

# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

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## General Project Information

### Project Description Narratives

#### Purpose, Scope, and Technical Approach:

Purpose: This portion of the Spent Nuclear Fuel (SNF) Mission supports the Hanford Site Mission to clean up the Site by providing safe, economic, environmentally sound management of Site SNF in a manner which stages it to interim on-site storage, initiates interim storage, and deactivating the 100 K Area facilities. The SNF scope includes:

›  
›› All the Hanford Site SNF, as defined in Hanford Spent Fuel Inventory Baseline, WHC-SD-SNF-TI-001. Sludge is considered SNF until removed from the K Basins.

›  
›› K Basin facilities, associated operations, and equipment. This includes the basins, solid and particulate matter, water and associated basin and auxiliary support equipment and buildings, as well as N reactor and Single-Pass Reactor (SPR) fuel contained in the K Basins.

›  
›› All the Hanford Site SNF stabilization, handling, and onsite transfer activities to achieve safe, interim storage. Retrieve all SNF at the K Basins for packaging, stabilization, and transportation to interim storage. Remove and transfer sludge and debris at the K Basins to disposition.

››  
››› All new or modified Hanford Site SNF facilities (Cold Vacuum Drying (CVD), Canister Storage Building (CSB)) associated with receipt, stabilization and interim storage before staging for final disposition. Acquire SNF interim storage facilities. Operate interim storage facilities until the SNF from the K Basins is stored in a dry configuration.

››  
››› Transfer and transport of SNF from custodian facilities to SNF facilities. Manage and integrate activities associated with SNF from locations on the Hanford Site other than the K Basins, including the other SNF at the Hanford Site. Operating the complex which includes the CSB and 200 Area Interim Storage Area.

›  
›› Management and integration of activities at the 100 K Area until the SNF, debris, and sludge have been removed from the K Basins. Characterization of the SNF and sludge at the K Basins. Treatment of the water at the K Basins until the SNF, sludge, and debris are removed.

››  
››› Accomplishment of all SNF activities safely, efficiently, in compliance with applicable regulations, and with the involvement of stakeholders.

›  
›› Deactivation of the K Basins and interim stabilization and storage facilities to a condition that meets requirements for transfer to the organization(s) responsible for final disposition of these facilities. Performance of activities that foster facility deactivation at no additional cost to SNF. Perform deactivation planning associated with existing and future SNF facilities. Deactivation activities associated with existing and future SNF facilities.

Scope: Specific project scope from the Hanford Site technical baseline is provided below in terms of the systems that the project has responsibility for.

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Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Page 1 of 23

# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

---

## Project Description Narratives

### 100 K Area Facilities

- Maintain Safe & Compliant SNF Storage in K Basins: Ongoing operations and maintenance assures safe storage of the K Basins SNF. This function includes all activities and facilities required to directly support the minimum safe operations of the basins during the Operations and Maintenance phase, including material and facility surveillance, radiological control, material and waste handling, safeguards and security, maintenance, operation of utility systems, planning/scheduling, engineering, training and assessments. This includes fuel from the Plutonium-Uranium Extraction Plant and from N Basin, if any is found there.
- Maintain Safe & Compliant 100 K Area Facilities: Following the Operations and Maintenance phase, maintain the 100 K Area facilities, structures, operating systems and equipment, and monitoring systems within the approved safety and compliance requirements until the facilities are made available for Decontamination and Decommissioning.
- Maintain Safe & Compliant Sludge, Debris and Water in K Basins: Following the Operations and Maintenance phase, K Basins sludge, debris and water will be maintained in safe condition until removed for disposal or treatment.
- Design/Modify/Construct Systems for Fuel Movement: This function includes the acquisition, installation, and startup of facilities and equipment necessary to support removal of the K Basins SNF and repackaging into Multi-Canister Overpacks (MCOs) for downstream fuel handling and storage. This function includes systems necessary for drying the fuel to remove free water from MCOs containing K Basins SNF to enable safe transport to and staging in the CSB. This function includes systems necessary to treat water contained in the basins to maintain water quality and safe conditions within the K Basins. Facility upgrades are performed to repair, replace, and modify essential K Basins infrastructure to maintain safe operations and to facilitate fuel removal from the K Basins, including dose reduction and modifications to support the cask/transportation system. Provides all facilities, equipment, software, and related items needed for all work activities, including systems, subsystems, components, and structures. Defines, designs, procures, constructs, and tests line item projects, major system acquisitions, general plant projects, modifications, and upgrades to facilities and systems. Includes Essential K Basin Upgrades, Dose Reduction, Fuel Retrieval, Cold Vacuum Drying, Integrated Water Treatment, Debris Removal, Multi-Canister Overpack (MCO), and Cask/Transportation System. Facility upgrades are performed to repair, replace and modify essential K Basin infrastructure to maintain safe operations and to facilitate fuel removal from K Basins, including dose reduction and modifications to support the cask transportation system.
- Operate SNF Removal Systems: Perform the Remove, Repackage, and Dry K Basins SNF functions. Includes operation of the Fuel Removal and supporting Systems including: MultiCanister Overpacks, Cold Vacuum Drying, Cask Transportation, Dose Reduction, Debris Removal and IWTS. This function includes all activities necessary to support removal of the K Basins SNF and repackaging into Multi-Canister Overpacks (MCOs) for downstream fuel handling and storage, including fuel retrieval, MCO, cask/transportation, facility upgrades, Integrated Water Treatment System (IWTS), and Cold Vacuum Drying. The SNF retrieval process, located within each Basin pool, removes fuel elements from existing canisters cleans them, and loads them into separate baskets prior to placement in the MCO. The MCO will provide primary confinement for fuel elements during transport, conditioning, and storage. The cask/transportation system will be utilized to load tier baskets into MCOs and transfer the loaded MCO/cask to the CVD facility and to the CSB. This function includes activities necessary for drying the fuel to remove free water from MCOs containing K Basins SNF to enable safe transport to and staging in the CSB. This function includes activities necessary to treat water contained in the basins to maintain water quality and safe conditions within the K Basins. This function includes transferring the full or empty package (MCO, cask) between

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Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Page 2 of 23

# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

---

## Project Description Narratives

the K Basins facility, CVD and the CSB. Also included are all steps required to declare facility and system readiness. Includes trained and qualified staff to perform required tasks for processing and storage of SNF.

· Transition 100 K Area Facilities: Perform the facility transition phase and initiate decontamination and deactivation for K Basins, including debris removal, basin water removal, and tritium reduction process. Also included are the remaining systems upon removal of sludge and SNF. Transfers the deactivated K Basins to D&D.

· Design/Modify/Construct Sludge Removal System: Manage, define, design, fabricate, and modify existing facilities and systems; procure, test, deliver, obtain approvals and permits, and accept the sludge removal system and equipment to support transfer of sludge from the K Basins to the tank farms. Provide all new intellectual and physical resources, including personnel, consultants, services, supplies, equipment, operational documentation, construction, and subcontracts of all kinds.

· Operate and Maintain Sludge Removal System: Receives, retrieves, stages, and processes sludge. Prepare sludge for offloading to tank farms. Transfers the conditioned sludge to the receiving facilities. Operate and maintain the K Basins sludge removal systems and equipment.

### Canister Storage Building

· Design/Construct Canister Storage Building: Manage, define, select site, design, fabricate, procure, start up and test, deliver, obtain approvals and permits, and accept the Canister Storage Building facilities, systems, and equipment needed to stage and store SNF. This includes operational documentation. Provides formally documented design and safety analyses, independent technical review, and opportunity for public involvement. Provide all new intellectual and physical resources, including personnel, consultants, services, supplies, equipment, operational documentation, construction, and subcontracts of all kinds.

· Receive Defense Production Reactor Spent Nuclear Fuel: This function includes systems and activities necessary to initiate interim storage. Operate and maintain the Canister Storage Building in accordance with governing safety codes and regulations. Provide required resources for safe and compliant operations. Maintain baseline documentation and qualified staff. Perform operational readiness reviews to ensure that safety and compliance are maintained. Administer storage operations and transfer agreements. Receive MCOs containing K Basins SNF and provide interim storage of the MCOs. Ensure the safety of operations by controlling and monitoring the MCO environment, and by maintaining the integrity of the MCOs. Handle MCOs to support the storage, stage, and maintain integrity functions. Collect and contain the incidental waste generated by the store, stage, maintain integrity, and handle functions. This function also includes receipt of Shippingport PWR core 2 assemblies stored at T Plant.

### 200 Interim Storage Area (ISA)

· Design/Construct 200 Area Interim Storage Area: Manage, define, design, fabricate, construct, procure, test, obtain approvals and permits, and accept equipment and facilities for other fuel sources such as T Plant, Fast Flux Test Facility, etc. This includes operational documentation.

· Implement Site-Wide Interim Storage at 200 Area: This function includes systems and activities necessary to transfer to and receive SNF in the

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Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Page 3 of 23

# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

---

## Project Description Narratives

200 Area ISA. Receive other SNF and initiate interim storage of other SNF, and transfer other SNF to interim storage at the 200 Area. Ensure the safety of operations by monitoring and maintaining the integrity of the storage systems. Plan, coordinate and schedule all necessary operations, transferring, monitoring, and other support activities required to achieve safe interim storage. Handle the other SNF storage systems to support storage, maintaining the integrity of the storage systems, and transferring the other SNF storage systems. Verify readiness to receive other SNF, obtain authorization to receive other SNF and accept custody of other SNF.

· Operate & Maintain 200 Area Interim Storage Area: Initiate interim storage of Site-Wide SNF in the 200 Area ISA. Operate and maintain the 200 Area Interim Storage Area structures, operating systems, equipment, and monitoring systems within the approved safety and compliance requirements. Plan, coordinate, and schedule necessary activities required for safe operations. Ensure the safety of operations by monitoring and maintaining the integrity of storage systems.

Technical Approach: The end point targets in the Hanford Strategic Plan addressed by this project include:

- Provide safe, stable, interim storage for nuclear materials in the 200 Area pending decisions on their ultimate disposition.
- Spent fuel removed and K-Basins cleaned sufficient to transition to D&D.
- Spent fuels consolidated in the 200 Area in safe, stable, cost-effective interim storage pending national decisions on their ultimate disposition.
- Spent fuels (light water reactor) removed to interim storage in 400 Area pending availability of 200 Area interim storage.
- Transfer Special Nuclear Material to the 200 Area for interim storage.
- Drain, decontaminate, and stabilize K-Basins Facility.

The technical approach and technology initiatives for the Project to accomplish the Hanford Strategic Plan end point targets are identified below.

### Project Status in FY 2006:

100 K Area Facilities

- The SNF Project end state in FY 2006 will consist of:
  - a. K Basins fuel in interim storage in the Canister Storage Building in the 200 Area.
  - b. K Basins sludge removed from the basins pending disposition with other site wastes.
  - c. K Basins debris disposed of as solid waste.
  - d. K Basins SNF facilities transitioning to organization(s) responsible for final disposition.
  - e. Sodium-bonded FFTF spent nuclear fuel transloaded and ready for shipment to INEEL for treatment and final disposition (exact shipment schedule to be determined pending development of national SNF consolidation plans).

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Dataset Name: **FY 1999 Planning Data**

Page 4 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

---

## Project Description Narratives

f. Non-defense production reactor SNF consolidated in the 200 Area for interim storage, with the exception of SNF located in the 200 Area Low-level Burial Grounds and SNF requiring added safeguards protection in the Hanford Plutonium Finishing Plant.

### Canister Storage Building

· The CSB Operations mission will not be complete in FY2006. The CSB will remain operational (WM02) until the spent nuclear fuel is removed and sent to a final repository or otherwise dispositioned. This operational life may extend in excess of 40 years with appropriate facility upgrades.

### 200 Interim Storage Area (ISA)

· The CSB Operations mission will not be complete in FY2006. The CSB will remain operational (WM02) until the spent nuclear fuel is removed and sent to a final repository or otherwise dispositioned. This operational life may extend in excess of 40 years with appropriate facility upgrades.

## Post-2006 Project Scope:

### 100 K Area Facilities

· The 100 K Area Facilities will be transitioned prior to decommissioning. Deactivation of the K Basins facilities to a condition that meets requirements for transfer to the organization(s) responsible for final disposition of these facilities.

### Canister Storage Building

· The CSB Operations will continue beyond FY2006. The facility will remain operational until the spent nuclear fuel is removed and sent to a final repository or otherwise dispositioned. The operational life of the CSB facility may extend in excess of 40 years with appropriate facility upgrades, under WM02.

### 200 Interim Storage Area (ISA)

· The CSB Operations will continue beyond FY2006. The facility will remain operational until the spent nuclear fuel is removed and sent to a final repository or otherwise dispositioned. The operational life of the CSB facility may extend in excess of 40 years with appropriate facility upgrades, under WM02.

## Project End State

The Hanford Strategic Plan end point targets achieved at completion of the project include:

### Hanford Mission End Point Targets Achieved

· Spent fuel removed and K-Basins cleaned sufficient to transition to D&D.

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Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Page 5 of 23

# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

---

## Project Description Narratives

- Spent fuels (light water reactor) removed to interim storage in 400 Area pending availability of 200 Area interim storage.
- Transfer Special Nuclear Material to the 200 Area for interim storage.
- Drain, decontaminate, and stabilize K-Basins Facility.

Specific work activities to close the facilities under this Project to be performed by others at the end of this Project's mission are identified below.100

### K Area Facilities

Work associated with facility performed by Decontamination & Decommissioning:

D&D K-Basins

### Canister Storage Building

Work associated with facility performed by Canister Storage Building Operations:

Decontaminate and Decommission (D&D) Canister Storage Building

Transition Canister Storage Building

Disposition Defense Production Reactor SNF

Maintain Safe & Compliant Canister Storage Building

Store Defense Production Reactor SNF

Work associated with facility performed by Immobilized Tank Waste Storage & Disposal:

Receive & Store IHLW, Part 1

Disposition IHLW, Part 1

### 200 Interim Storage Area (ISA)

Work associated with facility performed by Canister Storage Building Operations:

Store Site-Wide SNF

Transition 200 Area Interim Storage Facility

Decontaminate and Decommission (D&D) 200 Area Interim Storage Area

Maintain Safe & Compliant 200 Area Interim Storage Area

Disposition Site-Wide SNF

### Cost Baseline Comments:

The Spent Nuclear Fuel (SNF) project used Activity Based Cost (ABC) estimating methodology to develop the project's cost estimates and the corresponding Basis of Estimate (BOEs). The project used recognized cost estimating techniques including analogy, bottom-up/definitive, cost review and update, level of effort, parametric, trend analysis, and factoring. The level of effort technique was used sparingly and appropriately.

The following programmatic assumptions for the basis for the SNF cost estimate:

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Dataset Name: **FY 1999 Planning Data**

Page 6 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

---

## Project Description Narratives

- 1) Safety Analysis activities within the SNF Project are the highest risk to meeting the TPA milestones. All parties must adhere to the baseline schedule as submitted.
- 2) Reasonable recruiting efforts, within the PHMC control, will provide adequate candidates for operator and HPT training. Once trained, SNF staffing will not have major impacts due to other DOE program cutbacks.
- 3) Confirmatory characterization and process data will not be found to be outside of the current "bounding" assumptions.
- 4) Process validation during the initial fuel relocation is successful. Operational uncertainties have been incorporated into Witness model simulations as part of baseline. Since full mockup testing with production personnel has not been possible (to save time and cost), the contractor will maintain the process flow model on a continuing basis such that any required changes in schedule can be reflected as soon as possible in the project baseline.
- 5) FDH will provide written notification to DOE-RL within sixty(60) calendar days of any local needs that require reprogramming within the SNF Project.
- 6) KE will begin operations with an RA.
- 7) CERCLA Regulation
  - - The scope of the K Basins CERCLA interim remedial action consists of the following, upon issuance of the ROD:
    - Removing the SNF, sludge, debris, and water from the basins
    - Transferring the SNF to the SNF conditioning facility
    - Treating the sludge to meet waste acceptance criteria of the receiving facility(ies)
    - Transferring the sludge to the receiving facility(ies)
    - Pretreating the water and transferring it to the Effluent Treatment Facility
    - Transferring the debris to appropriate facilities
    - Deactivating the basins
      - - Does not impact system design
      - - Administrative process does not impact start of fuel movement.
- 8) OCRWM (RW-0333P rev.7)
  - Evolving requirements will not significantly impact systems designs, procedures, and fuel movement. Any future changes will be handled by change control on the project.
- 9) Tank Waste Remediation System (TWRS) Interface
  - No impacts at CSB to SNF baselines (dates, budgets, technical)
  - Sludge will be transferred to TWRS and stored in Double shell tanks (DST).
- 10) Annual funding will be consistent with baseline requirements.
- 11) TWRS authorization basis will not change in such a way that sludge pre-treatment is adversely impacted.
- 12) Transfer/receipt of waste streams will not be a limiting factor in attaining readiness for transition to ER.
- 13) K Basins transition to ER is based on removal of all fuel, sludge, water, and designated debris from the basins.
- 14) A portion of FRS, IWTS, load out systems and CVD must remain operational for potential processing of residual basin fuel elements or pieces discovered during the Sludge removal process.
- 15) CSB Operations is turned over to WM-02 at the beginning of FY2005 based on completion of welding in FY2004.
- 16) Baseline assumes no changes in DOE requirements for nuclear material accountability and no DOE changes in security requirements for the project facilities.

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Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Page 7 of 23

# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

---

## Project Description Narratives

17) Baseline assumes that a limited number of MCOs will be monitored for pressure during the first portion of the fuel retrieval task and that all others will be welded without further monitoring. It is assumed as part of the SNF Contingency Analysis that the project will investigate a cost effective way to non-intrusively monitor all capped and welded MCOs while in storage to prove that high pressures do not exist in the MCOs.

### Safety & Health Hazards:

The degraded condition of the Hanford K Basins SNF is generally considered to be among the most serious public and environmental safety concerns facing the USDOE. The Hanford SNF project was formed specifically to address the urgent need to move metallic uranium fuel from the present degraded storage conditions in the K Basins along the banks of the Columbia River to safe interim storage on the site's Central Plateau region. Minimum safe operations of the K Basins is critical to preventing significant releases of radioactivity to the environment and resultant public health impacts. If the basins are not actively maintained, a loss of coolant and shielding over the 2100 metric tons of fuel would result in exposing millions of curies of radioactivity directly to the environment. Removal of the fuel from the K Basins is required to mitigate the continuing gradual degradation of the basin structure, corrosion of the fuel, and buildup of sludge and resultant radioactivity. Continuing degradation of the fuel and the basin gradually increases the risk of serious impact to Columbia River users, the downstream public, workers, and the environment.

### Safety & Health Work Performance:

Current operations of the K Basins are accomplished safely using resources as required by authorization basis documents and approved S/RIDs. An integrated safety management system (ISMS) is being established in accordance with DNFSB recommendation 95-2. Implementation of the ISMS is expected to be completed during FY 1999. Requirements for safety and health resources will increase with the start of fuel removal operations in November 2000. An integrated Operational Readiness Review (ORR) will be conducted prior to the start of fuel removal operations. This ORR will assess readiness for safe retrieval, cleaning, and packaging of fuel from the K Basins, CVD operations, transport from the CVD to the CSB, and storage within the CSB. An evaluation of readiness will also be conducted prior to the start of sludge removal operations.

The current SNF Project scope includes deactivation of the 100K Area Facilities for transfer to the organization(s) responsible for final disposition. When SNF has been placed into interim storage, the CSB will be transferred to the CSB Operations Project (RL-WM02) for surveillance and maintenance of the SNF and eventual permanent disposition in the national repository.

### PBS Comments:

The Spent Nuclear Fuel Project is a highly visible project with the State of Washington Department of Ecology, Region X of the US Environmental Protection Agency (USEPA), regional stakeholders, and Indian Nations. The spent nuclear fuel stored at the K Basins represents a significant potential threat to the public and environment because of its proximity to the Columbia River and the deteriorating condition of the basins and the fuel. Enforceable milestones with respect to the removal of fuel, sludge, and debris and eventual deactivation of the basins and removal of the water are addressed in the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement).

In May 1994, the Defense Nuclear Facilities Safety Board (DNFSB) issued Recommendation 94-1 which identified concerns related to the U.S. DOE's legacy fissile materials remaining from past defense production activities, including spent nuclear fuel stored at the K Basins. The DNFSB expressed concern about the existing storage conditions for these materials and the slow pace at which the conditions were being remediated. Progress on SNF Project activities are reported to the DNFSB as part of the Site Integrated Stabilization Management Plan in support of USDOE's 94-1 Implementation

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Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Page 8 of 23

# Project Baseline Summary Report

Data Source: EM CDB

Operations/Field Office: Richland

Site Summary Level: Hanford Site

Project RL-WM01 / Spent Nuclear Fuels Project

Report Number: GEN-01b

Print Date: 3/9/2000

HQ ID: 0393

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## Project Description Narratives

Plan.

In November 1994, the Hanford Advisory Board submitted consensus advice to the USDOE, the USEPA, and the Washington Department of Ecology that they should continue to move toward expedited removal of spent fuel from the K Basins as quickly as possible because it is most consistent with several key Board values including protection of the Columbia River, protection of public/worker health and safety, putting wastes (and other materials) in an environmentally safe form, and getting on with cleanup to achieve substantive progress in a timely manner.

### Baseline Validation Narrative:

An independent Critical Analysis was completed by Professional Analysis, INC. (PAI) on September 30, 1998. The critical analysis is the basis for project validation and was performed for each subproject. The final report presented PAI's opinion, as an independent reviewer, of the validity of the High Probability Baseline (HPB) Cost. PAI stated, "that the total project cost will not exceed the HPB, less contingency, by more than 10 percent. However, PAI believes that there is potential for greater than 10 percent reduction of the HPB.

Of the original 814 findings in the PAI critical analysis, all of them have been closed or consolidated. The few remaining findings have been consolidated into 16 findings that will be tracked and dispositioned by the Results Management Team (RMT).

## General PBS Information

Project Validated? Yes Date Validated: 9/30/1998

Has Headquarters reviewed and approved project? Yes

Date Project was Added: 12/1/1997

Baseline Submission Date:

FEDPLAN Project? Yes

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

## Project Identification Information

DOE Project Manager: Elizabeth D Sellers

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Dataset Name: FY 1999 Planning Data

Page 9 of 23

Date of Dataset: 9/20/1999

# Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Richland**

Print Date: **3/9/2000**

Site Summary Level: **Hanford Site**

HQ ID: **0393**

Project **RL-WM01 / Spent Nuclear Fuels Project**

## General PBS Information

Is this a High Visibility Project (Y/N):                    Y

## 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)	1,528,686	25,934	1,554,620	184,663	158,344	183,273	161,385	192,054	190,955	191,337	195,174	152,680	105,579	86,014	46,957	
PBS Baseline (constant 1999 dollars)	1,464,199	21,812	1,486,011	184,663	158,344	183,273	161,385	192,054	187,027	183,367	183,018	140,089	94,787	75,559	40,362	
PBS EM Baseline (current year dollars)	1,528,686	25,934	1,554,620	184,663	158,344	183,273	161,385	192,054	190,955	191,337	195,174	152,680	105,579	86,014	46,957	
PBS EM Baseline (constant 1999 dollars)	1,464,199	21,812	1,486,011	184,663	158,344	183,273	161,385	192,054	187,027	183,367	183,018	140,089	94,787	75,559	40,362	
	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)	25,934	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	21,812	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (current year dollars)	25,934	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	21,812	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

## Baseline Escalation Rates

Dataset Name: **FY 1999 Planning Data**

Page 10 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Richland**

Print Date: **3/9/2000**

Site Summary Level: **Hanford Site**

HQ ID: **0393**

Project **RL-WM01 / Spent Nuclear Fuels Project**

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	2.10%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%
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
2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%			

## Project Reconciliation

### Project Completion Date Changes:

Previously Projected End Date of Project: 9/30/2003

Current Projected End Date of Project: 9/30/2007

Explanation of Project Completion Date Difference (if applicable):

### Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	846,838	Actual 1997 Cost:	158,344	Actual 1998 Cost:	161,385
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	527,109	Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):			14,232
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	541,341				

### Project Cost Changes

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 (+):

Cost Reductions Due to Science & Technology Efficiencies (-):

Subtotal: 541,341

Additional Amount to Reconcile (+): 576,734

Dataset Name: **FY 1999 Planning Data**

Page 11 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Richland**

Print Date: **3/9/2000**

Site Summary Level: **Hanford Site**

HQ ID: **0393**

Project **RL-WM01 / Spent Nuclear Fuels Project**

## Project Reconciliation

Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars): **1,118,075**

### Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
COMPLETE CVD CONSTRUCTION / ACCEPT 1ST 2 BAYS	S08-99-069	8/27/1999	8/27/1999						Y		
COMPLETE CVD CONSTRUCTION / ACCEPT 2ND 2 BAYS	S08-99-070	6/19/2000	6/19/2000						Y		
COMPLETE FUEL REMOVAL FROM BASINS	S00-00-902	12/31/2003	12/31/2003	12/31/2003			Y	Y			
COMPLETE FUEL/SLUDGE/DEBRIS/WATER REMOVAL	S10-99-955	7/31/2007	7/31/2007	7/30/2007			Y				
COMPLETE KE FRS CONSTRUCTION	S04-98-356	11/16/2000	11/16/2000						Y		
COMPLETE KE IWTS ATP	S04-97-621	2/28/2001	2/28/2001	2/28/2001			Y		Y		
COMPLETE KW BASIN WATER REMOVAL	S10-99-952	9/29/2005	9/29/2005	9/30/2005			Y				
COMPLETE KW CASK FACILITY MODS	S06-97-009	9/22/1999	9/22/1999	9/30/1999			Y		Y		
COMPLETE KW FRS CONSTRUCTION	S04-97-355	7/7/1999	7/7/1999						Y		
COMPLETE KW FUEL REMOVAL	S03-03-068	4/30/2003	4/30/2003	4/30/2003			Y				
COMPLETE KW WATER REMOVAL	S10-99-954	10/30/2006	10/30/2006	10/31/2006			Y				
COMPLETE REDUCING TRITIUM CONCENTRATION	S03-01-501	10/31/2005	10/31/2005	10/31/2005			Y				
COMPLETE SLUDGE REMOVAL FROM K BASINS	S04-01-215	8/31/2005	8/31/2005	8/31/2005			Y	Y			
PROVIDE REMEDIAL DESIGN REPORT TO EPA	S01-99-124	3/31/2000	3/31/2000	3/31/2000			Y				
REMOVE FIRST MCO FROM KE BASIN	S00-02-901	11/30/2001	11/30/2001	11/30/2001			Y				
REMOVE FIRST MCO FROM KW BASIN	S00-01-900	11/30/2000	11/30/2000	11/30/2000			Y	Y	Y		
START KE SLUDGE TRANSFER TO TREATMENT SYSTEM	S04-02-205	7/30/2004	7/30/2004	7/31/2004			Y	Y			

Dataset Name: **FY 1999 Planning Data**

Page 12 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Richland**

Print Date: **3/9/2000**

Site Summary Level: **Hanford Site**

HQ ID: **0393**

Project **RL-WM01 / Spent Nuclear Fuels Project**

## Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
START KE WATER REMOVAL	S10-99-953	10/31/2005	10/31/2005	10/31/2005			Y				
START KW BASINS WATER REMOVAL	S10-99-951	9/30/2004	9/30/2004	9/30/2004			Y				
START TRITIUM LEVEL REDUCTION	S03-00-500	4/30/2004	4/30/2004	4/30/2004			Y				
SUBMIT REMEDIAL ACT FEASIBILITY STUDY TO EPA	S01-99-122	11/30/1998	11/30/1998	11/30/1998		11/20/1998	Y				
COMPLETE KW IWTS CONSTRUCTION / INSTALLATION	S04-97-620	6/21/1999	6/21/1999						Y		
SUBMIT MCO TOPICAL TO DOE-RL	S05-98-100	11/5/1998	11/5/1998			11/5/1998					
COMPLETE SPENT NUCLEAR FUEL PROJECT	S00-01-909	7/31/2007	7/31/2007								
COMPLETE KE CASK FACILITY MODS	S06-97-012	1/25/2001	1/25/2001				Y		Y		
Begin Spent Nuclear Fuel Project	PBS-97-014		2/28/1997								
PBS Mission Completion	PBS-MC-014		9/30/2007								
PBS Project End	PBS-PE-014		9/30/2007								

## 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
COMPLETE CVD CONSTRUCTION / ACCEPT 1ST 2 BAYS	S08-99-069										Completion is RL SFD acceptance of the SNFP signed CAT procedures with punchlist items for the first two bays by August 27, 1999. Test procedures shall be provided to RL SFD for review 30 calendar days prior to initiating testing.
COMPLETE CVD CONSTRUCTION / ACCEPT 2ND 2 BAYS	S08-99-070										Complete Cold Vacuum Drying (CVD) Process Equipment Construction Acceptance Testing for the second two bays by June 19,

Dataset Name: **FY 1999 Planning Data**

Page 13 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

## 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
COMPLETE FUEL REMOVAL FROM BASINS	S00-00-902		Y								2000. Complete the removal of fuel from the K Basins.
COMPLETE FUEL/SLUDGE/DEBRIS/WATER REMOVAL	S10-99-955										Complete removal of spent nuclear fuel, sludge, debris, and water at DOE's K Basins.
COMPLETE KE FRS CONSTRUCTION	S04-98-356										Complete construction and installation of KE Basin Spent Fuel Retrieval System (FRS).
COMPLETE KE IWTS ATP	S04-97-621										Complete construction of the KE Basin Integrated Water Treatment System (IWTS).
COMPLETE KW BASIN WATER REMOVAL	S10-99-952										Complete KW Basin Water removal.
COMPLETE KW CASK FACILITY MODS	S06-97-009										Complete 105KW Basin Cask/Transportion modifications/construction.
COMPLETE KW FRS CONSTRUCTION	S04-97-355										See completion description.
COMPLETE KW FUEL REMOVAL	S03-03-068										Clean and transport spent fuel stored in canisters at KW to the Cold Vacuum Drying (CVD) facility.
COMPLETE KW WATER REMOVAL	S10-99-954										Complete K East Basin Water Removal.
COMPLETE REDUCING TRITIUM CONCENTRATION	S03-01-501										Complete replacement of contaminate KE Basin water.
COMPLETE SLUDGE REMOVAL FROM K BASINS	S04-01-215		Y								Complete sludge removal from K Basins.
PROVIDE REMEDIAL DESIGN	S01-99-124										RL to provide Remedial Design

Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

## 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
REPORT TO EPA											Report (RDR) to EPA within 3 months after CERCLA Record of Decision (ROD) approval. ROD approval is anticipated on 6-30-98, which would result in RDR submittal to EPA by 9-30-99. SNFP will submit RDR (review draft) to RL.
REMOVE FIRST MCO FROM KE BASIN	S00-02-901										Remove first MCO from KE Basin.
REMOVE FIRST MCO FROM KW BASIN	S00-01-900		Y								Remove first MCO from KW Basin.
START KE SLUDGE TRANSFER TO TREATMENT SYSTEM	S04-02-205		Y								Initiate transfer of K Basin sludge upon completion and approval of ORR by DOE-RL.
START KE WATER REMOVAL	S10-99-953										Initiate full scale K East Basin water removal.
START KW BASINS WATER REMOVAL	S10-99-951										Initiate full scale K West Basin water removal.
START TRITIUM LEVEL REDUCTION	S03-00-500										Initiate replacement of contaminated K East Basin water.
SUBMIT REMEDIAL ACT FEASIBILITY STUDY TO EPA	S01-99-122										RL submits CERLA Remedial Action Feasibility Study (FS) and proposed Plan (PP) to EPA. SNFP submits review draft and final draft of the FS/PP, in support of this milestone.
COMPLETE KW IWTS CONSTRUCTION / INSTALLATION	S04-97-620										See completion of description.
SUBMIT MCO TOPICAL TO DOE-RL	S05-98-100										Submit the MCO topical report to DOE for review and approval.

Dataset Name: **FY 1999 Planning Data**

Page 15 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Richland**

Print Date: **3/9/2000**

Site Summary Level: **Hanford Site**

HQ ID: **0393**

Project **RL-WM01 / Spent Nuclear Fuels Project**

## 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
COMPLETE SPENT NUCLEAR FUEL PROJECT	S00-01-909										This event is the completion of the SNF Project scope as defined in the SNF Project Management Plan.
COMPLETE KE CASK FACILITY MODS	S06-97-012										Complete 105KE Basin Cask/Transportation modification/construction.
Begin Spent Nuclear Fuel Project	PBS-97-014			Y							Administrative input to document the start of this PBS.
PBS Mission Completion	PBS-MC-014					Y					Administrative input to document the mission completion of this PBS.
PBS Project End	PBS-PE-014				Y						Administrative input to document the project end of this PBS.

## 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
<b>Fac.</b>														
Deact. During Per.	NF	22.00	0.00	22.00	4.00									
<b>SNF</b>														
Moved to Dry Storage	MTHM	2,121.70	0.00	2,121.70				0.00	0.00	0.00	763.32	946.94	411.44	
<b>SNF</b>														
Shipped for Consolidation	MTHM	0.72	0.00	0.72				0.00	0.00	0.00	0.00	0.36	0.00	0.00
<b>Tech.</b>														
Deployed	Ntd	3.00	0.00	3.00					3.00					

Dataset Name: **FY 1999 Planning Data**

Page 16 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Richland**

Print Date: **3/9/2000**

Site Summary Level: **Hanford Site**

HQ ID: **0393**

Project **RL-WM01 / Spent Nuclear Fuels Project**

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
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**Fac.**

Deact. During Per. NF 22.00

**SNF**

Moved to Dry Storage MTHM

**SNF**

Shipped for Consolidation MTHM 0.00 0.36

**Tech.**

Deployed Ntd

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
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**Fac.**

Deact. During Per. NF 16.00 42.00

**SNF**

Moved to Dry Storage MTHM 2,121.70

**SNF**

Shipped for Consolidation MTHM 0.72

**Tech.**

Deployed Ntd 3.00 3.00

**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
HASI	8297	R	1607-K2, 1607-K2 Septic Tank and Associated Drain Field, 124-KE-1, 1607-K2	/										

Dataset Name: **FY 1999 Planning Data**

Page 17 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Richland**

Print Date: **3/9/2000**

Site Summary Level: **Hanford Site**

HQ ID: **0393**

Project **RL-WM01 / Spent Nuclear Fuels Project**

## 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	
			Sanitary Sewer System, 1607-K2 Septic Tank												
HASI	8298	R	100-K-37, 1706-KE Sulfuric Acid Tank	/											
HASI	8299	R	100-K-36, 1706-KE Chemical Storage Facility Dry Well	/											
HASI	8300	R	100-K-35, 183-KE Acid Neutralization Pit	/											
HASI	8301	R	100-K-29, 183-KE Sandblasting Site	/											
HASI	8302	R	UPR-100-K-1, 100-KE Fuel Storage Basin leak, UN-100-K-1	/											
HASI	8303	R	1607-K6, 1607-K6 Septic Tank and Associated Drain Field, 124-KW-1, 1607-K6 Sanitary Sewer System, 1607-K6 Septic Tank	/											
HASI	8304	R	116-K-3, 1904-K Outfall Structure, 1908-K Outfall Structure	/											
HASI	8305	R	1607-K4, 1607-K4 Septic Tank and Associated Drain Field, 124-K-2, 1607-K4 Sanitary Sewer System, 1607-K4 Septic Tank	/											
HASI	8306	R	100-K-42, 100 Area KE Basin, 105-KE Fuel Storage Basin, K East Basin, Irradiated Fissile Material Storage, Metal Storage Basin, 100-K-40	/											
HASI	8307	R	1607-K1, 1607-K1 Septic Tank and Associated Drain Field, 124-K-1, 1607-K1 Sanitary Sewer System, 1607-K1 Septic Tank	/											
HASI	8308	R	126-KE-2, 183-KE Liquid Alum Storage Tank #2	/											
HASI	8309	R	120-KE-8, 165-KE Brine Pit, 165-KE Brine Mixing Tank	/											
HASI	8310	R	116-KE-6D, 1706-KE Ion Exchange Column,	/											

Dataset Name: **FY 1999 Planning Data**

Page 18 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Richland**

Print Date: **3/9/2000**

Site Summary Level: **Hanford Site**

HQ ID: **0393**

Project **RL-WM01 / Spent Nuclear Fuels Project**

## 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	
			1706-KE Waste Treatment System												
HASI	8311	R	116-KE-6C, 1706-KE Waste Accumulation Tank, 1706-KE Waste Treatment System	/											
HASI	8312	R	116-KE-6B, 1706-KE Evaporation Tank, 1706-KE Waste Treatment System	/											
HASI	8313	R	116-KE-6A, 1706-KE Condensate Collection Tank, 1706-KE Waste Treatment System	/											
HASI	8314	R	1607-K5, 1607-K5 Septic Tank and Associated Drain Field, 124-KE-2, 1607-K5 Sanitary Sewer System, 1607-K5 Septic Tank	/											
HASI	8315	R	100-K-52, 1706-KE Wet Fish Studies Laboratory	/											
HASI	8316	R	100-K-74, 105-KW Waste Storage Tank, Holding Tank	/											
HASI	8317	R	100-K-73, 105-KW Collection Box	/											
HASI	8318	R	100-K-72, 105-KW Pump Gallery and Catch Tank, D Sump	/											
HASI	8319	R	100-K-71, 105-KE Collection Box	/											
HASI	8320	R	100-K-70, 105-KE Waste Storage Tank, Holding Tank	/											
HASI	8321	R	100-K-69, 105-KE Sump "C"	/											
HASI	8322	R	100-K-68, 105-KE Pump Gallery and Catch Tank, D Sump	/											
HASI	8323	R	100-K-38, 1706-KE Caustic Soda Tank	/											
HASI	8324	R	100-K-58, 100-KE Water Treatment Facilities Underground Pipelines	/											
HASI	8325	R	100-K-7, 165-KE Ethylene Glycol Tanks,	/											

Dataset Name: **FY 1999 Planning Data**

Page 19 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Richland**

Print Date: **3/9/2000**

Site Summary Level: **Hanford Site**

HQ ID: **0393**

Project **RL-WM01 / Spent Nuclear Fuels Project**

## 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
			165-KE-E and 165-KE-W											
HASI	8326	R	100-K-51, 105-KE 90-Day Waste Accumulation Area, 100K 90-Day Waste Storage Facility	/										
HASI	8327	R	600-212, Relocatable Latrine Facility Holding Tank System	/										
HASI	8328	R	100-K-50, 1725-K & 1726-K Sanitary Sewer System Holding Tank	/										
HASI	8329	R	100-K-47, 1904-K Process Sewer	/										
HASI	8330	R	100-K-46, 119-KE French Drain, Drywell	/										
HASI	8331	R	100-K-43, KW Basin, 105-KW Fuel Storage Basin, K West Basin, Irradiated Fissile Material Storage	/										
HASI	8332	R	100-K-75, 105-KW Sump "C"	/										
HASI	8333	R	100-K-67, 165-KE Power Control Building	/										

## Technology Needs

Site Need Code: RL-SNF01

Site Need Name: Contaminant Mapping of K-Basins

Focus Area Work Package ID: DD-02

Focus Area Work Package: Fuel Storage Pool and Associated Facilities D&D

Focus Area: DDFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Cost

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Dataset Name: **FY 1999 Planning Data**

Page 20 of 23

Date of Dataset: **9/20/1999**

# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

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## Technology Needs

Site Need Code: RL-SNF02

Site Need Name: Decontamination of K-Basin Pool

Focus Area Work Package ID: DD-02

Focus Area: DDFA

Benefits (Cost, Risk Reduction, Both): Both

Focus Area Work Package: Fuel Storage Pool and Associated Facilities D&D

Agree with Technology Link: Y

### Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Site Need Code: RL-SNF03

Site Need Name: Fixatives for K-Basin

Focus Area Work Package ID: DD-02

Focus Area: DDFA

Benefits (Cost, Risk Reduction, Both): Both

Focus Area Work Package: Fuel Storage Pool and Associated Facilities D&D

Agree with Technology Link: Y

### Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

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Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Page 21 of 23

# Project Baseline Summary Report

Data Source: **EM CDB**  
 Operations/Field Office: **Richland**  
 Site Summary Level: **Hanford Site**  
 Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**  
 Print Date: **3/9/2000**  
 HQ ID: **0393**

## Technology Needs

**Site Need Code:** RL-SNF05  
**Site Need Name:** Underwater Fuel Rack Cutting System  
**Focus Area Work Package ID:**  
**Focus Area:**  
**Benefits (Cost, Risk Reduction, Both):** Risk Reduction

**Focus Area Work Package:**  
**Agree with Technology Link:** N

<u>Technologies</u>	<u>Cost Savings (in thousands of dollars)</u>	<u>Range of Estimate</u>
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**Site Need Code:** RL-SNF06  
**Site Need Name:** Sludge Treatment Process  
**Focus Area Work Package ID:** DD-02  
**Focus Area:** DDFA  
**Benefits (Cost, Risk Reduction, Both):** Both

**Focus Area Work Package:** Fuel Storage Pool and Associated Facilities D&D  
**Agree with Technology Link:** Y

<u>Technologies</u>	<u>Cost Savings (in thousands of dollars)</u>	<u>Range of Estimate</u>
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### Related CCP Milestones

### Related Waste Streams

Agree?      Change?

02114: HLW-21 - SNF Basin Sludge	Y	N
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## Technology Deployments

Deployment Year
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<u>Deployment Status</u>	<u>Planned</u>	<u>Forecast</u>	<u>Actual Date</u>
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# Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Richland**

Site Summary Level: **Hanford Site**

Project **RL-WM01 / Spent Nuclear Fuels Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0393**

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## Technology Deployments

<u>Deployment Status</u>	<u>Deployment Year</u>		
	<u>Planned</u>	<u>Forecast</u>	<u>Actual Date</u>
<b>Technology Name:</b> Integrated Water Treatment System			
Deployment Commitment	1999		
<b>Technology Name:</b> Fuel Retrieval System			
Deployment Commitment	1999		
<b>Technology Name:</b> Thermogravimetric Analysis Instrument			
Deployment Commitment	1999		