facilities will be shut down consistent with the Moderator Management Plan. Included in this task is the routine operation to remove corrosive, radioactive, and light water contamination. The Rework Unit (RW) and the Dupont Water Plant (DW) isotopically upgrade heavy water. The high Activity Moderator (HAM) facility in K Area, and the Moderator Processing Facility (MPF) and Technical Purification Facility (TPF) in D Area, remove various contaminants from heavy water. The activity also includes drum washing, and Tritium Effluent Water Monitor operation. Continue receipt of heavy water from Oak Ridge and support other off site requirements.

Purchase 1,000 additional stainless steel drums.

Milestone/ Schedule Information

- Procure additional stainless steel drums - FY1998
- Complete processing of heavy water intended for sale - FY1999
- Complete processing of heavy water intended for storage - FY1999

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Heavy Water Processing

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	13,800	14,800	7,300	0	0	0	0	0	0	0	35,900	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	13,800	14,800	7,300	0	0	0	0	0	0	0	35,900	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities	113	113	114								340	

Quantity is given in metric tons of heavy water.

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity
Project Name H Area — Project Number 55
Type of Project XIII-B Deactivation (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO — SR-Program Responsibility Nuclear Materials Stabilization

Project Definition/Work Scope Description

If there are no new missions for the H-Area facilities, Nuclear Materials Stabilization Program (NMSP) will begin a deactivation program in FY03. Detailed deactivation plans do not currently exist and development of these plans should be funded in years prior to completion of the NMSP (2000-2002). After completion of the Nuclear Material Stabilization Program, H Area facilities are visioned to be highly contaminated hazard class 2 nuclear facilities. The primary objective of the 4 year (2003-2006) deactivation program is to reduce the risks associated with these nuclear facilities and lower long term S&M costs associated with these facilities by implementing an accelerated deactivation program. The H Area facilities will attempt to achieve a passive state of operation, facilities will be locked with only quarterly entry for inspection and monitoring. The maintenance of the building structures and key safety systems (ventilation/monitoring) are expected to be the only routine activities required. It is expected that these conditions would be maintained for up to a 10 year period awaiting final decisions on facility D&D. The H Area facilities are envisioned to be completely deactivated by the end of 2006.

Milestone/ Schedule Information

Develop and approve facility deactivation - Phase I (facility stabilization) plans by Sept.-02
Begin deactivation by Oct-02
Complete Phase I deactivation of H Area Facilities by Sept.-06

Specific milestones will be developed as Deactivation Planning begins in FY99. For planning purposes, it is assumed that there will be approximately 100% of the H Area facilities deactivated by the end of 2006.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

H Area

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations				3,000	3,000	3,000	96,080	96,417	110,433	107,777	419,707	
Other												
Total Cost				3,000	3,000	3,000	96,080	96,417	110,433	107,777	419,707	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												
square ft.										430,000	430,000	
facilities												

Discussion

Quality of the estimate is low. It is based upon best Engineering judgment, estimate was prepared using a parametric analysis of current S&M and operational standby costs, 1993 SRS Canyon De-Inventory Plans and information obtained from the Hanford-Purex Deactivation Plan to generate SRS expenditures for deactivation activities.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name F Area **Project Number** 56

Type of Project XIII-B Deactivation (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO **SR-Program Responsibility** Nuclear Materials Stabilization

Project Definition/Work Scope Description

If there are no new missions for the F-Area facilities, Nuclear Materials Stabilization Program (NMSP) will begin a deactivation program in FY03. Detail deactivation plans do not currently exist and development of these plans should be funded in years prior to completion of the NMSP (2000-2002). After completion of the Nuclear Material Stabilization Program, F Area facilities are visioned to be highly contaminated hazard class 2 nuclear facilities. The primary objective of the deactivation program is to reduce the risks associated with these nuclear facilities and lower long term S&M costs associated with these facilities by implementing an accelerated deactivation program. The F Area facilities are envisioned to be the most difficult to deactivate, and the facilities will not be completely deactivated by the end of 2006. Further funding during this time period (2003-2006) would not necessarily result in completion of the deactivation program, it is anticipated that additional deactivation activities through 2008 will be required to deactivate the F Area facilities to achieve the level of S&M forecasted for the H Area facilities (2006).

Milestone/ Schedule Information

Develop and approve facility deactivation - Phase I (facility stabilization) plans by Sept.-02
Begin deactivation of F Area Facilities by Oct-03
Deactivation approximately 70% complete Sept-06
Complete F Area facilities deactivation by Sept-08

Specific milestones will be developed as Deactivation Planning begins in FY00. For planning purposes, it is assumed that 70% of the F Area facilities will be deactivated by the end of 2006.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

F Area

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations				4,000	4,000	4,000	93,363	101,147	114,352	108,093	428,955	200,000
Other												
Total Cost				4,000	4,000	4,000	93,363	101,147	114,352	108,093	428,955	200000

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities												500000

Discussion

Quality of the estimate is low. It is based upon best Engineering judgment, estimate was prepared using a parametric analysis of current S&M and operational standby costs, 1993 SRS Canyon De-Inventory Plans and information obtained from the Hanford-Purex Deactivation Plan to generate SRS expenditures for deactivation activities.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name 247-F Project Number 57

Type of Project XIII-B Deactivation (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility Nuclear Materials Stabilization

Project Definition/Work Scope Description

The 247-F facility has undergone an initial deactivation program in FY96 and will complete current scope of work in FY97. It is estimated that there will be a 60% reduction in long term S&M costs realized with the completion of the current program.

Issues that preclude further reductions in S&M are relocation of the current personnel and computer development lab in the building administrative wing (estimated $1-3 million to relocate), complete decommissioning of the process manufacturing core (estimated $40 million in early 90's). Completion of these activities could result in further S&M reductions (estimated at < $0.3 million annually) with only quarterly entry to ensure integrity of the building structure and to monitor for potential contamination spread.

Milestone/ Schedule Information

Deactivation efforts initiated in FY96 will be completed in FY97, the facility is expected to be maintained in the resulting state of S&M until a final decision is reached on D&D of the facility.

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

247-F

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	5,809	4,145	4,471	3,606	3,410	3,186	3,042	2,850	2,749	2,661	35,929	
Other												
Total Cost	5,809	4,145	4,471	3,606	3,410	3,186	3,042	2,850	2,749	2,661	35,929	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities	160,000										160,000	

Discussion

Budget quality estimate for S&M costs based on FY98 OYB. The quality of the estimate is high, detailed work activities and bottoms-up estimating was used to develop the FY98 OYB assuming initial phase of deactivation is complete in FY97.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name M Area Project Number 58

Type of Project XIII-C Long-term Monitoring (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☒ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

This effort entails low-cost Surveillance and Maintenance activities of M-Area facilities to ensure the area poses acceptable risk to the environment, site personnel, and general public. Periodic surveys will be conducted on support equipment required for fire protection, habitability, and environmental protection. Maintaining lighting, handrails, walking surfaces, and barriers to radioactive/contaminated areas lessen potential personnel injury or radiation exposure.

Milestone/ Schedule Information

None - maintain status quo.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

M Area

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	0	0	0	0	500	500	500	500	500	500	3,000	.
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	0	0	0	0	500	500	500	500	500	500	3,000	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities												

Discussion

No performance indicator data is given due to the nature of the activity.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity
Project Name Reactor Projects   Project Number 59
Type of Project XIII-C Long-term Monitoring (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☒ ER ☐ TD ☐ NM ☐ SO   SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

This effort entails low-cost Surveillance and Maintenance activities of P, C, R, K, and L Reactor facilities to ensure the area poses acceptable risk to the environment, site personnel, and general public. Periodic surveys will be conducted on support equipment required for fire protection, habitability, and environmental protection. Maintaining lighting, handrails, walking surfaces, and barriers to radioactive/contaminated areas lessen potential personnel injury or radiation exposure.

Milestone/ Schedule Information

None - maintain status quo.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Reactor Projects Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	0	0	0	2,000	6,000	6,000	6,700	6,700	6,700	6,700	40,800	
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	0	0	0	2,000	6,000	6,000	6,700	6,700	6,700	6,700	40,800	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities												

Discussion
No performance indicator data is given due to the nature of the activity.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity
Project Name D Area **Project Number** 60
Type of Project XIII-C Long-term Monitoring **(select one from the Attachment II categories)**
Managing or Funding Program (check one or more) ☐ WM ☒ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility EF&RFS

Project Definition/Work Scope Description

This effort entails low-cost Surveillance and Maintenance activities of D-Area facilities to ensure the area poses acceptable risk to the environment, site personnel, and general public. Periodic surveys will be conducted on support equipment required for fire protection, habitability, and environmental protection. Maintaining lighting, handrails, walking surfaces, and barriers to radioactive/contaminated areas lessen potential personnel injury or radiation exposure.

Milestone/ Schedule Information

None- maintain status quo.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

D Area

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	0	0	0	0	100	100	100	100	100	100	600	
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	0	0	0	0	100	100	100	100	100	100	600	0

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities												

Discussion

No performance indicator data is given due to the nature of the activity.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name Heavy Water Storage **Project Number** 61

Type of Project XIII-C Long-term Monitoring (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO **SR-Program Responsibility** EF&RFS

Project Definition/Work Scope Description

This effort entails low-cost Surveillance and Maintenance activities of L-Area facilities used to store Heavy Water, and the heavy water inventories, to ensure the area poses acceptable risk to the environment, site personnel, and general public. Periodic surveys will be conducted on support equipment required for fire protection, habitability, and environmental protection.

Milestone/ Schedule Information

None - maintain status quo.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Heavy Water Storage

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Operations	0	0	0	1,000	1,000	1,000	1,000	1,000	1,000	1,000	7,000	
Other	0	0	0	0	0	0	0	0	0	0	0	0
Total Cost	0	0	0	1,000	1,000	1,000	1,000	1,000	1,000	1,000	7,000	0

Output/Metrics	1997	1998	1999	2000	2001	20(2	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in square ft. facilities												

Discussion
No performance indicator data is given due to the nature of the activity.

Attachment IV

Site Infrastructure Landlord Program

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Plantwide Fire Protection Project Number 65

Type of Project XIV-A Projects (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility Infrastructure

Project Definition/Work Scope Description

The mission of the Plantwide Fire Protection Project (PWFP) is to design and install a cost effective and prioritized set of fire protection upgrades to existing SRS facilities. These upgrades are designed to improve fire safety, and to allow the SRS to apply commercial practices while meeting the requirements of DOE Orders and national codes and standards relative to fire protection.

Milestone/ Schedule Information

2/27/97 - Project complete Fire Protection H-Canyon Detectors
3/31/97 - Project complete DWPF Fire Proteciton Improvements
7/31/97 - Project Complete Service Facilities Fire Protection Upgrades
8/29/97 - Project Complete HB-Line Fire Protection Upgrade
6/30/98 - Project Complete F Canyon/FB Line Fire Protection Upgrade

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

Plantwide Fire Protection

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	2,227	1,553	500								4,280	
Other												
Total Cost	2,227	1,553	500								4,280	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

N/A

Discussion

Baseline validated.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name Operations Support Facility Project Number 66
Type of Project XIV-A Projects (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility Infrastructure

Project Definition/Work Scope Description

This new facility provides administrative office space for operations-related activities. Project construction is completed and remaining activites are for project closure only.

Milestone/ Schedule Information

3/31/97 - Project financially closed.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Operations Support Facility

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	12										12	
Other												
Total Cost	12										12	

Output/Metrics Amounts in	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete

N/A

Discussion
Baseline validated.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Plant Maintenance & Improvement Project Number 67

Type of Project XIV-A Projects (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility Infrastructure

Project Definition/Work Scope Description

This line item consists of three subprojects: S-3515, D-Area Domestic Water; S-5916, WSRC Oversight; S-3072, A-Area Powerhouse Effluent Treatment/Reroute.

S-3515, completed in FY95 by the Corps of Engineers, provided a domestic water system in D Area which complies with current SCDHEC regulations for drinking water. S-5916, also completed, provided for WSRC project management oversight of project S-3515.

S-3072 is under construction with a forecast completion in FY98. This project routes A Area powerhouse flows not requiring treatment directly to a NPDES permitted outfall. Flows requiring treatment are routed to the A Area sanitary wastewater collection system. This project will bring SR into compliance with Settlement Agreement 90-13-W between DOE and SCDHEC to cease all untreated discharge.

Milestone/ Schedule Information

6/13/97 Construction Complete
8/29/97 Project Complete

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Plant Maintenance & Improvement

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction											274	
Operations	216	58										
Other												
Total Cost	216	58									274	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

N/A

Discussion
Baseline validated.

Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Domestic Water Upgrades Project Number 68

Type of Project XIV-A Projects (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility Infrastructure

Project Definition/Work Scope Description

This line item project encompasses upgrades to the site Domestic Water treatment,storage and distribution systems to comply with the South Carolina Department of Health and Environmental Controls (SCDHEC) state drinking water regulation, R61-58.

The Line Item will install intra-area distribution systems in A,B,D,N,TNX,and Forestry Areas; two elevated storage tanks; a water treatment plant; a transmission pipe connecting D-Area with TNX facility; and an inter-area transmission loop connecting A,Forestry,Z,S,H,N,C,F,and B areas. Scope of the activity does not presently include any improvements in L Area that would be required to support the continued or expanded staffing for a spent fuel storage mission in the Area.

Milestone/ Schedule Information

8/31/97- Complete Turnover of Systems For Startup Testing Phase II
9/29/97 - KD-4 Approval to commense operations Phase II
9/30/97 - Project Complete: Phase II

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Domestic Water Upgrades

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	2,025	299									2,324	
Other												
Total Cost	2,025	299									2,324	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

N/A

Discussion
Baseline validated.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Building Chillers Project Number 69

Type of Project XIV-A Projects (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility Infrastructure

Project Definition/Work Scope Description

This line item project provides for the replacement or retrofit of refrigeration chillers containing chlorofluorocarbons (CFCs) that are located in various facilities sitewide. Legislation banned CFC production effective 12/31/95.

Ozone depleting substances will be removed from SRS Operations in all facilities where 10 lbs or more refrigerant charge is utilized.

* This Line Item is being implemented via 11 subprojects:

S-5533, Tritium	S-6055, 299-H	S-6053, Analytical Lab
S-6015, 777-10A	S-6056, 235-F	S-6059, 247-F
S-6016, F-Canyon	S-6057, D-Area	S-6054, DWPF
S-6052, H-Canyon	S-6058, A-Area	

Milestone/ Schedule Information

12/31/96 - Award FPCC Tritium Consol PH II
6/30/98 - Award FPCC 249-H Tritium PH III
6/30/98 0 Tritium Consol Construction Complete Ph II
3/31/99 - Construction Complete Phase III

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Building Chillers

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	8,541	8,500	8,000	7,500	10,959						43,500	
Operations	1,578	2,490	2,836	2,077	1,949	527					11,457	
Other												
Total Cost	10,119	10,990	10,836	9,577	12,908	527					54,957	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

N/A

Discussion
Baseline validated

Attachment IV

Supporting Data

Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Radio Trunking System Project Number 70

Type of Project XIV-A Projects (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility Infrastructure

Project Definition/Work Scope Description

The trunked radio system incorporates the use of a computer controlled radio system to automatically assign radio channels in a manner transparent to the radio user. The system software allows dynamic reconfiguration of communication resources to meet operations requirements or temporary short term emergency needs. The project will provide a new tower site or sites with a small equipement shelter, backup power, and a trunked radio repeater system. Portions of the existing radio systems will continue to be operational in conjunction with the trunked radio system. Most conventional plant radios will be replaced with the trunked radios and transferred to the new system.

Milestone/ Schedule Information

12/17/96 - Complete Title II Design
5/12/98 - Construction Complete
6/30/98 - KD-4 Approval to Commense Operations
9/3/98 - Project Complete

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Radio Trunking System

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	150	149									299	
Other												
Total Cost	150	149									299	

Output/Metrics	1997	1998	1999	2000	2001	200?	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

N/A

Discussion
Baseline validated.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Site Road Infrastructure Project Number 71

Type of Project XIV-A Projects (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility Infrastructure

Project Definition/Work Scope Description

This activity encompasses Infrastructure activities for road & bridge repairs to major site roads. The remaining work in this task covers the tracking of Corps of Engineer work on bridges only.

Milestone/ Schedule Information

None

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Site Road Infrastructure	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Costs												
Construction												
Operations	142	150	150	150							592	
Other												
Total Cost	142	150	150	150							592	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

N/A

Discussion
Baseline validated.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name High Level Drain Lines Project Number 72

Type of Project XIV-A Projects (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility Infrastructure

Project Definition/Work Scope Description

This Line Item replaces the High Level Drain Lines for the network of labs in Building 772-F with Halar Pipe designed to withstand the corrosive effects of discarded lab reagents and lab sample materials associated with high level radioactive analytical testing and analysis.

Milestone/ Schedule Information

3/31/97 - Construction Complete
6/30/97 - Project Complete

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

High Level Drain Lines												
Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	455										455	
Other												
Total Cost	455										455	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion
Baseline validated.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Health Physics Support Facility Project Number 73

Type of Project *XIV-A Projects* (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility Infrastructure

Project Definition/Work Scope Description

This project will provide an approximately sized 45,000 sf facility to include a dosimetry and in-vitro laboratory in which to perform dosimetric analyses and radiological in-vitro bioassay analyses.

This project will support regulatory and health protection requirements which continue to become more restrictive and comprehensive. Basic inadequacies and deterioration of the present facility make it extremely difficult to process dosimetry, urine and fecal bioassay samples in a timely and accurate fashion in order to support radiological objectives (production process, decontamination, decommissioning and waste cleanup) and personnel protection requirements at the Savannah River Site.

Milestone/ Schedule Information

01/97 - A&E work initiated (Title 1 design).
2/98- Physical construction starts.
3/00- Physical construction complete.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Health Physics Support Facility

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	1,500	4,200	10,300	1,200							17,200	
Operations	160	170	250	510							1,090	
Other												
Total Cost	1,660	4,370	10,550	1,710							18,290	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

/A

iscussion
aseline validated

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name *Environmental Monitoring Lab* Project Number 74
Type of Project XIV-A Projects (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility *Infrastructure*

Project Definition/Work Scope Description

This new facility will provide a 54,000 sf laboratory and a 1,800 sf waste neutralization complex (to be used by both the HPSSF and EML prior to discharging wastes to the environment).

The facility will effectively support continued compliance with regulatory requirements through timely performance of radiological effluent monitoring and surveying and non radiological monitoring and surveillances throughout SRS and the surrounding areas. The EML also performs Baseline Studies prior to construction of major installations in each area within SRS. The EML provides support to: DWPF, Reactors, Consolidated Incinerator Facility (CIF), Environmental Restoration and other environmental programs.

Milestone/ Schedule Information

1/97 - A&E work initiated (Title 1 design).
3/98 - Physical construction starts.
3/00 - Physical construction ends.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Environmental Monitoring Lab

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction			2,300	5,600	18,100	4,280					30,280	
Operations			450	430	400	600	290				2,170	
Other												
Total Cost			2,750	6,030	18,500	4,880	290				32,450	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

•

N/A

Discussion

Baseline validated

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity
Project Name DOE-Non WSRC Construction Project Number 101.9
Type of Project XIV-A Projects (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility DOE-Savannah River

Project Definition/Work Scope Description

This project is the Upgrade Site Road Infrastructure project being executed by the Army Corp of Engineers. It involves the replacement of four bridges including the 2-lane bridge on Road F, two 4-lane bridges on Road C, and the clover leaf bridge at Road 2 and Road C. One of the Road C bridges and the Road F bridge are currently on wooden pile foundations and will be replaced with steel pile structures. The other Road C bridge was derated due to low strength steel used during construction. The clover leaf has experienced differential settlement at abutments and wing walls.

Milestone/ Schedule Information

Initiate Title I Design -- January 1, 1995
Complete Title I and II design -- January 31, 1996
Start Physical Construction -- July 1996
Complete Construction -- September 1998

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

DOE-Non WSRC Construction

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	4,137	2,713									6,850	
Operations	0	0	0	0	0	0	0	0	0	0	0	
Other												
Total Cost	4,137	2,713	0	0	0	0	0	0	0	0	6,850	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Infrastructure Line Items Project Number 79

Type of Project XIV-A Projects (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility Infrastructure

Project Definition/Work Scope Description

This project is for the upfront planning, design, and budget determinations, and documentation required to support future Infrastructure line items.

Milestone/ Schedule Information

None, milestones are established with the individual line item as they are carried forward to approval.

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

Infrastructure Line Items	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Costs												
Construction	0	0	0	6,776	11,759	14,221	12,829	11,839	10,419	11,663	79,506	
Operations				13,192	8,917	12,771	6,180	7,356	6,675	5,000	60,091	
Other												
Total Cost	0	0	0	19,968	20,676	26,992	19,009	19,195	17,094	16,663	139,597	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

N/A

Discussion

Future Line Items is planning case only.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name Operational Activities Project Number 75

Type of Project XIV-B Operational Activities (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☐ NM ☒ SO SR-Program Responsibility Infrastructure

Project Definition/Work Scope Description

Operational Activities includes all site baseline activities necessary to operate the Site Infrastructure Program including the following:

1. Requested Infrastructure support for DOE's direct Savannah River activities.
2. Reimbursed work for USForrestry Service (USFS) in support of Savannah River land management.
3. Capital Equipment projects for the purchase and installation of equipment upgrades to obsolete equipment and new equipment to support Priority 1: safe storage of nuclear materials; regulatory requirements and commitments and Priority 2: support of mission critical operations .
4. General Plant Projects (GPP) are projects involving the design (excluding conceptual), construction, installation or other acquisition of land, property right, buildings, structures, utility lines, roads or facilities necessary to reduce or eliminate health, fire, safety and security problems in support of general site infrastructure and the SRS Mission consistent with DOE requirements. In particular, these projects support Priority 1: safe storage of nuclear materials; regulatory requirements and commitments, and Priority 2: support of mission critical operations .

Milestone/ Schedule Information

This project includes many and varied levels of tasks and activities. Identification of specific milestones for these tasks/activities is unrealistic.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Operational Activities												
Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction	9,265	12,734	8,268	8,204	5,670	4,751	4,751	4,751	4,751	4,751	67,896	
Operations	6,097	11,974	13,260	11,940	7,166	7,950	8,092	7,717	7,354	7,002	88,552	
Other												
Total Cost	15,362	24,708	21,528	20,144	12,836	12,701	12,843	12,468	12,105	11,753	156,448	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

N/A

Discussion
Baseline validated.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☒ Project ☐ Level of Effort Activity

Project Name Waste Minimization   Project Number 76

Type of Project XIV-B Operational Activities (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☐ ER ☐ TD ☐ NM ☐ SO   SR-Program Responsibility Solid Waste

Project Definition/Work Scope Description

An aggressive waste minimization program is being developed and implemented at SRS. Key strategies will included waste volume allocation, a generator financial accountability for waste volume generation and increased utilization of innovative commercial best practices, such as screening and release initiatives. Waste minimization will be integrated with clean-up and stabilization activities, emphasizing life-cycle costs, return-on-investment and mortgage reduction by reducing waste generation. Demonstrate and deploy innovative technologies to reduce all wastes including sanitary waste both on and off-site utilizing cooperative and other agreements. Transfer these technologies to provide regional economic diversification among SR and external private industries.

Milestone/ Schedule Information

Reduce by 50% the generation of Low Level waste - 12/31/99
Reduce by 50% the generation of Low Level Mixed waste - 12/31/99
Reduce by 50% the generation of Hazardous waste - 12/31/99
Reduce by 50% the total releases and offsite transfers for treatment and disposal of toxic chemicals - 12/31/99
Reduce by 33% the generation of Sanitary waste - 12/31/99
Recycle 33% of Sanitary waste - 12/31/99

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

Waste Minimization	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Costs												
Construction												
Operations	2,460	2,363	1,944	1,372	1,373	1,379	1,379	1,379	1,379	1,379	16,407	
Other												
Total Cost	2,460	2,363	1,944	1,372	1,373	1,379	1,379	1,379	1,379	1,379	16,407	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Not Applicable.

Discussion

Planning. References used include Out-Year-Budget and Baseline Environmental Management Report.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name Wackenhut Landlord Activities Project Number 100.4

Type of Project XIV-B Operational Activities (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility DOE-Savannah River

Project Definition/Work Scope Description

The work scope for this activity pertains to the personnel and services provided in support of the operating contract to include all indirect/overhead costs. These services are manadated by the operating contract and requirements associated with supporting protective force operations. Landlord activities involve planning, training, compliance, administration, environment, safety and health, clerical, as well as area support functions to include 700-A Area protective forces, law enforcement, and barricade personnel.

Milestone/ Schedule Information

1st Qtr FY03 - Eliminate applicable support personnel and non-labor costs, as necessary, in response to decreased protective force requirements.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Wackenhut Landlord Activities

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	21,259	25,951	28,584	28,584	29,716	28,754	23,196	23,196	23,196	23,196	255,632	
Other												
Total Cost	21,259	25,951	28,584	28,584	29,716	28,754	23,196	23,196	23,196	23,196	255,632	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion

Based upon WSI budget review & requirement estimates. The data for 2003-2006 are acceptable only if data sheet assumptions prove valid. This information assumes that protective force operations and requirements will be drastically downsized beginning in FY03 due to conceptual projects which will consolidate storage of Special Nuclear Materials.

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name Forest Service Project Number 101.5

Type of Project XIV-B Operational Activities (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility DOE-Savannah River

Project Definition/Work Scope Description

The Savannah River Forest Station conducts a program of natural resource management to protect soil and watershed values, provide healthy forest within a National Environmental Research Park, enhance environmental diversity, protect threatened and endangered species, and provide quality habitats for wildlife. The Forest Service manages the SRS secondary road system, maintains the exterior boundaries, participates in waste-site closure projects, and provides aerial photo services. Reserach includes endangered species recovery, wetland pine and hardwood restoration, biodiversity, productivity, and smoke and pest control. The Forest Service provides wildland fire protection program to insure on-site initial attack capability as well as fire prevention, presuppression, and detection.

Milestone/ Schedule Information

Not Applicable - Level of Effort

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Forest Service												
Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	11,800	10,500	10,553	10,522	10,492	10,462	10,361	10,260	10,160	10,062	105,172	
Other												
Total Cost	11,800	10,500	10,553	10,522	10,492	10,462	10,361	10,260	10,160	10,062	105,172	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name Ecology Lab Project Number 101.6

Type of Project XIV-B Operational Activities (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO SR-Program Responsibility DOE-Savannah River

Project Definition/Work Scope Description

The Savannah River Ecology Laboratory is a research unit of the University of Georgia operating on the Savannah River Site. This unit performs research in basic and applied ecology as well as on the fate and effects of various contaminants and the effects of other stresses on the biological communities. In addition to research, SREL provides environmental education and training programs to the local community and schools in the area as well as supervision of students and faculty members from various colleges and universities. Data acquired by SREL since 1951 provide the basis for ecological risk assessment necessary for site clean-up and remediation activities.

Milestone/ Schedule Information

Not Applicable -- Level of Effort

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

Ecology Lab Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	10,200	10,500	12,066	12,094	11,927	11,763	11,649	11,536	11,423	11,312	114,470	
Other												
Total Cost	10,200	10,500	12,066	12,094	11,927	11,763	11,649	11,536	11,423	11,312	114,470	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity
Project Name DOE Other Program Support G&E **Project Number** 101.7
Type of Project XIV-C Grants & External Support (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☐ ER ☐ TD ☒ NM ☐ SO **SR-Program Responsibility** DOE-Savannah River

Project Definition/Work Scope Description

Provides funding for Payments in Lieu of Taxes (PILTS) to local counties in which SRS is situated consistent with provisions of the Atomic Energy Act. Also provides funding for special studies related to groundwater migration conducted by the U.S. Geological Service as well as studies conducted by educational institutions (including grants to Historically Black Colleges and Universities) related to SRS Environmental Management activities.

Milestone/ Schedule Information

Not Applicable - Level of Effort

Attachment IV

Project /Level of Effort Activity Funding Table

(In Thousands of 1998 Dollars)

DOE Other Program Support G&E

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	59,650	
Other												
Total Cost	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	59,650	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion

Attachment IV

All Other

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity

Project Name DOE Federal Salaries/Benefits Project Number 101.1

Type of Project XV-A Program Direction (select one from the Attachment II categories)

Managing or Funding Program (check one or more) ☒ WM ☒ ER ☒ TD ☒ NM ☐ SO SR-Program Responsibility DOE-Savannah River

Project Definition/Work Scope Description

Provides for Federal oversight of all SRS activities including contract administration for several major prime management & operating contracts and Inter-agency agreements. Included are costs related to travel, contractual services and supplies, training, Federal salaries/benefits, and support services directly related to Federal oversight responsibilities.

Milestone/ Schedule Information

Not Applicable - Level of Effort

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

DOE Federal Salaries/Benefits

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	64,762	61,110	61,110	61,110	61,110	61,110	61,110	61,110	61,110	61,110	614,752	
Other												
Total Cost	64,762	61,110	61,110	61,110	61,110	61,110	61,110	61,110	61,110	61,110	614,752	

Output/Metrics	1997	1998	1999	2000	2001	20^2	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion

Attachment IV
Supporting Data
Worksheet for Projects and Level of Effort Activities

Check One ☐ Project ☒ Level of Effort Activity
Project Name DOE Other Program Support Project Number 101.8
Type of Project XV-B Program Support (select one from the Attachment II categories)
Managing or Funding Program (check one or more) ☐ WM ☒ ER ☐ TD ☐ NM ☐ SO SR-Program Responsibility DOE-Savannah River

Project Definition/Work Scope Description

Provides funding to the State of South Carolina Department of Health and Environmental Control (DHEC) in support of the Federal Facility Agreement activities. Also funds the Agreement in Principle with the States of South Carolina and Georgia under the Emergency Preparedness/Planning Grant, the Emergency Monitoring and Oversight Grant, and the Georgia Emergency Management Agency Grant. Also provides funding to the Army Corp of Engineers, the South Carolina Water Resources Commission, and the U.S. Geological Service for activities directly related to the Environmental Restoration Program.

Milestone/ Schedule Information

During the period covered by the ten year plan, these activities represent a level of effort. Annual payments will be made on established due dates.

Attachment IV
Project /Level of Effort Activity Funding Table
(In Thousands of 1998 Dollars)

DOE Other Program Support

Costs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Construction												
Operations	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	59,650	
Other												
Total Cost	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	5,965	59,650	

Output/Metrics	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1997-2006	2007-Complete
Amounts in												

Discussion

Attachment V

Summary of Major Opportunities

ATTACHMENT V
SUMMARY OF MAJOR OPPORTUNITIES

This attachment presents potential opportunities for improving the Environmental Management Program cost and schedule at Savannah River. These opportunities are restricted to Savannah River and comprise mortgage reduction, risk reduction, and privatization initiatives.

Attachment V

Summary of Major Opportunities

Mortgage Reduction	IRR	NPV	Payback Period
Canyon Deactivation	15%	32.9%	11 Years
Canyon Consolidation with restart capability	TBD	0.6%	Immediate
Improve HLW Tank Closure Process	18%	16%	17 Years

Risk Reduction	Worker	Public	Environment
Accelerate HLW Glass Production Rate	H to LAR*	H to LAR*	H to LAR*
Accelerate the Enviromental Remediation of SRS sites	H/M/L to LAR*	H/M/L to LAR*	H/M/L to LAR*

* LAR= Lowest Acceptable Risk based on a determination of no further action by the regulators.

Privatization	Estimated M&O Cost	Estimated Privitization Cost	Estimated Savings
Privatize SNF Transfer & Storeage	$368M	$325M	$43M

OTHER POTENTIAL CANDIDATES BEING CONSIDERED

Store Tritium for Decay

Privatize TRU Waste Treatment

Privatization of Decontamination of Large Equipment

MW Treatment and Disposal by Commercial Vendor

Combined Glass Waste Storage Building (GWSB) and Transfer and Storage Facility (TSF)

Mortgage Reduction

Deactivation F&H Area Chemical Processing Facilities

SCENARIO DESCRIPTION

The stabilization of all SRS nuclear materials identified as at risk in the DOE Implementation Plan to the DNFSB's 94-1 Recommendation will be complete by the year 2002. Pending no identification for potential future missions, these facilities will begin a systematic deactivation program. These nuclear (chemical separations) facilities are expected to be highly contaminated, and contain significant chemical and industrial hazards. The initial phase of deactivation will include system flushes, removal of chemicals, and general decontamination (fixation) to reduce hazards and risks. During phase II of deactivation non-safety related systems will be systematically shutdown while maintaining the facilities in compliance with safety documentation. Significant reductions in the eventual surveillance and maintenance expenditures for the deactivated facilities (estimated at $60-65 million annually) are anticipated after completion of F&H Area facilities by the end of 2008.

Assumptions

- Not included in the 10 Year Plan
- Detailed deactivation planning for the F&H Area facilities is funded to begin in FY00
- Detailed schedules and cost profiles will be developed when scope and endpoint analysis has been established
- Deactivation will begin immediately after stabilization of all at risk nuclear materials unless other missions have been identified for the F&H Area facilities
- F&H Area facilities will be maintained in compliance with safety documentation as reductions in hazards and risks are achieved.
- No major dismantling activities are expected to be completed during the deactivation phase, D&D is not expected to begin within 10 years after completion of deactivation

Sensitivities

- DNFSB commitments for nuclear material stabilization are considered complete by 2002
- Requirements for the continued surveillance and maintenance of F&H Area facilities will be established through evaluation of facility safety documentation
- Potential future missions (EM & MD) currently preclude any final decisions on deactivation at this time
- Stakeholders support timely facility deactivation of F&H Area facilities after stabilization of all at risk nuclear materials complete

Basis for Project Choice as a Mortgage Reduction:

Because of the potential for a significant mortgage reduction associated with the deactivation of these facilities, the deactivation of F&H Area facilities has been included in the NMPS baseline case. Initial estimates for mortgage reduction include a $60-70 million annual savings after 2008, with a potential further reductions if a "passive" facility mode can be achieved.

Data Quality

Because of their size, residual contamination and complexity, the Canyons, B-Lines and ancillary facilities present a challenge for deactivation. To date, only a very limited study of deactivation requirements has been undertaken. The best estimate of cost for the deactivation is based on Hanford experiences with engineering judgment. Initial estimates for the deactivation of F&H Area facilities, including the required on-going S&M costs, is $350 million. These forecasts are preliminary and may be subject to change as deactivation plans develop.

(INTENTIONALLY BLANK)

Site (Location): *Savannah River (NMSP)*
Waste Type: *N/A*
Description: *Deactivation of F & H Area Facilities Mortgage Reduction Study*
Mail Code: *EM-60*
Constant $ Year: *Discounted to 1996 constant dollars*
ADS No.(s): *N/A*

(i) Fiscal Year	(ii) Alternative Funding	(iii) Discounted Cash Flow (NPV) 3%	(iv) Discounted Cash Flow (NPV) 7%	(v) Target/Min Safe Storage Funding	(vi) Discounted Cash Flow (NPV) 3%	(vii) Discounted Cash Flow (NPV) 7%	(viii) Annual Delta (v) - (ii)	(ix) Cumulative Delta	(x) Internal Rate of Return (IRR)
1996	$0	$0	$0	$0	$0	$0	$0	$0	
1997	$0	$0	$0	$0	$0	$0	$0	$0	
1998	$0	$0	$0	$0	$0	$0	$0	$0	
1999	$0	$0	$0	$0	$0	$0	$0	$0	
2000	$6,219	$5,526	$4,744	$0	$0	$0	($6,219)	($6,219)	
2001	$6,038	$5,208	$4,305	$0	$0	$0	($6,038)	($12,257)	
2002	$5,862	$4,909	$3,906	$0	$0	$0	($5,862)	($18,119)	
2003	$146,926	$119,464	$91,498	$94,000	$76,431	$58,538	($52,926)	($71,045)	
2004	$145,567	$114,912	$84,721	$91,000	$71,836	$52,963	($54,567)	($125,612)	
2005	$162,327	$124,410	$88,295	$88,000	$67,445	$47,866	($74,327)	($199,939)	
2006	$151,795	$112,950	$77,165	$86,000	$63,992	$43,718	($65,795)	($265,734)	
2007	$72,257	$52,200	$34,329	$83,000	$59,961	$39,433	$10,743	($254,991)	
2008	$7,028	$4,929	$3,121	$81,000	$56,812	$35,965	$73,972	($181,019)	
2009	$34	$23	$14	$78,000	$53,114	$32,367	$77,966	($103,053)	
2010	$33	$22	$13	$76,000	$50,245	$29,474	$75,967	($27,086)	
2011	$32	$21	$12	$74,000	$47,498	$26,821	$73,968	$46,882	
2012	$31	$19	$11	$72,000	$44,868	$24,389	$71,969	$118,851	
2013	$30	$18	$9	$70,000	$42,351	$22,160	$69,970	$188,821	
2014	$29	$17	$9	$68,000	$39,943	$20,119	$67,971	$256,792	
2015	$29	$17	$8	$66,000	$37,639	$18,250	$65,971	$322,763	
2016	$28	$16	$7	$64,000	$35,435	$16,539	$63,972	$386,735	
2017	$27	$15	$7	$62,000	$33,328	$14,974	$61,973	$448,708	
2018	$26	$14	$6	$60,000	$31,314	$13,543	$59,974	$508,682	
2019		$0	$0		$0	$0	$0	$508,682	
2020		$0	$0		$0	$0	$0	$508,682	
2021		$0	$0		$0	$0	$0	$508,682	
2022		$0	$0		$0	$0	$0	$508,682	
2023		$0	$0		$0	$0	$0	$508,682	
2024		$0	$0		$0	$0	$0	$508,682	
2025		$0	$0		$0	$0	$0	$508,682	
2026		$0	$0		$0	$0	$0	$508,682	
2027		$0	$0		$0	$0	$0	$508,682	
2028		$0	$0		$0	$0	$0	$508,682	
2029		$0	$0		$0	$0	$0	$508,682	
2030		$0	$0		$0	$0	$0	$508,682	
2031		$0	$0		$0	$0	$0	$508,682	
2032		$0	$0		$0	$0	$0	$508,682	
2033		$0	$0		$0	$0	$0	$508,682	
2034		$0	$0		$0	$0	$0	$508,682	
2035		$0	$0		$0	$0	$0	$508,682	
2036		$0	$0		$0	$0	$0	$508,682	
2037		$0	$0		$0	$0	$0	$508,682	
2038		$0	$0		$0	$0	$0	$508,682	
2039		$0	$0		$0	$0	$0	$508,682	
2040		$0	$0		$0	$0	$0	$508,682	
2041		$0	$0		$0	$0	$0	$508,682	
2042		$0	$0		$0	$0	$0	$508,682	
2043		$0	$0		$0	$0	$0	$508,682	
2044		$0	$0		$0	$0	$0	$508,682	
2045		$0	$0		$0	$0	$0	$508,682	
2046		$0	$0		$0	$0	$0	$508,682	
2047		$0	$0		$0	$0	$0	$508,682	
2048		$0	$0		$0	$0	$0	$508,682	
2049		$0	$0		$0	$0	$0	$508,682	
2050		$0	$0		$0	$0	$0	$508,682	
2051		$0	$0		$0	$0	$0	$508,682	
2052		$0	$0		$0	$0	$0	$508,682	
2053		$0	$0		$0	$0	$0	$508,682	
2054		$0	$0		$0	$0	$0	$508,682	
2055		$0	$0		$0	$0	$0	$508,682	
2056		$0	$0		$0	$0	$0	$508,682	
2057		$0	$0		$0	$0	$0	$508,682	
2058		$0	$0		$0	$0	$0	$508,682	
2059		$0	$0		$0	$0	$0	$508,682	
2060		$0	$0		$0	$0	$0	$508,682	15%
Totals	$704,318	$544,689	$392,179	$1,213,000	$812,211	$497,118			
NPV Ratio (3%)	32.9%								
NPV Ratio (7%)	21.1%								
IRR	15%								
Payback	11								

7/30/96, 10:53 AM

CANYON CON

SCENARIO DESCRIPT

This scenario results in stabi H-Canyon HM processing w restart/startup would be main facilities is complete (per DN Scenario and the Revised Bas

- All Mk-16/22 SNF is pr
- Miscellaneous aluminum
- All plutonium scrap and
- H-Canyon and HB-Line readiness to restart withi

This scenario results in stabil than the revised baseline sce scenario results in packaging later than the revised baseline

ASSUMPTIONS

- Not included in the 10 Y
- This activity has not bee
- The DOE 94-1 Impleme reflect this scenario.
- The DNFSB agrees to th
- Capability to process 5%
- Flowsheets for dissolutio developed and implement

SENSITIVITIES

- This scenario results in p months later than the cu
- This scenario meets the I capabilities until materia
- Some stakeholders have SRS and other DOE-own desires to see early deact

- A decision not to restart the H-Canyon HM process and currently idle HB-Line processes would reduce SRS capacity to support alternatives under consideration in pending DOE material stabilization and/or disposition decisions potentially resulting in implementation delays should such alternatives be implemented and would preclude implementation of inter-site mortgage reduction opportunities described elsewhere in this plan.

BASIS FOR PROJECT CHOICE AS A MORTGAGE REDUCTION CANDIDATE

This scenario has a high probability of success if implemented. Canyon consolidation was initially proposed without retention of H-Area capability as a cost reduction opportunity, with cost savings estimated at approximately $160 million (undiscounted) through FY2006 versus the DOE 94-1 Implementation Plan Baseline (FY98 Five Year Plan). Meeting the DNFSB requirement of capability retention in H-Canyon and HB-Line, as included in this scenario, reduces the estimated cost savings to approximately $60 million versus the FY98 FYP. The Revised Baseline Scenario utilizes contingency canyon capability to achieve earlier stabilization and uses installed capabilities. This Consolidation Scenario delays stabilization and relies on installation of new capability in F-Area facilities. The total ten year costs for the scenario and the Revised Baseline Scenario are essentially the same.

DATA QUALITY

Category - Medium

The ten-year cost projection for this scenario is based upon data developed for the FY98 Five Year Plan. The majority of activities in this scenario are identical to those in the FY98 FYP which included activity-based costing. Where activities in this scenario differ from the FY98 FYP, costs were estimated based on level of effort using expert opinion.

Site (Location):	*Savannah River (NMSP)*
Waste Type:	*N/A*
Description:	*Canyon consolidation Cost Comparison*
Mail Code:	*EM-60*
Constant $ Year:	*Discounted to 1996 constant dollars*
ADS No.(s):	*N/A*

(i) Fiscal Year	(ii) Alternative Funding	(iii) Discounted Cash Flow (NPV) 3%	(iv) Discounted Cash Flow (NPV) 7%	(v) Target/Min Safe Storage Funding	(vi) Discounted Cash Flow (NPV) 3%	(vii) Discounted Cash Flow (NPV) 7%	(viii) Annual Delta (v) - (ii)	(ix) Cumulative Delta	(x) Internal Rate of Return (IRR)
1996		$0	$0		$0	$0	$0	$0	
1997	$308,132	$299,157	$287,974	$311,309	$302,242	$290,943	$3,177	$3,177	
1998	$292,474	$275,685	$255,458	$295,067	$278,129	$257,723	$2,593	$5,770	
1999	$289,520	$264,952	$236,335	$288,877	$264,363	$235,810	($643)	$5,127	
2000	$270,470	$240,309	$206,340	$274,727	$244,091	$209,588	$4,257	$9,384	
2001	$218,400	$188,394	$155,716	$227,018	$195,828	$161,861	$8,618	$18,002	
2002	$204,930	$171,626	$136,554	$200,750	$168,125	$133,768	($4,180)	$13,822	
2003	$180,199	$146,518	$112,219	$172,978	$140,647	$107,722	($7,221)	$6,601	
2004	$165,072	$130,309	$96,073	$167,177	$131,971	$97,299	$2,105	$8,706	
2005	$180,412	$138,271	$98,132	$181,381	$139,013	$98,659	$969	$9,675	
2006	$167,760	$124,829	$85,281	$170,294	$126,715	$86,569	$2,534	$12,209	
2007		$0	$0		$0	$0	$0	$12,209	
2008		$0	$0		$0	$0	$0	$12,209	
2009		$0	$0		$0	$0	$0	$12,209	
2010		$0	$0		$0	$0	$0	$12,209	
2011		$0	$0		$0	$0	$0	$12,209	
2012		$0	$0		$0	$0	$0	$12,209	
2013		$0	$0		$0	$0	$0	$12,209	
2014		$0	$0		$0	$0	$0	$12,209	
2015		$0	$0		$0	$0	$0	$12,209	
2016		$0	$0		$0	$0	$0	$12,209	
2017		$0	$0		$0	$0	$0	$12,209	
2018		$0	$0		$0	$0	$0	$12,209	
2019		$0	$0		$0	$0	$0	$12,209	
2020		$0	$0		$0	$0	$0	$12,209	
2021		$0	$0		$0	$0	$0	$12,209	
2022		$0	$0		$0	$0	$0	$12,209	
2023		$0	$0		$0	$0	$0	$12,209	
2024		$0	$0		$0	$0	$0	$12,209	
2025		$0	$0		$0	$0	$0	$12,209	
2026		$0	$0		$0	$0	$0	$12,209	
2027		$0	$0		$0	$0	$0	$12,209	
2028		$0	$0		$0	$0	$0	$12,209	
2029		$0	$0		$0	$0	$0	$12,209	
2030		$0	$0		$0	$0	$0	$12,209	
2031		$0	$0		$0	$0	$0	$12,209	
2032		$0	$0		$0	$0	$0	$12,209	
2033		$0	$0		$0	$0	$0	$12,209	
2034		$0	$0		$0	$0	$0	$12,209	
2035		$0	$0		$0	$0	$0	$12,209	
2036		$0	$0		$0	$0	$0	$12,209	
2037		$0	$0		$0	$0	$0	$12,209	
2038		$0	$0		$0	$0	$0	$12,209	
2039		$0	$0		$0	$0	$0	$12,209	
2040		$0	$0		$0	$0	$0	$12,209	
2041		$0	$0		$0	$0	$0	$12,209	
2042		$0	$0		$0	$0	$0	$12,209	
2043		$0	$0		$0	$0	$0	$12,209	
2044		$0	$0		$0	$0	$0	$12,209	
2045		$0	$0		$0	$0	$0	$12,209	
2046		$0	$0		$0	$0	$0	$12,209	
2047		$0	$0		$0	$0	$0	$12,209	
2048		$0	$0		$0	$0	$0	$12,209	
2049		$0	$0		$0	$0	$0	$12,209	
2050		$0	$0		$0	$0	$0	$12,209	
2051		$0	$0		$0	$0	$0	$12,209	
2052		$0	$0		$0	$0	$0	$12,209	
2053		$0	$0		$0	$0	$0	$12,209	
2054		$0	$0		$0	$0	$0	$12,209	
2055		$0	$0		$0	$0	$0	$12,209	
2056		$0	$0		$0	$0	$0	$12,209	
2057		$0	$0		$0	$0	$0	$12,209	
2058		$0	$0		$0	$0	$0	$12,209	
2059		$0	$0		$0	$0	$0	$12,209	
2060		$0	$0		$0	$0	$0	$12,209	#NUM!
Totals	$2,277,369	$1,980,050	$1,670,082	$2,289,578	$1,991,124	$1,679,941			
NPV Ratio (3%)	0.6%								
NPV Ratio (7%)	0.6%								
IRR	#NUM!								
Payback	0								

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SCENARIO DESCRIPT

The three scenarios for HLW

Minimum Safe Storage -
the ground water tab
no reasonable long t

Target - this scenario inc
Processing Facility
commitments.

Accelerated - this scenar
the production rate a
removed from the 2
facilities will be co
2006 baseline plan.

ASSUMPTIONS

This Plan, which is included

- The Site Treatment
will be met;

- The Federal Facility
2028 will be met;

- The SRS Separation

- A Federal Repositor
of each canister is $

- Infrastructure upgrad
HLW until such tim

SENSITIVITIES

At this time, and with the fur
be met. Because virtually all
involve funding. The SRS
recommended increased fund
Scenario are sensitive to Reg
obtaining an NRC ruling that
classified as "Incidental Waste

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BASIS FOR PROJECT CHOICE AS A MORTGAGE REDUCTION CANDIDATE

The 2006 baseline plan has incorporated two HLW program options that provided significant risk reduction and cost savings for the site:

1. Increased Production Rate - the fixed cost of maintaining the various HLW facilities in a state of full readiness is about $400 million per year. The total cost (variable plus fixed) of producing 200 canisters per year is about $450 million per year. An additional $26 million per year increases canister production to 300 per year which acclerates the completion of the HLW program from 2026 to 2018.

2. Tank Closure - additional funding of about $64 million during the 10 year plan period will allow 20 waste tanks to be closed. This will allow large sections of the Tank Farms to be shut down and placed in a low maintenance mode in FY2007 and will result in a savings of approximately $27 million per year in constant FY96 dollars beginning in FY2008.

The combination of these two options result in a reduction of the life cycle cost for the High Level Waste Program from $14.1 billion to 10.8 billion. A savings of $3.3 Billion in constant FY96 dollars with an Internal Rate of Return of 18%.

In addition to the favorable mortage reduction potential that these options provide, it also significantly reduces the risk of environmental releases at the site. Many of the HLW tanks are 40 years old. Some will be 60 years old before the HLW has been removed; well beyond the design life of the tanks. While the tanks are currently in a safe state, the waste is highly mobile. Eleven of these tanks have existing leaksites and 12 of the tanks are situated in the water table. These tanks currently contain over 480 million curies of High Level Waste. The longer the waste remains in the tanks, the greater the risk to human health and the environment.

The Tank Closure and Accelerated Canister Production options were selected based on input from the SRS Citizens Advisory Board as well as other peer review panels. The SRS Citizens Advisory Board, which concerns itself with all SRS programs, stated in their Recommendation #12

> "...the greatest risk to the public, workers and the environment are the chemical reprocessing wastes stored in the high-level waste tank farms. Outside of operational safety, the discharge of this obligation (to remove and vitrify all HLW by 2028) should have the highest funding priority by DOE."

The acceleration of the HLW canister production and tank closure mission will significantly reduce the above risks.

DATA QUALITY

The data quality is high. The Tank Farms have several years of actual costs. The pretreatment facilities have between 2 and 6 years of actual cost data. Contracts are in place for all chemicals, raw materials, etc. All cost estimates are Activity Based.

RISK REDUCTION

Accelerate HLW Glass Production Rate

PRODUCTION DESCRIPTION

The High Level Waste Processing System is an integrated system involving safe storage; waste removal; pretreatment; vitrification of high level waste and interim storage of filled glass waste canisters; and treatment and disposal of low level waste. For risk reduction evaluation, the system has to be considered as an integrated whole involving the following individual projects:

H-Tank Farm	Vitrification Operations
F-Tank Farm	Glass Waste Storage Building
Waste Removal Activities	Effluent Treatment Facility
ITP/ESP Operations	Saltstone Facility

ASSSUMPTIONS

The key assumption is that the waste storage tanks will remain intact for the duration of the waste removal mission. Given the current 40-year average age of waste storage tank farms, the estimated design life of waste storage tanks, the close proximity of the tanks to the water table, and the additional 20-year projected duration of waste removal and disposal activities, continued long-term storage of existing HLW in current tanks without an active waste removal program is not considered to be a credible alternative.

SENSITIVITIES

Tank safety is highly dependent on the support infrastructure (electrical, instrument air, steam, etc.) and therefore on funding for infrastructure upgrade projects. The entire HLW program is highly dependent on tank safety as all 51 of the wwaste tanks have a specific function in the HLW mission. If one of the new Type III tanks were to start leaking, the program described in this Plan would have to be alttered resulting in significant impacts such as support for Separations and Reactor programs and delays to the HLW mission.

BASIS FOR PROJECT CHOICE AS A RISK REDUCTION PROJECT

The SRS Citizen's Advisory Board has called the HLW currently stored in the H and F Tank Farms the "...greatest risk to the public, workers and the environment. Outside of operational safety at SRS, discharging the obligation (to vitrify and remove all HLW by FY2028) should have the highest funding priority by DOE." (SRS CAB Recommendation #12, November 28, 1995.) Earlier an independent review committee, after four months of investigating the high level waste system, had concluded that there must be an "...appreciation for the risk penalty of delay...posed by materials now in the tanks in a relatively mobile form. Until the wastes are transformed into less mobile forms, such as saltstone and glass, they represent a very real threat to the enviroment." (SRS HLW Review Committee Report, William H. Hamilton, Sr., Chairman, 1994.)

DATA SOURCE & DATA QUALITY

The following data was used to develop the 10-Year Plan:

- HLW FY98 Risk Data Sheets
- DWPF Final Supplemental EIS (DOE/EIS-0082-S), 11/94.
- Safety Analysis - 200 Area, Liquid Radioactive Waste Handling Facilities, DPSTSA-200-10 Sup-18, 8/88.

The following models were used to analyze this data:

- ProdMod, computer simulation of the SRS HLW System, SRTC.
- HLW System Plan, Revision 6 (U), HLW-OVP-95-0102.

Site (Location): *SR*
Waste Type: *HLW & LLW*
Description: *Acceleration of HLW Program & Tank Closure*
Mail Code: *EM-30*
Constant $ Year: *1996*
ADS No.(s): *SR 31-316 & 21-27*

(i) Fiscal Year	(ii) Alternative Funding	(iii) Discounted Cash Flow (NPV) 3%	(iv) Discounted Cash Flow (NPV) 7%	(v) Target/Min Safe Storage Funding	(vi) Discounted Cash Flow (NPV) 3%	(vii) Discounted Cash Flow (NPV) 7%	(viii) Annual Delta (v) - (ii)	(ix) Cumulative Delta	(x) Internal Rate of Return (IRR)
1996	$479,618	$479,618	$479,618	$479,618	$479,618	$479,618	$0	$0	
1997	$425,417	$413,026	$397,586	$425,417	$413,026	$397,586	$0	$0	
1998	$436,924	$411,843	$381,626	$433,153	$406,288	$378,333	($3,771)	($3,771)	
1999	$447,358	$409,396	$365,177	$443,768	$406,111	$362,247	($3,590)	($7,361)	
2000	$434,745	$386,265	$331,665	$434,413	$385,970	$331,412	($332)	($7,693)	
2001	$450,083	$388,246	$320,903	$441,559	$380,893	$314,825	($8,524)	($16,217)	
2002	$448,709	$375,787	$298,994	$441,967	$370,140	$294,501	($6,742)	($22,959)	
2003	$499,856	$406,429	$311,285	$435,331	$353,964	$271,102	($64,525)	($87,484)	
2004	$501,208	$395,658	$291,708	$448,826	$354,307	$261,221	($52,382)	($139,866)	
2005	$483,193	$370,327	$262,825	$442,661	$339,263	$240,778	($40,532)	($180,398)	
2006	$484,728	$360,683	$246,411	$443,047	$329,669	$225,223	($41,681)	($222,079)	
2007	$466,437	$336,964	$221,601	$441,303	$318,807	$209,660	($25,134)	($247,213)	
2008	$419,697	$294,367	$186,350	$442,521	$310,375	$196,485	$22,824	($224,389)	
2009	$410,609	$279,605	$170,388	$426,769	$290,609	$177,094	$16,160	($208,229)	
2010	$442,063	$292,256	$171,440	$439,913	$290,834	$170,606	($2,150)	($210,379)	
2011	$440,928	$283,015	$159,813	$437,922	$281,085	$158,723	($3,006)	($213,385)	
2012	$389,196	$242,534	$131,834	$434,099	$270,516	$147,044	$44,903	($168,482)	
2013	$377,197	$228,210	$119,411	$424,700	$256,950	$134,449	$47,503	($120,979)	
2014	$358,895	$210,813	$106,184	$426,480	$250,512	$126,180	$67,585	($53,394)	
2015	$383,742	$218,843	$106,108	$473,015	$269,754	$130,793	$89,273	$35,879	
2016	$387,163	$214,363	$100,050	$467,209	$258,682	$120,736	$80,046	$115,925	
2017	$325,379	$174,907	$78,583	$472,413	$253,945	$114,094	$147,034	$262,959	
2018	$282,990	$147,690	$63,875	$478,311	$249,627	$107,961	$195,321	$458,260	
2019	$55,624	$28,184	$11,734	$482,639	$244,549	$101,811	$427,015	$885,295	
2020	$55,905	$27,502	$11,021	$447,110	$219,948	$88,146	$391,205	$1,276,500	
2021	$56,204	$26,843	$10,356	$414,711	$198,068	$76,410	$358,507	$1,635,007	
2022	$56,524	$26,210	$9,733	$398,137	$184,614	$68,557	$341,613	$1,976,620	
2023	$56,865	$25,600	$9,151	$382,667	$172,272	$61,583	$325,802	$2,302,422	
2024	$57,230	$25,014	$8,608	$381,569	$166,775	$57,389	$324,339	$2,626,761	
2025	$57,619	$24,450	$8,099	$321,436	$136,400	$45,182	$263,817	$2,890,578	
2026	$58,035	$23,910	$7,624	$281,674	$116,046	$37,003	$223,639	$3,114,217	
2027		$0	$0		$0	$0	$0	$3,114,217	
2028		$0	$0		$0	$0	$0	$3,114,217	
2029		$0	$0		$0	$0	$0	$3,114,217	
2030		$0	$0		$0	$0	$0	$3,114,217	
2031		$0	$0		$0	$0	$0	$3,114,217	
2032		$0	$0		$0	$0	$0	$3,114,217	
2033		$0	$0		$0	$0	$0	$3,114,217	
2034		$0	$0		$0	$0	$0	$3,114,217	
2035		$0	$0		$0	$0	$0	$3,114,217	
2036		$0	$0		$0	$0	$0	$3,114,217	
2037		$0	$0		$0	$0	$0	$3,114,217	
2038		$0	$0		$0	$0	$0	$3,114,217	
2039		$0	$0		$0	$0	$0	$3,114,217	
2040		$0	$0		$0	$0	$0	$3,114,217	
2041		$0	$0		$0	$0	$0	$3,114,217	
2042		$0	$0		$0	$0	$0	$3,114,217	
2043		$0	$0		$0	$0	$0	$3,114,217	
2044		$0	$0		$0	$0	$0	$3,114,217	
2045		$0	$0		$0	$0	$0	$3,114,217	
2046		$0	$0		$0	$0	$0	$3,114,217	
2047		$0	$0		$0	$0	$0	$3,114,217	
2048		$0	$0		$0	$0	$0	$3,114,217	
2049		$0	$0		$0	$0	$0	$3,114,217	
2050		$0	$0		$0	$0	$0	$3,114,217	
2051		$0	$0		$0	$0	$0	$3,114,217	
2052		$0	$0		$0	$0	$0	$3,114,217	
2053		$0	$0		$0	$0	$0	$3,114,217	
2054		$0	$0		$0	$0	$0	$3,114,217	
2055		$0	$0		$0	$0	$0	$3,114,217	
2056		$0	$0		$0	$0	$0	$3,114,217	
2057		$0	$0		$0	$0	$0	$3,114,217	
2058		$0	$0		$0	$0	$0	$3,114,217	
2059		$0	$0		$0	$0	$0	$3,114,217	
2060		$0	$0		$0	$0	$0	$3,114,217	18%
Totals	$10,230,141	$7,528,558	$5,379,761	$13,344,358	$8,961,620	$5,886,751			
NPV Ratio (3%)	16.0%								
NPV Ratio (7%)	8.6%								
IRR	18%								
Payback	17								

Risk Reduction

Accelerate the Enviromental Remediation of SRS sites

PRODUCTION DESCRIPTION

By accelerating work previously planned for post-FY 2006, worker, public, and environmental risk will be further reduced. This acceleration consists the following actions which are included in the 10 Year Plan:

- o Completing remediation of a remaining 12 high risk units.
- o Completing assessments (generally culminating in submittal of a Record of Decision) for an estimated remaining 49 low/medium risk units.
- o Completing remediation of 13 of an estimated remaining 49 low/medium risk units.

ASSSUMPTIONS

Additional funding (which is included in this 10 Year Plan but was not a part of the FY 1998 Out-year Budget plan) is made available in the years 2002 through 2006 such that the described risk reduction measures can be achieved.

SENSITIVITIES

Since the majority of units which are being added to the 10 Year Plan have not yet been through the Site Evaluation Program screening process, many uncertainties remain with respect to the nature and extent of contamination. These uncertainties have the potential for affecting assessment and remediation cost and schedule projections. Therefore, the amount of work which can be accomplished within a given period of time is also subject to the resolution of the uncertainties.

BASIS FOR PROJECT CHOICE AS A RISK REDUCTION PROJECT

Increase regulator and public-at-large satisfaction with respect to the pace of the cleanup work.

DATA SOURCE & DATA QUALITY

Primary data sources have been life-cycle cost estimates and schedules.
FY98 RDSs
EM40 Relations Risk Ratings

Privatization

SNF Transfer and Storage Facility (TSF)

Background

Spent nuclear fuel (SNF) from off-site research reactors is currently being wet stored in the 105-L disassembly basin and RBOF. These facilities will provide the packaging capability required to place SNF in a "road-ready" condition, and will be in full compliance with the codes, standards, and regulations for new DOE facilities. While the current facilities have been enhanced to ensure the continued safe and efficient management of current SNF inventories and future receipts, both DOE and the commercial nuclear industry have determined that dry storage technology is safer and more cost effective in the long term.

Options

Two options were considered for this project. The first option is to construct and operate the TSF as a Government Owned - Contractor Operated facility (GOCO). The other option is to privatize the transfer and storage facility.

Description of Privatization Approach

A privatized SNF transfer and storage approach would result in the selection of a private vendor through competitive bidding. The vendor would design, construct, permit, operate, decontaminate, and decommission a TSF using private funding. The cost of design and construction is roughly estimated at $240 million. This cost would be deferred and amortized during facility operation, projected to begin in FY2002.

Issues

While deferring costs, privatization raises issues such as potential schedule delays inconsistent with stakeholder expectations, loss of operating flexibility with corresponding increases in operating costs, difficulties in future SNF program integration, and complications to performance and liability relationships.

Available Current Baseline Life Cycle Cost Estimate by Fiscal Year

(in $millions)

Project Activity	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	Total
M&O – Construction	0	20	55	95	65	5	0	0	0	0	240
– Operation	0	0	0	0	3	25	20	20	20	20	108
Privatization – Operation	0	0	0	0	5	68	63	63	63	63	325
Difference	0	20	55	95	63	(38)	(43)	(43)	(43)	(43)	23

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Basis for Determining Whether Privatization Would be Cost Effective

All costs presented above are based on rough order of magnitude estimates from the draft Critical Decision One Mission Need Package (CD-1) for the SNF storage and packaging program. Both approaches must be competitively bid. When these are bid, firmer cost estimates will be provided.

Costs for the privatization option were calculated assuming (1) 8% interest on private investment; (2) ten year amortization beginning in FY2002; and (3) privatization vendor profits would derive from any savings in design and construction costs versus the M&O option.

Basis for Selection

Privatization of SNF storage and packaging program would reduce near term (five years) costs to the government within the ten year planning window but would not reduce total costs. "Mortgage reduction" costs associated with relocation of SNF from the existing wet storage facilities to the new TSF should be significant, regardless of the option chosen.

Confidence in Data Low

OTHER POTENTIAL CANDIDATES BEING CONSIDERED

Mortgage Reduction

Store Tritium for Decay

Background

Develop assured storage (long-term safe storage, about 100 years) for tritium-contaminated wastes to allow to decay. Would eliminate need for complicated treatment processes/facilities for this. waste.

Assumptions

After the decay period, manage as Sanitary Waste.

Container available with design life of 100-years (re-packaging or over-packing may be required).

Providing adequate storage capacity facility size), as waste generation is continuing.

The storage criteria is reasonable based on level of tritium allowed (off-gas/air quality concern).

South Carolina will agree with storage philosophy versus disposal.

Performance Assessment and NEPA would be required.

Sensitivities

Permitting would be required.

Stakeholders prefer disposal versus storage.

DNFSB involvement.

Action still may be required after 100-years for non-tritium waste and classified waste.

Basis for Project Choice as a Mortgage Reduction Candidate

Eliminate treatment cost and potentially reduce final disposal cost.

Data Quality

Low based on expert opinion.

Privatization of TRU Waste Treatment

Background

This opportunity would allow SRS to process high activity plutonium upfront and achieve TRU waste preparation for WIPP well ahead of the current schedule. Privatization could make a process facility available in three to five years at an estimated cost of $40 million, which is a fraction of the current estimate of $275 million for a new facility. Accelerating TRU treatment would also allow us to obtain experienced B-Line personnel to work with this material. SR could also use this facility to process mixed waste (Containment Building/vendor treatments) and LLW. Barriers to this option are political issues regarding the facility's buffer zone, lack of funding, and outstanding litigation on the facility.

DOE would need to establish ownership of the facility and set-up privatization (facility sold after SRS waste processed). This would release DOE from D&D efforts and mortgage costs.

Options Analyzed

DOE would build a Category 2 facility or use existing facility (e.g. 235-F) with modifications. For whatever facility is selected, its current mission would have to be complete before used. No options have been developed to date.

Description of Privatization Approach

Vendor would produce WIPP certified waste and ship (turn-key).

Issues

Permitting required, Public Involvement, Retrofitting to current standards and expense (for short-term process) are major issues.

Available Current Baseline Life Cycle Cost Estimate by Fiscal Year

See attached spreadsheet.

Basis for Determining Privatization Would be Cost Effective

Cost of privatizing versus new facility. Shipment required in both cases; whether a vendor processes or treatment is performed on-site.

Basis for Selection

Economics and effectiveness of operation are basis for selection.

Confidence in Data

Low since no detailed studies are done at this time; studies are planned.

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Privatization

Privatization of Decontamination of Large Equipment

Background

This opportunity would be suitable for processing large equipment components which will become a greater problem in the future as facilities are D&D'd. There are transportation and safety issues with transporting these items off-site (as well as on-site issues) that need to be clarified and resolved. A new facility to handle these items could be avoided.

DOE would need to establish ownership of facility and set-up privatization (facility sold after SRS waste processed). This would release DOE from D&D efforts and mortgage costs.

Options Analyzed

DOE would build a facility or use existing facility with modifications. No options have been developed to date.

Description of Privatization Approach

Vendor turn-key operation.

Issues

Off-site transportation issues minimized. Permitting would be required. Retrofitting to current standards and availability of capital funds are issues, along with 'piece by piece' processing by vendor. Vendor may be inhibited from performing commercial(non-SRS/DOE) work in this facility if required to comply with DOE Orders for that work. This could be a mortgage reduction opportunity.

Available Current Baseline Life Cycle Cost Estimate by Fiscal Year

See attached spreadsheet.

Basis for Determining Privatization Would be Cost Effective

Cost of retrofitting (partial) versus new facility (not fully developed at this time) and obtaining regulatory approval.

Basis for Selection

Economics (potentially reduces cost over a new facility)and effectiveness of operation are basis for selection. Potentially accelerates schedule for disposition of contaminated large equipment (versus new facility - not versus vendor subcontracting).

Confidence in Data

Low since no detailed studies are done at this time.

(INTENTIONALLY BLANK)

Privatization

MW Treatment and Disposal by Commercial Vendor

Background

Commercial treatment and disposal of MW is both a privatization and mortgage reduction initiative and could preclude SRS having to build treatment and disposal facilities (e.g., Containment Building, HW/MW vaults, other storage facilities). SRS currently does not have funding to pursue this, and some wastes may not be suitable for disposal at existing facilities.

The Savannah River Site is currently storing low level mixed wastes in RCRA permitted facilities. Storage will continue until appropriate treatment and disposal facilties are developed for each waste stream. The SRS Site Treatment Plan, as approved by SCDHEC, outlines the regulatory commitments and schedules for treatment and disposal of SRS mixed wastes. These commitments include the use of a RCRA permitted Containment Building for the treatment of various mixed waste streams. In addition, SRS is planning to design and construct a Hazardous/Mixed Waste Disposal Facility to be opertional by 2004.

Options Analyzed

The option currently being pursued, per the approved STP, is to design, permit, and build a permitted Containment Building at SRS. The costs of the building will depend on whether an existing building is re-furbished or if a new building is constructed.

Additional options that may be considered include the use of private/commercial vendors to treat and dispose of SRS mixed wastes.

Description of Privatization Approach

Private vendors would be contracted to design, permit, and build a RCRA Containment Building to house the various treatment processes committed for SRS mixed waste streams. Private vendors would also be contracted to perform these treatment techniques. Both the low level waste and the mixed wastes resulting from the various treatments would then be disposed of at commercial disposal facilities.

In addition, a commercial disposal facility would be contracted with for the disposal of SRS mixed wastes, in lieu of design, permitting and construction of a RCRA permitted disposal facility at SRS.

Issues

The schedule in the STP must be met for any privitazation approach, or a modification to the STP must be pursued with SCDHEC.

DOE Order 5820.2A, Radioactive Waste Management, Deviation Requests would be needed in order to dispose of DOE-generated radionuclides off-site. While this can be done locally, at DOE-SR, a blanket approach would be preferable if the treatment/disposal of several waste streams would be privatized.

SRS would still need to have a plan for wastes that do not meet the private vendors' Waste Acceptance Criteria. Because much of SRS's mixed waste is legacy waste, generated before the Waste Characterization Program, there is some level of uncertainty as to the waste characterization of some containers.

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Basis for Determining Privatization Would be Cost Effective

Cost of vendor treatment and disposal versus new facilities and obtaining regulatory approval. The permitted Containment Building for the treatment of various mixed waste streams is estimated to cost \$14M (new facility)and \$3M to refurbish an existing building. The design/construction of a Hazardous/Mixed Waste Disposal Facility has an order-of-magnitude estimate of \$20M.

Basis for Selection

Cost, may be easier to permit off-site, some vendors may already have permits.

Confidence in Data

Low since no conceptual design is done at this time.

Mortgage Reduction

Combined Glass Waste Storage Building (GWSB) and Transfer and Storage Facility (TSF)

Background

Spent nuclear fuel (SNF) from off-site research reactors is currently being wet stored in the 105-L disassembly basin and RBOF. These facilities will provide the packaging capability required to place SNF in a "road-ready" condition, and will be in full compliance with the codes, standards, and regulations for new DOE facilities. While the current facilities have been enhanced to ensure the continued safe and efficient management of current SNF inventories and future receipts, both DOE and the commercial nuclear industry have determined that dry storage technology is safer in terms of reduced corrosion rate, more efficient, and cost effective in the long term.

Separately, The Defense Waste Processing Facility (DWPF) is producing canisters of vitrified High Level Waste as "road-ready" wasteforms, awaiting shipment to the federal repository. A Glass Waste Storage Building (GWSB) was constructed as a part of the original DWPF program, but it will be filled to capacity about FY2006, the exact date depending on the DWPF canister production rate.

Options

The current approach for these two new facilities is just that: construct two separate facilities, using conventional DOE Line Item procurement and managementprocesses.

Description of Combination Approach

A combined GWSB/TSF would capitalize on the fact that both facilities are intended to store canisters of "waste" in a form "road ready" for the federal repository. The waste forms for each facility will look similar on the outside (12-foot long, two-foot diameter stainless steel canisters), and exhibit similar characteristics (high contact radiation dose, modest decay heat generation). Sharing a facility could save significantly on capital costs for canister handling systems, ventilation/heat removal systems, monitoring systems, design, site investigation, etc.. Operating costs could be reduced similarly -- through use of common personnel, procedures, training, management, inventory systems, radcon, etc..

The potential cost saving is even greater when considering the long term requirement for a facility to ship glass waste canisters to the repository. Current and planned GWSB designs (and corresponding cost estimates do not provide facilities to load the glass canisters into a cask or other overpack for shipment to the repository. Because it must receive spent nuclear fuel in shipping casks, the TSF, a priori, has a facility capable of loading canisters. Thus, combining the GWSB with the TSF avoids the heretofore unbudgeted cost of a glass waste shipping facility.

Issues

The only significant issue is one of timing: the TSF is intended to begin operation in FY2002; the GWSB will not be needed until a few years later -- the exact timing depending on DWPF production rate. A phased construction approach for the storage portion of the facility made be effective in resolving this issue, so that otherwise unnecessary capital funding requirements can be deferred as long as possible.

Potential issues of sharing organizational responsibility and sharing a facility between B&Rs should be overcome with responsible management attention.

Available Current Baseline Life Cycle Cost Estimate by Fiscal Year

The current cost estimate for TSF design and construction is $240 M, and the current cost estimate for the GWSB is $100 M. Operation of the two facilities would cost at least $20 M per year. The suggested combination of these two facilities is a new and novel concept requiring considerable study before it can be concluded what, if any cost saving would accrue, and whether, in fact, it is the best option for DOE. As a very rough estimate, it is suggested that at least $50 M in capital and operating costs could be saved in the ten-year period of this Plan. There could also be a cost saving for privatization but that has not been analyzed.

Basis for Determining Whether Combination/Privatization Would be Cost Effective

Engineering studies must be completed to determine the extent to which the GWSB and TSF could share structures, systems, and operations. The resulting cost savings must be estimated in some degree of detail, and the potential for complication arising from the combined responsibilities of organizations/B&Rs must be carefully considered.

Basis for Selection

Selecting between the current "separate" option and the proposed "combination" option should be made using best management judgment, considering the factors noted above. The determination of whether or not to attempt privatization of the combined facility must be made in FY97 as the TSF must begin operation in FY2002.

Confidence in Data

Low

Attachment VI

Support Cost Crosscut

ATTACHMENT VI

SUPPORT COST CROSSCUT

Attached is Savannah River's Support Cost Crosscut (FUNCTIONAL COST) for the period FY 1997 through FY 2006. Data has been forecasted in the General Support, Mission Support and Total Functional Cost format as specified in the original guidance. This data constitutes what is know as "Functional Cost" and represents a DOE Financial Management System Improvement Council (FMSIC) initiative.

The FMSIC began the Functional Cost initiative in FY 1995. The primary objective of this initiative was to quantify a particular site's overall cost into two (2) main components: 1) Functional Support costs or cost which supported program mission and/or initiatives and 2) mission direct costs. Within the Functional Support area, there are two (2) sub-categories of costs: 1) General Support or those costs which are traditionally primarily General & Administrative in nature and 2) Mission Support costs or those costs which are more technical in nature in support of mission direct work. Examples follow:

GENERAL SUPPORT	Executive Direction, Human Resources, Chief Financial Officer, Procurement, Legal, etc.
MISSION SUPPORT	Environmental, Safety & Health, Maintenance, Utilities, Safeguards/Security, etc.

Functional Cost is comprised of twenty-three functional categories. Each category has a specific definition intended to create consistency across the DOE complex. Ultimately, it is envisioned that Functional Cost will replace many of the current crosscuts (Safety & Health, Maintenance, ALBURT, etc.)

For Savannah River, the data represents all Westinghouse/Bechtel and Wackenhut contract cost and has been developed consistent with current FMSIC guidance (refinement of this process is still ongoing). For the period, anticipated costs are trending downward approximately 16%. Adjusting for a nominal inflation rate of 3%, equates to an additional 38% reduction or 54% cumulatively in real terms.

The following categories were used to report Support Cost on attachment VI. The categories are subdivided as follows:

General Support

- Execution Direction
- Human Resources
- Chief Financial Officer
- Internal Oversight
- Procurement
- Legal
- Administrative Support
- Management/Award/Incentive Fee
- Taxes
- Information Services

Mission Support

- Environmental
- Safety and Health
- Facilities Management/Engineering
- Maintenance
- Utilities
- Safeguard and Security
- Laboratory Directed Research and Development
- Information/Outreach Activities
- Logistics Support
- Quality Assurance/Compliance
- Laboratory Support
- Other Technical Support Activities
- Matrix Management
- Other

Attachment VI
Support Cost Crosscut
(Millions of dollars)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
General Support	$154.4	$143.9	$142.9	$141.9	$140.8	$139.8	$138.8	$137.8	$136.8	$135.9	$1,413.0
Mission Support	520.6	491.6	487.3	482.9	477.4	474.0	445.1	440.7	436.3	432.0	4,687.9
Total	$675.0	$635.6	$630.2	$624.8	$618.2	$613.8	$583.9	$578.5	$573.1	$567.8	$6,100.9

Note(s):

(1) The above reflect costs for WSRC, BSRI & WSI.

(2) The above costs are based on FMSIC guidance and cross all program funding sources.

Attachment VII

Supplemental Information

Other Program Enhancements
Technology Development Needs

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ATTACHMENT VII
SUPPLEMENTAL INFORMATION

is attachment presents potential opportunities for reducing the Environmental Management ɔgram mortgage across the complex as well as synergistic interactions with non-EM programs. addition, innovative technology development opportunities are identified for the Waste anagement and Environmental Restoration programs.

Attachment VII
Summary of Major Opportunities

EM Mortgage Reduction	Potential Cost Savings	Payback Period
Support Rocky Flats closure by receipt of slag & crucible matetrials (Stabilize additional EM at risk material)	$474M	13 Years
Support Rocky Flats closure by receipt and storage of stablized Pu	$1B	40 Years
Blend down 25 MT of HEU for commerical sale	$70M	10 Years
Change shipping requirements and/or WIPP WAC for TRU	TBD	TBD
Storage or Disposal of Commercial Greater-than-Class C Waste	TBD	TBD

MD Mortgage Reduction	Potential Cost Savings	Payback Period
Disposition of Weapons Plutonium	$2.8B	50 Years
Consolidate Storage of DOE's Plutonium*	$1.7B	50 Years

* This is a combination of EM and MD

Science and Technology Summary

High Level Waste
Solid Waste
Environmental Restoration (including D&D)
Other

Mortgage Reduction (EM)

Support Rocky Flats Closure by Receipt of Slag & Crucible Matetrials (Stabilize Additional EM at Risk Material)

Under this alternative all of the Rocky Flats Scrub Alloy, Pyrochemical Salts and Sand, Slag and Cruciable (SS&C) would be prepared for processing at Rocky Flats Environmental Technology Site (RFETS) and shipped to SRS for dissolving and conversion to metal in F-Canyon/FB-Line. After processing the metal would be placed in long term DOE Standard 3013-94 storage containers and stored in the F-Area Actinide Packaging & Storage Facility. Assuming this effort begins in 7/97, the metal will be placed in long term storage by the end of FY02.

This alternative has been evaluated by a DNFSB 94-1 Integration Working Group (IWG) Trade Study. The trade study indicates this will stabilize the materials 13 years earlier, thereby meeting a DNSF 94-1 milestone objective that could otherwise not be achieved. Additionally cost savings of ~$474M are indicated versus other stabilization alternatives (disposition to WIPP).

Assumptions

This activity has not been included in the 10 year plan baseline.

RFETS would bagless package all existing scrub alloy and ship to SRS for processing to metal in F-Canyon and FB-Line.

RFETS would Scrub the Pyrochemical Salts to a scrub alloy, bagless package the alloy and ship to SRS for processing to metal in F-Canyon and FB-Line. RFETS would also package and ship the waste salts from the scrubbing process to WIPP.

RFETS would finish pulverizing the SS&C material, bagless package and ship to SRS for processing to metal in F-Canyon and FB-Line.

An empty room (in Building 235-F at SRS) will be converted into an interim vault by 1/98, for use as a lag area for storing the residues prior to processing to metal.

All metal from the above processing would be packaged into a bagless container and placed in a long term storage vault at SRS.

All SRS processing is consistent with already established practices for SRS materials.

Sensitivities

An EIS must be completed to evaluate the full range of reasonable alternatives and impacts. Also, applicable permitting issues will be addressed and resolved.

Basis For Mortgage Reduction Candidate

- Financial savings of $474 million
- The material is stabilized 13 years faster
- The material reaches a defined end state in a container approved for long term storage

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Data Quality

The schedule represents SRS processing windows available which have not been fully integrated with RFETS capability. The cost estimate was developed as a part of DOE Headquarters TRADE STUDIES which used a bottoms up estimate method where possible and an engineering method as a supplement. None of the estimates represent resource loaded schedules. SRS estimates are of good quality, based upon extrapolation of detailed cost estimates prepared for stabilization of similar materials and contained in existing five-year plan budgets.

Cost Spreadsheet

ROCKY FLATS ALTERNATIVE
($Millions)

FY	SA/WIPP	SALTS / WIPP	SS&C/WIPP	TOTAL/WIPP
96	1.2	33.3	2.99	37.49
97	3.724	21.7	6.54	31.964
98	2	27	4.16	33.16
99	2	42	1.55	45.55
00	2	33.5	1.51	37.01
01	2	33.1	1.47	36.57
02	2	32.6	1.43	36.03
03	2	32.2	1.39	35.59
04	2	31.8	1.36	35.16
05		31.3	1.32	32.62
06		30.9	1.28	32.18
07		30.4	1.24	31.64
08		30	1.2	31.2
09		29.6	1.16	30.76
10		29.1	1.12	30.22
11		28.7	1.08	29.78
12		28.2	1.05	29.25
13		27.8	1	28.8
14		27.3	0.97	28.27
15		26.8	0.93	27.73
TOTAL 1996-2015	18.924	607.3	34.74	660.964

SRS ALTERNATIVE
($Millions)

FY	SA	SALT	SS&X	TOTAL PROGRAM
96	0.1	15	1	16.1
97	3.6	15.7	4.6	23.9
98	3.6	16.3	5.2	25.1
99	0.1	30.8	6	36.9
00	0.1	53.2	6	59.3
01	0.1	16	2.5	18.6
02	0.175	2.1	0.25	2.525
03	0.025	0.3	0.03	0.355
04	0.025	0.3	0.03	0.355
05	0.025	0.3	0.03	0.355
06	0.025	0.3	0.03	0.355
07	0.025	0.3	0.03	0.355
08	0.025	0.3	0.03	0.355
09	0.025	0.3	0.03	0.355
10	0.025	0.3	0.03	0.355
11	0.025	0.3	0.03	0.355
12	0.025	0.3	0.03	0.355
13	0.025	0.3	0.03	0.355
14	0.025	0.3	0.03	0.355
15	0.025	0.3	0.03	0.355
TOTAL 1996-2015	8.1	153	25.94	*187.04

*NOTE: Includes $74.9 million SRS costs. Remainder of program cost covers cost of Rocky Flats treatment, packaging and shipping.

Mortgage Reduction (EM)

Support Rocky Flats Closure by Receipt and Storage of Stablized Pu

Use of SRS facilities to provide inter-site assistance (e.g., Rocky Flats) for storage of plutonium pending final disposition. Utilize the infrastructure and facilities at SRS to achieve substantial cost savings.

A one module expansion of the Actinide Packaging and Storage Facility (APSF) will result in a major mortgage reduction benefit.

Assumptions

This activity has not been included in the 10 year plan baseline.

Major assets that will exist at SRS would be leveraged and utilized to support this action. The scenario involves the utilization of APSF in the F-Area. New feeds such as metals and oxides from Rocky Flats are assumed to be an important focus of attention. The approach would provide an additional vault module to APSF. The incremental cost of this add-on module will be far less than an effort to build a new facility at any other DOE locations. Cost evaluations indicate the capital cost to add this module would be approximately one-seventh the current cost of APSF. The proposed expansion involves a 5,000 position add-on which would allow inter-site assistance to other sites in the complex as well as Rocky Flats. Removal of plutonium metals and oxides meeting D025 and D3013 would be accomplished before 2006.

Sensitivities

A substantial benefit is gained from expanding a facility rather than building new facilities at one or more sites in the DOE complex. The number of 5,000 position modules that should be added to APSF will be determined by the inventory of plutonium forms at other sites that SRS can assist. The life-cycle cost savings for the one module expansion is estimated to be $1B. The total investment (capital and operating) for a one module expansion of APSF is estimated to be $0.225B, assuming a 40 year storage period.

Basis for Project Choice as a Mortgage Reduction

- Cost effectiveness; over one billion dollars of life-cycle costs would be saved due to avoidance of new facilities at other sites and the extendable storage capacity of the APSF.
- Widespread support from citizens, citizens groups and congressional representatives regarding pursuit of future mission.
- Very high probability of success; straightforward expansion of APSF. Minimal re-arrangement of equipment and layout may be involved.

Data Quality

Much of the cost information for the expansion of APSF is based on extrapolation of details developed from the conceptual design of the current APSF, as proposed in an FY97 Line Item Project. Potential updates to the layout to support expansion have been identified. The overall quality of the cost information is judged to be "medium" based on the definitions provided in the "Mortgage Reduction Outline."

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Mortgage Reduction (EM)

Blend Down of HEU at SRS

Background

Under this scenario 15.4MT of unirradiated, off-spec, fuel and ingot forms of uranium/aluminum alloy currently stored at SRS and Oak Ridge and 9.3MT of unalloyed uranium currently stored at Oak Ridge will be blended down to commercial specification LEU for sale to TVA. Assuming this activity begins in 7/00, it would be complete with all material blended in 3/05.

This mortgage reduction opportunity yields a net savings of $70M based on a comparison to a "no action" alternative - compaction of the unirradiated material at SRS and shipment to Oak Ridge for storage as described in the HEU Disposition EIS.

Assumptions

This activity has not been included in the 10 year plan baseline.

Production cost and schedules are from the SRS Utilization Studies (Case IV-F.4.)

Waste cost are based on $650 per kg of aluminum for alloyed material and 10% of this for unalloyed based on expert opinion.

Safeguards cost assume HEU bears the entire K-Area Safeguards cost after 10/98 and building support cost after 2001.

Capital cost in 2000 is for a shredder/chipper to reduce dissolving time by increasing exposed material surface area.

Sales income is based on estimated return of $18,750 per kg of 100% U-235 based on Oak Ridge report, " Cost Comparison for Highly Enriched Uranium Disposition", (Y/ES-122).

A privatized LEU (UNH) conversion facility is assumed to be available on-site in H Area.

Sensitivities

The HEU Disposition EIS Record of Decision is expected to be issued by 8/96 providing a NEPA basis for the proposed program: eliminating the proliferation potential of stockpile surplus HEU and maximizing the commercial use and economic recovery value of this material.

Basis for Mortgage Reduction Candidate

- Net financial gain of approximately $70M
- Material converted to non-proliferation form

Data Quality

This is a level of effort/expert opinion estimate. None of the estimates represent resource loaded schedules.

Mortgage Reduction (EM)

WIPP Waste Acceptance Criteria (WAC) and Shipping Requirements

Background

Revise WIPP WAC so that it can take larger containers (black boxes). WIPP has physical handling capabilities to handle larger container types, but the WAC is based on shipping requirements which limit container size due to heat loading and hydrogen generation. Shipping requirements would also have to be relaxed to support this initiative. This change to the WAC would eliminate SRS (possibly other facilities) having to repackage materials currently in black boxes.

Modify WIPP WAC to accept certified black boxes. Increase heat load criteria.

Assumptions

This activity has not been included in the 10 year plan baseline.

Do not have to build capability in treatment facility.

Produce black boxes certified for shipment.

Sensitivities

Improve public imagine of SRS/DOE/WSRC.

Compliance with Site Treatment Plan.

Concern in states on waste-shipping route.

Basis for Project Choice as a Mortgage Reduction Candidate

Enhance stakeholder relations (process is more economical and faster). The current path is to construct a TRU Waste Characterization and Process Facility, estimated to cost $150M (for a Category 2 facility) or $50M for a shell-structure to permit vendors to set-up equipment.

High probability of success.

Data Quality

Low based on expert opinion.

Mortgage Reduction (EM)

Storage or Disposal of Commercial Greater-Than-Class C Waste at SRS

Background

DOE is responsible for this waste, and small volumes of it are beginning to require storage by DOE since some commercial reactors are beginning decommissioning. These waste may be disposed at Yucca Mountain in the future. SRS has storage capacity for the waste, either in existing facilities (such as E-Area Vaults) or privatized with other SRS treatment and storage operations. Additionally, EAV performance assessment would allow disposal of some radionuclides at greater-than-class C concentrations. Additional funding for EIS, facility modifications (if needed), and operation of the facility have not been included in the 10 year plan cost estimates.

Assumptions

Storage would be limited to only decommissioned reactor waste and sources.

Waste would be disposed in Yucca Mountain.

Sensitivities

Licensing may be required.

NEPA action would be required.

This is a DOE mission currently not being met.

Basis for Mortgage Reduction Candidate

New facilities would not be required, either through use of existing SRS faciliteis or privatization.

Data Quality

Low based on expert opinion. No detailed studies are done at this time, and have not been planned.

Mortgage Reduction (MD)

Disposition of Excess Weapons Plutonium.

Background

Utilize the infrastructure and facilities of the Savannah River Site to accomplish program objectives involving multiple sites, and achieving substantial cost savings and accelerated completion.

The DOE has developed detailed information related to the future management of excess weapons plutonium. Such stockpiles require proper attention to address security, environmental, safety and health considerations. Included in the effort to date has been publication of a draft programmatic environmental impact statement that discusses a list of 37 potential disposition alternatives. The short list of alternatives includes immobilization of the plutonium and/or use of the plutonium in reactors to generate electric power. The Savannah River Site has been actively involved with the DOE in evolving both of these types of alternatives. Technical, schedular and cost information related to immobilization as well as MOX fabrication alternative approaches have been developed by SRS personnel that utilize the unique assets of the site. Successful demonstration of the "can-in-canister" approach to support vitrification based immobilization has occurred, for example.

Assumptions

This activity has not been included in the 10 year plan baseline.

Major, existing assets at SRS would be leveraged and utilized to support these activities. SRS facilities, including F-Canyon, New Special Recovery, Plutonium Storage Facility and high level waste management facilities would be cost effectively utilized to disposition technology, involving new feeds from other locations in the DOE complex. Upgrades in safeguards and security, HVAC, monitoring, for example, are anticipated and have been defined. Representative estimates of funding to provide required operating capabilities indicate a $2.8B benefit in cost savings for the utilization of SRS due to the unique applicability of infrastructure and facilities for this large operational mission involving 50MT of plutonium. An investment in the range of $1.7B has been estimated as the life-cycle funding level necessary.

Sensitivities

Future DOE decisions related to the specific end states and technologies to deploy for the disposition of the excess weapons plutonium will influence the specific facilities and infrastructure at SRS that would be leveraged. For example, assuming immobilization, vitrification technology be part of the deployment decision, the DWPF and the can-in-canister approach could be utilized. Should a MOX end-state be part of the technology decision, the "P" reactor area of SRS could be effectively utilized. Current cost estimates indicate the investments for vitrification, MOX, or hybrid MOX-vitrification deployment to be similar for leveraging the SRS facilities and infrastructure. Many of the SRS facilities utilized, particularly for front-end feed preparation, would be common to any of the technology paths for Pu disposition.

Basis for Project Choice as a Mortgage Reduction Candidate

- Cost effectiveness; estimated cost savings in excess of $2.5B

- Widespread support from citizens, citizens groups and congressional representatives regarding pursuit of future missions.

- High probability of success; utilization of existing facilities, infrastructure and workforce oriented for large operations and production

Data Quality

Inputs supportive of proposed new missions will often be lacking in the "preliminary design" pedigree that can provide high quality cost data. However, the costs reflected herein represent expert opinion and the leveraged use of existing SRS facilities and infrastructure for which designs and operational information exist. Therefore, the data quality is considered to be at least "medium" as defined in the "Mortgage Reduction Outline."

Mortgage Reduction (EM & MD)

Consolidate Storage of DOE's Plutonium

Background

Use of SRS facilities to provide inter-site assistance for storage of plutonium pending final disposition. Utilize the infrastructure and facilities at SRS to achieve substantial cost savings. Add multiple modules to the Actinide Packaging and Storage Facility (APSF) to accommodate the consolidated inventory of DOE plutonium and achieve substantial cost savings.

This initiative involves a greater expansion of APSF compared to a separate writeup focused on Rocky Flat inventories for plutonium stabilization at SRS.

Assumptions

This activity has not been included in the 10 year plan baseline.

Major assets that will exist at SRS would be leveraged and utilized to support this action. The scenario involves the utilization of APSF in the F-Area. New feeds from multiple sites in the DOE complex are assumed including excess weapons and strategic reserve inventories of plutonium. The approach will provide an expansion of APSF to a total of 40,000 positions for storage of plutonium metals and oxides meeting DOE STD 3013 and other actinides meeting other agreed-to standards. The expansion would be accomplished by a series of seven add-on modules. The incremental cost of these modules will be far less than building new facilities at other DOE locations. Based upon current design for the APSF, construction schedules for any additional vault modules may require extension by one or two years.

Sensitivities

A substantial benefit is gained from expanding a facility rather than building new facilities at one or more sites in the DOE complex. A 40,000 position (8 module) scenario includes a substantial allowance for future, undefined utilization. In any event, the life-cycle cost savings for an expansion of one module has been estimated to be approximately $1B. Estimates of the total life-cycle cost advantage for a 50 year, large seven module expansion at SRS (7 modules) compared to multiple site storage conclude an approximately $1.7B cost savings for use of an expanded APSF would occur.

Basis for Project Choice as a Mortgage Reduction

- Cost effectiveness; total life-cycle cost savings in the range of $1.7B projected due to avoidance of new facilities (or multiple upgrades) at other sites when compared to the extendable storage capacity of the APSF.

- Widespread support from citizens, citizens groups and congressional representatives regarding pursuit of future missions.

- Very high probability of success; straightforward expansion of APSF. Minimal re-arrangement of equipment and layout may be involved.

Data Quality

The quality of information is at the conceptual design level. Specific re-arrangements within the APSF to support the expansion to 40,000 positions have already been identified. The conceptual design for the current inventory needs for APSF is completed. The overall quality of the cost information is judged to be "medium" based on the definitions provided in the "Mortgage Reduction Outline" guidance.

Science and Technology Summary

High Level Waste

Reverse Addition of Solutions (In-Tank Processing)
Smaller Replacement Melters for DWPF
ESP Just-In-Time Counter Current Decantation
Optimize Waste Loading in for DWPF Glass
Alternative Salt Removal Techniques
New Approaches to Salt Stone Grout Disposal
Onsite Disposal of Pu-238 Waste

Solid Waste

Non-Thermal Wet-Oxidation Process
Dual-Temperature Liquid Catalytic Exchange
Russian Hybrid Melter for Pu-238 Wastes
Oxidation and Vitrification of Mercury Contaminated Ion Exchange Resins
Volume Reduction of CIF Blowdown by Evaporation

Environmental Restoration (including D&D)

In Place Immobilization and Decay
Precision Pump & Treat
Intrinsic Geochemical Stabilization
Root Zone Remediation
Density Balancing Mobilization
In-Situ Oxidation Using Fenton's Chemistry
Characterization, Monitoring and Sensing for Various Subsurface Contaminants

Other

Enhanced Performance Assessment Methodology

(INTENTIONALLY BLANK)

Candidate Innovative Technology Development Opportunities

Technology Name: Reverse Addition of Solutions (In-Tank Processing)

Office: EM-50 **Funding Needed in Budget Years:** FY 97 - FY98

Principal Investigator Department/Division: WM&ET/SRTC

Background: Chemistry process changes need to be made in order to improve the precipitation process using sodium tetraphenylborate borate.

Description: The reverse addition option will reverse the order of introduction of materials into Tank 48H. The original design sequence is salt solution, then dilution water and finally sodium tetraphenylborate. The reverse addition sequence is dilution water, sodium tetraphenylborate and then salt solution. The reverse sequence improves precipitation reaction conditions and shortens overall time for precipitation. The precipitation will be occurring continuously and gradually with addition of salt solution. Precipitates will be forming in dilute solution and in the presence of existing precipitate. These are excellent conditions for particle growth and best reaction rate.

Funding Needs: TBD

Benefits: The reverse addition improves precipitation reaction conditions and shortens overall time for precipitation. The reversed sequence will shorten time for precipitation and should improve filter performance by improving particle morphology.

Supporting Documentation:

Challenge 10/300 Technology Plan: High Impact Technology Initiatives, High Level Waste Management Division, page 6, August 1995.

SRS High Level Waste Management Priority List, Technology Need No. 2. Waste Removal Technology Demonstration , dated 7/22/96.

Candidate Innovative Technology Development Opportunities

Technology Name: Smaller Replacement Melters for DWPF

Office: EM-50 **Funding Needed in Budget Years:** FY 97 - FY03

Principal Investigator Department/Division: WM &ET/SRTC

Background: Smaller, less expensive DWPF replacement melters capable of operating DWPF at a higher attainment rate are needed.

Description: The current replacement candidate is the experimental DWPF stirred melter. Another alternative is a higher temperature melter.

Funding Needs: TBD

Benefits: The usage of such a melter would decrease expenses by lowering the melter costs and melter disposal costs. In addition, some nominal savings could be gained by the usage of less electrical power and the reduction of operators required to monitor the melt cell during extended downtimes.

Supporting Documentation:

Challenge 10/300 Technology Plan: High Impact Technology Initiatives, High Level Waste Management Division, page 8, August 1995.

SRS High Level Waste Management Priority List, Technology Need No. 10. Waste Removal Technology Demonstration , dated 7/22/96.

Candidate Innovative Technology Development Opportunities

Technology Name: ESP Just-In-Time Counter Current Decantation

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY03

Principal Investigator Department/Division: WM &ET/SRTC

Background: Less wash water is needed in the feed prep cycle at DWPF.

Description: The ESP-JIT process uses counter-current decantation (CCD) for the washing. The CCD circuit produces six thickeners (estimated as 7 ft diameter), one feed and one product tank (9,000 gallons each, 15 ft diameter by 7 ft high). The feed tank is equipped to do Al dissolution.

Funding Needs: TBD

Benefits: The Just-In-Time process for ESP (ESP-JIT) produces much lower levels of dissolved salts (<0.1 M soluble Na) in sludge while using very much less wash water (1/5 as much versus 1co-wash, 1/10 as much as no co-wash).

Supporting Documentation:

Challenge 10/300 Technology Plan: High Impact Technology Initiatives, High Level Waste Management Division, page 7, August 1995.

SRS High Level Waste Management Priority List, Technology Need No. 6. Waste Removal Technology Demonstration , dated 7/22/96.

Candidate Innovative Technology Development Opportunities

Technology Name: Optimize waste loading in for DWPF glass

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY00

Principal Investigator Department/Division: WM & ET/SRTC

Background: If the current flowsheets, sludge washing and blending strategies and glass making constraints are used, DWPF will take 70 years to make approximately 5,720 canisters at a life-cycle cost of $7.1 billion and a cost of $250,000 per canister to store them in the Federal Repository. The largest life cycle cost reduction available would be through adequately funding a rational schedule for waste removal; however, if more waste can be put in fewer cans, a significant amount of money can be saved.

Description: The following approached could be analyze: use of trim chemicals to increase waste loading, increasing acceptable leach rate of glass to increase waste loading, use of cheaper dry chemicals instead of frit to reduce material costs.

Funding Needs: TBD

Benefits: See "Background"

Supporting Documentation:

Challenge 10/300 Technology Plan: High Impact Technology Initiatives, High Level Waste Management Division, page 7, August 1995.

SRS High Level Waste Management Priority List, Technology Need No. 10. Waste Removal Technology Demonstration , dated 7/22/96.

Candidate Innovative Technology Development Opportunities

Technology Name: Alternative Salt Removal Techniques

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY 99

Principal Investigator Department/Division:

Background: The objective of the initiative would be to develop a more cost-effective process for removing salt from High Level Waste tanks that the use of mixer pumps. An important consideration of this objective is what it takes to close the tanks as this will dictate performance requirements for the salt removal process.

Description: Alternative to be evaluated include density gradient, water jet, combinations with mixer pumps and other alternative mixing techniques.

Funding Needs: TBD

Benefits: The benefit to the High Level Waste system would be reduction in the cost to outfit a salt tank for waste removal, thereby outfitting more tanks for the same amount of capital investment.

Supporting Documentation:

Challenge 10/300 Technology Plan: High Impact Technology Initiatives, High Level Waste Management Division, page 5, August 1995.

SRS High Level Waste Management Priority List, Technology Need No. 9. Waste Removal Technology Demonstration , dated 7/22/96.

Environmental Science and Technology Strategic Plan 1996 - 2006, June 1996 Radioactive Tank Waste Remediation, Mid-Term 5-year Goal Provide a better understanding of the technical issues associated with the following areas to guide process development - chemical and physical conditions that affect slurry performance." page 18, first bullet.

<u>Candidate Innovative Technology Development Opportunities</u>

Technology Name: New Approaches to Saltstone Grout Disposal

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY98

Principal Investigator Department/Division: WM&ET/SRTC

Background: SRTC Interim Waste Technology funded $75K in FY 96. High Level Waste (HLW) Engineering is looking for money-saving alternatives to vault disposal of Saltstone.

Description: Major areas for evaluation are:
- Better formulation of saltstone
- Better membrane technology
- Selection of geologically better sites

Funding Needs: FY 97 $100K
FY 98 $100K

Benefits: Cost savings

Supporting Documentation:

IWT internal communications: Site Screening for Saltstone Disposal Alternatives

Candidate Innovative Technology Development Opportunities

Technology Name: Onsite Disposal of Pu-238 Waste

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY98

Principal Investigator Department/Division: WM&ET/SRTC

Background: The current process for disposal of wastes containing Pu-238 with concentrations greater than 100nCi/g is to certify to the Waste Isolation Pilot Plan (WIPP) Waste Acceptance Criteria, and ship the containers in a TRUPACT II Transporter to WIPP for disposal.

Description: The E-Area Vaults Performance Assessment showed that vault disposal of Pu-238 is limited by the decay product U-234. The limit for U-234 is 32 curies per vault, which is equivalent to 90,000 curies of Pu-238. Seven vaults would be required to dispose of the 580,000 curies currently in storage.

Funding Needs: FY97 - $200K
FY98 - $300K

Benefits: This proposal saves SRS and DOE $302.5M

Supporting Documentation:

SRS Waste Management Draft EIS, WM EIS DOE EIS 0217D

Performance Assessment for Low Activity Waste Vaults, WSRC-RP-94-218

Systems Analysis Applied to TRU Waste Management (U), Hootman and McDonnel, 5/12/95, PDI-ISS-95-0002

Cost Bases for Systems Analysis of TRU Waste Disposal Options (U), McDonnel, 5/26/95, PDI-ISS-95-0012

COBRA Run, Job 5820

Candidate Innovative Technology Development Opportunities

Technology Name: Non-Thermal Wet-Oxidation Process

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY98

Principal Investigator Department/Division: WM&ET/SRTC

Background: This technology has been developed specifically to address the needs of Savannah River, Rocky Flats, DoD facilities, commercial nuclear operations, hazardous waste generators in private industry, and small-volume generators such as university and medical laboratories. Of particular interest to the DOE Complex is the destruction of, or decontamination of, solid, TRU-contaminated job-control waste (a heterogeneous mixture of plastics, cellulose, lead, rubber, resins, solvents, oils, steel, ceramics, HEPA filters, etc.).

Description: The purpose of this program is to demonstrate a nitric-phosphoric acid destruction technology which can treat a heterogeneous waste by oxidizing the solid and liquid organic compounds while decontaminating noncombustible items. The process will operate below 200°C and at atmospheric pressure for most materials, and at moderate pressures (< 20 psig) for complex organics, and will convert hazardous organics and organic substrates to gases and inorganic salts while simultaneously performing a surface decontamination of the noncombustibles.

Funding Needs: FY97 - $200K
FY98 - $200K - full scale demo

Benefits: The expected payoff for a successful program will be large for government agencies, particularly DoD and DOE. This technology will provide a simple treatment method for most types of hazardous organics from lab-scale to production-scale quantities, and offers a relatively inexpensive alternative to incineration. It will also aid DoD in remediating many of its hazardous and toxic materials. The list of applications is seemingly endless because the process can destroy most liquid and solid organics, whether they be plastics, resins, solvents, waste oils, munitions, or toxic byproducts.

Supporting Documentation:

SR Solid Waste Need Statement, SRS-SWMD-TND-TRU-03: "Treatment of TRU waste for destruction of organic constituents." page 3-1 of the SR Solid Waste Program End-Users Guide.

Environmental Science and Technology Strategic Plan 1996 - 2006, June 1996, Mixed Waste Characterization, Treatment and Disposal, Near-Term 3-year Goal: "Ensure technologies are developed to treat at least 90 percent of DOE's current mixed waste inventory. The minimum target is demonstration of three technologies capable of treating 90 percent of the DOE mixed waste by 1997." page 17, first bullet.

Candidate Innovative Technology Development Opportunities

Technology Name: Dual-Temperature Liquid Catalytic Exchange

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY00

Principal Investigator Department/Division: WM&ET/SRTC

Background: DOE has expressed a goal to perform its environmental clean up actions in an expedited-rapid fashion. A goal of "10 years" has been developed. To make relevant progress toward this goal, DOE will need to complete characterization activities and then implement both baseline and innovative technologies in an efficient manner. In general, all sites would benefit from appropriate use of improved site characterization and monitoring methods. Important overall concepts include:

- emphasis on site screening tools to provide data on site and at a lower cost
- emphasis on depth discrete sampling
- increased use of 3D imaging of contaminant and geology data for both reporting and modeling
- appropriate use of "expedited site characterization" concepts.

Description: Dual temperature liquid catalytic exchange: time frame, FY97 through FY00; total cost, approximately $2000K; most cost effective isotope separation for ER conditions.

Funding Needs:

FY97 - $500K
FY98 - $500K
FY99 - $500K
FY00 - $500K

Benefits: Reduced costs versus most alternatives and improved safety versus Girdler Sulfide process.

Supporting Documentation:

SR Environmental Restoration End-Users Guide: Section 3.0 Need Statements, Category B - Groundwater Technology Needs Assessment, item 5 "In-situ or ex-situ groundwater interim removal action/containment technologies for radionuclides, VOCs and metals in unconsolidated subsurface sediments, i.e., sandy/clayey soils." page 3-1.

Environmental Science and Technology Strategic Plan 1996 - 2006, June 1996, Subsurface Contaminants, Near-Term 3-year Goal: "Develop and demonstrate in-situ containment systems for metals and radionuclides; assess cost effectiveness and evaluate risk reduction potential." page 19, fourth bullet.

Candidate Innovative Technology Development Opportunities

Technology Name: Russian Hybrid Melter for Pu-238 Wastes

Office: EM-50 **Funding Needed in Budget Years**: FY97 - FY00

Principal Investigator Department/Division: WM&ET/SRTC

Background: This task proposes to continue development of a Russian hybrid melter to process heterogeneous TRU wastes and to commercialize the technology by identifying a U.S. manufacturer as a licensee. The task will focus on drummed Pu-238 and Pu/mixed TRU wastes. These wastes must be treated before shipment and final disposal to control offgassing, to control isotopic content for shipping, and to meet WIPP Waste Acceptance Criteria and TRU PACT II shipping requirements. Compact high temperature melters are required to destroy organics and consolidate metals in plutonium and transuranic wastes for safe transport and disposal, to minimize TRU waste volumes, and to decontaminate and segregated low level waste from TRU waste. The regulatory drivers for this development effort are the FFCA, RCRA, DOT/NRC Transportation Requirements, and WIPP WAC.

Description: The Russian Ministry of Atomic Energy partially developed a system for treatment of Russia's solid wastes from Pu-238 and Pu-239 production. The hybrid system is capable of treating high organic and high metal content wastes, and does not depend upon refractories for long equipment life. A Russian fabricated pilot scale integrated unit for treatment of TRU solid waste has been assembled at Georgia Tech. A U.S. equipment manufacturer will be sought to license the Russian/DOE technology and produce a U.S. standard version for U.S. radioactive operations. In a staged approach, the Russian or the U.S. produced equipment will be installed in a glove box and operated with: 1) surrogate waste, 2) low level mixed waste, 3) Pu waste, and 4) Pu-238 waste. The glass and metal produced will be tested for regulato.y acceptance.

Funding Needs:
FY97 - $1,000K Pilot Scale Demonstration
FY98-00 - $1,000K/year for Full Scale Demonstration/Deployment

Benefits: The cold wall crucible technology provides reliability to the operation of the vitrification system. The casting / pouring capability provides a good separation of the glass from the metal. Overall, the hybrid melter provides a robust, well contained vitrification system which should be capable of minimizing health hazards. The final waste forms should be homogeneous and of high quality, with the majority of the radionuclides concentrated in the glass phase.

Supporting Documentation:

SR Solid Waste Need Statement, SRS-SWMD-TND-TRU-05: "Treatment of bulk mixed waste and non-mixed waste TRU waste to meet WIPP waste acceptance criteria." page 3-2 of the SR Solid Waste Program End-Users Guide.

Environmental Science and Technology Strategic Plan 1996 - 2006, June 1996, Mixed Waste Characterization, Treatment and Disposal, Mid-Term 5-year Goal: "Ensure Treatment and disposal options are available for the most refractory of DOE's mixed waste streams. Unique mixed wastes in the Doe system will require longer term research to identify cost effective treatment and disposal options." page 18, second bullet.

<u>**Candidate Innovative Technology Development Opportunities**</u>

Technology Name: Oxidation and Vitrification of Mercury Contaminated Ion Exchange Resins

Office: EM-50 **Funding Needed in Budget Years:** FY 97 - FY 98

Principal Investigator Department/Division: WM & ET/SRTC

Background: A method of disposal is need for ion exchange resins used in reactor basins which are contaminated with mercury.

Description: SRTC has developed a low-temperature nitric-phosphoric acid pretreatment process for oxidizing organics. This process was demonstrated on spent reactor basin ion exchange resins which was used to remove radioactive contaminants from basin water. It proved very successful in destroying the organics. Mercury contaminated resins could also be treated with the same process which would destroy the organics and solublize the mercury. Two stabilization processes would then be performed on the materials; amalgamation of the mercury and vitrification of the oxidized materials.

Funding Needs: FY 97 $ 400K
FY 98 $1,300K

Benefits: Final stabilization and disposition of hazardous waste.

Supporting Documentation:

SR Solid Waste Need Statement, SRS-SWMD-TND-TRU-03: "Treatment of TRU waste for destruction of organic constituents." page 3-1 of the SR Solid Waste Program End-Users Guide.

Environmental Science and Technology Strategic Plan 1996 - 2006, June 1996, Mixed Waste Characterization, Treatment and Disposal, Near-Term 3-year Goal: "Ensure technologies are developed to treat at least 90 percent of DOE's current mixed waste inventory. The minimum target is demonstration of three technologies capable of treating 90 percent of the DOE mixed waste by 1997." page 17, first bullet.

Candidate Innovative Technology Development Opportunities

Technology Name: Volume Reduction of CIF Blowdown by Evaporation

Office: EM-50 **Funding Needed in Budget Years:** FY 97

Principal Investigator Department/Division: WM&ET/SRTC

Background: Wet off-gas systems generate a secondary waste stream known as blowdown resulting from the scrubbing operation. The blowdown stream is predominantly water with up to 20 wt% solids that include ash particulates and salts resulting from the neutralization of acid gases. The blowdown is currently stabilized by in-drum cement stabilization without volume reduction. Significant disposal cost savings can be achieved by stabilization of the blowdown by dewatering to drastically reduce stabilized waste volume for disposal. The cement stabilization process has not demonstrated successful stabilization of dewatered salts due to high concentrations of hazardous metals. Large volumes of liquid blowdown result in large quantities of stabilized waste for disposal. Reduced disposal volumes of dewatered blowdown stabilized by emerging technologies to meet regulatory requirements for disposal will significantly reduce disposal costs.

Description: The Savannah River Site (SRS) Consolidated Incinerator Facility (CIF) will incinerate combustible low level and mixed wastes for volume reduction of combustible wastes and destruction of hazardous organics. The CIF consists of a rotary kiln incinerator with a wet off-gas system which generates a liquid waste known as "blowdown" containing scrubbed off-gas contaminants. Currently, the blowdown, consisting of 80 wt% water and a maximum of 10 wt% chloride salts and 10 wt% solids, is stabilized in cement without any volume reduction.

Total or partial de-watering of the blowdown will result in significant disposal cost savings. However, existing stabilization technologies, such as cement stabilization, have not demonstrated successful stabilization of concentrated salts in dewatered blowdown due to high concentrations of hazardous metals. Laboratory testing, however, with emerging technologies has shown promising results, i.e., thermoplastic microencapsulation. Therefore, pilot scale demonstration testing for stabilization of dewatered blowdown is a proposed technology development need. A technology demonstrating successful stabilization of dewatered blowdown will result in cost savings from disposal of significantly reduced disposal volume over existing process of stabilizing blowdown with 80 wt% water content in concrete.

Funding Needs: FY97 - $100K
FY98 - $100K
FY99 - $50K

Benefits: Technical: Current baseline stabilization technology exists. The need is not driven by technical concerns.

Regulatory: The current baseline stabilization technology meets the regulatory requirements. This need is not driven by regulatory concerns.

Environmental, Health & Safety: Fulfillment of this need by an emerging stabilization technology may provide a superior stabilization treatment for hazardous metals. However, this need is not driven by ES&H concerns, since a baseline technology exists.

Cost Savings Potential: This need is cost driven. Significant reduction of the volume of the blowdown to be stabilized will significantly reduce treatment and disposal costs.

Supporting Documentation: Solid Waste Needs Technology Prioritization Listing DC-96-0168

Candidate Innovative Technology Development Opportunities

Technology Name: In Place Immobilization and Decay

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY00

Principal Investigator Department/Division:

Background: DOE has expressed a goal to perform its environmental clean up actions in an expedited-rapid fashion. A goal of "10 years" has been developed. To make relevant progress toward this goal, DOE will need to complete characterization activities and then implement both baseline and innovative technologies in an efficient manner. In general, all sites would benefit from appropriate use of improved site characterization and monitoring methods. Important overall concepts include:

- emphasis on site screening tools to provide data on site and at a lower cost
- emphasis on depth discrete sampling
- increased use of 3D imaging of contaminant and geology data for both reporting and modeling
- appropriate use of "expedited site characterization" concepts.

Description: In place immobilization and decay: FY97 through FY00; total cost, approximately $2000K; similar to precision pump and treat and on-site use of water.

Funding Needs: $500K each year FY97 through FY00.

Benefits: Cost effective large scale modification of hydrologic balance.

Supporting Documentation:

SR Environmental Restoration End-Users Guide: Section 3.0 Need Statements, Category B - Groundwater Technology Needs Assessment, item 5 "In-situ or ex-situ groundwater interim removal action/containment technologies for radionuclides, VOCs and metals in unconsolidated subsurface sediments, i.e., sandy/clayey soils." page 3-1.

Environmental Science and Technology Strategic Plan 1996 - 2006, June 1996, Subsurface Contaminants, Near-Term 3-year Goal: "Develop and demonstrate in-situ containment systems for metals and radionuclides; assess cost effectiveness and evaluate risk reduction potential." page 19, fourth bullet.

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Candidate Innovative Technology Development Opportunities

Technology Name: Intrinsic Geochemical Stabilization

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY01

Principal Investigator Department/Division:

Background: DOE has expressed a goal to perform its environmental clean up actions in an expedited-rapid fashion. A goal of "10 years" has been developed. To make relevant progress toward this goal, DOE will need to complete characterization activities and then implement both baseline and innovative technologies in an efficient manner. In general, all sites would benefit from appropriate use of improved site characterization and monitoring methods. Important overall concepts include:

- emphasis on site screening tools to provide data on site and at a lower cost
- emphasis on depth discrete sampling
- increased use of 3D imaging of contaminant and geology data for both reporting and modeling
- appropriate use of "expedited site characterization" concepts.

Description: Intrinsic geochemical stabilization: time frame, FY97 through FY01; total cost, approximately $2000K; addresses long term risk and portion of plume that is not cost effectively cleaned up using baseline methods - the basis of the technology is the observation that metals appear to precipitate and age from hydroxides toward more stable oxides over time (eliminating the possibility of future water phase contamination).

Funding Needs: $400K each year FY97 through FY01

Benefits: A low cost low energy sustainable technology that cleans up the plume boundaries at many large sites. Real risk reduction using such technologies will allow costs to be constrained by limiting the need to use or expand pump and treat systems.

Supporting Documentation:

SR Environmental Restoration End-Users Guide: Section 3.0 Need Statements, Category B - Groundwater Technology Needs Assessment, item 3. "Dense nonaqueous phase liquids (DNAPL) remediation technologies in deep unconsolidated subsurface sediments, i.e., sandy/clayey soils." page 3-1.

Environmental Science and Technology Strategic Plan 1996 - 2006, June 1996, Subsurface Contaminants, Mid-Term 5-year Goal: "Develop and demonstrate containment, monitoring and remediation systems for use with in-situ dense non-aqueous phase liquids (DNAPL)." page 20, third bullet. Long-Term 10-year goal, "Develop and demonstrate in situ systems for more efficient and more cost effective remediation of DNAPL contaminated aquifers (as alternates to pump and treat)." page 20 second bullet.

Candidate Innovative Technology Development Opportunities

Technology Name: Root Zone Remediation

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY99

Principal Investigator Department/Division:

Background: DOE has expressed a goal to perform its environmental clean up actions in an expedited-rapid fashion. A goal of "10 years" has been developed. To make relevant progress toward this goal, DOE will need to complete characterization activities and then implement both baseline and innovative technologies in an efficient manner. In general, all sites would benefit from appropriate use of improved site characterization and monitoring methods. Important overall concepts include:

- emphasis on site screening tools to provide data on site and at a lower cost
- emphasis on depth discrete sampling
- increased use of 3D imaging of contaminant and geology data for both reporting and modeling
- appropriate use of "expedited site characterization" concepts.

Description: Root Zone Remediation in Outcrop Zone: time frame, FY96 through FY99; total cost, approximately $800K; addresses long term risk and portion of plume that is not cost effectively cleaned up using baseline methods - a low cost, low energy sustainable technology that cleans up the plume boundaries at many large sites.

Funding Needs: $300K in FY97
$300K in FY98
$200K in FY99

Benefits: Real contaminant destruction and risk reduction using such technologies will allow costs to be constrained by limiting the need to expand pump and treat systems.

Supporting Documentation:

SR Environmental Restoration End-Users Guide: Section 3.0 Need Statements, Category B - Groundwater Technology Needs Assessment, item 3. "Dense nonaqueous phase liquids (DNAPL) remediation technologies in deep unconsolidated subsurface sediments, i.e., sandy/clayey soils." page 3-1.

Environmental Science and Technology Strategic Plan 1996 - 2006, June 1996, Subsurface Contaminants, Mid-Term 5-year Goal: "Develop and demonstrate containment, monitoring and remediation systems for use with in-situ dense non-aqueous phase liquids (DNAPL)." page 20, third bullet. Long-Term 10-year goal, "Develop and demonstrate in situ systems for more efficient and more cost effective remediation of DNAPL contaminated aquifers (as alternates to pump and treat)." page 20 second bullet.

Candidate Innovative Technology Development Opportunities

Technology Name: Density Balancing Mobilization

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY99

Principal Investigator Department/Division: ESS/WM&ET

Background: DOE has expressed a goal to perform its environmental clean up actions in an expedited-rapid fashion. A goal of "10 years" has been developed. To make relevant progress toward this goal, DOE will need to complete characterization activities and then implement both baseline and innovative technologies in an efficient manner. In general, all sites would benefit from appropriate use of improved site characterization and monitoring methods. Important overall concepts include:

- emphasis on site screening tools to provide data on site and at a lower cost
- emphasis on depth discrete sampling
- increased use of 3D imaging of contaminant and geology data for both reporting and modeling
- appropriate use of "expedited site characterization" concepts.

Description: Density Balancing Mobilization: time frame, FY96 through FY99; total cost, approximately $1500K; addresses highest priority ER need at SRS - an aggressive technology that rapidly removes large amounts of DNAPL solvent with improved safety.

Funding Needs: $500K in FY97
$500K in FY98
$500K in FY99

Benefits: Risk reduction, process improvement. The pure organic is mobilized as the density is reduced - eliminating the possibility of undesired gravitational mobilization.

Supporting Documentation:

SR Environmental Restoration End-Users Guide: Section 3.0 Need Statements, Category B - Groundwater Technology Needs Assessment, item 3. "Dense nonaqueous phase liquids (DNAPL) remediation technologies in deep unconsolidated subsurface sediments, i.e., sandy/clayey soils." page 3-1.

Environmental Science and Technology Strategic Plan 1996 - 2006, June 1996, Subsurface Contaminants, Mid-Term 5-year Goal: "Develop and demonstrate containment, monitoring and remediation systems for use with in-situ dense non-aqueous phase liquids (DNAPL)." page 20, third bullet. Long-Term 10-year goal, "Develop and demonstrate in situ systems for more efficient and more cost effective remediation of DNAPL contaminated aquifers (as alternates to pump and treat)." page 20 second bullet.

Candidate Innovative Technology Development Opportunities

Technology Name: In-Situ Oxidation Using Fenton's Chemistry

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY98

Principal Investigator Department/Division:

Background: DOE has expressed a goal to perform its environmental clean up actions in an expedited-rapid fashion. A goal of "10 years" has been developed. To make relevant progress toward this goal, DOE will need to complete characterization activities and then implement both baseline and innovative technologies in an efficient manner. In general, all sites would benefit from appropriate use of improved site characterization and monitoring methods. Important overall concepts include:

- emphasis on site screening tools to provide data on site and at a lower cost
- emphasis on depth discrete sampling
- increased use of 3D imaging of contaminant and geology data for both reporting and modeling
- appropriate use of "expedited site characterization" concepts.

Description: Organic contaminants and NAPLs

In situ Oxidation using Fenton's Chemistry: time frame, FY96 through FY98, addresses highest priority ER need at SRS - an aggressive technology that "burns" burns large amounts of NAPL solvent in place without extracting it to the surface.

Funding Needs: $300K in FY97
$300K in FY98
$200K in FY99

Benefits: This is efficient because physical properties make the NAPL removal process extremely inefficient.

Supporting Documentation:

SR Environmental Restoration End-Users Guide: Section 3.0 Need Statements, Category B - Groundwater Technology Needs Assessment, item 3. "Dense nonaqueous phase liquids (DNAPL) remediation technologies in deep unconsolidated subsurface sediments, i.e., sandy/clayey soils." page 3-1.

Environmental Science and Technology Strategic Plan 1996 - 2006, June 1996, Subsurface Contaminants, Mid-Term 5-year Goal: "Develop and demonstrate containment, monitoring and remediation systems for use with in-situ dense non-aqueous phase liquids (DNAPL)." page 20, third bullet. Long-Term 10-year goal, "Develop and demonstrate in situ systems for more efficient and more cost effective remediation of DNAPL contaminated aquifers (as alternates to pump and treat)." page 20 second bullet.

Candidate Innovative Technology Development Opportunities

Technology Name: Characterization, Monitoring and Sensing for Various Subsurface Contaminants

Office: EM-50 **Funding Needed in Budget Years:** FY97 - FY 2006

Principal Investigator Department/Division: CP & HT/SRTC

Background: Faster and more cost-effective methods are needed for determination of lateral and vertical concentration profiles of contaminant plumes in soil and groundwater through development, delivery, and implementation of sensors for cone penetrometer deployment and enhanced cone penetrometer sampling and push techniques. Input stream characterization, process monitoring, and effluent monitoring technologies are needed to support permitting of full-scale low level waste stream treatment facilities. Technologies are needed to remotely characterize and map areas in support large-scale D&D operations where surface contamination due to various radionuclides and hazardous organic compounds

Description: A variety of fiber optic-laser based spectroscopic techniques will be explored using terminus doped optically sensitive or excited chemicals to measure fluoresence, adsorption or emission from surface contaminants. Sensors will be tailored to specific applications.

Funding Needs: $1,000K per year

Benefits: Remote sensing of surface contaminants in hostile environments avoids exposure of personnel to unnecessary situations where whole body radiation doses may be very high and to air borne exposure of contamination thereby reducing the risk of assimilation. Real-time at-facility sensing also reduces the cost of sampling and analytical laboratory analysis time.

Supporting Documentation:

SR Environmental Restoration End-Users Guide: Section 3.0 Need Statements, Category C - Characterization Techniques/methods Technology Needs Assessment, item 3. "Sample collection, and well drilling technology that eliminates aqueous or nonaqueous investigation-derived waste (IDW) and control of contaminant migration long well casings." page 3-2.

Environmental Science and Technology Strategic Plan 1996 - 2006, June 1996, Mixed Waste Characterization, Treatment and Disposal, Mid-Term 5-year Goal: Enable advanced characterization of high-level waste tanks, providing in-situ sensor technologies to better define chemical, physical, and radiological properties of tank wastes, and data fusion tools to provide tomographic maps of waste tank content, integrating and correlating measurement results with historical tank inventory data." page 23, first bullet.

Candidate Innovative Technology Development Opportunities

Technology Name: Enhanced Performance Assessment Methodology

Office: EM-50 **Funding Needed in Budget Years:** FY97

Principal Investigator Department/Division: WM&ET/SRTC

Background: As derived from the EAV PA, many treated SRS waste forms cannot be disposed of in the proposed HW/MW vaults due to restrictive radionuclide limits. Additionally, restrictive radionuclide limits are restricting disposal of some LLW waste streams in EAV. The restrictive limits result from conservative assumptions used in the development of the EAV PA limit. No other disposal options have been identified for those waste forms thus requiring indefinite storage since other DOE sites are struggling with the same problem. In the absence of refined performance based limits, alternative waste treatment, packaging or disposal facilities meeting the conservatively developed PA limits would need to be developed, designed and implemented.

Description: Performance Assessment (PA) results for the Savannah River Site's (SRS) E-Area Vaults (EAV) provide significant constraint on the ability to dispose of radionuclides. This issue also affects many treated mixed-waste streams which cannot be disposed of in the proposed Hazardous Waste/Mixed Waste (HW/MW) Vaults due to the same restrictive radionuclide limits. PA development necessarily invokes utilization of hundreds of parameters to model waste form and site characterization. Where actual test data does not exist, conservative assumptions are used in model development thus driving PA results to exclude disposal options for many treated mixed and untreated non-mixed waste forms. Refinement or elimination of these conservative assumptions is needed to demonstrate compliant disposal of these waste forms. Some concepts for reducing conservatisms have been identified in the EAV PA but not pursued due to funding constraint..

Funding Needs: FY97 - $100K
FY98 - $100K
FY99 - $100K

Benefits: Cost savings have not been quantified, however, reduction of PA conservatisms is clearly less costly than development, design and implementation of alternative, treatment, packaging, or disposal facilities. Near term refinement of conservatisms would also eliminate the need for additional permitted storage capacity that would be required if disposal options were not available. Additional cost avoidance would result from avoidance of either penalties or shutdown of waste generating facilities. Cost savings could also be realized by establishing higher disposal limits and thus enabling relaxation of some waste characterization requirements imposed to comply with restrictive disposal limits. Some of these savings could be applied to LLW where existing limits are resulting in storage of waste streams exceeding disposal criteria.

Supporting Documentation:

SRS Solid Waste Management Department Technology Development Needs Statement, SRS-SWMD-TDN-LLW-01.