DEPARTMENT OF ENERGY

Washington, DC 20585

April 4,1995

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Mr. Robert M. Bernero
Director
Nuclear Material Safety and Safeguards
Mail Stop T8A23
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Bernero:

The U.S. Department of Energy is pleased to provide you with a copy of the Record of Decision on the "Final Supplemental Environmental Impact Statement, Defense Waste Processing Facility, Savannah River Site, Aiken, South Carolina" (DOE/EIS-0082-S).

This Record of Decision documents the Department's decision to complete and operate the Defense Waste Processing Facility at the Savannah River Site as currently designed. The Record of Decision also outlines the rationale behind the decision and the consequences of its implementation. All public comments received on the Defense Waste Processing Facility Supplemental EIS were considered in the preparation of the Final Supplemental EIS and the Record of Decision.

The Department appreciates the interest and efforts of all who participated in the public involvement process. Any additional comments and questions can be directed to the Savannah River Operations Office, NEPA Compliance Officer, U.S. Department of Energy, P.O. Box 5031, Aiken, South Carolina 29804-5031. Thank you for your continuing interest in the Savannah River Site.

Sincerely,

Jill E. Lytle
Deputy Assistant Secretary
for Waste Management
Environmental Management

Enclosure

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Department of Energy

Record of Decision; Defense Waste Processing Facility at the Savannah River Site, Aiken, SC

AGENCY: U.S. Department of Energy, DOE

ACTION: Record of Decision, Defense Waste Processing Facility at the Savannah River Site (SRS), Aiken, South Carolina.

SUMMARY: The U.S. Department of Energy (DOE) is publishing a Record of Decision for the Defense Waste Processing Facility (DWPF). DOE has prepared and issued a Final Supplemental Environmental Impact Statement (EIS) (DOE/EIS-0082-S, November 25, 1994) to assess the potential environmental impacts of completing construction and operating the DWPF, a group of associated facilities and structures, to pretreat, immobilize, and store high-level radioactive waste at the Savannah River Site (SRS). On the basis of the analysis of impacts in the Supplemental EIS, monetary costs, and regulatory commitments, DOE has decided to complete construction and startup testing, and begin operation of DWPF. The facility will be completed and operated as designed, which includes modifications to the conceptual design originally proposed and evaluated in the EIS prepared for the DWPF in 1982 (DOE/EIS-0082). DOE also will implement additional safety modifications to DWPF

that will substantially reduce or eliminate potential accidental releases of radioactive material and chemicals in the unlikely event of a severe earthquake. Independent readiness reviews of DWPF facilities will be conducted, and any potential concerns raised in these reviews will be resolved before DOE proceeds with radioactive operations.

High-level radioactive waste at SRS, the result of nuclear materials production, has been stored in large underground tanks at SRS since 1954. This waste now amounts to approximately 129 million liters (34 million gallons) and exists as sludge, soluble salts dissolved in water (supernatant), and crystallized saltcake formed from evaporation of the supernatant. DWPF includes facilities to pre-treat the salt (supernatant and saltcake) and sludge components using existing high-level waste tanks. Pre-treatment of the salt component will involve chemical precipitation in a high-level waste tank followed by filtration for separation of highly radioactive constituents (cesium, strontium, and plutonium) from the salt solution, yielding two output streams: a highly radioactive precipitate slurry and a low radioactivity salt solution. Pre-treatment of the highly radioactive sludge will involve washing it with a sodium hydroxide solution in selected high-level waste tanks to remove aluminum hydroxide and other soluble salts. The highly radioactive constituents in the precipitate slurry and the pre-treated sludge will be immobilized at DWPF by incorporating them in borosilicate glass in a process called vitrification. The highly radioactive vitrified waste will be sealed in stainless steel canisters and stored in vaults at DWPF until a permanent geologic repository becomes available. The low radioactivity salt solution resulting from salt and sludge pre-treatment will be immobilized in the Saltstone

Manufacturing Plant (one of the DWPF facilities) by being blended with cement, slag, and flyash, which will harden into a concrete-like material called saltstone. Saltstone will be permanently disposed of in large vaults located near DWPF.

Storage of high-level radioactive waste in tanks presents continued long-term risk from releases to the environment, both from normal operations and potential accidents. Completion and operation of DWPF will provide DOE with facilities to immobilize high-level waste at SRS in a form that will significantly reduce potential long-term hazards to human health and the environment.

FOR FURTHER INFORMATION CONTACT: For further information on DWPF or to receive a copy of the Final Supplemental EIS contact: SR NEPA Compliance Officer, U.S. Department of Energy, Savannah River Operations Office, P.O. Box 5031, Aiken, South Carolina 29804-5031, (800) 242-8269. For further information on the DOE National Environmental Policy Act (NEPA) process, contact: Carol M. Borgstrom, Director, Office of NEPA Policy and Assistance (EH-42), U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, D.C. 20585, (202) 586-4600, or leave a message at (800) 472-2756.

SUPPLEMENTARY INFORMATION:

I. Background

DOE prepared this Record of Decision pursuant to the regulations of the Council on Environmental Quality for implementing National Environmental Policy Act (NEPA) (40 CFR Parts 1500-1508) and DOE's NEPA Implementing Procedures (10 CFR Part 1021). This Record of Decision is based on DOE's Final Supplemental Environmental Impact Statement (EIS) for the Defense Waste Processing Facility, SRS, Aiken, South Carolina (DOE/EIS-0082-S).

DOE's SRS occupies approximately 800 square kilometers (300 square miles) adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina, about 40 kilometers (25 miles) southeast of Augusta, Georgia, and about 32 kilometers (20 miles) south of Aiken, South Carolina. When established in the early 1950s, SRS's primary mission was to produce nuclear materials to support the defense, research, and medical programs of the United States. SRS's present mission emphasizes waste management, environmental restoration, and decontamination and decommissioning of facilities that are no longer needed.

The process used in the past to recover uranium and plutonium from production reactor fuel and target assemblies in SRS's two chemical separations areas resulted in high-level radioactive waste. This waste, which now amounts to approximately 129 million liters (34 million gallons), is stored in underground tanks at the F- and H-Area Tank Farms. After

introduction into the tanks as a liquid, the high-level waste separates into a sludge layer at the bottom of the tanks and an upper layer of salts dissolved in water (supernatant). Evaporation of the supernatant in the tank farms using evaporators has produced a third waste form in the tanks, crystallized saltcake.

In 1979 and 1980, DOE prepared an EIS (DOE/EIS-0023; 44 FR 88320, December 3, 1979) and issued a Record of Decision (45 FR 9763, February 13, 1980) to continue a research and development program to develop technology for removing these wastes from the tanks and immobilizing the highly radioactive constituents in a form suitable for disposal. In its Record of Decision, DOE indicated that immobilization was the process most likely to ensure that the waste would remain contained in a form that would pose the least threat to human health or the environment.

In 1982, DOE published an EIS (DOE/EIS-0082; 47 FR 10901, March 12, 1982) evaluating a proposal to design, construct, and operate the DWPF to immobilize SRS high-level waste in a form suitable for safe storage, transport, and ultimate disposal at a permanent geologic repository. A Record of Decision to construct and operate DWPF was issued on June 1, 1982 (47 FR 23801). Subsequently, after completing an Environmental Assessment (DOE/EA-0179; 47 FR 32778, July 29, 1982), DOE selected borosilicate glass as the medium of choice for stabilization of high-level waste at DWPF.

The DWPF is now mostly constructed, and the major high-level waste pre-treatment processes and the vitrification process are nearly ready to operate. However, DOE has made design changes to the DWPF process since the 1982 EIS to improve efficiency and safety of the facility. Among these changes are modifications to processes for pre-treatment of the salt

(i.e., supernatant and saltcake) and sludge components of the high-level waste before vitrification, and modifications in methods used for onsite disposal of the immobilized low radioactivity waste fraction (saltstone) resulting from salt pre-treatment. The potential environmental impacts of these modifications had been considered individually, but not cumulatively, in prior NEPA documentation.

In view of these considerations, DOE determined that a focused EIS-level review of the environmental impacts of the DWPF as now envisioned was timely and appropriate. Thus, on April 6, 1994, DOE published in the Federal Register a Notice of Intent (59 FR 16499) to prepare a Supplemental EIS for the operation of the DWPF. This notice initiated a formal scoping period that extended through May 31, 1994.

DOE held three informal public workshops early in the scoping period in North Augusta, South Carolina; Savannah, Georgia; and Columbia, South Carolina on April 12, 19, and 21, 1994, respectively, to provide the public with information on the DWPF. Interested parties were invited to submit comments for consideration in the preparation of the Supplemental EIS. DOE also established a toll-free telephone line allowing interested parties to submit comments by voice or facsimile. Comments were also submitted by mail and at formal public scoping meetings held in Savannah, Georgia, and North Augusta and Columbia, South Carolina, on May 12, 17, and 19, 1994, respectively.

On August 26, 1994, DOE and the U.S. Environmental Protection Agency (EPA) published Notices of Availability of DOE's Draft Supplemental EIS in the Federal Register (59 FR 44137 and 59 FR 44143, respectively). EPA's notice officially started the public

comment period on the Draft Supplemental EIS, which extended through October 11, 1994. Comments were received by letter, telephone (voice mail), and formal statements made at 10 public hearing sessions. The hearings, which included the opportunity for informal discussions with DOE personnel involved with DWPF, were held in Aiken, South Carolina on September 13, 1994 (2 sessions); Hilton Head, South Carolina on September 14, 1994; Beaufort and Hardeeville, South Carolina, and Savannah, Georgia (first session) on September 15; Savannah, Georgia (second session) on September 16; and Allendale, Barnwell, and Columbia, South Carolina on September 20, 1994.

DOE considered the comments it received from agencies, organizations, and individuals on the Draft Supplemental EIS in preparing the Final Supplemental EIS. On November 18, 1994, DOE announced its completion of the Final Supplemental EIS, and EPA published a Notice of Availability of the document in the Federal Register on November 25, 1994 (59 FR 60630), following distribution of approximately 300 copies to government officials and interested groups and individuals.

II. Alternatives

In the Final Supplemental EIS, DOE examined two major alternatives for treating waste at DWPF, and a no-action alternative. These alternatives are described below.

A. Proposed Action

Under this alternative, DOE would complete construction and begin operation of the DWPF as currently designed to immobilize SRS high-level radioactive waste. DOE would continue DWPF process and facility modifications that are underway, complete startup testing activities, and operate the facility upon completion of testing. DOE also would implement safety modifications to substantially reduce or eliminate the probability and consequences of accidental releases of radioactive materials and chemicals in the unlikely event of a severe earthquake. These modifications, which would be implemented before the facility is operated with radioactive waste, address three types of systems: process vessel ventilation systems, building ventilation systems, and systems to prevent or reduce releases of hazardous chemicals. These upgrades could be achieved through additional barriers and within the basic design of the existing facility. The upgrades would ensure that radioactive and hazardous materials would be confined during and following postulated accidents to provide a level of safety to facility workers and the public that is within SRS standards.

Based on operating plans and projected funding used in the SEIS analysis, high-level waste processing would be completed in about 24 years. As analyzed in the SEIS, DWPF includes pre-treatment processes, the Vitrification Facility and associated support facilities and structures, and Saltstone Manufacturing and Disposal, as described below.

<u>Pre-treatment Processes and Facilities</u>:

- Extended Sludge Processing - a washing process that would be carried out in selected

H-Area high-level radioactive waste tanks, to remove aluminum hydroxide and soluble salts from the high-level waste sludge. Sludge would be processed in the DWPF, and the wash water would be directed to the Evaporator Feed Tanks. These facilities are built and the sludge washing process is being tested.

- In-Tank Precipitation (ITP) - a process that would be carried out in selected H-Area high-level radioactive waste tanks and associated new facilities to remove dissolved radioactive constituents (strontium, cesium, and plutonium) from the highly radioactive salt solution by chemical precipitation and filtration. The precipitate would be sent to Late Wash, which is now under construction; the remaining low radioactivity salt solution would be sent to Saltstone Manufacturing and Disposal. These facilities are constructed, and testing is nearly complete.
- Late Wash - a process to concentrate residual radioactive constituents and wash the highly radioactive precipitate resulting from ITP to remove a chemical (sodium nitrite) that could potentially interfere with operations in the Vitrification Facility. This facility is being constructed.

<u>Vitrification Facility and associated support facilities and structures</u>:

- Vitrification Facility - a large building that contains processing equipment to immobilize the highly radioactive sludge and precipitate portions of the high-level waste in borosilicate glass. The sludge and precipitate would be treated chemically, mixed with frit (finely ground glass), melted, and poured into stainless steel canisters that would then be welded shut. The facility is presently constructed and undergoing startup testing.

- Glass Waste Storage Buildings - buildings for storage of the radioactive glass waste canisters in highly shielded and ventilated vaults located below ground level. One building is completed; another building is in the planning stage and would be built as part of the proposed action.
- Chemical Waste Treatment Facility - an industrial waste treatment facility that neutralizes nonradioactive wastewater from bulk chemical storage areas and nonradioactive process areas of the Vitrification Facility. This facility is constructed and in operation.
- Failed Equipment Storage Vaults - shielded concrete vaults that would be used for storage of failed process equipment that is too radioactive to allow onsite disposal. These vaults would be used until permanent disposal facilities can be developed. Two vaults are nearly constructed; four more vaults are planned for the near future. DOE estimates that a total of approximately 14 vaults would be needed to accommodate waste generated during the 24-year Vitrification Facility operating period as analyzed in the SEIS.
- Organic Waste Storage Tank - A 568,000-liter (150,000-gallon) capacity aboveground tank that stores a flammable liquid organic waste consisting primarily of benzene, a byproduct of processing precipitate prior to vitrification. During radioactive operations, this waste would contain small amounts of radioactivity, primarily cesium. The tank is constructed and currently stores nonradioactive liquid organic waste generated during nonradioactive chemical testing of the Vitrification Facility.

<u>Saltstone Manufacturing and Disposal</u>:

- Saltstone Manufacturing Plant - a processing plant that would blend the low radioactivity

salt solution with cement, slag, and flyash to create a mixture that hardens into a concrete-like material called saltstone. The plant is in operation to treat liquid waste residuals from the F- and H-Area Effluent Treatment Facility, an existing wastewater treatment facility that serves the F- and H-Area Tank Farms. The plant is ready for treatment of low radioactivity salt solution produced by ITP.

- Saltstone Disposal Vaults - large concrete disposal vaults into which the mixture of salt solution, flyash, slag, and cement that is prepared at the Saltstone Manufacturing Plant is pumped. After cells in the vault are filled, they are sealed with concrete. The vaults would then be covered with soil, and an engineered cap constructed of clay and other materials would be installed over the vaults to reduce infiltration by rainwater and leaching of contaminants into the groundwater. Two vaults have been constructed. About 13 more vaults would be constructed over the life of the facility for the proposed action.

B. Ion Exchange Alternative

This alternative is as described above for the proposed action, except that DOE would replace the ITP process with an ion exchange process for high-level waste pre-treatment. DOE examined two options for implementing ion exchange for waste pre-treatment: (1) phased replacement and (2) immediate replacement. In phased replacement, ITP would operate until the ion exchange facility had been designed, constructed, tested, and was available for use, in approximately 14 years. In immediate replacement, ITP would not operate and waste removal from tanks would not begin, meaning the waste would remain in a

more mobile state until the ion exchange facility was operational in approximately 10 years. Under the immediate replacement option, the ion exchange facility would be available four years earlier than it would be under the phased replacement alternative. Because ITP would not be operating to empty the high-level waste tanks, DOE would design, construct, and test an ion exchange facility on an accelerated schedule.

C. No action

Under this alternative, DOE would continue to manage SRS high-level waste in the F- and H-Area Tank Farms for an indefinite period until an alternative to DWPF can be developed to effectively immobilize the high-level waste. DOE would not operate the Vitrification Facility and associated facilities and structures, ITP, or Extended Sludge Processing. DOE would continue current Saltstone Manufacturing and Disposal operations to treat waste residuals from the F- and H-Area Effluent Treatment Facility. DOE would "mothball" the Vitrification Facility for an indefinite period and reduce DWPF operations staff accordingly. At least two additional Saltstone Disposal Vaults would be constructed for disposal of F- and H-Area Effluent Treatment Facility waste residuals.

D. Environmental Impacts of Alternatives Documented in the Supplemental EIS

The alternatives (except the no-action alternative) would result in an overall reduction in risk to human health and the environment associated with management of high-level

radioactive waste currently stored in the tank farms. As long as the waste remains in the tanks, particularly in liquid form, releases to the environment could occur as a result of leaks, spills, or tank system rupture. In the process of reducing this overall risk, taking action would have environmental impacts. Although the no-action alternative would not pose these operational impacts, it also would not reduce the continuing risk posed by tank storage of the high-level radioactive waste. Implied in the no-action alternative is the operation at some future time of a replacement immobilization facility (an alternative to DWPF) to treat the high-level radioactive waste. However, the risks and impacts of future alternative immobilization facilities are not known and were not evaluated in the Final Supplemental EIS.

Under all the alternatives, minor impacts would be expected to geologic resources (e.g., soils), surface water, socioeconomic resources, traffic and transportation, and decontamination and decommissioning. No impacts to cultural resources, aesthetic and scenic resources, floodplains and wetlands, or threatened and endangered species would be expected from implementing any of the alternatives. Other impacts are discussed below.

Each alternative considered in the Supplemental EIS, including no action, would result in the unavoidable loss or alteration of land, natural resources, and associated natural resource services (e.g., groundwater for drinking, natural habitats). Land used for the Saltstone Disposal Vaults, approximately 22 hectares (55 acres) under the no-action alternative, and approximately 73 hectares (180 acres) under the proposed action, or under the ion exchange alternatives, would be permanently committed to waste management and would not be available for other purposes (e.g., forestry). Under the no action alternative, two additional

vaults would be constructed on land that has already been cleared. Under the action alternatives, further land use impacts would be spaced over time as an additional 13 new Saltstone Disposal Vaults are constructed. Small mammals, reptiles, and birds occupying this habitat would be displaced or disturbed by clearing and construction activities, but local and regional populations of these wildlife species would not be impacted.

Under all alternatives, use of this land for waste disposal would also unavoidably impact groundwater. Some contamination of shallow groundwater at and near the Saltstone Disposal Vaults is projected to occur from leaching of radionuclides and other pollutants (e.g., nitrate). However, releases from the vaults are not expected to reach the shallow groundwater for at least 100 years, and contamination is projected to remain below drinking water standards beyond a distance of 100 meters (328 feet) from the vaults. Peak concentrations of nonradioactive contaminants are expected to occur at least 1,000 years after closure. The peak radiological dose from groundwater contamination will occur 2,000 years after closure and is 100 times less than current EPA dose limits for drinking water.

Under normal operations, radiation exposure to workers and members of the public would be well within DOE and EPA limits for any of the alternatives. DOE does not expect adverse health effects to members of the public. Normal operations under either action alternative could result in approximately one additional fatal cancer from exposure to radiation among DWPF workers over the 24 years of DWPF processing as analyzed in the SEIS.

Under any of the alternatives, wastes would be generated as a result of operations. These wastes would include low-level, hazardous, mixed (hazardous and radioactive), construction

debris, and sanitary wastes. In addition to these waste streams, highly radioactive failed equipment such as failed melters, process vessels, and miscellaneous small failed equipment would be generated under the action alternatives. The wastes generated under any alternative would impact the existing and planned SRS waste management infrastructure. The treatment and disposal options for these waste streams, except for the highly radioactive failed equipment (which is specifically designated for storage in the Failed Equipment Storage Vaults) and sanitary waste, are being evaluated in the *SRS Waste Management EIS*, currently being prepared.

Major differences in potential impacts among the alternatives include the following:

- Although long-term risk to human health and the environment would be reduced by immobilizing the waste, the proposed action and either option under the ion exchange alternative would initially pose an increased risk above that posed by continued storage (no action). During the period of DWPF operation, the risk would gradually decrease below that of continued tank storage to a smaller, continuing risk from radioactive glass waste canisters stored underground in the Glass Waste Storage Buildings and from residual radioactivity in the high-level waste tanks and processing facilities. Under the ion exchange immediate replacement option, current levels of risk from tank farm operations would persist for an additional 10 years because high-level waste removal and stabilization would be delayed 10 years. Under the no-action alternative, the risk from managing high-level radioactive waste at the tank farms would continue indefinitely.
- Under either action alternative, radiological releases, resulting from failures of DWPF

equipment and systems after a severe earthquake (frequency of once every 5,000 years), could result in a dose of approximately 4,000 rem to a worker located 100 meters (328 feet) from the Vitrification Facility and greater doses to workers located closer to the facility. Such doses would result in death within a few days. These equipment and system failures would also result in doses to the public that exceed the DOE dose standard for normal operations. The proposed action includes safety modifications, which would be implemented before the facility is operated with radioactive waste, to substantially reduce or eliminate the probability and consequences of these failures resulting from a severe earthquake.

- Potential, but unlikely, chemical accidents under each of the action alternatives could result in nitric acid concentrations that may cause nearby workers to experience or develop life-threatening health effects or prevent them from taking protective actions. The proposed safety modifications would be in place to minimize the consequences of these potential accidents.
- Potential, but unlikely, chemical accidents for the proposed action and for the first 14 years of the phased replacement option could result in formic acid and benzene concentrations that may cause nearby workers to experience or develop life-threatening health effects or prevent them from taking protective actions. This potential impact would not exist for the no-action alternative, the immediate replacement ion exchange option, or the last 10 years of the phased replacement ion exchange option. The proposed safety modifications would be in place to minimize the consequences of these potential accidents.
- The ion exchange alternative poses a lower risk from hazardous materials than does operation of ITP because fewer hazardous byproducts, such as benzene, would be produced.

- The ion exchange and no-action alternatives would eliminate the generation of DWPF organic waste as compared to the proposed action.

E. Environmentally Preferable Alternative

DOE considers the alternative that would use ion exchange as an ITP pre-treatment replacement to be the environmentally preferable alternative. However, DOE considers either of the action alternatives (i.e., proposed action and ion exchange alternative) environmentally preferable over the no-action alternative because the risk posed by storing the high-level waste at the tank farms under the no-action alternative would continue indefinitely, as long as the high-level radioactive waste remained in the tanks (particularly in liquid form), due to potential releases to the environment from leaks, spills, or tank system rupture.

Although DOE considers the ion exchange alternative environmentally preferable, implementation of ion exchange would result in certain environmental impacts as discussed above. Under the phased replacement option, the proposed action impacts are present during the first 14 years. Under the immediate replacement option, an additional 10 years of risk would exist from tank storage of the high-level radioactive waste. The total impacts of the ion exchange alternative (both phased and immediate replacement options), including the impacts of existing offsite facilities and reasonably foreseeable onsite facilities and operations, would be equal to or less than those of the proposed action.

The advantages of the ion exchange alternative result from the elimination of benzene as a byproduct of ITP. In addition, either ion exchange replacement option would result in a slight decrease in the generation of mixed waste compared to the proposed action. However, the ion exchange alternative would slightly increase the number of radiologically contaminated facilities at SRS requiring eventual decontamination and decommissioning.

The ion exchange alternative which would not produce benzene or use formic acid in the vitrification process, would eliminate the risks caused by these substances in an accident. This alternative would also reduce the likelihood of radiological accidents at the Vitrification Facility by eliminating benzene, which is flammable and could cause explosions under certain accident scenarios. However, under the proposed action, DOE would implement safety modifications, before radioactive operations are initiated, to substantially reduce or eliminate the probability and consequences of such events.

III. Decision

DOE has decided to implement the proposed action as described in the Final Supplemental EIS. DOE will complete construction and begin operation of the DWPF as currently designed to immobilize high-level radioactive waste. DOE will also implement additional safety modifications to DWPF that will substantially reduce or eliminate potential accidental releases of radioactivity and chemicals in the unlikely event of a severe earthquake. DOE will continue the DWPF process and facility modifications that are underway, complete startup testing activities, and meet requirements for independent

reviews. Upon completion of these activities, DOE will operate the facility. Based on operating plans and projected funding used in the SEIS analysis, high-level waste processing would be completed in about 24 years.

A. *Discussion*

On the basis of analyses presented in the Final Supplemental EIS, DOE considers the no-action alternative to be the least favorable of the alternatives considered. DOE considers tank storage of the high-level radioactive waste (i.e., the no-action alternative) to be only a temporary solution to managing this waste, while action alternatives offer a long-term solution, providing for the immobilization of the waste in a form suitable for safe storage and ultimate disposal at a permanent geologic repository. As discussed above, the risk of potential releases to the environment posed by storing the high-level radioactive waste in tanks would continue as long as waste remained in the tanks.

Selection of the no-action or the ion exchange immediate replacement alternative would result in DOE being unable to achieve or maintain timely compliance with environmental requirements and commitments made to environmental regulatory agencies. Since 1982, DOE has entered into two major compliance agreements with regulatory agencies that affect DWPF. The first is the Federal Facility Agreement with the Environmental Protection Agency and the South Carolina Department of Health and Environmental Control (SCDHEC), made effective in August 1993. It was developed to ensure that environmental restoration activities at SRS meet applicable requirements of the Comprehensive

Environmental Response, Compensation, and Liability Act and the Resource Conservation and Recovery Act (RCRA). DOE committed in this agreement to remove the high-level waste from those high-level waste tanks and tank system components that do not meet stringent standards, including adequate secondary containment to minimize the potential for releases to the environment. DOE also committed to develop, and is in the process of negotiating, a waste removal plan and schedule to be approved by EPA and SCDHEC. This plan and schedule is based on operating DWPF, including ITP and Extended Sludge Processing, which EPA and SCDHEC formally recognize in the agreement as appropriate treatment for high-level radioactive waste at SRS.

The second of these agreements is the Land Disposal Restrictions Federal Facility Compliance Agreement between DOE and EPA, first made effective in March 1991 and last amended in June 1994. This agreement specifies actions DOE must take to ensure compliance with the land disposal restriction requirements of RCRA. It applies to certain SRS hazardous wastes that are also radioactive (i.e., mixed wastes), including high-level waste at SRS. The land disposal restrictions require that hazardous and mixed waste be treated to meet specific treatment standards to reduce potential hazards and limit the amount of waste that can be stored in an untreated condition. EPA has specified vitrification as the treatment to be used for high-level waste, and the Land Disposal Restrictions Federal Facility Compliance Agreement requires DOE to vitrify this waste in the DWPF system as necessary to support the waste removal plan and schedule developed in accordance with the Federal Facility Agreement.

Several other factors contributed to DOE's decision to implement the proposed action rather than the ion exchange alternative. First, the difference in impacts between these two alternatives would be small. Although the impacts of the ion exchange alternative would be less than the proposed action, primarily due to the shorter period of benzene production (phased replacement) or the elimination of benzene production (immediate replacement), the benzene emissions would be within regulatory standards. Also, safety modifications will be made to reduce the likelihood and consequences of accidents that could occur from the presence of benzene. Secondly, construction and implementation of an ion exchange system would be expensive. The total cost of designing and constructing the ion exchange facility is projected to be $500 million. The approximate cost of the immediate replacement option would be $1.1 billion, in addition to the $500 million for designing and constructing the ion exchange facility. Finally, although an ion exchange system is technically feasible, uncertainty exists in designing and implementing this system for DWPF. Large-scale demonstrations would be required to validate the safety basis and the efficiency of the process to remove cesium, strontium, and plutonium, and to demonstrate the impacts on radioactive glass quality.

IV. Mitigation Action Plan

A Mitigation Action Plan is not required (10 CFR 1021.33) because safety improvements have been incorporated into the proposed action to reduce the consequences from potential accidents.

V. Final SEIS Comments

The U.S. Environmental Protection Agency Region IV expressed concern about projected high level waste throughput from storage of foreign research reactor fuel or from acceptance onsite of commercial wastes. The vitrification of waste other than liquid high level waste now in tanks (and small increments produced as a result of site activities) is not proposed at this time. If a proposal is made at a later time, appropriate NEPA review will be undertaken. The final SEIS, taking account of preliminary estimates of reasonably foreseeable actions, including the acceptance of foreign research reactor spent nuclear fuel, containing enriched uranium of United States origin, stated that the incremental volume of high-level radioactive waste than could result from these activities and that might be processed in DWPF is small compared to the volume of high-level waste currently stored in the tank farms (Section 2.2.1) and presented estimates of cumulative impacts (Section 4.1.17). The acceptance of commercial wastes at the Savannah River Site has not been proposed and is therefore outside the scope of the DWPF SEIS.

VI. Conclusion

DOE has determined that the best course of action for immobilizing SRS radioactive high-level waste is to complete construction and startup testing and operate DWPF as currently designed, but include additional safety modifications to reduce or eliminate potential accidental releases of radioactive materials and benzene in the event of a severe

earthquake. This conclusion is based on careful consideration of environmental impacts, monetary costs, and regulatory commitments. Storage of high-level radioactive waste in tanks, particularly in liquid form, presents continued risk of releases to the environment, both from normal operation and accidents. Completion and operation of DWPF will effectively reduce potential hazards to human health and the environment posed by this high-level radioactive waste.

Issued in Washington, D.C. on March 28, 1995

Thomas P. Grumbly

Assistant Secretary For Environmental Management