SUMMARY

This section summarizes the Final Environmental Impact Statement (EIS) on the proposed restart of L-Reactor at the Savannah River Plant (SRP) in South Carolina. In preparing this Final EIS, the U.S. Department of Energy (DOE) has considered the comments that were submitted by government agencies, private organizations, and individuals during the public review period that followed publication of the Draft EIS in September 1983.

This summary also presents the principal comments on the Draft EIS grouped by category, the Department's responses, and modifications made in response to these comments. Also, as required by the Council on Environmental Quality's (CEQ) regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA), the Final EIS discusses the Department's preferred alternative.

Contents of the EIS

In accordance with the provisions of the National Environmental Policy Act and the Department of Energy's NEPA guidelines, the Final EIS contains a description of the proposed action, which is the restart of L-Reactor as soon as practicable, and the reason for this action. The Final EIS also contains descriptions of the following major elements:

- Alternative ways to produce defense nuclear materials
- The present environment that would be affected by the restart of L-Reactor
- The environmental consequences of L-Reactor operation
- Potential ways to reduce the environmental effects of restarting L-Reactor
- The environmental effects that would arise from the increased use of existing SRP facilities due to L-Reactor restart, and the cumulative environmental effects
- Environmental monitoring and studies
- Federal and state requirements for the restart of L-Reactor, and the status of compliance with these requirements

Purpose of this EIS

The Department of Energy, as a Federal agency, is required by the National Environmental Policy Act of 1969, as amended, to assess the potential environmental impacts of its major actions. In August 1982 the Department, seeking to comply with NEPA requirements, published an Environmental Assessment on the restart of L-Reactor and a related Finding of No Significant Impact. Following publication of this finding, a number of groups and individuals expressed their concerns about the possible environmental effects of the L-Reactor restart.

Subsequently, in November 1982, a lawsuit was filed seeking to prevent the restart of L-Reactor until an environmental impact statement had been prepared.

On July 14, 1983, the President signed the Energy and Water Development Appropriations Act, 1984, which directed the Department of Energy to prepare an EIS on L-Reactor on an "expedited" basis. On July 15, 1983, the Federal District Court of Washington, D.C., acting on the November 1982 lawsuit, directed the Department of Energy to prepare an EIS on the proposed restart of L-Reactor. Accordingly, on July 19, 1983, the Department announced that it would prepare an EIS on the proposed restart of L-Reactor to comply with the provisions of NEPA and the Energy and Water Development Appropriations Act, 1984.

The purpose of this EIS is to assess the environmental consequences of the proposed restart of L-Reactor. This Final EIS sets forth and evaluates two major kinds of activities: The first are potential ways to produce defense nuclear materials as alternatives to the restart of L-Reactor; the second are mitigation measures that could avoid, reduce, or compensate for environmental effects occurring before or after the restart. Congressional approval might be necessary for certain alternatives to the restart and for some mitigation measures.

Based on this Final EIS, the Department will prepare a Record of Decision that will state the Department's decision on the proposed restart of L-Reactor. The Record of Decision will identify all the alternatives considered, including those considered environmentally preferable, and will review the factors that were weighed in balancing the need for the restart of L-Reactor against the potential environmental effects from its operation.

Proposed Action

Under the Atomic Energy Act of 1954, the Department of Energy is responsible for developing and maintaining the capability to produce all defense nuclear materials required for the U.S. weapons programs. To this end, the Department operates nuclear reactor production complexes at its Hanford Reservation and Savannah River Plant. The Hanford Reservation currently operates a single reactor, the N-Reactor, for both nuclear materials and steam production; the Savannah River Plant operates three reactors--C-, K-, and P-Reactors--to produce defense nuclear materials only.

The proposed action in this EIS is to restart L-Reactor as soon as practicable. L-Reactor, which is located on the Savannah River Plant, previously operated from 1955 to 1968 to produce plutonium. It is a heavy-water (deuterium oxide) moderated, special-purpose production reactor. Its secondary cooling water is supplied from the Savannah River.

The Department's preferred alternative in this Final EIS is to restart L-Reactor after the construction of a 1000-acre once-through cooling lake. This preferred alternative is different from that presented in the Draft EIS, which was the restart of L-Reactor with direct discharge of secondary cooling water to Steel Creek followed by subsequent thermal mitigation. The impacts of the 1000-acre lake were fully bracketed by the discussions in the Draft EIS of the 1300- and 500-acre impoundments. The actual acreage has been changed but the identification and nature of the impacts is essentially the same. Direct

discharge is referred to as the "reference case" alternative in this Final EIS. The change in the preferred alternative was made in response to public comments and a determination by the State of South Carolina that direct discharge would not be permittable under the current National Pollutant Discharge Elimination System (NPDES) permit regulations.

To ensure that the preferred cooling-water alternative is a viable option for the decisionmaker consistent with the restart of L-Reactor as soon as practicable, the Department prepared and filed dredge and fill (404) and NPDES permit applications with the U.S. Army Corps of Engineers and the South Carolina Department of Health and Environmental Control (SCDHEC), respectively, before the completion of this Final EIS.

Need for L-Reactor

To meet the additional requirements for plutonium contained in the Nuclear Weapons Stockpile Memorandum approved by President Carter on October 24, 1980, the Department of Energy proceeded to implement the most timely and cost-effective production initiatives. These initiatives provided a substantially greater amount of plutonium but not enough to fully meet the requirements. Accordingly, the Department proposed several additional initiatives for implementation, including the restart of L-Reactor at the Savannah River Plant.

The requirements for increased defense nuclear material and the production initiatives necessary to provide the additional production capacity have been reaffirmed in subsequent Stockpile Memoranda since 1980, including a Memorandum for fiscal years 1984 through 1989 that was approved by President Reagan on February 16, 1984. This Nuclear Weapons Stockpile Memorandum--which is the most recent--defines the annual requirements for defense nuclear materials for fiscal years 1984 through 1989, the planning directives for the next 5-year period, and 5 additional years of projections for long-range planning.

In approving the Stockpile Memorandum, President Reagan emphasized the importance of meeting annual requirements and maintaining an adequate supply of defense nuclear materials by directing that: "As a matter of policy, national security requirements shall be the limiting factor in the nuclear force structure. Arbitrary constraints on nuclear materials availability shall not be allowed to jeopardize attainment of the forces required to assure our defense and maintain deterrence. Accordingly, DOE shall . . . assure the capability to meet current and projected needs for nuclear materials and . . . restart the L-Reactor at the Savannah River Plant, Aiken, S.C., as soon as possible."

The specific need for L-Reactor is supported by a quantitative analysis of the production capabilities of DOE facilities and the requirements set forth in the Nuclear Weapons Stockpile Memorandum. This information is classified in accordance with the Atomic Energy Act of 1954. A classified appendix to this EIS (Appendix A), which contains the quantitative analysis of the need for L-Reactor, has been revised in accordance with the latest approved Nuclear Weapons Stockpile Memorandum. This analysis supports the need to restart L-Reactor as soon as practicable.

During the public review period on the Draft EIS, comments were submitted on the need for additional defense nuclear materials and the quantitative analysis supporting this need. Based on these comments, the Department has provided

additional information in Chapter 1 to clarify the production capabilities of selected production initiatives. The Department has not, however, modified this Final EIS to include an analysis of the need for nuclear weapons, their use, and specific nuclear weapon systems, or to include a publicly available quantitative analysis of the need for defense nuclear materials. Information on defense nuclear material requirements, inventories, production capacity, and projected effects on weapon system deployments is classified. In addition, the national policy on nuclear weapons, their deployment, and the need for increased weapons is beyond the scope of this EIS.

Production Alternatives to the Restart of L-Reactor

In accordance with NEPA regulations, the Department of Energy has examined a range of production alternatives to the restart of L-Reactor as soon as practicable. The alternatives include those that have production capabilities similar to that of L-Reactor and those that have only partial-production capabilities compared with that of L-Reactor.

The alternatives that have production capabilities that are similar to that of L-Reactor include restarting R-Reactor at the Savannah River Plant; restarting one of the K-Reactors at the Hanford Reservation in Richland, Washington; and recovering plutonium from spent fuel produced by commercial power reactors.

R-Reactor began operation in late 1953 and was placed in standby status in mid-1964 due to a decline in the need for defense nuclear materials. Since R-Reactor was placed in standby status, its systems and components have not been maintained as well as those in L-Reactor and could not be started in less than 5 years. K-West (KW) and K-East (KE) Reactors at the Hanford Reservation began operation in 1955 and were shut down in 1970 and 1971, respectively, due to a decline in the need for defense nuclear materials. The K-Reactors have been retired and are being prepared for decontamination and decommissioning. The fuel fabrication plant has been dismantled and some essential equipment has been removed. More than 5 years would be required to restore either K-Reactor for the production of plutonium.

Theoretically, weapon materials could be produced directly in existing commercial light-water reactors, or weapons-grade plutonium could be separated isotopically from high-assay plutonium in existing spent fuel from light-water reactors. However, the conversion of spent commercial reactor fuel into weapons-grade plutonium is currently prohibited by law [Atomic Energy Act of 1954, as amended, 42 USC section 2007(e)].

The alternatives that have partial-production capabilities compared to that of L-Reactor are as follows: increasing the power of the N-Reactor at the Hanford Reservation or increasing the power of operating reactors at the Savannah River Plant; reducing the plutonium-240 content of reactor-produced plutonium to allow a more rapid conversion of fuel-grade plutonium into weapons-grade material through blending; and adopting (sooner than had been scheduled) a new design for plutonium-producing fuel assemblies--known technically as the Mark-15 fuel lattice--in the SRP reactors. A quantitative analysis has shown that none of these options, or combinations of options, would provide the required amount of defense nuclear materials.

The Department has also examined a delayed L-Reactor restart in combination with the implementation of two partial-production options--the accelerated use of the Mark-15 lattice in the SRP reactors and the reduction of the plutonium-240 content of plutonium produced in N-Reactor. The Department's analysis concluded that implementing these partial-production options would require additional time and Congressional action to appropriate funds for the use of the Mark-15 lattice, which also would require more time. Furthermore, this combination of alternatives would not provide the amount of required defense nuclear materials.

As required by NEPA, the Department also considered taking no action and maintaining the L-Reactor in a ready-for-operation mode. However, no action would not meet the requirements for defense nuclear materials.

The only available production alternative that satisfies the requirements for defense nuclear materials is the restart of L-Reactor as soon as practicable.

Individuals who commented on the Draft EIS suggested accelerating several partial- and full-production initiatives, including the development of a new production reactor, the recovery of material from retired and obsolete warheads, and an accounting of any surplus production material. None of these accelerated initiatives could provide the required material in sufficient time. The recovery of material from retired and obsolete warheads as well as from production material surpluses was taken into account in the need for material contained in the Nuclear Weapons Stockpile Memoranda. After careful review of the comments, the Department did not make any major changes to the discussion of production alternatives in this Final EIS.

Environmental Effects of the Restart of L-Reactor

This Final EIS first discusses the environmental effects of the restart of L-Reactor without the implementation of any mitigation measures (i.e., the reference case). Reasonable mitigation measures that could reduce environmental impacts are then discussed, followed by the environmental consequences of the Department's preferred alternative and those of no action.

The following sections summarize the environmental impacts of the Department's preferred alternative, including the impacts of normal operation, incremental impacts, cumulative impacts, and potential impacts from postulated accidents.

Normal operation. The Department of Energy's preferred alternative is to restart L-Reactor as soon as practicable, together with the following actions:

- Construct a 1000-acre lake before resuming L-Reactor operation, redesign the reactor outfall that carries the thermal discharge from the reactor to the lake, and operate L-Reactor in such a way that a temperature of 90°F (32.2°C) or less is maintained in about half the lake, thereby ensuring a balanced biological community. After L-Reactor is operating, the Department will conduct studies to confirm the effectiveness of the cooling lake and to decide on the need for precooling devices to allow greater operational flexibility.

- Use the L-Area seepage basin for the periodic disposal of disassembly-basin purge water, while continuing to study and evaluate moderator detritiation.

- Use batch discharge for the periodic disposal of sludge from the L-Reactor cooling-water reservoir.

- Use the existing L-Reactor confinement system.

The principal environmental effects of the preferred alternative would be the results of the construction and use of the 1000-acre lake to reduce L-Reactor thermal effects, the withdrawal of cooling water from the Savannah River, and the release of radionuclides.

Cooling lake--The 1000-acre lake would be constructed by placing an embankment across Steek Creek upstream from the Seaboard Coast Line Railroad bridge. The lake would be about 3900 feet (1200 meters) at its maximum width--with an average width of approximately 2000 feet (600 meters)--and would extend about 4 and a half miles (7 kilometers) upstream from the embankment. While the embankment was being built, the creek would flow past the work area through a temporary metal conduit. The construction of the lake would also require the relocation of electric transmission and cable rights-of-way.

Under an expedited schedule, the 1000-acre lake could be complete in 6 months at a capital cost of approximately $25 million. This major acceleration of the schedule has been made possible because of the Corps of Engineers workforce recently utilized for the construction of the Richard B. Russell Dam on Savannah River is now becoming available and because no long-lead-time equipment items are required for this alternative. Approximately 550 construction personnel, including civil engineers for design and supervision, would be required to construct the lake.

The lake would inundate 225 acres of wetlands and 775 acres of uplands in the Steel Creek corridor. An additional 100 acres of uplands would be lost due to the relocation of electric and cable rights-of-way. A total of between 735 to 1015 acres of wetlands in the Steel Creek corridor, delta, and Savannah River swamp would be impacted.

One historic mill-and-dam site that is eligible for inclusion in the National Register of Historic Places would also be inundated. A resource recovery plan for this site has been developed by the University of South Carolina Institute of Archeology and Anthropology and has been approved by the State Historic Preservation Officer and the Advisory Council on Historic Preservation. Additional historic and archeological sites might be located in the lake area. A survey is underway to identify potentially significant sites. Contingent on the survey's results, needed measures would be taken before the lake is filled.

Construction of the earthen embankment and diversion system would cause some temporary increases in suspended solids in Steel Creek. Fugitive dust and particulate emissions from construction and clearing activities would occur. These emissions, though, would be confined to relatively small areas and would be generally short-lived. Runoff and sediment from construction areas would be controlled by the use of sediment basins and other control measures such as berms, dikes, drains, and mulch.

When the construction of the lake has been completed and the lake filled, L-Reactor thermal discharges would enter through a modified discharge structure that would enhance cooling efficiency. Cooling-water discharges would be managed by altering reactor power levels to maintain a balanced biological community in the lake [i.e., about 50 percent of the lake would not exceed 90°F (32.2°C)]. The balanced biological community probably would not be established until 3 to 5 years after the lake had been filled. The projected water temperatures in the summer (5-day worst case) at the Steel Creek delta and mouth would be within 2°F (1°C) above the ambient temperature. During the winter, projected temperatures at Road A and points downstream from the embankment would be from 13° to 16°F (7°C to 9°C) above the ambient temperature. The lake concept and the management of L-Reactor discharges are expected to meet State water-quality standards.

The Department of Energy anticipates that the lake would contain a balanced biological community similar to that of Par Pond on the Savannah River Plant. Fish species from the Savannah River could enter the lake as eggs, larvae, or fry when L-Reactor is not operating. The exact balance of species that will develop cannot be predicted accurately; however, experience at Par Pond indicates that a community dominated by bass and bluegill would probably develop.

Endangered species--The flows of water from the lake during periods of L-Reactor operation would affect foraging habitat for the endangered wood stork and habitat for the American alligator.

The wood stork (Mycteria americana) was listed as an endangered species on February 28, 1984--five months after the Draft EIS for L-Reactor was completed. Studies on the wood stork were initiated in April 1983. The design of the study program together with its preliminary results were reviewed with the U.S. Fish and Wildlife Service (FWS) during an informal consultation process. Data from the wood stork program is contained in this Final EIS. A Biological Assessment of the wood stork was submitted to the FWS at the end of March 1984. The FWS is reviewing this assessment before it issues its Biological Opinion, which could include mitigation measures. The Department anticipates that after its review, the FWS will concur in the Department's conclusion that while the operation of L-Reactor could affect portions of the wood stork's SRP foraging habitat, the operation of L-Reactor and of other ongoing and planned operations would not affect the continued existence of this species.

On February 25, 1983, the FWS issued a Biological Opinion on the American alligator (Alligator mississippiensis), which concluded that the operation of L-Reactor as then proposed--direct discharge of cooling water--would not jeopardize the continued existence of this species. Since the Biological Opinion was issued, the Department has identified the 1000-acre lake as its preferred cooling-water system. An updated biological assessment that includes the 1000-acre lake was submitted to the FWS at the end of March 1984. The FWS is reviewing this updated assessment before it issues a Biological Opinion, which could include needed mitigation measures. The Department anticipates that, after its review, the FWS will concur with the Department's finding that L-Reactor operation would not have an adverse effect on the continued existence of this species.

The Department is cooperating with the Fish and Wildlife Service to develop a Habitat Evaluation Procedure (HEP) for the Steel Creek system and the 1000-acre lake. The HEP will identify the value of habitat to be gained or lost with the implementation of the preferred cooling-water alternative for use in assessing further mitigation. The Department will implement additional mitigative measures that might be identified through the HEP process; if required, it will request Congressional funding authorization and appropriation.

Cooling-water withdrawal--During L-Reactor operation, water for secondary cooling would be withdrawn from the Savannah River at a rate of about 400 cubic feet (11 cubic meters) per second. This withdrawal--amounting to less than 4 percent of the average flow and 7 percent of the 7-day, 10-year low flow of the river--would cause entrainment and impingement of fish, fish eggs, and larvae in the area of the water intake canal. Studies in 1982 and 1983 show that an estimated 3 to 6 percent of the fish eggs and larvae that pass the intake canal would be lost annually. An estimated average of 16 fish per day would be lost due to impingement during normal river flow.

Radioactive releases--The discharge of L-Reactor cooling water would transport a portion of the cesium-137 and cobalt-60 that remains in the Steel Creek channel and floodplain. The quantities of cesium-137 and cobalt-60 that would be transported from Steel Creek to the Savannah River and to the offsite Creek Plantation Swamp were estimated by monitoring their movement in Steel Creek at flows as high as 220 cubic feet (6 cubic meters) per second during cold flow testing of L-Reactor.

Because the factors that could influence such transport in the combined lake-stream system are difficult to quantify precisely, it is conservatively estimated to be no greater than that from direct discharge (i.e., 4.4 curies of cesium-137 and 0.25 curie of cobalt-60 during the first year).

In addition to the radiocesium and radiocobalt transported to the Savannah River and the adjacent swamp, other liquid and atmospheric releases of radioactivity would occur during normal operation of L-Reactor. The principal sources of these releases are the disassembly basin for irradiated fuel and target assemblies in the reactor building and the periodic purge of water from this basin to the L-Area seepage basin. Radioactivity would be released as a result of the evaporation of water containing tritium in the seepage basin, and as a result of the movement of radionuclides from the seepage basin through shallow ground water to the 1000-acre lake. This movement through the shallow ground water would allow partial decay of the radioactivity. The discharge to the seepage basin would be expected to affect only shallow ground water in the vicinity of L-Reactor; deeper ground-water formations such as the Tuscaloosa and Congaree would not be affected by radioactivity because of the geologic and hydrologic characteristics of the L-Reactor area.

Other sources of radioactivity include atmospheric effluents generated during reactor operation and releases of small process-water leaks into the cooling-water discharge.

The conservatively estimated radiological dose to the maximally exposed person living near the Savannah River Plant from all L-Reactor sources during the first year of normal operation would be 3.6 millirem, or 1/26 of that received from natural radiation sources during the same year. The average dose to

the population within 50 miles (80 kilometers) of the Plant and to the Beaufort-Jasper and Port Wentworth water-consuming populations during that year would be 27.6 person-rem, or 1/3900 of the dose from natural background radiation.

Comments--Many of the comments on the Draft EIS were related to the direct discharge of cooling water, the environmental effects of such discharge, and the potential impact on ground water from the periodic discharge of disassembly-basin water to the L-Area seepage basin.

Comments on the discharge of cooling water dealt principally with how the direct discharge of cooling water related to the water-quality standards of the State of South Carolina. In the Draft EIS, direct discharge was examined in relation to conditions contained in the National Pollutant Discharge Elimination System (NPDES) draft permit issued by the State in August 1982. Several comments noted that subsequent drafts of the permit contained a different compliance point--from in the Savannah River to the discharge point at Steel Creek. Therefore, the direct discharge of cooling water could not comply with the State's standards.

As a result of these comments and continuing discussions with the State of South Carolina on an NPDES permit for L-Reactor, the Department has modified Section 4.1 of this Final EIS by dropping the analysis of direct discharge as it related to the NPDES draft permit issued in August 1982. In addition, Section 4.4.2, which describes cooling-water mitigation measures, includes more measures than those described in the Draft EIS and provides temperature data for assessing compliance with water-quality standards. Also, the Department has changed its preferred cooling-water alternative from direct discharge and subsequent mitigation to construction of a 1000-acre lake prior to L-Reactor restart. Several new sections have been added to discuss this preferred alternative specifically.

Some comments also questioned the analysis of potential ground-water impacts from the periodic discharge of radioactively contaminated disassembly-basin purge water to the L-Area seepage basin. Specifically, these comments questioned the basis for predicting a horizontal movement of radionuclides through shallow ground water rather than vertical movement into deeper, more important ground-water formations, and the effect on future ground-water use of the movement of radionuclides. To clarify the bases for its predictions of horizontal movement and the effect of additional ground-water use, the Department has included additional information in Chapters 3 and 4 and Appendix F.

In response to other comments, the Department has incorporated additional information in the Final EIS on continuing studies of the wood stork and on entrainment and impingement.

Incremental impacts. The restart of L-Reactor would result in incremental increases in the level of effluents and emissions and handling of materials at a number of facilities currently operating at the Savannah River Plant. These facilities include a fuel and target fabrication area (M-Area), two chemical separations areas for irradiated materials (F- and H-Area), and facilities that generate steam and handle and store high- and low-level radioactive waste.

The main environmental effects from incremental increases at these operating facilities would result from greater discharges to the seepage basins in

the M-, F-, and H-Areas, and incremental increases in both ground-water withdrawal and radioactive releases.

Discharges to seepage basins--The M-Area seepage basin was placed in service in 1958 to settle out and contain uranium discharges from fuel and target production operations. Currently, very little wastewater seeps from the basin; instead, most of the water overflows the basin and seeps into the ground at Lost Lake. In the past, waste effluents included large volumes of volatile organic compounds used as metal degreasing agents. Substantial quantities of these solvents entered shallow ground water from several sources: effluent sewer leaks, the seepage basin, overflow to Lost Lake, and miscellaneous spills. In early 1982, the State of South Carolina and EPA were promptly notified that concentrations of two organic degreasers--no longer used at SRP--were detected in the Tuscaloosa Formation. On the basis of well surveys and monitoring, the contamination of the Tuscaloosa Formation is believed to have resulted from the movement of organic degreasers from shallow ground water down the annuli of wells that had defective cement grout between the sediment and the well casings.

The discharge of volatile organic compounds in process wastewaters from the M-Area operations has been reduced substantially due to recent changes in operating practices. The use of one sewer line to the M-Area seepage basin has been discontinued and another line has been repaired.

High concentrations of the organic compounds in the shallow ground water in the M-Area are being removed by both a pilot and a prototype air stripper. State and Federal agencies have reviewed the ground-water remedial action plan for the removal of the organic compounds using recovery wells and a large air stripper; this plan will be implemented in August 1984. The use of the M-Area seepage basin is scheduled to be discontinued by April 1985, when a new wastewater-treatment plant will begin processing the effluent.

Fuel and targets for loading into the L-Reactor already have been produced in the M-Area. The incremental increase in the discharge to the M-Area seepage basin due to L-Reactor represents approximately a 33-percent increase. However, by the end of 1984, the effluent volume attributable to L-Reactor incremental increases will be reduced by 80 percent. Contaminants discharged to the M-Area seepage basin due to L-Reactor and previous SRP operations prior to April 1985 are expected to be intercepted by the wells to be installed as part of the remedial action program. After April 1985, any incremental releases attributable to L-Reactor will be treated by a new wastewater treatment facility.

Since 1954 and 1955, the Savannah River Plant has discharged large volumes of nonradioactive chemicals and low levels of radioactivity to the seepage basins in the F- and H-Areas. The present discharges to the F- and H-Area seepage basins are not characterized as "hazardous" except for frequent periods of low pH and infrequent discharges of mercury and chromium. The chromium discharges result primarily from the processing of offsite fuels. Discharges to the F- and H-Area seepage basins have not resulted in contamination of the Congaree ground water or of ground water in deeper formations such as the Tuscaloosa. The green clay--a thick layer at the base of the McBean Formation--and the clays in the upper Ellenton Formation and at the base of the Congaree Formation have been effective barriers in preventing the vertical movement of contaminants in the F- and H-Areas.

Because of changes in operating practices--principally recycling--discharges to the F- and M-Area seepage basins have been reduced since 1982 by 45 percent and 7 percent, respectively.

The Department of Energy plans to request fiscal year 1986 Congressional funding for an effluent treatment facility to process the wastewater discharged to the F- and H-Area seepage basins.

Ground-water withdrawal--The L-Reactor restart would result in the withdrawal of additional ground water for operating facilities. The additional withdrawal is projected to be about 210 cubic feet (5.9 cubic meters) per minute, which would be a 7-percent increase over the withdrawal rate at SRP in 1982. This withdrawal is expected to have little impact on offsite water levels; however, increased withdrawals could cause the head differential between the Tuscaloosa and Congaree in the H-Area to become downward, and the head differential in the M-Area to become increasingly downward. These changes to the head differential are not expected to result in any contamination of aquifers such as the Tuscaloosa because of the presence of the green clay in the central portion of the Plant and the establishment of the remedial action program for the M-Area.

Ground-water protection--The Department of Energy is currently committed to several items related to ground-water monitoring and mitigation at the Savannah River Plant, including:

- Continuing and expanding the program of ground-water monitoring and studies
- Involving the State of South Carolina in onsite ground-water monitoring activities
- Taking mitigative actions to reduce pollutants released to the ground water and establishing a mutually agreed-on compliance schedule for mitigation efforts

A number of comments concern the contamination of ground water at SRP, especially from such practices as the use of seepage basins. The Department has drafted an "SRP Groundwater Protection Implementation Plan," which examines strategies and schedules for initiating mitigative actions for the cleanup of past operations that threaten to or contaminate SRP ground water, including the closing and decommissioning of seepage basins. The plan has been reviewed by State agencies and the Environmental Protection Agency. The mitigation actions ultimately adopted will be the subject of a separate NEPA review.

Radioactive releases--The resumption of L-reactor operation would also result in incremental radioactive releases from the Central Shops area, the fuel and target fabrication area, and the separations area. These incremental releases would result in a composite maximum individual dose of 0.087 millirem in the first year and 0.072 millirem during the tenth year, or less than 0.1 percent of the average dose of 93 millirem received by an individual living near the SRP site from natural sources of radiation. The maximum population dose from incremental releases is estimated to be 8.1 person-rem in the tenth year of L-Reactor operation, or about 0.007 percent of the dose to the population living

within 50 miles (80 kilometers) of the Plant and the Beaufort-Jasper and Port Wentworth drinking-water populations from natural radiation sources.

This Final EIS also discusses the potential impacts associated with incremental increases in the handling and storage of high- and low-level radioactive waste.

Comments--Comments on the Draft EIS regarding incremental impacts from the restart of L-Reactor were concerned primarily with the potential ground-water impacts from continued seepage basin use. Comments ranged from general statements that the restart of L-Reactor would increase ground-water contamination by 33 percent to several specific comments on ground-water data, analysis methodologies, and assumptions about geology and hydrology.

Comments from state and Federal agencies indicated concern about jurisdictional responsibilities under the Resource Conservation and Recovery Act, and the relationship of proposed cleanup programs to incremental increases in releases due to the restart of L-Reactor. Almost all the comments received reflected a general concern that the restart of L-Reactor should not increase any existing levels of ground-water contamination.

The Department has made several modifications in this Final EIS in response to the comments received. These include the addition of well data and recent monitoring results, additional analyses on the amount of incremental releases to seepage basins, the effects of additional ground-water withdrawal, and additional information on the present status of remedial action and ground-water protection programs.

Cumulative impacts. The cumulative impacts considered in the EIS include the effects of L-Reactor and support facility operations together with those of other SRP and major nearby facilities. Major SRP facilities include the planned Fuels Material Facility and Defense Waste Processing Facility. Other facilities near the SRP include the Vogtle Nuclear Power Plant, the Urquhart Steam Station, the Chem-Nuclear, Inc., plant, and the Barnwell Nuclear Fuel Plant.

The primary areas of cumulative environmental impact discussed in this Final EIS include socioeconomic impacts and the impacts from ground-water usage, cooling-water withdrawal and discharge, and radioactive releases.

Socioeconomics--Construction of the Fuel Materials Facilities, the Defense Waste Processing Facility, and other Savannah River Plant projects are expected to increase the labor force by 2800 persons by the end of September 1984. In addition, the restart of the L-Reactor would temporarily add about 550 personnel to construct the 1000-acre lake. The cumulative work force that might relocate to the area would total about 800 personnel. This work force, some of which has already relocated, is not expected to cause major impacts in the six-county area surrounding SRP.

Ground-water use--Cumulative ground-water consumption at the Savannah River Plant is expected to increase slightly--30 cubic feet (0.75 cubic meter) per minute--because of the operation of the Fuel Materials Facility and the Defense Waste Processing Facility. The added withdrawals will reduce the upward head differential between the Tuscaloosa and Congaree Formations in the central portion of the Savannah River Plant, and the head differential will become

increasingly downward beneath the H- and M-Areas. These changes in the head differential will not affect the quality of ground water in the Tuscaloosa Aquifer because of clay barriers at the F- and H-Areas and the remedial action program at the M-Area. The cumulative SRP ground-water withdrawal impacts on offsite water levels are expected to be small.

Cooling-water discharge and withdrawal--In addition to the proposed restart of L-Reactor, other sources of thermal discharge include the currently operating reactors at the Savannah River Plant, the Vogtle Nuclear Power Plant, which will use natural-draft cooling towers, and the Urquhart Steam Station. Cumulative thermal discharges to Steel Creek from the proposed 1000-acre lake and K-Reactor are expected to be less than 7°F (4°C) above the water temperature of the Savannah River during spring and summer at the mouth of Steel Creek. No thermal blockage is expected in the Savannah River as a result of SRP and Vogtle Power Plant thermal discharges. The total cumulative withdrawal from the Savannah River for cooling water is expected to result in the entrainment of about 19 percent of the fish eggs and larvae passing the Plant intakes and the impingement of about 53 fish per day. During periods of high water, cumulative impingement could reach 104 fish per day.

Radioactive releases--The cumulative SRP radiological effects analyzed in this Final EIS include the sum of the doses from L-Reactor, its increment of the support facilities, current operation with three reactors, and the planned Fuel Materials Facility and Defense Waste Processing Facility--which are expected to become operational in the late 1980s. The radiological dose due to the Vogtle Nuclear Power Plant was included, but the dose from the Barnwell Nuclear Fuel Plant was not included because this plant is not expected to operate. The cumulative composite maximum individual dose of 3.6 millirem is 27 times less than the average dose of 93 millirem received by an individual living near the site from natural radiation. The cumulative composite population dose of 163 person-rem is about 0.15 percent of the exposure of about 109,000 person-rem from natural radiation sources to the population living within 50 miles (80 kilometers) of the Savannah River Plant and the Beaufort-Jasper and Port Wentworth drinking-water populations.

Comments--Comments on the Draft EIS cumulative impact discussion included requests that the Department (1) evaluate the cumulative effects of "nuclear development" in the Savannah River Basin, and (2) consider further the cumulative impacts to water resources. In the EIS, the Department has evaluated the potential radiological effects resulting from cumulative Savannah River Plant releases--existing and planned--as well as those from other nuclear facilities in the vicinity of the Plant. The Department has also included additional information on cumulative ground-water withdrawals and on the current status of studies concerning maintenance of Savannah River flow rates below the Clarks Hill dam.

Postulated accidents. The EIS considers a number of postulated reactor accidents that could result in the release of radioactive materials into the environment. These include credible accidents and severe hypothetical accidents that are not considered credible or probable.

The credible accidents include a major moderator spill, the melting of a single assembly during a discharge mishap, the melting of 3 percent of the core caused by a reloading error, and the melting of 1 percent of the core due to a

loss-of-coolant accident. The 3-percent core melt has the highest potential consequences of the credible accidents. The estimated maximum individual whole-body radiation dose received by a person residing at the SRP boundary from this postulated accident is calculated to be 0.39 rem, with a maximum thyroid dose of 1.5 rem. Both of these doses are well below the Nuclear Regulatory Commission's site evaluation dose guidelines of 25 rem and 300 rem for the whole body and thyroid, respectively.

The EIS also discusses an accident beyond those considered credible--a postulated 10-percent core melt--to provide a perspective on the consequences of an accident having an extremely low probability but a potentially great severity. The probability for this accident is estimated to be between 1 in 1 million and 1 in 100 million per reactor-year. The consequences calculated indicate no cases of early fatalities, no cases where the maximum individual whole-body dose would exceed 1.7 rem, and no cases where the thyroid dose would exceed 11.7 rem. Again, the estimated doses from this beyond-credible accident would be well below the Nuclear Regulatory Commission's site evaluation dose guidelines established for commercial power reactors.

To provide a further perspective on the overall accident risk (defined as consequence times probability) of L-Reactor operation, this Final EIS contains a preliminary total risk curve that depicts the annual probability of an individual living at the SRP boundary receiving more than a certain dose from postulated severe accidents. The results shown in this curve were based on the Safety Analysis Report, and include a range of accidents up to low-probability, high-consequence accidents, including hypothetical 100-percent core-melt scenarios at the upper bound of the consequence spectrum.

In addition to postulated reactor accidents, the Final EIS also discusses non-nuclear hazards and such natural phenomena as earthquakes and tornadoes, the evolution of reactor safety at the Savannah River Plant and current programs to improve safety, and emergency planning.

The aspect of the accident analyses that received the most comments concerned the need for a containment building for L-Reactor, the comparability of L-Reactor to the Nuclear Regulatory Commission requirements for commercial nuclear reactor site criteria (10 CFR 100), and the presentation of a "worst-case" analysis.

For the most part, the comments on the need for a containment building were general, often only citing that commercial reactors are required to have them and that L-Reactor is not. The need for pressure containment buildings for commercial light-water reactors is based on their design and site characteristics and on the need for specific engineered safety features. Reactors of different designs and engineered safety features other than a containment building can also limit radioactive releases and be within acceptable standards for a range of postulated accidents. The Fort St. Vrain reactor, which has been licensed by the Nuclear Regulatory Commission, is an example of a commercial reactor without a containment building; its design and engineered safety features are different from those in commercial light-water reactors.

The L-Reactor has several important design features and alternative engineered safety features that must be considered in any comparison with commercial light-water reactors. For example, L-Reactor operates at much lower pressures

and temperatures than commercial light-water reactors; thus, the stored energy in a postulated loss-of-coolant accident--which is of primary concern in the need for a containment building--is much less. Other important differences exist for operational limits, emergency shutdown systems, the confinement system, the type of fuel, and the distance to the nearest site boundary. These differences, considered in the analysis of credible accident events and resultant consequences, indicate that L-Reactor with its confinement system would meet the Nuclear Regulatory Commission's radiation protection site evaluation factors for a commercial reactor.

Other comments received on the need for a containment building concerned the comparability of the accident analyses for L-Reactor to the Nuclear Regulatory Commission's requirements for reactor site criteria (10 CFR 100). Specifically, commentors contended that a postulated 100-percent core-melt accident was the proper basis for assessing the safety comparability of L-Reactor to commercial reactors. They also contended that if the 100-percent core-melt accident were used as the basis, L-Reactor would not meet the Nuclear Regulatory Commission's site evaluation factors.

The requirements of 10 CFR 100 do not assume or require the assumption of a full-core (100-percent) meltdown as a basis for assessing consequences, as contended. These requirements clearly indicate analyses of ". . . accidental events, that would result in potential hazards not exceeded by those from any accident considered credible." Again, the design differences between reactors and different engineered safety features must be considered in determining "accidents considered credible." In recognition of the high-heat capacity of the Fort St. Vrain graphite-moderated reactor, for example, no fuel melting was assumed in specifying the source term for determining compliance with 10 CFR 100. Similarly, the most severe credible L-Reactor accident is a postulated criticality accident that results in a 3-percent core melt. The postulated criticality accident, rather than the loss-of-coolant accident used for commercial light-water reactors, reemphasizes the differences in the design and engineered safety systems between L-Reactor and commercial light-water reactors.

Finally, commentors contended that the Draft EIS failed to present a worst-case analysis. Specifically, they asserted that the EIS should have presented the consequences of a 100-percent core-melt accident with a concurrent failure of the active confinement system, rather than those of a 10-percent postulated core-melt accident.

The Department of Energy recognizes uncertainties inherent in its predictions of the probabilities and consequences of extremely low-probability but high-consequence accidents. The worst-case analysis required by NEPA is intended to provide the decisionmaker with information that balances the need for the action against the risk and severity of possible adverse impacts if the action proceeded in the face of uncertainty. The "uncertainty" in this instance, however, is not one that questions the severity of the consequences if this class of accident were to occur, but rather the degree of improbability of its occurrence (i.e., whether once in 10 million years or once in a billion or more years). The detailed analyses of the very-low-probability, 10-percent, core-melt accident, together with available information on the consequences and probabilities of a spectrum of more severe but even less probable accidents included in the EIS are judged to provide the decisionmaker with sufficient information for this purpose.

Summary of Environmental Effects

Table S-1 summarizes and compares the environmental consequences of the Department's preferred alternative and the no-action alternative.

Monitoring and Studies

In addition to its extensive environmental studies on L-Reactor, the Department of Energy has begun several long-range studies to determine the Savannah River Plant's overall effect on the health and environment of people who live in nearby areas. These studies are intended to identify any further improvements that can be made to SRP operations.

The Department is committed to making whatever modifications might be necessary to ensure that SRP operations do not pose an undue risk to the local environment or to public health. Representatives of Federal and state agencies are active participants in these studies. The studies initiated by the Department of Energy relate to four basic areas, which are summarized below.

Cooling water. The Department initiated a 2-year study in July 1983 to further assess the effects of SRP thermal discharges on the Savannah River ecosystem, including all major streams that flow to the river and adjacent wetlands. The study is an expansion of ongoing studies concerning the three operating reactors, steam plant operations, and the proposed operation of L-Reactor.

Participating in the study are the States of South Carolina and Georgia, the U.S. Environmental Protection Agency (Region IV), the U.S. Fish and Wildlife Service (Region IV), and the U.S. Army Corps of Engineers (South Atlantic Division).

This study is examining the environmental effects associated with cooling-water withdrawal and thermal discharges. It is assessing wetland impacts, impacts to fish populations, utilization of the SRP wetlands and streams by aquatic and semiaquatic species, including endangered species, water-quality parameters, and radionuclide and heavy-metal transport. The study is assessing spawning areas at intervals along the river and near the mouth of tributaries from Augusta downstream to the area of salt-water intrusion.

Thermal mitigation. The Department will consider alternatives to the direct discharge of cooling water for all major SRP thermal discharges from operating facilities. Among the alternative systems being evaluated are cooling towers, cooling ponds, and spray cooling systems.

Ground water. Continued efforts are being made to safeguard ground-water systems by removing contaminants from the water-table aquifer in the Fuel and Target Fabrication Area. In addition, the Department is committed to stopping all further use of the seepage basin at the fuel fabrication facility by April 1985. The "SRP Groundwater Protection Implementation Plan" will be the subject of a separate NEPA review.

Table S-1. Comparison of impacts for the preferred alternative and the no-action alternative

Impact	Preferred Alternative[a]	No Action[b]
Land use and socioeconomics	1000 acres would be required for the construction of the cooling lake and about 130 acres of land for relocating roads and right-of-ways; operating workforce of about 350 required as well as 550 temporary construction workers for lake construction.	No additional land would be required; standby workforce of about 100 will be required; approximately 330 operating jobs would be lost.
Archeological sites	Five sites eligible for inclusion in the National Register might be affected; a approved resource recovery plan has been developed for one historic site located within the proposed lake area; archeologic studies in the lake area are continuing and mitigative measures will be taken if significant sites are found.	Some erosional impacts are anticipated from cold flow testing to the eligible sites.
Cooling-water withdrawal	L-Reactor will withdraw about 400 cubic feet (11 cubic meters) per second, or about 4% of the average annual flow rate and 7% of the 7-day, 10-year low flow of the Savannah River; withdrawal will cause impingement of an additional 16 fish per day, and entrainment of about 3 to 6% of all fish eggs and larvae passing the SRP intakes when L-Reactor is operating under average conditions.	Testing and flushing of secondary cooling-water system approximately several days per month at flows up to 6.2 cubic meters per second; impingement and entrainment impacts during these test periods will be about one-half the impacts for the preferred alternative.
Cooling-water discharge	L-Reactor will discharge about 400 cubic feet (11 cubic meters) per second of cooling water to the 1000-acre lake; reactor power will be adjusted to assure a balanced biological community in the lake; projected water temperatures in the summer (5-day, worst-case) at the Steel Creek delta, mid-swamp, and the mouth of Steel Creek would be within about 2°F (1°C) of ambient; average values of water temperatures at the mouth of Steel Creek are projected to be 82°F, 72°F, and 55°F (28°C, 22°C, and 13°C) during summer, spring, and winter, respectively; the 5-day, worst-case value during summer is projected to be 86°F (30°C) or within about 2°F (1°C) of ambient.	No thermal discharges to Steel Creek; however, minor impacts during periods of testing would occur due to flooding and siltation.

Table S-1. Comparison of impacts for the preferred alternative and the no-action alternative (continued)

Impact	Preferred Alternative[a]	No Action[b]
Wetlands/ habitats	1000-acre lake would affect between 735 and 1015 acres of wetlands/habitats in the Steel Creek corridor, delta, and Savannah River swamp, and about 875 acres of upland; cooling lake would provide a balanced biological community in the lake; delta growth would resume at about 1-2 acres per year; DOE is working with the Department of Interior on use of the Habitat Evaluation Procedure to identify further mitigation.	Minor impacts during periods of testing.
Aquatic impacts	Minor impacts downstream of the embankment to the delta due to flooding and siltation; spawning of riverine and anadromous fishes in the Savannah River swamp below the Steel Creek delta would not be affected except in winter when the water temperatures would be 12°F to 16°F (7° to 9°C) above ambient; cold shock effects would be minimal due to gradual heat loss after shutdown; the lake embankment would prevent access by riverine and anadromous fish to about 100 acres of Steel Creek wetlands above L-Reactor, however, the only migratory fish in this reach of Steel Creek is the American eel which can access the lake; access to Meyers Branch would not be affected by the lake.	No thermal discharges to Steel Creek; however, minor impacts during periods of testing would occur due to flooding and siltation.
Endangered species	Increased flow from the cooling lake would affect foraging habitat for the wood stork, and the habitat for the American alligator; additional habitat for alligator would be created by the lake; consultation with FWS continuing for both species; no impacts to shortnose sturgeon.	Habitat for wood stork and American alligator could be affected intermittently during cold flow testing. No impacts to the shortnose sturgeon.
Water quality	Liquid effluents discharged would have chemical characteristics similar to those in the Savannah River.	No impacts. Periodic cold-water testing discharges would have chemical characteristics similar to those in the Savannah River.

Table S-1. Comparison of impacts for the preferred alternative and the no-action alternative (continued)

Impact	Preferred Alternative[a]	No Action[b]
Ground-water quality		
L-Area	Disassembly-basin purge water containing principally tritium will be discharged to the L-Reactor seepage basin; shallow ground water will become contaminated by discharges that will eventually discharge to the cooling lake in about 20 years; the use of the seepage basin will allow radioactive decay; deeper groundwater sources will be protected by clay barriers; DOE will continue to study the feasibility of moderator detritiation.	No discharges to the L-Area seepage basin.
M-Area	Incremental discharges increased by 33 percent; by the end of 1984, incremental discharges will be reduced by 80 percent; contaminants will be intercepted by remedial action program; a new treatment facility will replace seepage basin use by April 1985.	Same as for preferred alternative except effluents from ongoing operations will continue without incremental increase due to L-Reactor.
F- and H-Areas	Incremental discharge to seepage basins would result in a 7 percent increase in concentration of contaminants in shallow groundwater; deeper formations would be protected by confining clay units; treatment facilities to replace seepage basins use when Congressional approval obtained.	Same as for preferred alternative except effluents from ongoing operations will continue without incremental increase due to L-Reactor.
Ground-water use	A total of 210 cubic feet (5.9 cubic meters) per minute will be withdrawn from the Tuscaloosa aquifer for L-Reactor and its support facilities; total ground-water withdrawal by SRP is projected to be 7% greater than in 1982.	Ground-water withdrawal of 33 cubic feet (0.94 cubic meter) per minute is required.
Air quality	Operational emission from K-Area would increase by 10 percent consisting primarily of NO_x, SO_x, and particulate matter; some fugitive dust emissions would occur during construction of lake; no detectable impact on local or regional air quality is expected.	No change from present operations; no detectable impact on air quality would be expected.

Table S-1. Comparison of impacts for the preferred alternative and the no-action alternative (continued)

Impact	Preferred Alternative[a]	No Action[b]
Solid waste	All unsalvageable domestic trash would be packaged and disposed of in SRP landfill; sanitary waste sludge would be disposed of at the SRP sludge pit; bottom ash sluiced to the K-Area ash basin would increase by 10%.	No change from present operations.
Radiological releases and effects		
Radiocesium	About 4.4. curies of radiocesium would be transported during the first year and about 20-25 percent less each year; radiocesium releases would not exceed any applicable standards or affect public health and safety.	Small amounts would be resuspended during periodic testing and flushing.
Radiation dose	Maximum individual dose of 3.6 millirem in the first year, or about 26 times less than the average received by an individual living near SRP from natural radiation; total-body dose to both the 50-mile (80-kilometer) and downstream river-water-consuming populations of 36 person-rem (tenth year), or less than 0.032 percent of the dose from natural background radiation.	No radioactive releases from L-Reactor or incremental releases from support facilities.
Health effects	Estimated health effects in the first year about 0.003 premature cancer death and 0.006 genetic disorder; releases during the tenth year would eventually cause about 0.006 premature cancer death and 0.01 genetic disorder.	No radioactive releases from L-Reactor or incremental releases from support facilities.
Accidents	Accidents are highly unlikely; safety systems at SRP have been improved to further reduce the chance of an accident; small additional risks.	L-Reactor would not operate nor would there be incremental use of support facilities.

[a]The preferred alternative is to restart L-Reactor as soon as practicable after construction of a 1000-acre lake. Impacts identified are those from the operation of L-Reactor and incremental increases at support facilities.

[b]No action is defined as maintaining L-Reactor in a ready-for-operation standby mode.

Health effects. The Department is continuing health effects studies of cancer mortality rates in the areas around SRP. These studies concentrate on those types of cancer for which a proven causal relationship with radiation exposure has been demonstrated. To date, no correlations have been established between population cancers and SRP operations.

Health studies of SRP employees are also being conducted by the Occupational Epidemiology Section of the Oak Ridge Associated Universities, and by the Epidemiology Group at Los Alamos National Laboratory, both of which are DOE laboratories. The Oak Ridge morbidity and mortality studies of radiation workers and the Los Alamos studies of plutonium workers are in the early stages.

At DOE's request, the Centers for Disease Control in Atlanta has organized a review committee of independent experts to review the results of population health effects studies and occupational epidemiological studies. Epidemiologists from the States of South Carolina and Georgia are participating in this study. The Department will adopt recommendations of this panel to modify its existing studies and to conduct additional studies.

Comments on monitoring and studies in the Draft EIS consisted for the most part of those that requested "independent" oversight or review of Savannah River Plant activities, and those that were concerned with particular aspects of the annual SRP monitoring program. The Department of Energy has attempted to respond to these concerns in this Final EIS by describing the interactions that are currently taking place with state and Federal agencies, the monitoring programs being conducted by the States of South Carolina and Georgia, and its ongoing commitment to adhere to applicable regulations and standards that will ensure continued protection of the area population's health and safety.

Federal and State Environmental Requirements

Table S-2 lists the permits and other environmental approvals required for the Department's preferred alternative before L-Reactor operation can resume. It indicates the status of each requirement. Based on the comments received on the Draft EIS and the identification of a preferred cooling-water mitigation alternative, the discussion of Federal and state environmental requirements has been expanded in this Final EIS.

Table S-2. Required regulatory permits and notifications

Activity/facility	Requirement(s)	Agency	Status
Water			
Process and sanitary-sewer outfalls	NPDES permit Construction permit	South Carolina Department of Health and Environmental Control, Industrial and Agricultural Wastewater Division	Discharges permitted Construction permitted
Domestic water supply system	Permit to construct ground-water wells, treatment and distribution systems	South Carolina Department of Health and Environmental Control, Water Supply Division	Domestic water-supply system construction permitted
Cooling-water discharge	316(a) (thermal impact) study	South Carolina Department of Health and Environmental Control, Industrial and Agricultural Wastewater Division	See Appendix L
Cooling-water discharge, preferred alternative (1000-acre lake)	NPDES permit	South Carolina Department of Health and Environmental Control, Industrial and Agricultural Wastewater Division	Pending completion of FEIS
	Dredge and fill permit (Section 404)	U.S. Army Corps of Engineers	Pending completion of FEIS
	Certification (Section 401)	South Carolina Department of Health and Environmental Control, Industrial and Agricultural Wastewater Division	Requested by COE as part of the dredge and fill permit process

Table S-2. Required regulatory permits and notifications (continued)

Activity/facility	Requirement(s)	Agency	Status
Oil storage	Spill prevention, control and countermeasure plan	EPA/South Carolina Department of Health and Environmental Control	To be included in overall plan for SRP
Air			
L-Area emergency diesel generators	Operation permits	South Carolina Department of Health and Environmental Control, Bureau of Air Quality Control	Permitted
F-, H, and M-Area process facilities	Operation permit amendments	South Carolina Department of Health and Environmental Control, Bureau of Air Quality Control	Application under review
K-Area powerhouse	Operation permit	South Carolina Department of Health and Environmental Control, Bureau of Air Quality Control	New permit not required
Endangered species	Consultation/ biological assessment	U.S. Fish and Wildlife Service and National Marine Fisheries Service	Consultations with FWS in process; consultations with NMFS completed
Fish and Wildlife Coordination Act	Consultation/ consideration of fish and wildlife resources	U.S. Fish and Wildlife Service	Consultations with FWS in progress
Migratory Bird Treaty Act	Consultation with FWS and development of mitigation plan	U.S. Fish and Wildlife Service	Consultation with FWS in progress

Table S-2. Required regulatory permits and notifications (continued)

Activity/facility	Requirement(s)	Agency	Status
Anadromous Fish Conservation Act	Consultation with FWS and development of mitigation plan	U.S. Fish and Wildlife Service	Consultation with FWS in progress
Historic preservation	Archeological survey and assessment	South Carolina Historic Preservation Officer	1000-acre lake will require new survey compliance, etc.
Floodplain/wetlands	Assessment and determination	U.S. Department of Energy	To be updated based on FEIS
Hazardous wastes	Resource Conservation and Recovery Act Requirements	U.S. Department of Energy/ South Carolina Department of Health and Environmental Control/U.S. Environmental Protection Agency	RCRA Program Management Plan in place