

Project Baseline Summary Report

Data Source: **EM CDB**
Operations/Field Office: **Savannah River**
Site Summary Level: **Savannah River Site**
Project **SR-ER04 / Pen Branch Project**

Report Number: **GEN-01b**
Print Date: **3/9/2000**
HQ ID: **0054**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

Purpose / Scope

The Pen Branch Watershed Project is one of six geographical divisions of SRS establish with the purpose of implementing the Federal Facility Agreement (FFA). The Pen Branch Watershed Project comprises several areas: Central Shops, G-Area, K-Area and L-Area. Portions of Central Shops received wastewater from equipment repair that contained low levels of radioactivity, trace quantities of nonradioactive organic and inorganic compounds, and inert solid wastes. K-Area Reactor Seepage Basin was used for the disposal of K-Area Reactor disassembly basin's purge water from 1957 to 1960. The CMP Pits were used for disposal of chemicals, metals and pesticides waste from 1971 to 1979. Burning/Rubble Pits in Central Shops, L-Area, and K-Area were used for the disposal of spent organic solvents, waste oils, paper, plastics, wood, telephone poles, and rubber. These wastes were periodically burned although in 1973, burning of wastes was discontinued, therefore a layer of soil was placed over the pit debris. These pits and the Rubble Pits in Central Shops, L-Area and K-Area were then filled to capacity with rubble such as concrete, bricks, tile, asphalt, plastics, wallboard, rubber and nonreturnable empty drums. These pits were covered with a layer of soil and closed in 1981. The K-Area Sludge land application site received sludge from the Central Shops Sludge lagoon in December 1980. Acceptable disposal practices in the past, associated with historical reactor operations, have produced waste units within the K-Reactor Area. Monitoring well data collected from the K-Reactor Area indicates the groundwater is contaminated with tritium, chlorinated volatile organics, other radionuclides, heavy metals, and sulfate.

Definition of Scope: Remediation of the Pen Branch Watershed Project will consist of the following:

- preliminary evaluation of suspect areas to determine if action is necessary,
- investigation and analysis of the identified waste units and any suspect areas identified through preliminary evaluations to determine further investigation and possible required remediation,
- implementation of remediation technologies to mitigate the impact of contaminants of concern on human health and the environment, and
- post action monitoring to ensure that the implemented technology was effective.

Remediation of the Pen Branch Watershed Project in accordance with CERCLA will decrease human and environmental risks to acceptable levels.

The Pen Branch Watershed Project will require remediation of

- primary source material,
- affected soils,
- affected surface water pathways, and
- affected groundwater.

Technical Approach

The technical approach to the preliminary evaluations and investigations will consist of sampling soil, surface water, and groundwater to determine the nature, extent, and mobility of the contaminants associated with the waste units. Once the sampling has been completed, analysis of the data will be performed to evaluate the current and future impacts to human health and the environment due to the waste unit. This information will be used to screen remediation technologies to identify the most effective remedy. The remedy will then be implemented, and post action monitoring initiated to ensure that it is effective.

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The types of remedies anticipated to be used or currently in use on the Pen Branch Watershed Project are

- capping (using either natural or synthetic materials),
- removal and proper disposal of contaminated soil and sediments, and
- other actions resulting from the FFA process.

In addition to these standard technologies, the Environmental Restoration Division is aggressively pursuing innovative technologies that will either enhance the effectiveness of the remedy or minimize the cost. Innovative technologies to be deployed in this project include various sampling and analysis methods to reduce Investigative Derived Waste. Technologies include

- Alternatives to pump and treat for ground water contamination;
- Long term low permeability cover systems;
- In situ solidification and stability technologies;
- New technologies to characterize and remediate DNAPL;
- Technologies to remotely identify the presence of buried waste;
- Phytoremediation and other passive treatment systems;
- Technologies to treat or hydraulically control tritium contaminated groundwater.

Project Status in FY 2006:

"Just in time" compliance is depicted in "Planning Case." ("Just in time" is defined as adherence to compliance direction in a manner that is "Just in time" to meet regulatory deliverables and avoid fines and penalties.)

In the planning case; assessment will be ongoing in 2006 for K-Area Sludge Land Application Site, G- Area Oil Seepage Basin, Hydrofluoric Acid Spill, SRL Oil Test Site, and K Reactor Groundwater. Assessment will be complete and remedial actions ongoing for Central Shop Sludge Lagoon, K-Area Isolated Hazardous Material Unit (131-K), and L-Area IHMU (131-3L). In FY06 remedial action will be complete for Ford Building Seepage Basin, Ford Building Waste Site, CMP Pits, and K-Reactor Seepage Basin.

In the target case, assessment will be ongoing in 2006 for K-Area Sludge Land Application Site, G-Area Oil Seepage Basin, Hydrofluoric Acid Spill, SRL Oil Test Site, and K Reactor Groundwater. Assessment will be complete and remedial actions ongoing for Central Shop Sludge Lagoon, and K-Area Isolated Hazardous Material Unit (131-K). In FY06 remedial action will be complete for Ford Building Seepage Basin, Ford Building Waste Site, CMP Pits, and K-Reactor Seepage Basin.

The difference in the planning and target case is that L-Area IHMU (131-3L) is currently not funded during FY01. This will result in a delay in the overall project completion by a minimum of two years therefore the target case for this project status in FY06 is assessment complete and remediation ongoing.

Post-2006 Project Scope:

"Just in time" compliance is depicted in "Planning Case." ("Just in time" is defined as adherence to compliance direction in a manner that is "Just in time" to meet regulatory deliverables and avoid fines and penalties.) Certain portions of L-Area Isolated Hazardous Material Unit 131-3L is unfunded at the target level of funding and could impact completion.

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Post-2006 scope for the planning case is as follows: K-Area IHMU (131-K), L-Area IHMU (131-3L), CMP Pits, G-Area Oil Seepage Basin, and Hydrofluoric Acid Spill will complete remediation by FY10. K-Area Sludge Land Application Site will be complete by FY13. K-Reactor Groundwater will have ongoing remediation, monitoring, and surveillance, and SRL Oil Test Site will have a Remedial Action Start in FY08.

Post-2006 scope for the target case includes L-Area IHMU (131-3L) finishing remediation two years later in FY12.

Project End State

The Pen Branch Watershed Project will meet the EM site end state after the completion of the remediation and monitoring described in the technical approach. After remediation has been completed, the sites will be subject to periodic five-year reviews of the ROD. Portions of the project where institutional controls were implemented will continue to require oversight until the property is transferred with appropriate deed restrictions.

Cost Baseline Comments:

- "Just In Time" compliance is depicted in "Planning Case."
- Target Funding for FY01 is insufficient for current regulatory requirements.
- Certain projects are unfunded at target level of funding and could impact completion.
- The Cost Baseline reflects fully utilized target funding in outyears (FY02 - FY06) for existing and anticipated regulatory requirements.
- Budget for regulatory driven Low Level Waste disposal will be included in Solid Waste Division's Program Baseline Summaries (PBS).

Safety & Health Hazards:

The criteria for determining the radiological hazard categories are provided in DOE-STD-1027-92 and the criteria for determining the chemical hazard categorization are provided in WSRC-MS-92-206. Chemical inventory is controlled in accordance with RDP 14.1, Chemical Management Program and Chemicals and Nonradioactive Hazardous Materials Control (U), DPSOL 105-1845-K.

Safety & Health Work Performance:

Activities and checkpoints are described by the Integrated Management System Description. The conditions and requirements are clearly established and agreed upon prior to the start of any project, and those requirements are contractually binding upon WSRC. The key elements of the WSRC Integrated Safety Program are to define the scope of work, identify and analyze hazards associated with the work, develop and implement hazard controls, perform work within controls, provide feedback on adequacy of controls, and continue to improve safety management. The WSRC Integrated Procedures Management System (IPMS) is the primary mechanism for implementing the objective, principles and functions of the Safety Management System. This system establishes company-level, division-level, and program-specific procedures consistent with organizational roles and ensures a consistent, discipline site wide approach to safety while performing work. The resource description, costs, and skill mix are defined in the following Sections: Costs D.2.2, Costs D.3, FTEs D.2.5, and FTEs D.2.7 of the IPMS.

PBS Comments:

The remediation of the Pen Branch Watershed Project is monitored very closely by both EPA Region IV and SCDHEC through the implementation of the FFA. If progress in this watershed is not made in accordance with the FFA, RCRA permits, and settlement agreements then DOE could be subject

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to fines and penalties from both regulatory agencies. In addition, portions of the Pen Branch Watershed Project have been identified as areas that could be developed for industrial purposes in the future. This future industrial use of the site could be impeded if remediation of the watershed is not conducted as planned.

Baseline Validation Narrative:

ERD's Baseline Validation History

The Environmental Restoration (ER) Department was established in 1990 with the mission to clean up (remediate) the environmental damage incurred during past operations. Although the scope of cleanup was not clearly defined at that time, DOE, through its contractors, initially identified 420 waste units. In 1992, the ER Department defined and bounded this scope of work via the Federal Facilities Agreement (FFA), a legally binding agreement between the Department of Energy (DOE), the U.S. Environmental Protection Agency, and the State of South Carolina. However, ER and DOE management realized the need to continue refining the scope defined in the FFA. A tool to manage the work in terms of scope, schedule, and cost was also needed. This realization led to the development of Baseline 93 (BL93).

To accomplish the scope of work found in the approved FFA, the ER Department realized that the scope of work had to be more clearly defined. BL 93 was organized by scope, schedule, and cost in accordance with the EM-40 "Project Management Notebook".

The first baseline was prepared using the "Balanced Program Strategy". This strategy considered the needs and requirements of worker and public health and safety, environmental concerns (risk), regulatory compliance and funding considerations. A mixture of high-, medium-, and low-risk waste units was scheduled at the same time. This balanced approach would later be changed to schedule the higher-risk units prior to lower-risks units.

The cost estimates in this baseline were in FY93 dollars. Escalation (to accommodate rising costs) was applied beginning in FY95. Neither contingency nor management reserve were built in to the cost estimate at this time. The baseline time frame extended only to FY99 per DOE direction and did not account for the full Life Cycle Cost. In early 1994, an Independent Cost Estimating (ICE) team reviewed BL93 and verified the building blocks used in development of BL93 were accurate.

Baseline 93 Highlights

- The parametric model template was developed for the SRS from a baselining model used at DOE Hanford. DOE approved this model.
- This first ER baseline used parametric modeling to estimate the cost of a project.
- The baseline reflected target values through FY99.
- The scope of work encompassed 420 waste units identified in the FFA, including the RCRA scope of work.
- Schedules were developed using legal drivers (i.e., settlement agreements, FFA and court orders).
- BL93 was endorsed by Savannah River Operations Office and EM-42 as a quality document.
- BL93 included data for FY93 to FY99 only per DOE direction.
- BL93 with the ICE comments included was utilized to request future funding.

In FY94, Congress required that DOE provide a Baseline Environmental Management Report (BEMR) with annual updates.

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The ER Department used this request as an opportunity to update the FY93 baseline. This report used the Life Cycle Cost Estimate (LCCE) for the first time. The LCCEs were not fully complete at the first request of the BEMR so parametric modeling in conjunction with LCCEs were used to develop the cost estimates for BEMR 94. Using legal drivers, BEMR 94 schedules indicated the life cycle of the ER program (including surveillance and monitoring) would extend to FY2045.

This was the first SRS ER baseline that included a full life cycle cost schedule for FFA Appendix C waste units. An estimated cost, for assessment only, was applied to FFA Appendix G waste units that had not been characterized or estimated in BL93. The estimates to cleanup Appendix G waste units were not included to capture the total cost of the ER program because there was not enough information to make an educated guess.

In the absence of a formal future land use designation, BEMR 94 assumed a base case that closely followed industrial criteria for remediation of waste units. All budgets were in constant FY95 dollars. No contingency or escalation was applied.

BEMR 94 Highlights

- Estimates were taken from a combination of modeled LCCEs and parametric estimates.
- Schedules were developed from legal drivers (FFA). The end date for all ER activity was estimated to be FY2045.
- The number of waste units could increase due to new discoveries.
- An estimate was included to cover the assessment of Appendix G waste units; no remediation costs were included.

BEMR 96 was the next update required by congress. In this update, technology approaches that would lead to productivity improvements were assumed. Remediation of FFA Appendix G waste units were now included and was the major contributor to the increase in cost from BEMR 94 to BEMR 96. These costs were developed using a model that assumed past experience that would continue for future site evaluation activities and cost. It was also assumed that 25% of the waste units in the Site Evaluation (SE) Program would be classified as high-risk sites and move into the base program. This assumption later proved to be incorrect.

BEMR 96 Highlights

- Estimates were taken from modeled LCCEs.
- Schedules were developed from legal drivers (FFA).
- With new waste unit discoveries, in addition to the split of existing waste units for tracking purposes, the scope of work was increased to 478 waste units.

Changing technologies and assumptions in land use demonstrated a need to further define the ERD scope of work, schedule, and cost. In April of 1996, ER issued the most inclusive baseline to date. The assumptions were clearly documented, with contingency derived from risk analysis and escalation applied in a logical manner (not straight-lined).

- BL96 used the information taken from LCCEs. These estimates were activity-based estimates with specific resources identified and applied to work scope.
- Schedules were then developed by applying regulatory drivers (i.e., FFA, primary agreements, other agreements and drivers).
- After further evaluation, some waste units were combined, dropping the population of waste units to 467.
- Although BEMR 96 included order of magnitude costs for remediation of waste units in Appendix G, they were not included in BL96. BL96 did not

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include any planning estimates.

- Schedules used the same regulatory drivers as BEMR 96.

In order to validate BL96, an ICE review was conducted.

The ICE team comments centered on the LCCEs. The cost delta between BL96 and BL96 ICE is primarily attributed to changes in scheduling and costs for program support. The agreed-to ICE comments significantly reduced the cost of this scope in the outyears. This review concluded with preparation of a baseline change package addendum to BL96 in April 1997. The ICE comments were incorporated into revised LCCE beginning in FY97.

A primary objective of the Ten Year Plan was to cleanup as many waste units as possible within ten years. The ER Program planned to complete remediation of the majority of high- and medium- risk waste units within ten years assuming regulatory flexibility with rescheduling of work and that funding would be available to support the work.

The concept of organizing work scope into areas (PBS) was first introduced in the Ten Year Plan. The SRS ER Program chose to utilize the natural occurrence of watersheds (areas) to summarize the projects. This PBS is a product of this WBS change.

Ten Year Plan Highlights

- Basis for the existing WBS configuration.
- Most high-risk units in cleanup by FY2006.
- 25% of Appendix G units were assumed to require further assessment and remediation.
- Scope of work was 467 sites.

The "Accelerating Cleanup: Paths to Closure" report was built on the concepts of the Ten Year Plan. Expanding on the area format, data requirements were further refined to produce an integrated management strategy for Environmental Restoration efforts across the DOE Complex. The ER program at SRS was also streamlining the regulatory process to accelerate remediation. One streamlining concept, the Plug-in Record of Decision (ROD) was also introduced. The Plug-in ROD is designed to reduce the time from characterization to actual remediation for sites with similar contamination where the same remediation technology is applied. Work scope was also re-evaluated to achieve maximum remediation results and cost reductions. Included in this update was the addition of the Integrator Operable Units (IOUs) that extended the schedule for cleanup after all the waste units in that area had been remediated.

Accelerated Cleanup: Paths to Closure Highlights

- Approved LCCEs were used to develop ACP Cost.
- Schedules were based on a new FFA, which reflected the cleanup of high-risk waste units first, followed by sites of lower risk.
- Scope of work was 477 waste units.

During FY97 and FY98, LCCEs were updated yearly to include the latest technologies used to clean up the waste units, which greatly increased the productivity of the ERD Program.

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Incorporation of technological advances resulted in increased savings from BL96 though the scope increased since BL96, due to site evaluation units moving into the base program.

During FY98, ER's Technical baseline was reviewed by TetraTech EM, Inc. and in November 1998 validated with minimal recommendations. These recommendations are under review and are being incorporated in future revisions to the LCCes.

Current Baseline Estimate Highlights

- Most comprehensive baseline
- Integration of Strategic Planning
- Environmental Risk Analyses and Assignment of waste units.
- Business Risk Analyses
- Baseline developed by consensus building by ERD, DOE, Regulators and the Public
- LCCes reviewed and approved by DOE
- FFA is primary driver of program
- Changes from BL96 to current estimates reconciled
- Recognition of new technologies
- Again, some waste units were split apart and newly discovered, increasing the ER program scope to 477 waste units.
- The ER program completion date moved from FY2045 to FY2038.

During the last six years, ERD has undergone significant improvement in defining work scope and estimating the cost to complete this scope. LCCes and schedules have evolved to definitive documents that will more accurately measure future changes in scope, schedule, and cost. A configuration control process is used to manage this baseline.

General PBS Information

Project Validated? Yes **Date Validated:** 10/3/1996
Has Headquarters reviewed and approved project? No
Date Project was Added: 12/1/1997
Baseline Submission Date: 7/3/1999
FEDPLAN Project? Yes

Drivers:	CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
	Y	Y	N	Y	N	Y	Y	Y

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DOE Project Manager: Cynthia V. Anderson
DOE Project Manager Phone Number: 803-725-3966
DOE Project Manager Fax Number: 803-725-7548
DOE Project Manager e-mail address: cynthia-v.anderson@srs.gov
Is this a High Visibility Project (Y/N):

Planning Section

Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006	
PBS Baseline (current year dollars)	82,602	104,758	187,360	3,622	3,622	10,228	10,228	6,658	10,862	10,816	13,172	9,491	5,458	6,135	6,160	
PBS Baseline (constant 1999 dollars)	76,261	70,786	147,047	3,622	3,622	10,228	10,228	6,658	10,485	10,077	11,950	8,384	4,695	5,138	5,024	
PBS EM Baseline (current year dollars)	82,602	104,758	187,360	3,622	3,622	10,228	10,228	6,658	10,862	10,816	13,172	9,491	5,458	6,135	6,160	
PBS EM Baseline (constant 1999 dollars)	76,261	70,786	147,047	3,622	3,622	10,228	10,228	6,658	10,485	10,077	11,950	8,384	4,695	5,138	5,024	
	2007	2008	2009	2010	2011- 2015	2016- 2020	2021- 2025	2026- 2030	2031- 2035	2036- 2040	2041- 2045	2046- 2050	2051- 2055	2056- 2060	2061- 2065	2066- 2070
PBS Baseline (current year dollars)	12,802	10,176	22,519	6,883	19,787	17,781	5,455	4,608	4,747	0	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	10,166	7,868	16,954	5,046	13,401	10,540	2,831	2,093	1,887	0	0	0	0	0	0	0

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	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS EM Baseline (current year dollars)	12,802	10,176	22,519	6,883	19,787	17,781	5,455	4,608	4,747	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	10,166	7,868	16,954	5,046	13,401	10,540	2,831	2,093	1,887	0	0	0	0	0	0	0

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	3.60%	3.60%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%
2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project: 12/22/2011
 Current Projected End Date of Project: 9/30/2038
 Explanation of Project Completion Date Difference (if applicable):

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars): 85,693 Actual 1997 Cost: 3,622 Actual 1998 Cost: 10,228
 Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars): 71,843 Inflation Adjustment (2.7% to convert 1998 to 1999 dollars): 1,940
 Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars): 73,783

Project Cost Changes

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Project Reconciliation

Cost Adjustments Reconciliation Narratives

Cost Change Due to Scope Deletions (-):		
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):		
Cost Growth Associated with Scope Previously Reported (+):	14,376	Regulatory changes, updated estimates, & scope changes resulted in a net cost growth.
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	88,159	
Additional Amount to Reconcile (+):	45,038	
<hr/>		
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	133,197	

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
Central Shops Sludge Lagoon (080-24G) Field Start	SR-ER04-137		12/30/1998	12/30/1998		12/31/1998	Y				
Central Shops Sludge Lagoon (080-24G) RA Start	SR-ER04-139		3/30/2003	3/30/2003			Y				
Central Shops Sludge Lagoon (080-24G) ROD Submittal	SR-ER04-138		12/30/2001	12/30/2001			Y			Y	
CMP Pits (080-17G, -17.1G, -18G, -19G, -18.1G, -18.2G, -18.3G) Re	SR-ER04-008		12/30/2001	12/30/2001			Y				
Ford Building Seepage Basin Remedial Action Start	SR-ER04-017		12/30/2001	12/30/2001			Y				
Ford Building Seepage Basin Rod Submittal Final	SR-ER04-016		9/29/2000	9/29/2000			Y			Y	
Ford Building Waste Site (643-11G) Signed ROD	SR-ER04-007		5/17/1999	5/17/1999			Y			Y	
Ford Building Waste Site (643-11G) Rev. 0 ROD Submittal	SR-ER04-010		2/28/1999	2/28/1999			Y			Y	
Ford Building Waste Site (761-13G) Remedial Action Start	SR-ER04-020		9/30/2000	9/30/2000			Y				

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Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
G-Area Oil Seepage Basin Field Start	SR-ER04-021		9/30/2004	9/30/2004			Y				
G-Area Oil Seepage Basin ROD Final Submittal	SR-ER04-022		9/30/2007	9/30/2007			Y			Y	
G-Area Oil Seepage Remedial Action Start	SR-ER04-023		12/30/2008	12/30/2008			Y				
Hydrofluoric Acid Spill Remedial Action Start	SR-ER04-042		6/30/2007	6/30/2007			Y				
Hydrofluoric Acid Spill Field Start Characterization	SR-ER04-040		3/30/2003	3/30/2003			Y				
Hydrofluoric Acid Spill ROD Submittal Final	SR-ER04-041		3/30/2006	3/30/2006			Y			Y	
K-Area Burning/Rubble Pit (131-K) and K-Area Rubble Pile (631-20G)	SR-ER04-006		5/5/2000	5/5/2000			Y			Y	
K-Area Reactor Seepage Basin (904-65G) Remedial Action Start	SR-ER04-009		9/30/2000	9/30/2000			Y				
K-Area Rubble Pile (631-20G) & Burning/Rubble Pit (131-K) Remedial	SR-ER04-032		8/5/2001	8/5/2001			Y				
K-Area Sludge Land Application Site (761-4G) Field Start	SR-ER04-024		12/30/2006	12/30/2006			Y				
K-Area Sludge Land Application Site (761-4G) Remedial Action Star	SR-ER04-026		3/30/2011	3/30/2011			Y				
K-Area Sludge Land Application Site (761-4G) Rod Submittal	SR-ER04-025		12/30/2009	12/30/2009			Y			Y	
K-Area Tritium Anomaly Field Start	SR-ER04-027		3/30/2004	3/30/2004			Y				
K-Area Tritium Anomaly ROD Submittal	SR-ER04-028		3/30/2008	3/30/2008			Y			Y	
K-Area Tritium Anomaly Remedial Action	SR-ER04-029		6/30/2009	6/30/2009			Y				
L-Area Burning/Rubble Pit (131-L) and L-Area Rubble Pit (131-3L)	SR-ER04-030		7/26/2000	7/26/2000			Y			Y	
L-Area Burning/Rubble Pit (131-L) and L-Area Rubble Pit (131-3L)	SR-ER04-031		12/30/2001	12/30/2001			Y				
L-Area Rubble Pit (131-4L) Field Start	SR-ER04-012		3/30/2007	3/30/2007			Y				

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Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
L-Area Rubble Pit (131-4L) ROD Submittal	SR-ER04-013		3/30/2010	3/30/2010			Y			Y	
L-Area Rubble Pit (131-4L) Remedial Action Start	SR-ER04-014		6/30/2011	6/30/2011			Y				
LT S&M Completion (If applicable)	SR-ER04-003		9/30/2038	9/30/2038							
Pen Branch IOU Remediated	37		12/30/2014	12/30/2014							
Pen Branch Integrator Operable Unit Field Start	SR-ER04-037		6/30/2010	6/30/2010			Y				
Pen Branch Integrator Operable Unit ROD Submittal	SR-ER04-038		6/30/2013	6/30/2013			Y			Y	
Pen Branch Integrator Operable Unit Remedial Action Start	SR-ER04-039		9/30/2014	9/30/2014			Y				
Pen Branch Monitoring Integrator Operable Monitoring Unit Field Start	SR-ER04-036		6/30/2002	6/30/2002			Y				
Project Mission Complete	SR-ER04-002		12/22/2011	12/22/2011							
Stormwater Outfall K-11 and L-12 Field Start	SR-ER04-033		12/30/2002	12/30/2002			Y				
Stormwater Outfall K-11 and L-12 ROD Submittal	SR-ER04-034		12/30/2005	12/30/2005			Y			Y	
Stormwater Outfall K-11 and L-12 Remedial Action Start	SR-ER04-035		3/30/2007	3/30/2007			Y				
Ford Building Waste Site (643-11G)	SR-ER04-050		8/17/2000	8/17/2000			Y				
Pen Branch IOU Monitoring Field Start	SR-ER04-051		12/30/1999	12/30/1999			Y				
CMP Pits (080-17G, -17.1G, -18G, -19G, -18.1G, -18.2G, -18.3G) ROD	SR-ER04-104		4/5/2001	4/5/2001			Y			Y	
K-Area Reactor Groundwater Field Start	SR-ER04-102		12/30/2011	12/30/2011			Y				
K-Area Reactor Groundwater ROD	SR-ER04-101		12/30/2015	12/30/2015			Y			Y	
K-Area Reactor Groundwater RA Start	SR-ER04-103		3/30/2017	3/30/2017			Y				
Project Start	SR-ER04-001		10/1/1996								

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Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critical Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Central Shops Sludge Lagoon (080-24G) Field Start	SR-ER04-137										
Central Shops Sludge Lagoon (080-24G) RA Start	SR-ER04-139										
Central Shops Sludge Lagoon (080-24G) ROD Submittal	SR-ER04-138										
CMP Pits (080-17G, -17.1G, -18G, -19G, -18.1G, -18.2G, -18.3G) Re	SR-ER04-008										
Ford Building Seepage Basin Remedial Action Start	SR-ER04-017										
Ford Building Seepage Basin Rod Submittal Final	SR-ER04-016										
Ford Building Waste Site (643-11G) Signed ROD	SR-ER04-007										
Ford Building Waste Site (643-11G) Rev. 0 ROD Submittal	SR-ER04-010									Y	
Ford Building Waste Site (761-13G) Remedial Action Start	SR-ER04-020									Y	
G-Area Oil Seepage Basin Field Start	SR-ER04-021										
G-Area Oil Seepage Basin ROD Final Submittal	SR-ER04-022										
G-Area Oil Seepage Remedial Action Start	SR-ER04-023										
Hydrofluoric Acid Spill Remedial Action Start	SR-ER04-042										
Hydrofluoric Acid Spill Field Start	SR-ER04-040										

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Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critical Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Characterization											
Hydrofluoric Acid Spill ROD Submittal Final	SR-ER04-041										
K-Area Burning/Rubble Pit (131-K) and K-Area Rubble Pile (631-20G)	SR-ER04-006										
K-Area Reactor Seepage Basin (904-65G) Remedial Action Start	SR-ER04-009										
K-Area Rubble Pile (631-20G) & Burning/Rubble Pit (131-K) Remedia	SR-ER04-032										
K-Area Sludge Land Application Site (761-4G) Field Start	SR-ER04-024										
K-Area Sludge Land Application Site (761-4G) Remedial Action Star	SR-ER04-026										
K-Area Sludge Land Application Site (761-4G) Rod Submittal	SR-ER04-025										
K-Area Tritium Anomaly Field Start	SR-ER04-027										
K-Area Tritium Anomaly ROD Submittal	SR-ER04-028										
K-Area Tritium Anomaly Remedial Action	SR-ER04-029										
L-Area Burning/Rubble Pit (131-L) and L-Area Rubble Pit (131-3L)	SR-ER04-030										
L-Area Burning/Rubble Pit (131-L) and L-Area Rubble Pit (131-3L)	SR-ER04-031									Unfunded at Target	
L-Area Rubble Pit (131-4L) Field	SR-ER04-012										

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Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critical Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Start											
L-Area Rubble Pit (131-4L) ROD Submittal	SR-ER04-013										
L-Area Rubble Pit (131-4L) Remedial Action Start	SR-ER04-014										
LT S&M Completion (If applicable)	SR-ER04-003				Y						
Pen Branch IOU Remediated	37									Y	
Pen Branch Integrator Operable Unit Field Start	SR-ER04-037										
Pen Branch Integrator Operable Unit ROD Submittal	SR-ER04-038										
Pen Branch Integrator Operable Unit Remedial Action Start	SR-ER04-039										
Pen Branch Monitoring Integrator Operable Monitoring Unit Field Start	SR-ER04-036										
Project Mission Complete	SR-ER04-002										
Stormwater Outfall K-11 and L-12 Field Start	SR-ER04-033									Y	
Stormwater Outfall K-11 and L-12 ROD Submittal	SR-ER04-034									Y	
Stormwater Outfall K-11 and L-12 Remedial Action Start	SR-ER04-035									Y	
Ford Building Waste Site (643-11G)	SR-ER04-050										
Pen Branch IOU Monitoring Field Start	SR-ER04-051										

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Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critical Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
CMP Pits (080-17G, -17.1G, -18G, -19G, -18.1G, -18.2G, -18.3G) ROD	SR-ER04-104										
K-Area Reactor Groundwater Field Start	SR-ER04-102										
K-Area Reactor Groundwater ROD	SR-ER04-101										
K-Area Reactor Groundwater RA Start	SR-ER04-103										
Project Start	SR-ER04-001				Y						

Performance Measure Metrics

Category/Subcategory	Units	1997-2006 Total	2007-2070 Total	1997-2070 Total	Actual Pre-1997	Planned 1997	Actual 1997	Planned 1998	Planned 1999	Planned 2000	Planned 2001	Planned 2002	Planned 2003	Planned 2004
RS														
Assess.	NR	21.00	12.00	33.00		2.00	2.00	2.00	2.00	5.00	7.00			
RS														
Cleanup	NR	17.00	15.00	32.00		2.00	2.00	1.00	2.00					5.00
Category/Subcategory	Units	Planned 2004	Planned 2005	Planned 2006	Planned 2007	Planned 2008	Planned 2009	Planned 2010	Planned 2011 - 2015	Planned 2016 - 2020	Planned 2021 - 2025	Planned 2026 - 2030	Planned 2031 - 2035	Planned 2036 - 2040
RS														
Assess.	NR		2.00	1.00	4.00		1.00	2.00	5.00					
RS														
Cleanup	NR	5.00	7.00				2.00	1.00	11.00	1.00				

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Category/Subcategory	Units	Planned 2036 - 2040	Planned 2041 - 2045	Planned 2046 - 2050	Planned 2051 - 2055	Planned 2056 - 2060	Planned 2061 - 2035	Planned 2066 - 2070	Exceptions	Lifecycle Total				
RS														
Assess.	NR									34.00				
RS														
Cleanup	NR									34.00				
Release Sites														
Site Code	RSF ID	Change Flag	Description	Class/Subclass Name	Planned Assess. Year	Forecast Assess. Year	Actual Assess. Date	Planned Comp. Year	Forecast Comp. Year	Actual Comp. Date	Acc. Year	No Action	Comp. Status	RAD
SARS	0061		080-17.1G \ CHEMICALS, METALS AND PESTICIDES PIT NO.2	Waste/Pits	2001	2002		2005	2006		1993	N		N
SARS	0062		080-17G \ CHEMICALS, METALS AND PESTICIDES PIT NO.1	Waste/Pits	2001	2002		2005	2006		1993	N		N
SARS	0063		080-18.1G \ CHEMICALS, METALS AND PESTICIDES PIT NO.4	Waste/Pits	2001	2002		2005	2006		1993	N		N
SARS	0064		080-18.2G \ CHEMICALS, METALS AND PESTICIDES PIT NO.5	Waste/Pits	2001	2002		2005	2006		1993	N		N
SARS	0065		080-18.3G \ CHEMICALS, METALS AND PESTICIDES PIT NO.6	Waste/Pits	2001	2002		2005	2006		1993	N		N
SARS	0066		080-18G \ CHEMICALS, METALS AND PESTICIDES PIT NO.3	Waste/Pits	2001	2002		2005	2006		1993	N		N
SARS	0067		080-19G \ CHEMICALS, METALS AND PESTICIDES PIT NO.2	Waste/Pits	2001	2002		2005	2006		1993	N		N
SARS	0078		131-2L \ GAS CYLINDER DISPOSAL FACILITY -	Liquid Surface Impoundments/Settling and Separation Basins	2000	2002		2004	2004		1993	N		N
SARS	0084		131-K \ K-AREA BURNING/RUBBLE PIT	Waste/Burn Pits	2000	2000		2004	2003		1993	N		N
SARS	0085		189-K \ K-AREA COAL PILE RUNOFF BASIN	Above Ground Material / Waste/Scrap Yards	1998	1998	4/30/1998	2002	2002	4/30/1998	1993	N		N

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Release Sites

Site Code	RSF ID	Change Flag	Description	Class/Subclass Name	Planned Assess. Year	Forecast Assess. Year	Actual Assess. Date	Planned Comp. Year	Forecast Comp. Year	Actual Comp. Date	Acc. Year	No Action	Comp. Status	RAD
SARS	0087		904-65G \ K-AREA SEEPAGE BASIN	Liquid Surface Impoundments/Seepage Basins	2000	2000		2004	2004		1993	N		Y
SARS	0088		631-20G \ K-AREA RUBBLE PILE	Above Ground Material / Waste/Debris Piles	2000	2000		2004	2003		1993	N		N
SARS	0089		761-4G \ K-AREA SLUDGE LAND APPLICATION SITE	Above Ground Material / Waste/Muck Piles	2010	2010		2014	2014		1993	N		N
SARS	0090		K-Area Tritium Anomaly	Spills and Leaks/Surface Spills	2007	2007		2011	2011		1993	N		Y
SARS	0093		131-L \ L-AREA BURNING/RUBBLE PIT	Waste/Burn Pits	2000	2002		2004	2004		1993	N		N
SARS	0145	R	K-AREA REACTOR GROUNDWATER	/	2007	2007		2011	2011		1993	N		Y
SARS	0148		188-0L \ L-AREA ASH BASIN 188-0L	Liquid Surface Impoundments/Settling and Separation Basins	2007	2007		2011	2011			N		N
SARS	0258		183-2K \ Combined Spills from 183-2K	Spills and Leaks/Surface Spills	2002	1998	6/30/1998	2002	1998	6/30/1998	1993	N		Y
SARS	0299		K-Area Area of Concern	Miscellaneous/Other	2005	2005		2009	2009		1993	N		N
SARS	0300		188-0K \ K-Area Ash Basin, 188-0K	Above Ground Material / Waste/Muck Piles	2009	2009		2013	2013		1993	N		N
SARS	0301		105-K \ K-Area Disassembly Basin 105-K	Liquid Surface Impoundments/Settling and Separation Basins	2011	2011		2015	2015		1993	N		Y
SARS	0302		186/190-K \ K-Area Reactor Cooling Water System	Buildings & Equipment/Other Buildings	2011	2011		2015	2015		1993	N		Y
SARS	0304		L-AREA EROSION CONTROL	Waste/Trenches / Outfalls	1999	1999	12/18/1998	1999	1999	12/18/1998	1993	Y		N
SARS	0305		L-AREA REACTOR COOLING WATER	Buildings &	2011	2011		2015	2015		1993	N		Y

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Release Sites

Site Code	RSF ID	Change Flag	Description	Class/Subclass Name	Planned Assess. Year	Forecast Assess. Year	Actual Assess. Date	Planned Comp. Year	Forecast Comp. Year	Actual Comp. Date	Acc. Year	No Action	Comp. Status	RAD
			SYSTEM	Equipment/Other Buildings										
SARS	0323		183-2L \ Potential Release of NaOH/H2SO4 from 183-2L	Above Ground Material / Waste/Storage Yards and Pads	1997		10/30/1996	1997		10/30/1996		N	Pending	N
SARS	0362		SPILL ON 01/01/57 OF <1 Ci OF BETA-GAMMA	Spills and Leaks/Surface Spills	1998	1998	9/30/1998	1998	1998	9/30/1998		N		Y
SARS	0378		106-1C \ Spill on 01/29/86 of <5 Gal of Water - Rad from 106-1C	Above Ground Material / Waste/Storage Yards and Pads	1997		12/13/1996	1997		12/13/1996		N	Pending	N
SARS	0413		Spill on 04/23/82 of 4800 Gal of Acid Solution	Above Ground Material / Waste/Storage Yards and Pads	1999	1999	3/15/1999	1999	1999	3/15/1999	1993	Y		N
SARS	0460		Stormwater Outfall K-011	Waste/Trenches / Outfalls	2005	2005		2009	2009		1993	N		N
SARS	0461		Stormwater Outfall L-012	Above Ground Material / Waste/Scrap Yards	2006	2006		2010	2010		1993	N		N
SARS	0469		GENERAL AREA, OTHER: PROCESS AND SEWER LINES AS ABANDONED	/	2010	2010		2014	2014			N		
SARS	0476		K REACTOR AREA: K-AREA REACTOR AREA CASK CAR RAILROAD TRACKS AS ABANDONED, NBN	/	2011	2011		2015	2015			N		
SARS	3011		Pen Branch Integrator Operable Unit (Index# 506)	/	2012	2012		2016	2016			N		N
SARS	3019		Combined Spills form 105-K, 106-K and 109-K, NBN (Index# 514)	/	2007	2007		2011	2011			N		N
SARS	3023		K-Area Reactor Groundwater (Index# 519)	/	2007	2007		2011	2011			N		N

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Technology Needs

Site Need Code: SR99-3019
Site Need Name: Long-Term Cover System for a Humid Environment
Focus Area Work Package ID: SS-11
Focus Area: SCFA
Benefits (Cost, Risk Reduction, Both): Both

Focus Area Work Package: Validation, Verification, & Long-Term Monitoring of Containment & Treatment
Agree with Technology Link: Y

Technologies

Cost Savings (in thousands of dollars) Range of Estimate

Related CCP Milestones

<u>Related Waste Streams</u>	<u>Agree?</u>	<u>Change?</u>
02209: BM - LLW Soil/Rubble/Debris (Cap)	Y	N
02205: BI - HAZ Soil/Debris (Cap)	Y	N

Site Need Code: SR99-3021
Site Need Name: Alternative Sample Collection and Well Installation Technology that Eliminates or Significantly Reduces Aqueous or Non-Aqueous Investigative Derived Waste (IDW)
Focus Area Work Package ID: SS-01
Focus Area: SCFA
Benefits (Cost, Risk Reduction, Both): Both

Focus Area Work Package: Characterization, Monitoring, Modeling and Analysis
Agree with Technology Link: Y

Technologies

Cost Savings (in thousands of dollars) Range of Estimate

Related CCP Milestones

<u>Related Waste Streams</u>	<u>Agree?</u>	<u>Change?</u>
02186: AC - HW Soil/Rubble/Debris	Y	N

