

United States Government

Department of Energy

memorandum

CCN 300837

DATE: DEC 13 2004

REPLY
TO
ATTN OF: EM-32 (Leonard Mucciari, 202-586-5620)

SUBJECT: Critical Decision-0, Mission Need for Sodium Bearing Waste Treatment Project

To: Paul M. Golan, Acting Assistant Secretary for Environmental Management

Attached is the Critical Decision-0 (CD-0), Mission Need for the Sodium Bearing Waste Treatment Project decision memorandum for your approval as the acquisition executive. All of the pre-CD-0 requirements defined in DOE Manual 413.3-1, Project Management for the Acquisition of Capital Assets, have been met including a review of the justification of mission need statement by the Office of Management, Budget and Evaluation. In addition, the Office of Environmental Management internal reviews of the CD-0 package were conducted by the Chief Operating Officer and the Office of Project Planning and Controls.

The Idaho National Engineering and Environmental Laboratory is planning to request both Critical Decision-1 and 2 approval for Alternative Selection and Cost Range and Performance Baseline respectively within 60 days of contract award.

If you have any questions or comments, please contact Karen Guevara, Director of the Office of Project Planning and Controls, at 202-586-4144.



Mark W. Frei
Deputy Assistant Secretary for
Business Operations

Attachment

cc: Suneel Kapur, ME-90
Inés Triay, EM-3

United States Government

Department of Energy

memorandum

Idaho Operations Office

Date: December 1, 2004

Subject: Approval of Critical Decision-0, Mission Need for the Sodium-Bearing Waste Treatment Project (INTEC-WP-04-031)

To: Paul M. Golan, Acting Assistant Secretary
Environmental ManagementFrom: Elizabeth D. Sellers, Manager *EDS 11/29/04*
NE-Idaho**ACTION:** Approve Critical Decision-0 (CD-0), Mission Need for the Sodium-Bearing Waste (SBW) Treatment Project at the Idaho National Engineering and Environmental Laboratory (INEEL).**ISSUE:** Approval of CD-0 for the SBW Treatment Project is needed to support: (1) continued efforts to treat and dispose of approximately one million gallons of SBW currently in storage at the INEEL, (2) a request for SBW Treatment Project line item construction funding in FY 2006, and (3) incorporation of SBW Treatment Project scope in the new Idaho Cleanup Project contract at the INEEL.**BACKGROUND:**

Approximately one million gallons of SBW is currently stored in underground stainless steel storage tanks at INEEL's Idaho Nuclear Technology and Engineering Center (INTEC). INTEC reprocessed spent nuclear fuel until 1992, resulting in the generation of millions of gallons of acidic reprocessing wastes and other radioactive liquid wastes. The wastes are regulated as mixed wastes under the Resource Conservation and Recovery Act (RCRA), due to the presence of hazardous constituents in the wastes. These wastes were stored in a Tank Farm Facility at the INTEC, and approximately eight million gallons of reprocessing wastes have been converted into a solid waste form through a calcination process. However, the calcination process was discontinued in May 2000, due to regulatory permitting issues, and approximately one million gallons of tank waste remains in storage at the Tank Farm Facility. This waste is acidic, and comprised mainly of facility decontamination solutions and other ancillary radioactive wastes, with a small percentage of the volume due to past reprocessing activities. This tank waste is relatively high in sodium when compared with wastes directly from past reprocessing, and as such, termed sodium-bearing waste (SBW). Evaluations of various treatment alternatives for the SBW were completed as part of, and subsequent to, the Idaho High-Level Waste and Facilities Disposition Environmental Impact Statement, issued in September 2002. These evaluations

Paul M. Golan

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INTEC-WP-04-031

concluded that the characteristics of the SBW allow for its treatment and disposal at the Waste Isolation Pilot Plant (WIPP) as a transuranic waste.

MISSION NEED:

A 1995 Idaho Settlement Agreement between the Department of Energy (DOE), Department of Navy, and the State of Idaho includes a requirement for DOE to treat the SBW by 2012, and a Consent Order issued by the State of Idaho requires DOE to cease use of the Tank Farm Facility tanks by 2012 unless upgraded with RCRA compliant secondary containments. In addition, the *DOE Environmental Management Performance Management Plan for the Accelerated Cleanup of the Idaho National Engineering and Environmental Laboratory* includes a site accelerated cleanup goal to have the SBW treated and disposed at the WIPP by 2012. The INEEL does not currently have a RCRA-compliant treatment facility for the SBW, and a project is needed to design and construct such a facility. The scope of work to treat and dispose of the SBW is included in the Request for Proposals for the new Idaho Cleanup Project contract at the INEEL, to commence in May 2005.

ESTIMATED COST RANGE:

Estimates for Total Project Cost range from ~\$200 M to \$380 M, based upon early engineering studies.

SENSITIVITY:

The approximately one million gallons of SBW includes a small percentage by volume of wastes associated with past spent nuclear fuel reprocessing. As such, public and regulatory stakeholder interest remains high with regards to classification of the waste. DOE efforts are currently focused upon implementation of recently adopted National Defense Authorization Act legislation which clarifies DOE's authorities to classify certain waste streams associated with past spent fuel reprocessing activities.

POLICY IMPACT: None

RECOMMENDATION: Approve CD-0 for the SBW Treatment Project.

EM-1 Approval:

M. Golan 1/3/05

EM-1 Disapproval:

Date:

Memorandum to: Paul Golan, EM-1

From: Mark Frei, EM-30

Subject: CD-0, Mission Need for Sodium Bearing Waste Treatment Project

EM Correspondence #: 2004-1771

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DOE/NE-ID-11193

**Mission Need Statement:
Sodium-Bearing Waste Treatment Project**

Non-Major Acquisition Project

September 2004

**Prepared for the
U.S. Department of Energy
Idaho Operations Office**

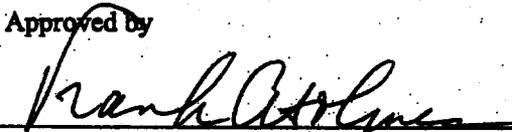
Mission Need Statement: Sodium-Bearing Waste Treatment Project

Non-Major Acquisition Project

DOE/NE-ID-11193

September 2004

Approved by



Frank C. Holmes, Acting Director, Facility and
Material Disposition Project

9/9/2004
Date



Richard B. Provencher,
Deputy Manager, Idaho Cleanup Project

9/9/04
Date

EXECUTIVE SUMMARY

The Department of Energy (DOE) Idaho Office's Idaho Nuclear Technology and Engineering Center (INTEC) Waste Program, at the Idaho National Engineering and Environmental Laboratory (INEEL), operates under the DOE's Office of Environmental Management (EM). The Program is responsible to manage, store, treat and dispose remaining DOE Sodium-Bearing Waste (SBW) and High-Level Waste calcine stored at INTEC. This document identifies the need for a facility to treat SBW to a final waste form. Storage of this waste in its current configuration represents a potential threat to the Idaho Snake River Plain Aquifer. Treatment of the SBW is also necessary to satisfy a court-ordered settlement agreement with the State of Idaho that requires treatment of approximately 900,000 gallons of SBW (mostly decontamination solutions) currently stored in the existing INEEL Tank Farm Facility (TFF) radioactive liquid waste storage tanks.

The SBW Treatment Project will provide the facilities to treat INTEC SBW to forms suitable for permanent disposal. The SBW Treatment Project is one of several interrelated projects or proposed projects which together form the Idaho Cleanup Project.

In order for the DOE to be in compliance with a 1992 Notice Of Noncompliance (NON) Consent Order, subsequent modifications to the NON Consent Order, the Idaho Settlement Agreement, and to meet the accelerated cleanup priorities in the EM Performance Management Plan for Accelerating Cleanup of the INEEL, the SBW must be treated for disposal, and the TFF taken out of service by 2012.

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ACRONYMS

CD	critical decision
DOE	U.S. Department of Energy
DOE-EM	U.S. Department of Energy-Environmental Management
DOE-HQ	U.S. Department of Energy, Headquarters
EPA	Environmental Protection Agency
ICP	Idaho Completion Project
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LCB	life cycle baseline
NE-ID	U.S. Department of Energy, Idaho Field Office
PMP	DOE Environmental Management Performance Management Plan for the Accelerated Cleanup of the Idaho National Engineering and Environmental Laboratory
RCRA	Resource Conservation and Recovery Act
TRU	transuranic
WAC	waste acceptance criteria
WBS	work breakdown structure
WIPP	Waste Isolation Pilot Plant

1. STATEMENT OF MISSION NEED

A Department of Energy (DOE) commitment to the State of Idaho contained in the 1995 Settlement Agreement¹ between the DOE, the Department of the Navy, and the state of Idaho drives the need to treat for disposal approximately one million gallons of sodium-bearing waste currently stored in underground storage tanks at the Idaho National Engineering and Environmental Laboratory (INEEL). The Settlement Agreement requires treatment of the waste by 2012. In addition, the *DOE Environmental Management Performance Management Plan for the Accelerated Cleanup of the Idaho National Engineering and Environmental Laboratory (PMP)*² increased the project scope of work to include not only treatment of the waste by 2012, but also disposal of the treated waste and closure of the tank farm storage tanks by the same date.

The approximately one million-gallons of acidic sodium-bearing waste (SBW) is currently stored in underground tanks at the Idaho Nuclear Technology and Engineering Center (INTEC) Tank Farm Facility (TFF). The INTEC is located at the Idaho National Engineering and Environmental Laboratory (INEEL). The INEEL is a U.S. DOE facility located west of Idaho Falls, Idaho, in the northeastern portion of the Eastern Idaho Snake River Plain. The TFF which stores the SBW, a mixed waste regulated under the Resource Conservation and Recovery Act (RCRA), is not compliant with current RCRA regulations, and a Notice of Non-Compliance Consent Order³ requirement exists which requires that DOE cease use of the tank farm tanks by 2012. In addition, the TFF includes tank vault structures which do not meet current seismic design criteria. The stored SBW is located over the Snake River Plain Aquifer, the major source of drinking water for southeastern Idaho and designated by the EPA as a Sole Source Aquifer. Evaluation of the source and characteristics of the SBW show that the waste can be solidified and meet planned waste acceptance criteria for disposal at the Waste Isolation Pilot Plant (WIPP) as a transuranic waste. However, the classification of the waste is uncertain, due to on-going litigation over DOE's process to classify waste streams associated with past spent nuclear fuel reprocessing. The Settlement Agreement requires that the SBW be treated for disposal by December 31, 2012.

Until May 2000, liquid waste stored in the TFF was converted by a calcination process into a solid calcine material and stored on-site awaiting future disposition. The calcination facility, operated under interim status as a RCRA mixed waste treatment facility, was not fully permitted. As such, a Consent Order³ issued by the State of Idaho required that the calcination facility be placed in standby condition by May of 2000. The Consent Order further required that a RCRA Part B permit be issued prior to any further operation of the facility. Compliance with current environmental regulations would require significant upgrades to the facility. Environmental impacts of available treatment options for the SBW, including continued calcination, were evaluated as part of the Idaho High-Level Waste and Facilities Disposition Environmental Impact Statement⁴, issued in September 2002. However, an accompanying Record of Decision to select a treatment technology has not yet been issued. The scope of work to treat the SBW has been included as part of the new Idaho Cleanup Project Contract at the INEEL. A Request for Proposals⁵ was issued for the contract in July 2004, with contract transition to occur in May 2005.

Therefore, production-level capabilities for treatment of SBW which are compliant with current environmental regulations do not exist at the INEEL. Such a capability is needed to treat the SBW into a form which can be disposed of at the WIPP to allow DOE to meet its legal obligations and reduce environmental threats. The proposed Sodium-Bearing Waste Treatment Project provides facilities and equipment to prepare the SBW for treatment and ultimate disposal at the WIPP as transuranic waste. Treatment of the waste for disposal at the WIPP will result in significant reduction in risk to the environment by removing liquid waste storage over the Snake River Plain Aquifer, meet commitments made in the Idaho Settlement Agreement and applicable Consent Orders, and meet EM goals for accelerating site cleanup.

This document describes the need to establish production-level capabilities to remove the sodium-bearing waste from the tank farm tanks and treat the waste to allow disposal as transuranic waste at the Waste Isolation Pilot Plant (WIPP) by 2012.

1.1 Background

From 1952 to 1992, DOE and its predecessor agencies reprocessed spent nuclear reactor fuel at the Idaho Chemical Processing Plant, located on the Snake River Plain in southeast Idaho. This facility, now known as the Idaho Nuclear Technology and Engineering Center (INTEC), is part of the INEEL. Processing operations at INTEC utilized multiple cycles of solvent extraction processes to extract uranium-235 and other defense-related materials from spent nuclear reactor fuel. These reprocessing activities, as well as numerous other ancillary facility activities and operations, generated millions of gallons of liquid radioactive wastes which were stored in the INTEC Tank Farm Facility (TFF). The TFF includes eleven large (300,000-gallons each) underground storage tanks, four smaller (30,000-gallons each) storage tanks, and the associated transfer piping and support systems. These tank wastes are regulated as a mixed waste under the Resource Conservation and Recovery Act (RCRA) due to their hazardous constituents. A calcination process was put in operation in the early 1960s to convert the liquid tank waste into small, granular solids called calcine. The calcination process produced a safer product for storage while significantly reducing the volume of stored waste. Approximately eight million gallons of tank waste has been converted to calcine, which is currently stored at INTEC, awaiting future disposition. The calcination process was placed in standby in May 2000 in compliance with a State of Idaho-issued Consent Order, due to the lack of a RCRA permit. (The calcination process operated in compliance with RCRA Interim Status requirements during its operation.) Approximately one million gallons of tank waste remains in the TFF, awaiting treatment and disposition. The tank waste which remains is comprised mainly of decontamination solutions and other radioactive wastes associated with INTEC activities ancillary to past reprocessing processes. However, a small volume of the tank waste originated with reprocessing activities. This combination of wastes is called sodium-bearing waste (SBW) due its relatively high sodium content in comparison to wastes directly from reprocessing. The TFF tanks which store the SBW include a small volume of settled solid particles, up to a few inches in depth. In accordance with DOE Order 435.1⁶, DOE has prepared a Waste Incidental to Reprocessing (WIR) Determination⁷ to evaluate the classification of the SBW. The WIR Determination concludes that the SBW should be treated and disposed of as transuranic waste. However, on-going litigation has resulted in a District Court decision which ruled that DOE's WIR Determination process was invalid. A legal appeal of the District Court decision is in progress, as well as efforts to clarify current legislation regarding waste classification.

1.2 Regulatory Drivers for the SBW Treatment Project

The SBW must be removed from the tank farm tanks and treated for disposal by December 31, 2012 in order for the DOE to be in compliance with the Idaho Settlement Agreement and a State of Idaho-issued Notice of Non-Compliance Consent Order. Specifically:

- On April 3, 1992 the State of Idaho issued a Notice of Non-Compliance Consent Order which addressed concerns regarding RCRA secondary containment requirements for the INEEL TFF tanks. The Consent Order prescribed dates by which the tanks and supporting equipment must be upgraded or removed from service. That Consent Order, and subsequent modifications to it, require that five of the large tanks with less robust secondary containment systems be removed from service or upgraded by June 30, 2003 and the remaining tanks be taken out of service or upgraded by December 31, 2012.

- DOE's original baseline was to empty the tanks by calcining all of the liquid waste. This course of action was selected in a 1995 Record of Decision as the appropriate treatment (60 CFR 28680; June 1, 1995). Also in 1995, the Department of Energy committed to complete several waste treatment activities as part of the Idaho Settlement Agreement. The Idaho Settlement Agreement includes a commitment for DOE to calcine (treat) the SBW by 2012.
- A third modification to the Notice of Non-Compliance Consent Order further stipulated that DOE place the calciner process in standby mode by June 1, 2000 unless, and until, DOE obtains a hazardous waste permit for continued operation of the facility. In accordance with that Consent Order, the calcination process was placed in standby, awaiting decisions regarding SBW treatment.
- In addition to a RCRA permit, EPA's air quality standards for hazardous waste combustion units would need to be met to allow continued operation of the calcination process. Significant physical upgrades to the calcination process would be required in order to comply with these standards.

1.3 Consequences of Not Performing This Action

The INEEL lies over the Snake River Plain aquifer. This aquifer is the major source of drinking water for southeastern Idaho and has been designated as a Sole Source Aquifer by the Environmental Protection Agency (EPA). Water storage in the aquifer is estimated at 2 billion acre-feet. Discharge from the aquifer is primarily from springs that flow into the Snake River and pumped removal for agricultural irrigation. The INTEC Tank Farm Facility (TFF), constructed in the 1950s and 1960s, does not comply with current RCRA standards with respect to the adequacy of secondary containment systems. Further, five of the tank vaults are of a pre-cast pillar and panel design that does not meet current seismic design requirements. Continued storage of SBW in the TFF poses a risk to the Snake River Plain Aquifer. If the SBW is not treated by 2012:

- Health and environmental risks of continued storage of radioactive liquid waste over the Snake River Plain Aquifer will go unmitigated.
- DOE will fail to meet the requirements of the Idaho Settlement Agreement and associated Notice of Non-Compliance Consent Orders.
- DOE-EM will fail to meet *DOE Environmental Management Performance Management Plan for the Accelerated Cleanup of the Idaho National Engineering and Environmental Laboratory (PMP)* accelerated cleanup objectives.
- Stakeholders will lose confidence in DOE's ability, as well as the ability of the involved state and federal administrative bodies, to meet legally binding commitments.

1.4 Support of the DOE EM Mission

In May 2002, DOE, the Idaho Department of Environmental Quality, and the Environmental Protection Agency signed a letter of intent⁸ formalizing an agreement to pursue accelerated risk reduction and cleanup at the INEEL. The letter provides the foundation for a collaborative plan for the accelerated cleanup at the INEEL, and DOE has developed the *Environmental Management Performance Management Plan for Accelerating Cleanup of the Idaho National Engineering and Environmental Laboratory (PMP)* to implement the letter of intent to fulfill the following agreed upon vision:

By 2012, the INEEL will have achieved significant risk reduction and will have placed materials in safe storage ready for disposal.

By 2020, the INEEL will have completed all active cleanup work with potential to further accelerate cleanup to 2016.

The PMP describes nine strategic initiatives DOE proposes to eliminate or reduce the environmental risks at the INEEL. The first strategic initiative is to "Accelerate INTEC Tank Farm Closure". The activities included in Tank Farm closure include:

- Empty pillar and panel vaulted tanks by January 2002 (Complete)
- Cease receipt of newly generated liquid waste into the tank farm by 2005
- RCRA close remaining tank farm tanks by 2012
- Treat, package and ship sodium-bearing waste offsite by 2012
- Coordinate tank farm soils remediation with tank closure actions and complete before 2020

The PMP also coordinates and integrates the schedules and funding profiles of the projects and subprojects needed to realize the vision of accelerated cleanup. All foreseeable capital assets and operating expenditures needed to accomplish the vision were used as a basis for developing the cost estimates that are included in that PMP, which was approved by the Assistant Secretary for Environmental Management. Furthermore, all PMPs complex-wide are being integrated for consistency as part of the top-to-bottom review process.

1.5 SBW Treatment Project Path Forward

The scope of the Sodium-Bearing Waste Treatment Project has been incorporated into the new Idaho Cleanup Project (ICP) contract at the INEEL. A Request for Proposals for the new contract was issued by the Department of Energy in July 2004. Current plans call for selection of a new contractor by March 2005 and a transition to the new contractor in May of 2005. Due to current legal uncertainties surrounding classification of the SBW (as either high-level waste or TRU waste) stipulations exist in the new contract RFP stating that work associated with SBW treatment will require specific authorization by DOE to proceed. It is currently planned that the selection of the new ICP contractor will include a mature SBW treatment technology and that upon contract transition, the design of the treatment process could promptly commence without significant technology development or conceptual design activities. Accelerated permitting, design, and construction schedules will need to be met to meet the requirement to have the SBW treated by 2012.

2. ANALYSIS TO SUPPORT MISSION NEED

Over the history of the INEEL, many alternatives have been considered for the long-term management and disposition of both the high-level waste calcine and the SBW at the INEEL. After termination of reprocessing of spent nuclear fuel in 1992, numerous options for treatment of SBW to a final waste form were evaluated. In 1997, DOE began preparing the Idaho High Level Waste and Facilities Disposition Environmental Impact Statement (EIS). The EIS analyzed numerous alternatives for SBW treatment, including the option of leaving the waste in place, and established their impacts to the environment in accordance with the National Environmental Policy Act (NEPA) process. A final EIS was issued in September 2002.

The EIS showed that the risks of leaving the waste in place were unacceptable due to the related long-term impacts to the environment (e.g., potential for contamination of the Snake River Plain Aquifer). In addition, such an option would not meet current regulatory requirements as outlined in the previous section and is not consistent with DOE-EM goals of accelerated cleanup. Shipping the waste to another site in the DOE complex for treatment was also evaluated in the EIS as an option to send waste to Hanford for vitrification. Logistical difficulties, stakeholder opposition to shipping liquid radioactive waste, the costs of the effort, and conflicting processing schedules limited the viability of the option. Engineering and applied development activities over the last few years have concluded that several technologies could be made viable for treatment of the SBW, including continued calcination, steam reforming, direct evaporation, vitrification, and grouting of the waste. Removal of the cesium from the waste as a head-end process to reduce over all treatment and disposal costs has also been investigated. In addition, studies have been completed which consider the use of existing facilities at INTEC to house the selected waste treatment technology.

Plans were in place in FY2003 to perform conceptual design activities on four of the most promising SBW treatment technologies, with a down-selection by the end of that calendar year. A Critical Decision 0 package was prepared for approval, including the results of an independent project review⁹ performed in 2002 by DOE-EM. However, on-going litigation regarding DOE's process for classifying waste streams associated with past spent fuel reprocessing activities, coupled with a DOE decision to incorporate the SBW treatment scope of work into the new ICP contract, resulted in a curtailment of the engineering and applied development work in support of a waste treatment technology selection. Details of the results of the recent technology development activities and engineering work were compiled into final reports to assist in evaluation of contract proposals.^{10,11}

It is currently planned that award of the new Idaho Cleanup Project will occur in May 2005, and will include the selection of a waste treatment technology. It is further assumed that adequate conceptual design information will have been developed by the selected contractor as part of the solicitation process. Finalization of the design activities could then commence upon contract award, beginning in May 2005. Work to develop the necessary regulatory permit applications can also commence in May 2005, with permit applications ready for submittal by the end of calendar year 2005. Project construction could start in early 2008. A three-year construction effort is anticipated, ending in late 2010, followed by a two-year operational phase. Waste treatment will then be able to be completed by the end of calendar year 2012.

3. IMPORTANCE OF NEED AND IMPACT IF NOT APPROVED

3.1 Importance of Need for the SBW Treatment Project

Approval of this mission need statement provides the basis for project funding in support of treatment of and disposition of the SBW. Production-level capabilities do not currently exist at the INEEL for treatment of SBW which are compliant with current environmental regulations. Approval of this mission need document will:

- Reduce environmental risks of continued storage of radioactive liquid waste over the Snake River Plain Aquifer,
- Meet legal commitments made by the Department of Energy in the Idaho Settlement Agreement and associated Consent Orders
- Meet EM objectives for accelerated site cleanup outlined in the *DOE Environmental Management Performance Management Plan for the Accelerated Cleanup of the Idaho National Engineering and Environmental Laboratory (PMP)*,
- Assist in gaining stakeholders confidence in DOE's ability to meet legally binding commitments.

3.2 Impact of Not Executing the SBW Treatment Project

Failure to approve and execute the SBW Treatment Project will result in DOE failing to meet the requirements of the 1995 Settlement Agreement and failing to meet DOE accelerated cleanup plan goals for the INEEL. Failure to remove and treat the SBW will result in the following consequences:

- Failure to comply with the 1995 Settlement Agreement between DOE, the Department of the Navy, and the State of Idaho, which could result in the suspension of DOE spent fuel shipments to the INEEL
- Failure to accomplish the INEEL accelerated cleanup plan
- Failure to reduce risks to human health and the environment

4. CONSIDERATIONS, RISKS, AND ASSUMPTIONS

4.1 Overarching Considerations

The scope of work to remove the approximately one million gallons of sodium-bearing waste from the INTEC Tank Farm Facility, treat the waste, and dispose of the waste at the WIPP has been incorporated into the new Idaho Cleanup Project (ICP) contract at the INEEL. The new ICP contract is currently planned to commence in May 2005. A preliminary project schedule for the SBW Treatment Project shows a need to commence in FY 2005 to finalize the design, so construction can begin in December 2007. Such an accelerated schedule requires that the selected contractor have in place a mature treatment technology, without need for significant technology development or conceptual design activities. Failure to make such a contract award could jeopardize DOE's ability to meet the schedule commitments of having the waste treated by 2012.

4.2 Assumptions

Current planning for the SBW Treatment Project is based on the following overarching assumptions:

- The approximately one million gallons of sodium-bearing waste currently stored in the INTEC Tank Farm Facility will be classified as transuranic waste in time to allow finalization of design activities to begin in FY2005.
- Significant technology development and conceptual design work is not necessary prior to finalization of design activities upon ICP contract award.
- The WIPP will be permitted by the State of New Mexico to allow disposal of the treated sodium-bearing tank waste as remote-handled transuranic waste
- WIPP will have in place transportation and receipt capabilities adequate to support the project treatment and shipping needs.
- Facility permits will be issued by the State of Idaho in time to support start of construction by December 2007.
- Funding will be available to meet the 2012 accelerated schedule.

4.3 Project Risks

Several uncertainties continue to exist which are associated with the SBW Treatment Project. Efforts over the last few years to resolve these uncertainties have been successful in some cases, but have failed in other areas. Listed below are the key uncertainties which continue to present project risks which need to be resolved or mitigated.

Sodium-Bearing Waste Classification: In accordance with DOE Order 435.1, a Waste Incidental to Reprocessing (WIR) Determination has been developed to provide the technical justification to classify the sodium-bearing waste as transuranic waste. However, on-going litigation (Natural Resources Defense Council, et.al. vs. Spencer Abraham) have resulted in a District Court decision which ruled that DOE's WIR Determination process was invalid. A legal appeal is currently under way, as well as Department efforts at legislative clarification. However, near-term resolution of the waste classification of wastes associated with past spent fuel reprocessing remains uncertain. Among the possible outcomes are that the

sodium-bearing waste would be classified as high-level waste, requiring treatment to high-level waste disposal standards and subsequent disposal at the nation's high-level waste repository. Another possibility is that the length of time to resolve the issue will result in delays in authorization to design and/or construct the project, jeopardizing compliance with treatment milestones.

WIPP's Acceptance of Remote-Handled Tank Waste: WIPP is not currently permitted to accept remote-handled transuranic waste, and as such, waste acceptance criteria for remote-handled transuranic has not been finalized. In addition, efforts are currently in progress by the State of New Mexico to require that DOE tank waste associated with past spent fuel reprocessing not be accepted without future permit modifications and public review. Along with efforts to resolve the waste classification issues surrounding the WIR Determination, DOE will need to continue efforts to obtain the necessary permits to allow the treated SBW to be disposed of in the WIPP.

Issuance of Permits to Support Facility Construction: The accelerated project schedule includes a two-year window between submittal of the necessary permits and commencement of construction. Discussions with the State of Idaho regarding permitting of a SBW Treatment Project indicate that significantly longer time may be needed to complete the permitting process. Efforts will need to continue to work with the State of Idaho to support an accelerated permitting timeline.

Accelerated Scheduling Assumptions: Several assumptions have been made regarding the length of time to complete certain project phases. It is assumed that significant technology development and conceptual design work is not necessary prior to finalization of design activities upon ICP contract award. The project timeline shows that final design activities will be allowed to commence upon contract award. Critical Decisions will need to be made without significant delay between project stages. Critical Decisions 1 and 2 need to occur simultaneously by May 2005, the planned commencement of the new ICP contract. Adequate design activities will need to be completed within a few months to allow for submittal of regulatory permit applications. Further, the construction and startup activities phase will need to complete within a three-year window. DOE efforts will need to be focused on achievement of these accelerated project phases.

WIPP Transportation and Receipt Capabilities: This project timeline assumes that WIPP's transportation and receipt capabilities will be adequate to support the project treatment and shipping needs. Such capabilities do not currently exist. Coordination between WIPP and the other field office sites will be needed to ensure that the necessary transportation and receipt capabilities are in place to support the needed shipping profiles.

4.4 Related Project Elements

4.4.1 Key Legal and Regulatory Aspects

This project is an Environmental Management activity at INEEL and is subject to numerous laws and regulations that apply to the treatment, storage, and disposal of wastes. Legal, federal, and state requirements for the management of HLW and SBW at INTEC include those established under the following:

Atomic Energy Act

The Atomic Energy Act of 1954 (42 USC 2011 et seq.) establishes responsibility for the regulatory control of radioactive materials including radioactive wastes. Pursuant to the Atomic Energy Act, DOE established a series of standards (DOE Orders) to protect health and minimize danger to life or property from activities at its

Nuclear Waste Policy Act

facilities.

The Nuclear Waste Policy Act of 1982, as amended (42 USC 10101 et seq.), established a national policy for disposal of civilian HLW and spent nuclear fuel in a geologic repository.

DOE Order 435.1

This order applies to the management of all HLW, transuranic waste, and low-level waste, including the radioactive component of mixed waste, for which DOE is responsible, with certain exceptions. This Order is to ensure that all DOE radioactive waste is managed in a manner that is protective of worker and public health, safety, and the environment.

Resource Conservation and Recovery Act (RCRA)

The SBW includes a combination of "characteristic" (e.g., toxic or corrosive) and "listed" hazardous wastes that are regulated under RCRA. New treatment facilities to implement DOE's waste treatment decisions for this project would be regulated under RCRA.

Notice of Noncompliance Consent Order

In 1992, DOE and the Idaho Department of Health and Welfare signed a consent order to resolve the Notice of Noncompliance (NON) issued by EPA Region 10 on January 29, 1990. The NON Consent Order addresses concerns regarding the RCRA secondary containment requirements for the INEEL radioactive liquid waste tanks by prescribing dates by which the tanks must be removed from service. This Consent Order and an August 18, 1998 modification required five of the tanks, (known as pillar and panel tanks) to be removed from service on or before June 30, 2003 (action completed) and the remaining tanks on or before December 31, 2012. On April 19, 1999, a third modification to the Consent Order required that DOE place the New Waste Calcining Facility (Calciner) in a standby mode by June 1, 2000 (action completed) unless the facility receives a hazardous waste permit for continued operation.

Idaho Settlement Agreement

In October 1995, the State of Idaho, the Department of the Navy, and DOE settled the cases of Public Service Company of Colorado v. Batt, involving the management of spent nuclear fuel at INEEL. The resulting Settlement Agreement/Consent Order (USDC 1995) requires DOE among other things to:

- Complete calcination of all remaining non-sodium-bearing liquid HLW by June 1998 (completed February 1998)
- Start calcination of liquid mixed transuranic waste/SBW by June 2001 (begun February 1998 and stopped June 1, 2000)
- Complete calcination of liquid mixed transuranic/SBW by December 2012.

The Settlement Agreement / Consent Order provides that DOE

may request that the Agreement be modified to conform to the selected treatment and actions in the event that these actions conflict with the Agreement. This agreement will have to be modified if calcination is not the selected treatment.

Site Treatment Plan (under the Federal Facility Compliance Act)

Under the Federal Facilities Compliance Act of 1992, DOE entered into an agreement with the State of Idaho as to how it would attain compliance with applicable treatment requirements for mixed wastes at INEEL. The Site Treatment Plan sets forth the terms and conditions that DOE must comply with to satisfy the land disposal restrictions applicable to the hazardous components of the mixed wastes at INEEL. The Plan proposes treatment of mixed HLW and mixed transuranic waste/SBW by calcination through the NWCF Calciner and a new Remote-Handled Immobilization Facility for processing the waste into forms suitable for disposal. This agreement will have to be modified if calcination is not the selected treatment.

4.4.2 Environmental Safety and Health

The project will comply with DOE Orders and INEEL requirements. DOE orders defining environmental related requirements include DOE Order 5400.1, "General Environmental Protection Program" and DOE Order 5400.5, "Radiation Protection of the Public and the Environment." Responsibilities for implementing the program are defined in a number of INEEL environmental program requirements documents and implementing control procedures.

The INEEL Radiological Control Program complies with the requirements of 10 CFR 835 and DOE O 441.1 series. The project will incorporate the radiological control requirements and procedures into the project documents and these will flow down to subcontractors during design and construction.

INEEL uses an Integrated Safety Management System (ISMS). A project safety and health representative will be assigned to the project team and will support the project manager in implementing the project safety and health program. Safety and health is responsible for coordinating industrial safety and industrial hygiene support within the Project. These ISMS functions and requirements will be flowed down to subcontractors through subcontract requirements. Verification that ISMS has been incorporated into these documents will be accomplished using self-assessment programs.

A Preliminary Documented Safety Analysis (PDSA) report will be completed per DOE STD - 3009-94 and DOE O 420.D, and quality levels will be established. Safety Categories will be established and will be used as the basis for applying the graded approach criteria required in 10 CFR 830 Subpart A and in DOE Order 414.1A. Criticality will be addressed in the PDSA. The planning assumption is that criticality is not a problem as the current PDSA for the Tank Farm shows that there are no issues with criticality.

5. APPLICABLE INTERFACES

The SBW Treatment Project will have interfaces with other DOE organizations and sites, and will share information and technology from and with other national laboratories. There will also be interfaces with other programs and projects, since the project is proposed in an existing DOE facility installation. These interfaces are discussed below.

5.1 DOE Organizations

The major waste products from this facility may be disposed of at WIPP. The waste acceptance criteria (WAC) for remote handled mixed transuranic waste at WIPP is still in development. Therefore, the project will interface with the repository to ensure that the waste product will conform to the WAC as required. An interface agreement is being developed between DOE-ID and DOE-CBFO that will formalize and specify communications between these organizations so that DOE-ID and the INEEL will be kept informed on any potential changes in the upcoming remote handled WAC so any impacts can be handled in an expeditious manner.

In addition to meeting the WIPP WAC, the project will need to coordinate waste shipping schedules with WIPP. Currently, in order for the project to meet the 2012 milestone, waste treatment throughput may need to be at a greater rate than present receipt capabilities at WIPP. Coordination is critical because long-term storage capability is not currently planned for as part of the SBW Treatment Project. In the event that shipments to WIPP are not feasible, additional shipping and handling capability will need to be provided by others or interim storage at INTEC will be provided. Existing storage facilities at INTEC may be suitable for this interim storage requirement. As in the case of the WAC issues mentioned above, the draft interface agreement provides for frequent communication of any changes in shipping needs and associated capabilities between DOE-ID and DOE-CBFO. The waste volumes associated with the SBW treatment are included in WIPP's Performance Management Plan that was approved by the Assistant Secretary of Environmental Management. EM has also been working to integrate complex-wide shipping schedules.

Additionally, as part of DOE efforts to resolve the waste classification issues currently in litigation, the Idaho Field Office will continue to coordinate with DOE-EM, DOE-GC, and other affected field offices with regards to issuance of the SBW Waste Incidental to Reprocessing (WIR) Determination.

5.2 National Laboratories

INEEL has benchmarked and shared information on technologies with other DOE sites and Laboratories. Ion exchange technology has been successfully used at both Savannah River Site (SRS) and the West Valley Demonstration Project. Vitrification technology has been developed and used at SRS and is in development at Hanford. Steam reforming technology is also being developed in cooperation with efforts for Hanford. It is planned that exchange of technology information will continue through the life of this project.

5.3 Outside Stakeholders

The NEPA process for this project was started early in order to determine the environmental impacts of the treatment of HLW calcine and liquid SBW. This has provided ample opportunity for outside stakeholder involvement in the treatment decision, however, continued involvement is still expected. The project plans to have a public affairs representative to work with various outside stakeholders.

The EM Performance Management Plan for Accelerating Cleanup of the Idaho National Engineering and Environmental Laboratory includes an agreement of the intent of the State of Idaho, the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Energy to work together to implement the plan's objectives of accelerated risk reduction and cleanup strategy. In addition, interfaces will continue with the State of Idaho and EPA Region 10 in regard to RCRA, air, and other environmental permitting issues and processes.

5.4 Other INEEL Projects/Programs

The SBW Treatment Project is one of several interrelated subprojects. The related subprojects include Tank Farm Closure, and Tank Farm CERCLA soils remediation. These projects have been integrated under the *Environmental Management Performance Management Plan for Accelerating Cleanup of the Idaho National Engineering and Environmental Laboratory*. Under this plan, the estimated costs for these capital and operating projects have been examined and integrated to be managed within the projected budgets for the INEEL.

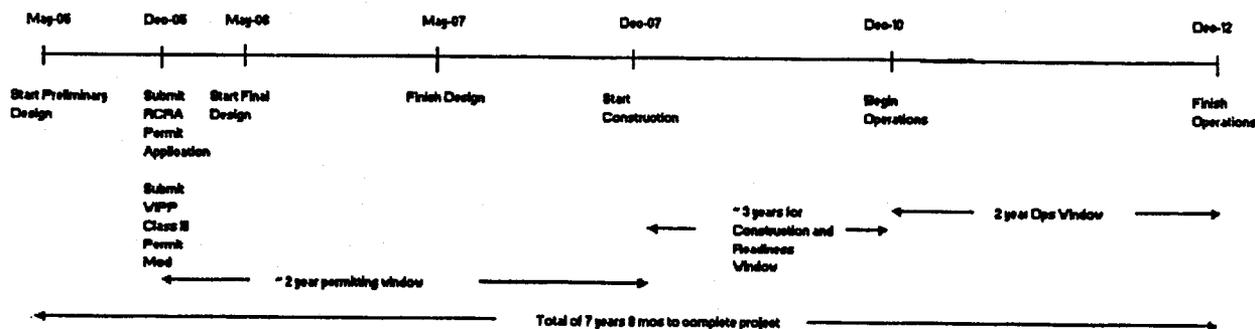
In order to meet the priorities and 2012 milestone of the "*Environmental Management Performance Management Plan for Accelerating Cleanup of the Idaho National Engineering and Environmental Laboratory*" the SBW must be treated and the INTEC Tank Farm tanks emptied prior to the RCRA closure of the last tank. In addition, remediation of the CERCLA soils in and around the Tank Farm Facility will also be completed by 2020. The CERCLA soils remediation is also being incorporated into the new ICP contract.

6. RESOURCE REQUIREMENTS AND SCHEDULE

6.1 Project Planning and Schedule

The SBW Treatment Project is planned to meet the requirements of the Idaho Settlement Agreement to have the waste treated by December 2012. In addition, the project is planned to meet the objectives of the EM PMP. Engineering feasibility studies at various levels of detail have been performed for several viable SBW treatment technologies. Current cost and schedule estimates are based on the feasibility studies and therefore the estimates are preliminary. Cost and schedule estimates will be further developed and refined during future design efforts. It is currently planned that award of the new Idaho Cleanup Project will occur in May 2005, and will include the selection of a waste treatment technology. It is further assumed that adequate conceptual design information will have been developed by the selected contractor as part of the solicitation process. Finalization of the design activities could then commence upon contract award, beginning in May 2005. Preliminary Design is estimated to last one year, followed by a one-year Final Design effort. Due to the relatively short time frame to complete the treatment of SBW, it is anticipated that no significant technology development work will be required. Work to develop the necessary regulatory permit applications can also commence in May 2005, with permit applications ready for submittal by the end of calendar year 2005. State of Idaho regulators have indicated that at least two-years will be required to review the permit applications. Further, it is anticipated that State of Idaho regulators will not allow construction efforts to commence until the appropriate permits are in place. Therefore, the project could start construction at the end of calendar year 2007. A three-year construction effort is anticipated, ending in late 2010, followed by a two-year operational phase. Waste treatment will then be able to be completed by the end of calendar year 2012.

A graphical timeline of the project is presented below.



6.2 Critical Decision Dates

Critical Decision dates for the SBW Treatment Project are planned as follows:

Decision	Date Needed
CD-0, Approve Mission Need	4 th Quarter FY04
CD-1/2, Approve Alternative Selection, Cost Range, and Performance Baseline	3 rd Quarter FY05 (See note below)

CD-3, Approve Start of Construction	1 st Quarter FY08
CD-4, Approve Start of Operations	1 st Quarter FY11

Note: Approval of critical decisions as shown above is key to achieving project success. Critical Decisions 1 and 2 need to occur simultaneously by May 2005, the planned commencement of the new ICP contract. Without timely CD-1 and CD-2 approvals, development of sufficient design information to support regulatory permit applications will be delayed. Such delays are a significant project risk in terms of meeting the 2012 milestone date for completion of SBW treatment.

6.3 Project Funding Profile and Cost

The SBW Treatment Project has developed an estimate the total project costs and profile. The Total Project Cost (TPC) has been estimated at approximately \$380 M. The required funding profile is shown below. The cost estimates can be used as a funding placeholder pending final decisions regarding the specific treatment technology to be used. Actual costs for the project are likely to be less than those presented in this document, the costs shown below are judged to be conservative estimates. The actual Cost Baseline for the project will be established with CD-2 approval.

SBW Treatment Project cost estimate* (in thousands).

	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	Total
Total Project Engineering Design			17,600	37,000					54,600
Total Line Item Construction				15,000	80,500	79,700	74,700	74,700	249,900
Total Other Project Costs	4,800	25,800	6,900	2,800	8,190	2,210	3,200	20,800	74,700
Total Project Costs (TPC)	4,800	25,800	6,900	20,400	60,190	82,710	82,900	95,500	379,200

* In accordance with 04-D-414, *Project Engineering Design (PED), Sodium Bearing Waste (SBW) Treatment Project, Idaho National Laboratory (INL), Idaho*¹² and 04-ID-02, *Sodium Bearing Waste (SBW) Treatment Project, Idaho National Laboratory (INL), Idaho*¹³.

6.4 Measures to Determine Project Success

Performance metrics that are driven by enforceable milestones, as well as schedule and cost, will be established for scope and major deliverables.

6.4.1 Measure of Schedule Success

Both quantitative and qualitative measures are planned to be used to establish schedule success. The project will measure schedule performance using an earned value system to measure quantifiable work accomplishments with respect to completed deliverables. Engineering and procurement deliverables (i.e., drawings, specifications, material requisitions, etc.) are planned to be tracked using progress and performance measurement tools. Construction schedule progress is planned to be determined based on quantities installed against the plan using quantity unit rate reporting tools. Contract earned-value will be

determined on a regular basis. Variances from planned schedule performance will be reviewed and dispositioned by project management and corrective action will be taken.

6.4.2 Measuring Cost Success

Cost performance is planned to be measured using a Work Breakdown Structure (WBS) to subdivide the total project into manageable units of work, which are then subdivided into successive lower levels of detail. Costs will be collected in alignment with the WBS, and reports will be generated for weekly, monthly, and year-to-date actual costs for both hours and dollars. Change control management and trend reporting are planned to be used to report variances from the baseline planned progress. Variances from planned cost performance can then be reviewed and dispositioned by project management, with corrective actions identified and implemented. Monthly estimates at completion can be developed based on actual performance and identified trends.

6.4.3 Measuring Successful Project Completion

The SBW Treatment Project will be considered complete when facilities to treat the SBW and package the treated waste for disposal at the WIPP are constructed, tested, and turned over to operations staff for treatment of the waste. Overall programmatic success will be achieved when the SBW is treated and disposed of at WIPP by the end of 2012.

7. SUMMARY

Approving this mission need statement by October 1, 2004 allows funding to be directed at FY 2005 project activities to design and construct an SBW Treatment Project to treat the approximately one million gallons of SBW currently stored in underground storage tanks at the INEEL. Treatment of the SBW is required by the Idaho Settlement Agreement and associated Consent Orders. The scope of work to treat the SBW for disposal at the WIPP by 2012 has been incorporated into the new Idaho Cleanup Project contract at the INEEL, with contract transition to commence in May 2005. Due to the relatively short timeframe to complete this project, work to complete a project design will need to commence without delay upon contract transition. Once completed, the SBW Treatment Project will allow the Department of Energy to:

- Reduce environmental risks of continued storage of radioactive liquid waste over the Snake River Plain Aquifer,
- Meet legal commitments made by the Department of Energy in the Idaho Settlement Agreement and associated Consent Orders, and
- Meet EM objectives for accelerated site cleanup outlined in the *DOE Environmental Management Performance Management Plan for the Accelerated Cleanup of the Idaho National Engineering and Environmental Laboratory (PMP)*

8. REFERENCES

1. *Settlement Agreement between the State of Idaho, the Department of Energy, and the Department of the Navy, to resolve all issues in the actions Public Service Co. of Colorado v. Batt, No. CV-91-0035-S-EJL (D. Id.) and United States v. Batt, No. CV-91-0065-S-EJL (D. Id.), dated October 16, 1995.*
2. *Environmental Management Performance Management Plan for Accelerating Cleanup of the Idaho National Engineering and Environmental Laboratory, DOE/ID-11006, dated July 2002.*
3. *Notice of Non-Compliance Consent Order, issued by Idaho Department of Health and Welfare, April 1992, and subsequent modifications*
4. *Idaho High-Level Waste and Facilities Disposition Environmental Impact Statement, DOE/EIS-0287, issued September 2002*
5. *Idaho Cleanup Project Contract Request for Proposals, RFP No. DE-RP07-03ID14516, July 21, 2004*
6. *DOE Order 435.1, Radioactive Waste Management, Change 1, August 28, 2001.*
7. *Idaho Nuclear Technology and Engineering Center Sodium-Bearing Waste – Waste-Incidental-to-Reprocessing Determination Report, DOE/ID-10780, August 2002, not yet approved for issue*
8. *Letter of Intent between DOE, Environmental Protection Agency, and Idaho Department of Environmental Quality, formalized on July 11, 2002.*
9. *Sodium Bearing Waste Treatment Facility CD-0 DOE-EM Independent Project Review FINAL REPORT, October 2002*
10. *Sodium-Bearing Waste Treatment Technology Evaluation Report, INEEL/ET-04-01692, February 2004*
11. *Sodium-Bearing Waste Treatment Alternatives Implementation Study, ICP/EXT-04-00489, July 2004.*
12. *04-D-414, Project Engineering Design (PED), Sodium Bearing Waste (SBW) Treatment Project, Idaho National Laboratory (INL), Idaho, dated July 14, 2004*
13. *04-ID-02, Sodium Bearing Waste (SBW) Treatment Project, Idaho National Laboratory (INL), Idaho, dated July 14, 2004*

04-ID-02, Sodium Bearing Waste (SBW) Treatment Project, Idaho National Laboratory (INL), Idaho

(Changes from FY 2005 Congressional Budget Request are denoted with a vertical line [|] in the left margin.)

Significant Changes

- The SBW Treatment Project was included as scope in the Request for Proposals for the new Idaho Cleanup Project. All Conceptual and Preliminary Design activities, including Critical Decision 0, were cancelled until the new contract is awarded. The new contractor will propose a method for treating the SBW for disposal. The project is forecasted to start in the second quarter of FY-2005, and the new contractor will complete all design activities (Conceptual, Preliminary, and Final Designs) by the end of FY-2006.
- Cost estimates are based on feasibility level studies of the various potential treatment alternatives.
- The project start has slipped one year to await the award of the new Idaho Cleanup Project and resolution of waste classification litigation issues.
- In May 2004 \$43.3M in project construction funds was shifted from FY 2005 to FY 2006. Later (June 2004 submittal) \$28.3M was further shifted into FY 2007 (\$20M) and FY 2008 (\$8.3M) leaving no funds in FY 2005 and \$15.0M in FY 2006 out of an original request of \$109.1M total for these two years. These funding shifts put achievement of the 2012 SBW treatment milestone at great risk, especially considering the need for 4.5 years to treat SBW by calcination (the basis for this submittal). Although other treatment alternatives are available for SBW treatment that could have shorter treatment periods if built new ("greenfield"), achievement of the 2012 milestone appears to be in jeopardy.
- Upon CD-0 Mission Need approval by the Acquisition Executive, the INL will revise the PED and Project Datasheets submitted for FY-2006 to reflect the current estimates.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost (\$000)	Total Project Cost (\$000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2004 Budget Request (PED / Pre-Conceptual) ^a	1Q 2004	4Q 2005			44,200	
FY 2004 Budget Request (PDS, Pre-Conceptual Estimate)	1Q 2004	4Q 2005	2Q 2005	2Q 2008	290,500	376,800
FY 2005 Budget Request (PED / Pre-Conceptual Estimate)	3Q 2004	2Q 2006			54,600	
FY 2005 Budget Request (PDS, Pre-Conceptual Estimate)	3Q 2004	2Q 2006	4Q 2005	4Q 2008	304,500	395,000
FY 2006 Budget Request (PED / Pre-Conceptual Estimate)	2Q 2005	4Q 2006	4Q 2007	3Q 2009	54,600	
FY 2006 Budget Request (PDS, Pre-Conceptual Estimate)	2Q 2005	4Q 2006	4Q 2007	3Q 2009	304,500	379,200

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs ^b
2004 (04-D-414)	20,500	0	0
2005 (04-D-414)	24,900	45,400	17,600
2006 (04-D-414)	9,200 ^c	9,200	37,000
2004	0	0	0
2005	0	0	0
2006	15,000	15,000	15,000
2007	85,800	85,800	80,500
2008	82,800	82,800	79,700
2009	53,100	53,100	58,000
2010	13,200	13,200	16,700

^a The PED request and PDS for the FY-2006 budget have been submitted as separate documents.

^b Cost will lag behind appropriations and obligations as contracts are awarded for design and construction activities

^c Assumes a \$20,500 carryover from FY-2004 and a \$24,900 carryover from FY-2005. Carryover is due to a delay in the project acquisition strategy and waste classification litigation issues.

Environmental Management/
INL - Idaho Cleanup Project/
04-ID-02, Sodium Bearing Waste Treatment Project
Post 2007 Completion
Project Data Sheets

FY 2006 Field Budget
07/14/2004

3. Project Description, Justification, and Scope

This budget request supports the equipment procurement, construction, construction management, quality assurance, and project management for the Sodium Bearing Waste (SBW) Treatment Project. The design effort will develop the final detailed design of the selected alternative and establish the scope, schedule, and cost baselines for the project. Design funding has been requested on a separate Project Engineering & Design (PED) funding request. This request plans construction funding and equipment procurement funding so that it will be available for those items on a timely basis to support the overall schedule. The SBW Treatment Project is one of several interrelated projects that are managed together under Idaho National Laboratory's (INL) Idaho Cleanup Project (ICP) and the EM Project Management Plan to Accelerate Cleanup, and are part of the process to close the Idaho Nuclear Technology and Engineering Center's (INTEC) Tank Farm Facility (TFF). In order for these projects to meet the clean-up schedule, they will be managed together and their activities coordinated under the Idaho Cleanup Project.

The SBW Treatment Project supports the Department of Energy's (DOE's) EM mission of safely storing / treating liquid radioactive wastes. The SBW Treatment Project, as planned, supports the EM initiative to accelerate clean up and reduce risk to the environment. In addition, it supports several Federal Facility Compliance commitments made with the State of Idaho.

The current DOE mission at INTEC includes cleaning up and managing radioactive and hazardous waste previously generated from nuclear fuel reprocessing activities. One of the major remaining waste forms at INTEC is liquid mixed transuranic (TRU) waste. This waste is locally defined as sodium bearing waste (SBW) due to its high content of sodium and potassium. SBW and Newly Generated Liquid Waste (NGLW) were primarily generated from past and on-going waste management and decontamination activities at INTEC. The present inventory of approximately 1.1 M gallons of SBW is stored in eleven 300,000 gallon, underground tanks in the TFF. These tanks are between 35 and 45 years old and were constructed prior to the establishment of the Resource Conservation and Recovery Act (RCRA) regulations.

Five of the eleven storage tanks are located in concrete vaults of a design that does not meet present structural safety requirements (the "pillar and panel vaults"), and none of the tanks have secondary containment capabilities that meet current RCRA regulations. The waste management / storage systems at INTEC currently operate under RCRA Part A interim status and a notice of non-compliance consent order.

A series of disputes over waste management and treatment, new waste, and spent nuclear fuel shipments into the State of Idaho resulted in a court ordered Settlement Agreement between Idaho, the DOE and the U.S. Navy in October 1995. Among many other things, the Settlement Agreement requires "cease-use" of the TFF tanks by December 31, 2012, because of their age, RCRA non-compliant configuration, and the seismic risk of release of their contents to the underlying Snake River Plain Aquifer. The evacuation of the tank contents by "calcination" (or otherwise treated) is also required. The 1998 NON-Consent Order Modification also requires cease-use of the TFF by December 31, 2012.

The scope and primary goal of the project is to design and construct a treatment process system that will treat the sodium-bearing waste (including solids) currently stored in the TFF tanks, along with any NGLW produced through 2012. The treatment process will convert the waste to a final waste form suitable for transport to and disposal at the Waste Isolation Pilot Plant in New Mexico. Several feasible alternative technologies to treat the SBW, tank solids, and NGLW have been identified and chosen through various systematic analyses and the National Environmental Policy Act (NEPA) process. The SBW Treatment Project has unique political, technical, cost, and schedule risks. The treatment alternative will be selected based on its ability to mitigate these risks. Final selection of the preferred treatment alternative will occur after a new contractor is selected to perform the Idaho Cleanup Project.

Environmental Management/
INL - Idaho Cleanup Project/
04-ID-02, Sodium Bearing Waste Treatment Project
Post 2007 Completion
Project Data Sheets

FY 2006 Field Budget
07/14/2004

4. Details of Cost Estimate

(dollars in thousands)		
	Current Estimate	Previous Estimate
Design Phase^d		
Preliminary and Final Design Costs (design drawings & specifications) (7.4% of TEC)...	22,600	22,600
Design Management Costs (1.2% of TEC)	3,800	3,800
Project Management Costs (3.3% of TEC)	10,000	10,000
Total, Engineering Design Inspection and Administration of Construction Costs (12.0% of TEC).....	36,400	36,400
Construction Phase		
Buildings.....	78,500	78,500
GFE / Tagged Equipment.....	22,100	22,100
Construction Management (5.1% of TEC).....	15,500	15,500
Project Management (5.7% of TEC).....	17,500	17,500
Total Construction Costs.....	133,600	133,600
Contingencies		
Design Phase (6.0% of TEC).....	18,200	18,200
Construction Phase (31.6% of TEC).....	96,300	96,300
Special for Multiple Options (6.6% of TEC).....	20,000	20,000
Total, Contingencies (44.2% of TEC).....	134,500	134,500
Total, Line Item Cost (TEC) ^e	304,500	304,500

5. Method of Performance

Design services will be obtained through competitive bid, cost-reimbursable subcontracts to an A-E firm experienced in design of similar facilities. The Idaho Cleanup Project contractor will manage overall performance of the project by self-performing or subcontracting at its preference.

^d The design funds have been requested in a separate PED budget request that was submitted together with these Project Data Sheets.

^e Costs are pre-conceptual ROM planning level estimates, based on feasibility study costs estimates for various alternatives and parametric scaled estimates from similar existing facility costs. The cost estimate above is based on the Calcination with Maximum Achievable Control Technology (CMACT) process, which may not be the selected treatment alternative.

6. Schedule of Project Funding^f
(dollars in thousands)

	Prior Years	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009 & Out Years	Total
Project Cost									
Project Cost									
Total, PED.....	0	0	0	17,800	37,000	0	0	0	54,800
Total, Line Item (Construction)	0	0	0	0	15,000	80,500	79,700	74,700	249,900
Total TEC.....	0	0	0	17,800	52,000	80,500	79,700	74,700	304,500
Other Project Costs									
R & D Necessary to Complete Construction.....	4,800	12,500	5,300	750	2,290	760	600	700	27,700
Conceptual Design Cost	0	0	0	0	0	0	0	0	0
Other Project -Related Costs	0	13,300	1,600	2,050	5,900	1,450	2,600	20,100	47,000
Total, Other Project Costs.....	4,800	25,800	6,900	2,800	8,190	2,210	3,200	20,800	74,700
Total Project Cost (TPC).....	4,800	25,800	6,900	20,400	60,190	82,710	82,900	95,500	379,200

^f This schedule reflects planned cash flow, not funding (appropriations)
Environmental Management/
INL - Idaho Cleanup Project/
04-ID-02, Sodium Bearing Waste Treatment Project
Post 2007 Completion
Project Data Sheets

7. Related Annual Funding Requirements

(FY 2006 dollars in thousands)

	Current Estimate	Previous Estimate
Average Annual Facility Operating Costs (includes contingency) ^g	74,200	74,200
Total Related Annual Funding.....	74,200	74,200
Total Operating Costs (operating from FY 2010 through FY 2014) ^h	333,700	333,700

8. Design and Construction of Federal Facilities

All DOE facilities are designed and constructed in accordance with applicable Public Laws, Executive Orders, OMB Circulars, Federal Property Management Regulations, and DOE Orders. The total estimated cost of the project includes the costs of measures necessary to assure compliance with Executive Order 12088, "Federal Compliance with Pollution Control Standards", section 19 of the Occupational Safety and Health Act of 1070, the provision of Executive Order 12196, and the related Safety and Health provisions for Federal Employees (CFR Title 29, Chapter XVII, Part 1960, and the Architectural Barriers Act, Public Law 90-480, and implementing instructions in 41 CFR 101-19.6).

The project will be located in an area not subject to flooding determined in accordance with Executive Order 11988.

The cost estimate included in this subproject budget request assumes tailoring of DOE Orders and the funding process to meet the project needs. All modifications and changes will be reviewed and approved with DOE prior to incorporation into the project plan.

^g Includes personnel for operation, maintenance, and repair of the facility, consumables, and utilities.

^h Assumes approximately 4.5 years of operation for SBW treatment by calcination using the existing INTEC fluidized bed calciner.

04-D-414, Project Engineering Design (PED), Sodium Bearing Waste (SBW) Treatment Project, Idaho National Laboratory (INL), Idaho

Significant Changes

- The SBW Treatment Project was included as scope in the Request for Proposals for the new Idaho Cleanup Project. All Conceptual and Preliminary Design activities, including Critical Decision 0, were cancelled until the new contract is awarded. The new contractor will propose a method for treating the SBW for disposal. The project is forecasted to start in the second quarter of FY-2005, and the new contractor will complete all design activities (conceptual, preliminary and final designs) by the end of FY-2006.
- The cost estimates are based on feasibility level studies of the various potential treatment alternatives.
- The project start has slipped one year to await the award of the new Idaho Cleanup Project and resolution of waste classification litigation issues.
- Upon CD-0 Mission Need approval by the Acquisition Executive, the INL will revise the PED and Project Datasheets submitted for FY-2006 to reflect the current estimates.

1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost (Design Only) (\$000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete	
FY 2004 Budget Request (A-E and technical design only, pre-conceptual estimate)	1Q 2004	4Q 2005	2Q 2005	2Q 2008	44,200
FY 2005 Budget Request (A-E and technical design only, pre-conceptual estimate.	3Q 2004	2Q 2006	4Q 2005	4Q 2008	54,600
FY 2006 Budget Request (A-E and technical design only, pre-conceptual estimate)	2Q 2005	4Q 2006	4Q 2007	3Q 2009	54,600

2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriations	Obligations	Costs
2004	20,500	0	0
2005	24,900 ^a	45,400	17,600
2006	9,200	9,200	37,000

3. Project Description, Justification, and Scope

The Sodium Bearing Waste Treatment Project provides the INL with capabilities to retrieve the SBW from the existing underground storage tanks and process the waste into a suitable form for transportation and disposal as a transuranic waste at the Waste Isolation Pilot Plant (WIPP). This project provides for Architect-Engineering (A-E) design services for the construction project. This allows the project to proceed from Conceptual Design into Preliminary (Title I) Design and Final (Title II) Design. The design effort will be sufficient to assure project feasibility, develop the details of the project scope, provide detailed estimates of construction costs based on the approved design, and provide procurement and construction schedules. It will also be extensive enough so that construction can physically start or long-lead procurement items can be procured in the fiscal year in which construction appropriations are received.

The use of Project Engineering Design (PED) funds to proceed immediately upon completion of Conceptual Design into Preliminary and Final Design will enable acceleration of the SBW Treatment Project. Some changes may occur in the cost profile based on the results of waste classification litigation and the selected treatment technology after the INL closure contract is awarded in early FY-2005. Physical construction funding for PED projects will be separately requested after completion of Preliminary Design work.

^a Assumes a \$20,500 carryover from FY-2004 and 24,900 in new appropriations in FY-2005 and \$9,200 new appropriations in FY-2006 to support \$54,600 cost for Preliminary and Final Design in 2005 and 2006. This carryover is due to the delay in the project caused by litigation over waste classification issues.

04-02, Sodium Bearing Waste Treatment Project, Idaho National Laboratory, Idaho Falls, Idaho

Preliminary Design Fiscal Quarter				Total Estimated Cost (Preliminary Design Only) (\$000)	Full Total Estimated Cost Projection (\$000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
2Q 2005	4Q 2005	4Q 2007	3Q 2009	17,600	304,500

Fiscal Year	Appropriations	Obligations	Costs
2004	17,600	0	0
2005	0 ^a	17,600	17,600

Final Design Fiscal Quarter				Total Estimated Cost (Final Design Only) (\$000)	Full Total Estimated Cost Projection (\$000)
A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
1Q 2006	4Q 2006	4Q 2007	3Q 2009	37,000	304,500

Fiscal Year	Appropriations	Obligations	Costs
2004	2,900	0	
2005	24,900	27,800	0
2006	9,200 ^a	9,200	37,000

Project Scope and Description

This budget request provides for Architect-Engineering (A-E) services (Preliminary and Final Design) and project management on the Sodium Bearing Waste (SBW) Treatment Project. The Preliminary Design effort will sufficiently detail the selected alternative and achieve a high confidence baseline to establish the acquisition performance baseline for SBW Treatment. Design will be extensive enough so that construction can physically start or equipment can be procured to meet the project schedule. The SBW Treatment Project is one of several interrelated projects that are managed together under Idaho National Laboratory (INL) Idaho Nuclear Technology and Engineering Center (INTEC) Waste Program, and are part of the process to close the INTEC Tank Farm Facility (TFF). In order for these projects to meet the clean-up schedule, they will be managed together and their activities coordinated under the INL's Idaho Cleanup Project.

^a Assumes a \$20,500 carryover from FY-2004 and 24,900 in new appropriations in FY-2005 and \$9,200 new appropriations in FY-2006 to support \$54,600 cost for Preliminary and Final Design in 2005 and 2006. This carryover is due to the delay in the project caused by litigation over waste classification issues.

The SBW Treatment Project supports the Department of Energy's (DOE's) Environmental Management (EM) mission of safely storing / treating liquid radioactive wastes. The SBW Treatment Project, as planned, supports the EM Project Management Plan (PMP) Initiative to accelerate clean up and reduce risk to the environment. In addition, it supports several Federal Facility Compliance commitments made with the State of Idaho.

The current DOE mission at INTEC includes cleaning up and managing radioactive and hazardous waste previously generated from nuclear fuel reprocessing activities. One of the major remaining waste forms at INTEC is liquid mixed transuranic (TRU) waste. This waste is locally defined as sodium bearing waste (SBW) due to its high content of sodium. SBW and Newly Generated Liquid Waste (NGLW) were primarily generated from past and on-going waste management and decontamination activities at INTEC. The present inventory of approximately 1.1 M gallons of SBW is stored in eleven, 35-45 year old, 300,000 gallon, underground tanks in the TFF.

Five of the eleven storage tanks are located in concrete vaults of a design that does not meet present structural safety requirements (the "pillar and panel tanks"), and none of the tanks have secondary containment capabilities that meet current Resource Conservation and Recovery Act (RCRA) requirements. The waste management / storage systems at INTEC currently operate under RCRA Part A Interim status and a notice of non-compliance consent order.

A series of disputes over waste management and treatment, new waste, and spent nuclear fuel shipments into the State of Idaho resulted in a court ordered Settlement Agreement that was reached between Idaho, the DOE and the U. S. Navy in October 1995. Among many other things, the Settlement Agreement requires "cease-use" of the TFF tanks by December 31, 2012, because of their age, RCRA non-compliant configuration, and a seismic risk of release of their contents to the underlying Snake River Plain Aquifer. The evacuation of the tank contents by "calcination" (or otherwise treated) is also required. The 1998 NON-Consent Order Modification also requires cease-use of the TFF by December 31, 2012.

The scope and primary goal of the project is to design and construct a treatment process system that will treat the sodium-bearing waste (including solids) currently stored in the TFF tanks, along with any NGLW produced through 2012, to a final waste form. Several feasible alternative technologies to treat the SBW, tank solids, and NGLW have been identified through various systematic analysis and the National Environmental Policy Act (NEPA) process. The new Idaho Cleanup Project contractor will select and implement the treatment alternative and will be required to meet the 2012 milestone date to complete treatment of the SBW.

The Performance Management Plan was signed in July of 2002. The CD-0 documents were completed in July of 2002 for the independent project review, revised and formally submitted in September 2002. CD-0 approval was scheduled for approval in October 2002, but was cancelled in April 2003 when it was decided to include the project in the new Idaho Cleanup Project.

4. Details of Cost Estimate

(dollars in thousands)		
	Current Estimate	Previous Estimate
Design Phase		
Preliminary Design costs (design drawings and specifications)(3.4% of TEC)	10,300	10,300
Final Design costs (design drawings and specifications)(4.0% of TEC)	12,300	12,300
Preliminary Design Management ^b costs (0.8% of TEC)	2,300	2,300
Final Design Management costs (0.5% of TEC)	1,400	1,400
Project Management ^c (Preliminary Design) costs (1.6% of TEC).....	5,000	5,000
Project Management (Final Design) costs (1.7% of TEC).....	5,100	5,100
Total Design Costs (12.0% of TEC)	36,400	36,400
Design Contingency (Title I & Title II) (6.0% of TEC)	18,200	18,200
Total Design Costs (17.9% of TEC)	54,600	54,600

5. Method of Performance

Design services will be obtained through competitive bid, cost-reimbursable subcontracts to A-E firms experienced in the design of similar facilities. The Idaho Cleanup Project contractor staff will manage the overall design effort and interfaces with the existing operating plant.

^b Design Management consists of oversight and control of design activities, not the actual design costs.

^c Project Management includes activities for the project manager, design reviews, project document control, project manager supervision, cost estimating, and conduct of operations.

6. Schedule of Project Funding^d

	Prior Years	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	Outyears	Total
Project Design Cost									
Preliminary Design.....	0	0	0	10,300	0	0	0	0	10,300
Final Design	0	0	0	0	29,800	0	0	0	29,800
Project & Design Management...	0	0	0	7,300	7,200	0	0	0	14,500
Total PED.....	0	0	0	17,600	37,000	0	0	0	54,600
Other Project Costs									
R & D for Project	4,800	12,500	5,300	750	2,290	760	600	700	27,700
Conceptual Design cost.....	0	0	0	0	0	0	0	0	0
NEPA Documentation Costs ^e	0	Satisfied by IHLW & FD EIS		0	0	0	0	0	0
Other Project-related Costs	0	13,300	1,600	2,050	5,900	1,450	2,600	20,100	47,700
Total Other Project Costs.....	4,800	25,800	6,900	2,800	8,190	2,210	3,200	20,800	74,700
Total PED and Other Project Costs	4,800	25,800	6,900	20,400	45,190	2,210	3,200	20,800	129,300

^d This schedule reflects planned cash flow, not funding (appropriations).

^e The Idaho High Level Waste and Facility Disposition EIS has been in progress since 1998.

RECORDS TRANSMITTAL

3- CORRESPONDENCE

1. DOCUMENT INFORMATION

Document ID: CCN 300837 Revision ID: _____ Project Number: 25051
 Title/Description: Memorandum - Critical Decision-0, Mission Need for Sodium Bearing Waste Treatment Project Date of Record: 12/13/2004
 Document Author/Creator: Mark W. Frei and Elizabeth D Sellers OR _____
 Document Owner: _____ Date Range From: 12/1/2004 To: 12/13/04
 Originating Organization: _____ Charge No.: _____
 ICP INEEL
 Periodic Review Frequency: N/A 5 years Annually Other: _____

2. RECORDS MANAGEMENT REQUIREMENTS

Uniform File Code(s): 8201 Disposition Authority: A17-31-d
 Category: Environmental If Environmental, Does Record Apply to: CERCLA RCRA N/A
 Quality Assurance Emergency Operating Sensitive Unclassified Legal & Financial Rights
 Keywords: Letter to Paul M. Golan from Mark W. Frei, Critical Decision-0, Mission Need for Sodium Bearing Waste Treatment Project , attached also a letter to Paul M. Golan from Elizabeth D. Sellers, Approval of Critical Decision-0, Mission Need for Sodium Bearing Waste Treatment Project, DOE/NE-ID-11193 dated 9/04

Record(s) pertain to: Nuclear Regulatory Commission (NRC)-funded programs
 DOE/RW-0333P
 WIPP/TRU Waste
 Total Pages: 140 OR N/A if record is bound in binder, folder, or envelope.
ICP SPECIFIC RECORD INFORMATION
 Choose applicable PHASE that record(s) pertains to:
 Closure Operational Readiness Preliminary Design
 Conceptual Design Operations None
 Design Pre-Conceptual Design
 Final Pre-Final

3. QA RECORD VALIDATION

Only required for QA records where no other method of validation (signature, initials, etc.) is available on the record itself

Validator Print/Type Name	Validator Signature	Validator S Number	Date
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4. SIGNATURES

Sign and Date as the Sender:
LOANN BELNAP [Signature] 9/13/2005
 Sender Print/Type Name Sender Signature Date
 Acceptance/ Receipt:
TSA-1EF602 [Signature] 9/13/05
 Location of Receiving Receiver Signature Date
 DRSC or SFL

5. RECORDS PROCESSING INFORMATION
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