

Summary

PERFORMANCE-BASED CLOSURE WITH CLASS A GROUT DISPOSAL ALTERNATIVE

This is one of two alternatives that would accommodate the potential use of the Tank Farm and bin sets for disposal of the low-level waste fraction. The facility would be closed as described for the Performance-Based Closure Alternative. Following completion of those activities, the Tank Farm or bin sets would be used to dispose of low-level waste Class A-type grout produced under the Full Separations Option.

PERFORMANCE-BASED CLOSURE WITH CLASS C GROUT DISPOSAL ALTERNATIVE

This alternative would also accommodate the potential use of the Tank Farm and bin sets for disposal of the low-level waste fraction. The facility would be closed as described above for the Performance-Based Closure Alternative. Following completion of those activities, the Tank Farm or bin sets would be used to dispose of low-level waste Class C-type grout produced under the Transuranic Separations Option.

PREFERRED ALTERNATIVE

Both DOE and the State of Idaho have designated performance-based closure methods as the Preferred Alternative for disposition of HLW facilities at INTEC. These methods encompass three of the six facility disposition alternatives analyzed in this EIS: Clean Closure, Performance-Based Closure, and Closure to Landfill Standards. Performance-based closure would be implemented in accordance with applicable regulations and DOE Orders. However, any of the disposition alternatives analyzed in this EIS, not including the No Action Alternative, could be implemented under performance-based closure criteria. Consistent with the objectives and requirements of DOE Order 430.1A, Life Cycle Management, and DOE Manual 435.1-1, Radioactive Waste Management Manual, all newly constructed facilities necessary to implement the waste processing alternatives would

be designed and constructed consistent with measures that facilitate clean closure. Therefore, the Preferred Alternative for disposition of new facilities is Clean Closure.

Waste management activities associated with any of the facility disposition alternatives would be carried out over a long period of time. Disposition actions would be implemented incrementally as the facilities associated with the generation, treatment, and storage of high-level and associated wastes approached the completion of their missions. Disposition actions would be systematically planned, documented, executed, and evaluated to ensure public, worker, and environmental protection in accordance with applicable regulations.

4.0 Areas of Uncertainty

This section discusses uncertainties associated with alternatives and options that are outside the scope of this EIS and that remain unresolved at the time of Final EIS issuance. DOE will appropriately factor these uncertainties into decisions made pursuant to this EIS.

4.1 Waste Acceptance Criteria

The disposal facility operator or regulator determines what materials can be received for disposal by establishing waste acceptance criteria. These criteria define parameters such as packaging requirements, waste form requirements, acceptable radiation levels, and limits on radionuclide content.

HLW REPOSITORY

DOE has identified preliminary waste acceptance criteria for disposal of HLW at the proposed Yucca Mountain repository. DOE has used these preliminary criteria in the design of its vitrification facilities at the Savannah River Site and the West Valley Demonstration Project. However, until such time as the criteria are

finalized, some uncertainties remain that could affect process design and system operation of the treatment options for INEEL mixed HLW.

TRANSURANIC WASTE FRACTION

Some of the waste processing alternatives and treatment options (e.g., Transuranic Separations Option) would produce transuranic waste for potential disposal in the Waste Isolation Pilot Plant. The transuranic waste that would be produced by processing INTEC *mixed* HLW may contain hazardous constituents currently not *covered* in the Waste Isolation Pilot Plant *RCRA Part B permit*. *In that case*, additional waste codes would need to be included in *that permit* before the *mixed* transuranic waste fraction would be acceptable for disposal. *Alternatively, DOE may consider demonstrating through the delisting process that the treated transuranic waste would not pose a hazard to human health or the environment, and therefore no longer merit regulation under RCRA.*

DETERMINATION OF EQUIVALENT TREATMENT

Vitrification is the treatment process currently identified *by EPA as the best demonstrated available technology* for mixed HLW that exhibits the RCRA characteristics of corrosivity or toxicity. This process *incorporates the waste in* a glass matrix. However, some of the waste processing options evaluated in this EIS *produce waste forms* such as *ceramic* (hot isostatic pressed), *cement*, and *calcine* that are not vitrification operations. Before these treated waste forms could be disposed of at a HLW repository, DOE would have to obtain a determination of equivalent treatment from the EPA. Such a determination can be granted when it is demonstrated that the proposed treatment will create a waste form that protects human health and the environment, meets applicable treatment standards, and is in compliance with Federal, State, and local requirements. Alternatively, DOE could submit a variance request to EPA, asking

to be exempted from the RCRA vitrification standard.

DELISTING

INTEC's mixed HLW calcine and mixed transuranic waste/SBW contain listed hazardous *wastes* that are *regulated* under RCRA. *The treated waste forms produced* under the various alternatives in this EIS would continue to be regulated as mixed wastes under RCRA, *unless they are delisted or otherwise excluded from the regulatory requirements of RCRA.*

There are uncertainties associated with obtaining a delisting. These include difficulties associated with sampling and analyzing the waste due to its radioactive properties, quality of data for analyses of wastes with very low concentrations of listed hazardous constituents, and availability of data from treatability studies when some treatment technologies lack technical maturity. Sufficient data on the listed waste and the performance of the final waste form will be required to successfully demonstrate that the waste would not harm human health or the environment. Finally, difficulties associated with delisting may increase if states having sites proposed as locations for management of delisted waste are reluctant to allow delisting due to the resulting loss of regulatory control over the waste.

Not knowing whether a delisting petition would be approved for treated mixed HLW introduces another uncertainty. *Under DOE's current waste acceptance criteria, RCRA-regulated HLW would not be accepted at the proposed geologic repository at Yucca Mountain. For this reason, DOE may consider alternative strategies to delisting, under initiatives such as EPA's Project XL (a program that offers flexibility to develop alternative strategies that replace or modify regulatory requirements, on the condition that they produce greater environmental benefits) or pursue a strategy that would exclude the treated mixed HLW from regulation under RCRA.*

4.2 Waste Incidental to Reprocessing

Some waste streams associated with HLW generation, treatment, and storage may be managed as transuranic or low-level waste. DOE Order 435.1, *Radioactive Waste Management, and its associated manual provide criteria and a process, called a waste incidental to reprocessing determination, that DOE will use to determine if waste streams associated with HLW can be managed as transuranic or low-level waste.*

A waste incidental to reprocessing determination is being developed to decide whether the final waste form resulting from treatment of the SBW should be managed and disposed of as transuranic waste. At DOE's request, the Nuclear Regulatory Commission performed a technical review of the draft waste incidental to reprocessing determination before DOE makes its decision, which is anticipated in 2002. Until the outcome of the waste incidental to reprocessing process is complete, uncertainties in final waste classification will remain.

4.3 Technical Maturity of Alternative Treatment Processes

Production scale experience in the operation of mixed HLW treatment processes specific to INTEC waste is *limited to calcination*. Because of differences in waste characteristics among DOE sites, knowledge gained at one site *may* not apply to others. Some proposed mixed HLW treatment processes are only in a preliminary stage of technology development; the viability of others has not been demonstrated beyond the bench scale or pilot stage. *Thus, there is uncertainty regarding technical viability and implementation.* Although *selection* of any of the mixed HLW treatment technologies will require additional technology development *and demonstration-scale proof of process before implementation, DOE considers vitrification to be a more mature technology to produce a final waste form than others evaluated in this EIS,*

requiring considerably less investment in development.

4.4 Timeframes

Under all waste processing and facility disposition alternatives there are some uncertainties related to the timeframes for implementation. These uncertainties include:

- *the technical maturity of technologies and how much development would be necessary before design and construction could begin*
- *the possibility that new regulatory requirements may be promulgated, which could introduce delays by affecting the design and cost of selected technologies*
- *the length of time it will take to get agency approvals for actions such as permits to operate, determinations of equivalency, and delisting petitions*
- *the availability of a geologic repository for INTEC's HLW, which will determine whether DOE will be able to ship this waste out of Idaho or have to store it indefinitely at the INEEL*
- *the timely appropriation of funds by Congress so that DOE can implement waste processing and facility disposition decisions*

Each of these uncertainties is addressed in this EIS.

4.5 Costs

Although NEPA *and the Council on Environmental Quality regulations do not* require agencies to address costs in an EIS, Federal agencies must identify the considerations, including factors not related to environmental quality, that are likely to be relevant and important to a decision. To support the decision process, *DOE will take into consideration the costs of implementing the alternatives.*