

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
STATEMENT OF F. JOHN VERNBERG		
November 14, 1983		
<p>Mr. M. J. Sires, III Assistant Manager for Health, Safety and Environment U.S. Department of Energy Savannah River Operations Office P.O. Box A Aiken, SC 29801</p>		
<p>Dear Mr. Sires:</p>		
<p>The following comments relate to the Draft Environmental Impact Statement, L-Reactor Operation, Savannah River Plant, Aiken, SC. This letter reflects my personal opinion and does not imply any official response by my employer.</p>		
<p>By way of introduction, I submit a brief statement of my professional background. In 1951 I received a Ph.D. from Purdue University - my training was in ecology. Since then I was employed by Duke University (Instructor to Professor from 1951-1969) and the University of South Carolina (Baruch Professor of Marine Ecology and Director of the Belle W. Baruch Institute for Marine Biology and Coastal Research from 1969 to the present). One of my professional interests is in the area of wetlands ecology. I have published over 120 papers and books on pollution, physiology, and ecology. Further, I have served as President of the Estuarine Research Federation, President of the American Society of Zoologists, and Chairman of the Physiological Ecology Section of the Ecological Society of America.</p>		
EJ-1	<p>Resumption of the L-Reactor operation will have obvious and immediate negative impact on wetlands and the aquatic biota, especially in Steel Creek. According to the Draft EIS at least 1000 acres could be impacted. Until relatively recent times, these habitats have been considered as useless and expendible based on the disappearance of hundreds of thousands of acres of wetlands because of various man-made developments. However, a tremendous literature, not cited in the Draft EIS, has</p>	<p>The operation of L-Reactor will eliminate between 750 and 1000 acres of wetlands for the direct discharge of cooling-water. The 1000-acre figure is a conservative estimate, and represents a maximum value. Cooling-water mitigation alternatives to direct discharge are discussed in Section 4.4.2 and Appendix I. These sections include an analysis of wetland impacts if the mitigation alternatives were implemented prior to or after the L-Reactor restart. Also see the response to comment AA-1 regarding cooling-water alternatives.</p>

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EJ-2	<p>demonstrated conclusively their economic, environmental, and societal values. It does not seem justified to again subject this region of South Carolina to environmental destruction as was done earlier when the L-Reactor was operational and before federal legislation began to protect the environment.</p> <p>The draft EIS appears to adequately describe the extensive damage to wetlands, aquatic life, morphology of Steel Creek, and wildlife due to nonradiological sources. Also the increased thermal discharge to the Savannah River has been projected. Have these projections taken into account potential future changes in Savannah River flow characteristics as a result of recent upstream modifications? If river flow drops significantly below previous values, how high would the river temperature go?</p>	<p>The thermal effects in the Savannah River resulting from the direct discharge of L-Reactor cooling water have been evaluated under a wide range of river flows, including flows less than the 7-day 10-year low flow of 159 cubic meters per second.</p>
EJ-3	<p>In contrast to the description of the adverse effects of certain nonradiological factors, the potential negative impacts from "normal" and accidental introduction of radionuclides and other chemicals are not as well documented. I did not see any assessment of the effects of previous radionuclide spills on Steel Creek and the Savannah River or recent disclosures of aquifer contamination. How adequately and extensively are environmental factors being monitored? On p 4-19 it is indicated that "most chemical contaminants are expected to be transported through the swamp into the Savannah River." On what is this expectation based? Does the swamp not act as a filter? What is the fate of these contaminants as they become part of the sediments? Have previous studies answered any of these questions?</p>	<p>The assessment of previous radionuclide spills on Steel Creek is extensively discussed in Appendix D and summarized in Sections 3.7.2 and 4.1.2.4. Environmental monitoring at SRP and L-Reactor monitoring programs are discussed in Chapter 6.</p> <p>The flow rate in Steel Creek, about 11 times the natural flow rate, would carry the cooling-water effluent from L-Reactor directly to the Savannah River, except during periods of flood which occur about 22 percent of the time. As discussed in Section 4.1.1.5 of the EIS, the water quality of the L-Reactor effluents discharged through the L-Reactor outfall to Steel Creek would be very similar to that of the Intake Savannah River water. In addition, these discharges would be made under an NPDES permit issued by SCDHEC. The comprehensive cooling-water study (Section 6.1.3) will further assess radionuclide and heavy-metal remobilization, deposition, and effects.</p>
EJ-4	<p>The assessment of radiation doses resulting from exposure to persistent radiolotopes or to isotopes that tend to bioaccumulate appears to be inadequate. For example, calculations of radiation doses resulting from the injection of meat and vegetables are based upon estimates of the contamination of food-stuffs by radioactive material deposited from the atmosphere on</p>	<p>See the response to comment BA-2 regarding the use of bioaccumulation factors. Root uptake by vegetation is not a significant pathway since water from the Savannah River is not used in significant quantities for irrigation; hence, deposition of airborne radioactive material is the most significant pathway.</p>

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EJ-5	<p>vegetation (B-14). Apparently, this assumption would greatly underestimate exposure because no account was made of other routes of incorporation of isotopes into vegetation, such as absorption through roots, and no account was made of bioaccumulation. With regard to exposure to those isotopes with long half-lives that persist in the environment, estimates were made of 100-year dose commitments for exposure to H-3, C-14, Kr-85, and I-129; however, a population of 250 million was assumed (B-31) for the dose commitment calculations (Table B-18). The effect that this assumption has on the dose calculation needs to be explained.</p>	<p>The 100-year environmental dose commitments for exposure to H-3, C-14, K-85, and I-129 beyond 80 km was based on a U.S. population of 250 million. Should a different population be used, the doses would increase or decrease in a proportional manner.</p>
EJ-6	<p>On page 8-2, lines 8 and 9, it is stated that after decommissioning and decontamination - this area can revert back to its natural state with minimal long-term effects." What is the justification for this view? What is minimal long-term effects? Section 4.6, Decontamination and Decommissioning, sheds little light on this point. Only one paper (a Master's Thesis by Repaske, 1981) had preliminary information or signs that the Savannah River swamp was beginning to recover. Will the proposed new indignity to this ecosystem be more drastic than that of the previous operating period of the L-Reactor? What other changes, such as in water table levels, use of Savannah River, or regional industrial development, have altered the regional ecosystem since 1951. The L-Reactor and its attendant activities are part of a larger ecosystem, one which is changing. I do not find any basis in this Draft EIS to support the thesis that this area will become productive over a long-term (not defined) period.</p>	<p>Justification for this view is based on the documented changes over time to the Steel Creek ecosystem following the previous operation of the L-Reactor. Minimal long-term effects means that the Steel Creek ecosystem, after a period of approximately 15 to 20 years, will achieve the level of community diversity and productivity that is present today.</p> <p>Changes to water levels in important aquifers is discussed in Sections 3.4.2, 4.1.1.3, 5.1.1.4, and 5.2.3 of this EIS.</p>
	<p>Sincerely yours, F. John Vernberg</p>	

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
STATEMENT OF RICHARD E. WATKINS		
November 14, 1983		
<p>Mr. Melvin J. Sires III U.S. Dept. of Energy Savannah River Operations Office Post Office Box A Aiken, South Carolina 29801</p>		
Dear Sir:		
EK-1	<p>It is disturbing that the current plans for restarting the L-Reactor will result in the discharge of hot water into Steel Creek. This water, much hotter than permitted by state regulations, will needlessly destroy 1000 acres of wetlands and will flush cesium into the Savannah River. Groundwater contamination is another significant concern.</p>	<p>See the response to comment AA-1 regarding cooling-water alternatives.</p>
EK-2	<p>Some of the environmental impacts are clearly avoidable, and steps must be taken before startup of L-Reactor to avoid these impacts. Savannah River Plant must be required to comply with the federal and state environmental standards which commercial nuclear reactor sites must meet.</p>	<p>See the response to comment AA-2 regarding the relationship of radiocesium and radiocobalt concentrations to EPA drinking-water standards, and the response to comment AJ-1 regarding ground water.</p>
EK-3	<p>Some of the environmental impacts are clearly avoidable, and steps must be taken before startup of L-Reactor to avoid these impacts. Savannah River Plant must be required to comply with the federal and state environmental standards which commercial nuclear reactor sites must meet.</p>	<p>See the responses to comments AA-3 and AF-2 regarding DOE's commitment to comply with applicable Federal and state regulations and to take all reasonable steps to mitigate impacts, and the response to comment BF-7 regarding the differences between SRP reactors and commercial light-water reactors.</p>
Yours truly,		
<p>Richard E. Watkins 2-B Kirkwood Apts. Camden, SC 29020</p>		

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
STATEMENT OF ALFRED H. VANG		
State of South Carolina Water Resources Commission Alfred H. Vang Executive Director November 14, 1983		
Mr. M. J. Sires, III Assistant Manager for Health, Safety and Environment U.S. Department of Energy Savannah River Operations Office P. O. Box A Aiken, South Carolina 29801		
ATTENTION: EIS for L-Reactor		
Dear Mr. Sires:		
The Water Resources Commission staff has reviewed the "Draft Environmental Impact Statement, L-Reactor Operation, Savannah River Plant" and submits the following comments for consideration in developing the Final EIS and reaching an ultimate decision on the project.		
EL-1	1. As part of the scoping process for the EIS, we requested a thorough evaluation of the effect of project operation on surface water use throughout the Savannah River Basin. While the Draft EIS does contain some information on water use, we believe more evaluation is desirable. The evaluation should consider total SRP streamflow needs for water supply and waste assimilation, including thermal effluent, and the impact of these needs on current and projected water use throughout the Basin. Consideration should be given to a substantial interbasin transfer being planned by the City of Greenville, South Carolina and to water use agreements being negotiated by the States of South Carolina and Georgia with the Corps of Engineers (for withdrawals from Clarks Hill, Hartwell and Russell Lakes). All water uses both upstream and downstream should be included in this evaluation.	Withdrawal of Savannah River water for restart of L-Reactor and ongoing SRP operations are discussed in Section 4.1 and 5.2 of this EIS. Wastewater discharges from SRP will be in compliance with the NPDES permits as issued by the South Carolina Department of Health and Environmental Control. Alternative thermal mitigation measures for L-Reactor are presented in Section 4.4.2 of this EIS. DOE is presently conducting a thermal mitigation study for the selection of thermal mitigation measures for SRP operating reactors. The Corps of Engineers maintains that in accordance with its agreement with Duke Power Company, the interbasin transfers from Lake Keowee to the City of Greenville cannot have an effect on the ability of the Corps of Engineers to generate electrical power at Lake Hartwell and Clarks Hill. The Corps of Engineers is presently assessing the request by the States of

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EL-2	2. The consumptive water use by L-Reactor and other SRP operations should be indicated, rather than simply stating that most water withdrawn will be returned.	South Carolina and Georgia regarding the withdrawal of water from Lake Hartwell and Clarks Hill. This assessment will include the ability of the Corps of Engineers to maintain its navigation project below the New Savannah Bluff Lock and Dam and to meet its electrical power generation requirements. This assessment will also consider the effects of the interbasin transfer. Until such time that the Corps of Engineers completes its assessment, flows below the New Savannah Bluff Lock and Dam will be maintained at the current levels by the Corps of Engineers.
EL-3	3. It is the position of this agency that the L-Reactor should be in compliance with State water quality standards for temperature at the time of restart. This position has been provided to the South Carolina Department of Health and Environmental Control as part of the NPDES permit review process. We believe that any private industry proposing a similar thermal discharge would be required to comply with State standards and DOE should be subject to the same requirement.	Based on Neill and Babcock (1971)--referenced in Chapter 4--it is estimated that the surface-water consumptive use for L-Reactor will be 0.85 cubic meter per second. L-Reactor operation will be in compliance with the NPDES permit issued by SCDHEC.
EL-4	<p>The Draft EIS clearly indicates that DOE's preferred cooling water alternative of once through cooling with direct discharge to Steel Creek will 1) violate State thermal standards, 2) produce severe adverse impacts on the Steel Creek ecosystem, 3) alter the environment by greatly increasing streamflow, 4) introduce large amounts of suspended solids to Steel Creek, and 5) resuspend radioactive Cesium and Cobalt deposited in Steel Creek sediments. All of these adverse impacts could be alleviated by use of the recirculating mechanical draft cooling tower alternative discussed in the Draft EIS.</p> <p>In the interest of protection of our water resources and water users, we recommend the recirculating mechanical draft cooling tower method as the preferred alternative incorporated in the Final EIS.</p>	<p>Section 4.4.2 of the EIS, which discusses cooling-water mitigation alternatives, has been revised based on public comments received on the draft EIS. Specifically, Section 4.4.2 has been revised to provide a detailed discussion of additional combinations of various cooling-water systems. In Section 4.4.2, each of the cooling-water mitigation systems is evaluated for attaining the thermal discharge limits of the State of South Carolina. Section 4.4.2 and a revised Appendix I, Floodplain/Wetland Assessment, discuss the wetland impacts of each of the systems considered.</p> <p>The Department of Energy has been reviewing and evaluating alternative cooling-water systems for L-Reactor. Based on these reviews and evaluations, and consultations with representatives of the State of South Carolina regarding a mutually agreed upon compliance approach, a preferred cooling-water mitigation alternative is identified in this EIS. This preferred cooling-water alternative is to construct a 1000-acre lake before L-Reactor resumes operation, to redesign the reactor outfall, and to operate L-Reactor in a way that assures a balanced</p>

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EL-5	<p>4. In order to insure uniform application of and compliance with requirements of the Resource Conservation and Recovery Act (RCRA), we support the position of administration of RCRA by the South Carolina Department of Health and Environmental Control for L-Reactor and other SRP operations.</p>	<p>biological community in the lake. The Record of Decision prepared by the Department on this EIS will state the cooling-water mitigation measures that will be taken which will allow L-Reactor operation to be in compliance with the conditions of an NPDES permit to be issued by the State of South Carolina.</p> <p>As stated in Chapter 7 of this EIS, the hazardous-waste management program of DOE meets the technical requirements of the EPA hazardous-waste regulations, and is compatible with the State of South Carolina DHEC requirements. SRP will cooperate with SCDHEC on all matters concerning solid and hazardous waste management.</p>
EL-6	<p>5. All of the mitigation alternatives discussed in Section 4.4 relating to safety systems, cooling water, liquid waste disposal and disposal of 186-Basin sludge are not preferred by DOE due to cost and/or impact on production schedule. We feel there are considerations more important than production schedule and cost, and that mitigation alternatives which protect the environment and public safety should be selected and committed to by DOE in the Final EIS.</p>	<p>Recently, DOE and EPA have signed a memorandum of understanding regarding the applicability of RCRA to DOE's military activities. It is DOE's position that state RCRA permitting authority does not apply to activities or substances subject to the requirements of the Atomic Energy Act of 1954, as amended. The underlying issues of applicability were recently reviewed in the District Court of Tennessee. A decision adverse to DOE's position was rendered on April 3, 1984. The Department of Energy does not plan to appeal this decision to the Circuit Court of Appeals. The Department will implement the requirements of RCRA at the Savannah River Plant in accordance with the MOU, and will work closely with SCDHEC on all activities related to hazardous-waste management.</p> <p>Chapter 4 provides the decisionmaker the necessary information on economic, engineering, and environmental factors to formulate a thorough, reasoned, and knowledgeable decision on the potential implementation of mitigation alternatives in relation to the need for defense nuclear materials. The Record of Decision on the EIS will address alternatives considered in reaching the decision, environmentally preferable alternatives, and preferences for alternatives based on the technical, economic, and statutory mission of the agency.</p>

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EL-7	<p>6. It is stated in the Draft EIS that no adverse ecological impacts are expected on the Savannah River except near the mouth of Steel Creek. In support of this expectation, studies by the ANSP (1953, 1957, 1961, 1967, 1970, 1977) are cited on page 4-18. Are these studies considered by DOE to be comprehensive and detailed enough to document that past L-Reactor and other SRP operations have not impacted Savannah River biota?</p>	<p>The ANSP references on page 4-18 of the draft EIS are to the statement "... to monitor the effects of SRP operations on the general health of the Savannah River." The statement that "... no major changes in the presence of species have occurred from past Savannah River operations at their stations or are expected to occur from the addition of heat and cooling water from L-Reactor..." is referenced by Matthews, 1982. The cited references and the statements that they reference do not refer to ecological impacts near the mouth of Steel Creek.</p> <p>The scope of the studies conducted by the ANSP are intended to evaluate the general health of the Savannah River; they are not meant to be a detailed study of the impacts of the SRP on a specific system such as Steel Creek.</p>
EL-8	<p>7. On page 4-12, reference is made to "...thermal effluent criteria of the South Carolina Water Classification Standards System (SCDHEC, 1981)..." It should be noted that these thermal criteria are actually thermal standards.</p>	<p>The word "criteria" has been changed to standards in the applicable sections of this final EIS.</p>
EL-9	<p>8. Section 3.4.1.1 indicates that the Corps of Engineers attempts to maintain a minimum flow of 178.4 cubic meters per second (6297 cfs) at the New Savannah Bluff Lock and Dam. Our information indicates that this figure should be 164.3 cms (5800 cfs).</p>	<p><u>In its Final Environmental Impact Statement, Operation and Maintenance of Clarks Hill Lake, Savannah River, Georgia and South Carolina</u>, the Army Corps of Engineers (1981) states "3.63 Navigation. A minimum flow of 5,800 c.f.s. is required below New Savannah Bluff Lock and Dam for navigation. The Clarks Hill discharges are regulated to meet this minimum with re-regulation provided at Stevens Creek Dam. A discharge of 6,300 c.f.s. is normally provided 80 percent of the time."</p>

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EL-10	9. Page S-5, fourth paragraph mentions pollutants in the Congaree Formation, but no mention is made of chlorinated hydrocarbons in the Tuscaloosa Formation.	In 1982, wells producing from the Tuscaloosa in A-Area were found to have low concentrations of chlorinated hydrocarbons; concentrations in water samples from these wells ranged from less than 3 to less than 27 micrograms per liter. Entry of chlorinated hydrocarbons into these wells is believed to have resulted from Tertiary groundwater migration through defects in the cement grout of at least one production well to the Tuscaloosa (Geraghty & Miller, 1983). Chlorinated hydrocarbons above the limit of detection (1 microgram per liter) have not been found in recent M- and A-Area wells drilled to monitor Tuscaloosa water quality. One of these new wells is located within 80 meters of the A-Area production well (53A) that previously exhibited the highest concentration of chlorinated hydrocarbons. The summary of this final EIS has been revised to include a discussion of the chlorinated hydrocarbon contamination in the Tuscaloosa Formation.
EL-11	10. Page 3-25, fourth paragraph states that the tan clay had disappeared in the M-Area. Although this is correct, there has been no mention of this unit previously and no description.	The tan clay is the lowest unit of the Barnwell Formation (Section F.2.7.1). Section 3.4.2.1 has been revised to provide a brief discussion of the tan clay.
EL-12	11. Page 3-36, second paragraph states that "In areas where downward head differential does not exist, such as M-Area..." Although this is correct, there has been no mention of this unit previously and no description.	The text of the EIS has been revised to read "In areas where downward head differential exists, such as M-Area, the drawdowns increase the natural downward head differential in the area immediately around the pumping wells."
EL-13	12. Page 4-7, third paragraph should read "...and 58.3 cubic meters per minute" instead of cubic meters per second.	The text of the EIS has been revised.

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EL-14	13. Same paragraph as in 12, above, should read "...the 30-kilometer square area..."	Within about a 32-kilometer radius of SRP (an area of over 3216 square kilometers) the current (1983) projected water use from the Tuscaloosa Aquifer is estimated to be 63 cubic meters per minute (see Section F.3.1). The study area for the ground-water flux calculation lies within the 3216 square kilometer area (see Section F.4.2).
EL-15	14. Page 5-12, second paragraph states that "Local water levels at pumping wells are not expected to continue to decline appreciably." But they have been declining since about 1978 and with increased pumpage both in and peripheral to the plant site, they could continue to decline.	From 1972 to 1981 there has been a general decline in winter precipitation. This accounts in part for the declining water levels as shown by well AK-183 in the outcrop area (Section 3.4.2.5). Calculations indicate that the decline in SRP monitoring wells is associated primarily with increased pumping at SRP. The text has been revised appropriately. Also see the response to comment BT-7 regarding ground water.
EL-16	15. Figure F-9 on page F-20 shows the 172 foot water elevation in well P3C is closer to the 180 foot contour than is the 177 foot water elevation of well P54.	The 180-foot contour was drawn to "honor" all data points. Neighboring data points show elevations of 173 and 177 feet. Appropriate weight has been given to each of the three elevations in this cluster when drawing this contour.
EL-17	16. Figure F-22, page F-50. The water table surface should be labeled.	The water table in the referenced figure has been labeled.
EL-18	17. Figure F-28, page F-69. The Tuscaloosa piezometric surface should have an arrow to clarify location. The arrow for the Congaree piezometric surface is mislocated.	The figure has been modified to designate the locations of the Tuscaloosa and Congaree piezometric surfaces.
EL-19	18. The piezometric maps of various aquifers in various areas should be contoured on an interval that would show the effects of the production wells on the water levels (cones of depression).	The piezometric maps were drawn from data obtained in monitoring wells. The cones of depression at SRP are not extensive, particularly those in the Tuscaloosa Formation. The density of monitoring wells is insufficient to show the cones of depression. Information on cones of depression in the Tuscaloosa Formation is provided in Section F.4.3, Siple (1967) and Du Pont (1983; DPST-83-829).
EL-20	19. Some note should be made as to which wells are pumping, how long, and the withdrawal rates.	Individual well pumping rate information is not measured at SRP; instead, process and domestic ground-water use is measured on a system basis in each "Area" of SRP. Historical data (1968-1983) on ground-water withdrawal rates are provided on an "Area" basis in Section F.3.2. Other information is

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EL-21	20. The text refers to data in the metric system whereas, many of the figures are labeled using the English system. They should be consistent.	provided in Siple (1967). Pumping histories of 12 selected wells from several formations have been portrayed graphically. Pumping information on an "Area" basis will be reported to SCWRC on a quarterly basis starting with the fourth quarter of 1983. Metric units were used whenever practicable. When English units were employed, appropriate conversion factors were provided. Re-drafting art work to change, for example, contours from English to metric units could distort the interpretations of the original preparer.
EL-22	21. No mention is made of the clastic dikes located in and near the H-Area seepage basin. These dikes provide a mode for concentration of beta emitters and allow for more rapid transport of pollutants to Four Mile Creek.	Clastic dikes were mapped during the geotechnical investigations for the Defense Waste Processing Facility (DWPF). The map area included H-Area. This mapping effort does not show the presence of clastic dikes near the H-Area seepage basins. Clastic dikes at SRP are, typically, less permeable than the surrounding sediments. These dikes have an ironstone margin with a clay center. Ground-water travel times from H-Area seepage basins to seep line springs along Four Mile Creek have been measured by tracking tritium in the plume. Representative travel times are reported in Section F.5.3.
EL-23	22. In several instances the text refers to the head in the Congaree being lower than that of the Tuscaloosa because the Congaree has been incised by several streams allowing for an area of discharge. Although this is true, the major reason for the lower head is that in the south-western part of the plant site the recharge area for the Congaree is lower than the recharge area of the Tuscaloosa.	The pattern of upward head differential between the Tuscaloosa and the Congaree and the increase in this differential from the northeast towards the southwest (along an axis nearly coincident with Lower Three Runs Creek) suggests that stream/river incision plays the dominant role, not differences in elevations of recharge zones. The effects of incision by Upper Three Runs Creek and the Savannah River on the Congaree piezometric surface are discussed and displayed in cross sections in Section F.4.1.
EL-24	23. In all of the piezometric maps, note should be made as to whether the water levels were made during pumping or under static conditions.	Water levels used to construct piezometric maps were measured in monitoring wells (not in pumping wells) during normal plant operations, including the withdrawal of process and domestic water from ground-water sources. Section F.1 of the FEIS has been revised to indicate conditions during ground-water level measurements.

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EL-25	24. As we pointed out during the scoping process, approximately 6000 wells have been drilled at the SRP. Many of these (approximately 600) were pre-existing domestic wells, some penetrating the Tuscaloosa, that have been abandoned. The status of these wells is not known, but any open holes or rusted-out casings provide a direct route for water from contaminated shallow aquifers to the Tuscaloosa. Since this situation was not addressed in the Draft EIS, please include it in the Final EIS.	The text of Section 3.4.2.3 has been modified and a new Section F.7 has been added in this Final EIS to reflect this concern. No abandoned wells are known to exist at or adjacent to waste disposal sites that will be utilized by L-Reactor or SRP.
EL-26	25. The presence of mica and kaolinitic clays in the subsurface will make ion exchange a significant problem in controlling the movement of contaminants in ground water, especially in the McBean Formation. Please address this situation in the Final EIS.	The presence of micaceous and kaolinitic subsurface materials was considered during computation of dose commitments that could result from liquid releases via the ground-water path (seepage basin to onsite streams). Radionuclide concentrations at outcrops along streams were derived from input obtained from a ground-water model of radionuclide transport. The source-term radionuclides and their daughter products were considered. Radioactive decay, ion-exchange, and the adsorptive and absorptive properties of the micaceous and kaolinitic clays of the SRP were also considered (Section B.2). Ion-exchange, adsorption and absorption effects are accounted for by the distribution coefficient (Kd). In performing these calculations appropriate Kd-values were assigned each radionuclide species.

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Thank you for the opportunity to comment on your Draft EIS. Please contact us if you have any questions regarding our comments.

Sincerely,

Alfred H. Vang
Executive Director

AHV:fw
cc: S. C. Water Resources Commissioners

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
STATEMENT OF RUTH THOMAS		
Environmentalists Inc. Founded 1972 November 12, 1983		
<p>Mr. M. J. Sires, III Assistant Manager for Health, Safety and Environment U.S. Department of Energy Savannah River Operations Office P.O. Box A Aiken, South Carolina 29801</p>		
Dear Mr. Sires:		
FINAL COMMENTS ON THE L-REACTOR DRAFT ENVIRONMENTAL IMPACT STATEMENT		
<u>Introduction:</u>		
EM-1	<p>In our Preliminary Comments of October 6, 1983, we requested that a discussion meeting be arranged between consultants with NUS Corporation consultants, state/Federal officials and commenting organizations for the purpose of addressing the defects of the Draft Environmental Impact Statement (draft EIS) related to the proposal to restart the L-Reactor. Such a meeting was not arranged by the Department of Energy (DOE).</p>	See the response to comment AB-21 regarding DOE's letter of October 31, 1983.
<u>THE DRAFT EIS FAILS TO QUALIFY AS A SCIENTIFIC DOCUMENT:</u>		
EM-2	<p>1. Failure to adequately identify specific references with support statements and conclusions in the text.</p> <p>2. In the cases when a reference is included in the text, no particular section of the report or the particular pages involved are not identified.</p>	The EIS listed appropriate references for the subject matter covered.
EM-3	<p>3. Failure to include references which provide the specific and detailed data needed to evaluate the proposal to restart the L-Reactor. The following list of documents</p>	The list of references provided was not needed to support any information given in the EIS.

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	<p>Includes some of the significant sources of information missing from the Draft EIS.</p>	
	<p>a. <u>Du Pont (E. I. du Pont de Nemours and Company), Control and Treatment of Radioactive Liquid Waste Effluents at the Savannah River Plant, DP-1349, W. R. Jacobsen, W. L. Marter, D. A. Orth, C.P. Ross, 1974 (This relates to leaks to storm sewers and discharges to seepage basins.)</u></p>	
	<p>b. <u>Tritium Toxicity: Effect of Low-Level H₂O Exposure on Developing Female Germ Cells in the Mouse, R. Lowry Dobson and Mary F. Cooper, Radiation Research 58, 91-100, 1974.</u></p>	
	<p>c. <u>U.S. Geological Survey, Hydrology of the Low-Level Radioactive-Solid-Waste Burial Site and Vicinity Near Barnwell, South Carolina, Open File Report 82-863, James M. Cahill, 1982. (On page 3-68 the Draft EIS lists a report on Chem-Nuclear prepared by the company itself, the newer findings of the U.S. Geological Survey are not included.)</u></p>	
	<p>d. <u>Dr. Thomas Mancuso, Study of Health Effects of Radiation Exposure to Workers at Hanford Washington Complex of Nuclear Plants, 1978. (Despite reports of bad peer reviews, only one was negative and that by Dr. Sidney Marks, whose work for the AEC gave him a conflict of interest problem.)</u></p>	
	<p>e. <u>Appendix II, Regional Tritium Dose Model, testimony of August 1, 1974 at the federal hearing on the Allied-General Nuclear Services; reprocessing plant, Docket No. 50-332 (This testimony related to the fact that the transfer of tritium is not monodirectional.)</u></p>	
	<p>f. <u>Du Pont, Leakage from Waste Tank 16, DP-1358, W. L. Poe, November 1974. (Numerous other reports of accidents, and problems at the Savannah River Plant are missing from the Draft EIS; reference sources.)</u></p>	
EM-4	<p>4. The use of classified and internal reports to support statements in the Draft EIS, yet these are unavailable to reviewers.</p>	<p>See the response to comment AB-2 regarding availability of classified documents.</p>

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EM-5	<p>5. Cases of evidence in referenced reports conflicting with statements in the text. (See page 4-144, Gibbons study of 1974 conflicts with statements on page 4-18).</p> <p><u>THE DRAFT EIS FAILS TO FULFILL THE REQUIREMENTS OF THE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) FOR EXAMPLE:</u></p>	See the response to comment AB-14 regarding the differences in the statements.
EM-6	1. Failure to provide adequate evidence regarding the benefits of the proposal to restart the L-Reactor.	See the response to comment AB-4 regarding "benefits."
EM-7	2. Failure to provide adequate evidence regarding the costs of restarting the L-Reactor, in terms of environmental and health damages and in terms of detrimental impacts to businesses of the state, including tourism.	There is no evidence to suggest that the restart of L-Reactor will have a detrimental impact to the businesses of the state including tourism. To the contrary, as discussed in Section 4.1.1.1 of the EIS, L-Reactor operation is expected to have annual total local expenditures in materials and services of approximately \$3 million and a total payroll and overhead expenditure of about \$21 million. These expenditures are expected to create about 50 regional job opportunities and to produce an additional direct and indirect income of another \$3 million. The total economic benefit to the SRP region during L-Reactor operation will amount to 400 direct and indirect job opportunities, about \$25 million in direct and indirect annual income and payroll, and \$3 million in direct annual expenditures on materials and services.
EM-8	3. The lack of adequate evidence related to both Costs and Benefits makes the balancing process of the NEPA law impossible to carry out.	See the response to comment AB-4 regarding balancing of costs and benefits.
EM-9	4. The fact that the Draft EIS is not a qualified scientific document means it is also unfit to serve as the basis of reaching decisions regarding the proposal to restart the L-Reactor.	The EIS was prepared in accordance with NEPA guidelines and CEQ regulations. The EIS was based on extensive published reports and accurately depicts the environmental consequences of the proposed restart of L-Reactor.
EM-10	5. Failure to comply with the NEPA requirement of environmental consideration "to the fullest extent possible" as mandated in Section 102 of the law. This includes the subject of alternatives to the proposed action and alternatives which would reduce the detrimental effects of the proposed restart of the L-Reactor. See our Preliminary Comments regarding production alternatives, safety alternatives and cooling water options.	See the responses to comments AB-4 and AB-5 regarding this EIS and NEPA.

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
<u>QUESTIONS AND COMMENTS:</u>		
EM-11	1. Explain the conflict between evidence about the toxic nature of radioactive materials and the DOE's conclusion that an approximate one third increase in the amount of these lethal substances (increase in production, storage, burial and release by intention and accident) at the Savannah River Plant would have no significant effect on the environment and the public's health.	There is no conflict inherent in the conclusion that an increase in the release of radioactive materials by one-third will not significantly affect the environment and public health. A one-third increase in an insignificant quantity results in a quantity which is still insignificant. Section 5.2.7 of the EIS presents health effects from all SRP and nearby nuclear facilities in the tenth year of L-Reactor operation that are estimated to be a total of 0.02 cancer fatality. Expected cancer death rates in a population of 852,000 (within 80 km) plus 317,000 (downstream water consumers) based on 1979 South Carolina and Georgia rates of about 147 per 100,000 population would be about 1720 per year. Thus, Savannah River Plant contributions (0.02 cancer fatality) would not change the projected cancer fatality rate by a detectable amount (1720 to 1720.02 per year).
EM-12	2. List the research consulting firms the DOE considered for preparing the Environmental Assessment? for the Draft EIS?	Both the EA and the EIS are DOE documents; DOE is solely responsible for their preparation and contents. DOE contracted with NUS Corporation as a technical support contractor to provide assistance to DOE/SR in the preparation of documents to comply with the NEPA. DOE followed its contracting and procurement regulations for competitive contracts before selecting NUS. Sixty-nine companies expressed an interest in bidding on the contract in 1980. DOE reviewed the prospectus of each company. The NUS Corporation was selected from among these companies to provide this technical support. The L-Reactor NEPA documents (the EA and EIS) were one task assigned to this contractor.
EM-13	3. Describe the criteria used to judge the knowledge, experience, and objectivity of the research firms considered.	<p data-bbox="1178 1025 1997 1169">With respect to experience, DOE developed an exclusion criterion that stated "The offeror must have prepared an Environmental Impact Statement (EIS) as defined in Section 102(2)(c) of NEPA for Federal agencies which related to the nuclear fuel cycle and radioactive waste management activities."</p> <p data-bbox="1178 1193 1997 1342">To narrow the competitive field to those companies with expertise in the nuclear fuel cycle and NEPA experience, DOE required the contractor to have expertise in the following areas: socioeconomic, radiological dose assessments, meteorology, geology, hydrology, ecology, biology, seismology, and engineering (civil, mechanical, nuclear).</p>

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EM-14	4. List the reasons why the DOE selected the same researchers to do the Draft EIS as those who had prepared the Environmental Assessment.	See the responses to comments EM-12 and EM-13. Because NUS Corporation assisted DOE in the preparation of the EA, it was familiar with the L-Reactor project and environmental effects. DOE is responsible for the technical accuracy of the EIS. Also see the response to comment AB-20 regarding the EA and its support documentation.
EM-15	5. The Draft EIS points out that numerous studies have been done on the health effects caused by exposure to radiation. The report, however, lists only a few studies as references. None of the animal research and none of Dr. Alice Stewart's studies are included. Numerous other studies are missing including Dr. Samuel Milham's findings of "too much cancer at Hanford" and Dr. Thomas Mancuso's follow up study on Hanford.	The EIS relies in general upon the reports and recommendations of the most authoritative institutions with respect to radiation-induced health effects, including the Committee on Biological Effects of Ionizing Radiations of the National Academy of Sciences, National Research Council. The studies of Stewart, Milham and Mancuso have been examined and dismissed as lacking in statistical power in the 1980 report of that committee.
EM-16	<p>The 3 health effect references chosen for Section 6 on Studies and monitoring were all done by one person, H. I. Sauer (page 6-13). According to those preparing the Summary, there is a need to "fill in missing time periods and update mortality rates through 1978" (page 5-11) in these reports of Dr. Sauer.</p> <p>Unless the Final EIS includes consideration of the evidence contained in numerous health effect studies, the DOE may be accused of manipulating information related to the L-Reactor restart proposal. In a speech at a January 1983 meeting of the Aiken Rotary, Du Pont's Vice Chairman, Richard Heckert stated that "(O)ften scientific fact are ignored," when nuclear issues are being considered. He went on to say that "(S)ometimes unsupported scientific arguments are created for the occasion," "in still other cases," he added, "valid data are manipulated to support predetermined political goals rather than to reach valid scientific conclusions." The DOE needs to review its own practices.</p>	<p>The study by H. I. Sauer, which was in progress when the DEIS was prepared, has now been completed and a report is being prepared. The study was reviewed by a panel of epidemiology experts on October 25-26, 1983. This panel, which was convened by the U.S. Public Health Service's Centers for Disease Control at the request of DOE, included epidemiologists from the health departments of the States of Georgia and South Carolina. A report of the panel's review is expected by the end of 1983.</p> <p>In Professor Sauer's study, he concludes that "the hypothesis that there is increased mortality due to the operation of SRP has been shown to be without foundation. The differences between U.S. rates and the rates for counties in South Carolina and Georgia, analyzed either cross-sectionally or as trends over time, do not display any consistent pattern. Though erratic and heterogeneous when organized from the angle of possible SRP induced radiation effects, the data might be better explainable when correlated with other factors of natural, socioeconomic or cultural character."</p>
EM-17	6. There are too many defects in the Draft EIS and in the responses the DOE made to those testifying orally and in writing to address all of them. We, therefore, selected the first ten pages of Dr. Roger Coate's Statement of May 24, 1983 to study. This particular testimony was chosen because of Dr. Coate's knowledge of numerous subjects related to the proposal to restart the L-Reactor.	Responses to the additional comments and answers are provided in the following comments and responses. Due to the format of this appendix a complete copy of the marked copy cannot be provided; however, a complete copy of the attachment is enclosed in the DOE report documenting the comment period on the Draft EIS.

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
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We added comments related to the information he presented and related to the answers supplied by the DOE. A copy of these comments is attached. These notes demonstrate that more questions were raised by the DOE's responses and that conflicting information was not cleared up. In some cases specific questions or comments were not addressed.

We ask that full consideration be given to our Preliminary Comments, these Final Comments and our notes related to Dr. Roger Coate's testimony.

Sincerely,

Ruth Thomas,
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Attachment A:
Notes on Dr. Coate's
testimony

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	<p>We have prepared notes on Dr. Coate's statement and DOE's response presentations to show that the agency has not adequately addressed issues raised in this testimony either in its comments here or in the Draft Environmental Impact Statement (EIS). (Boxed in areas are E. I.'s notes)</p>	
	<p>Ruth Thomas Environmentalists, Inc. 1339 Sinkler Road Columbia, S.C. 29206 tel. 782-3000</p>	
	<p>Only through page B-58.</p>	
EM-18	<p>From my review so far of the Draft EIS, it appears that the basic faults pointed out about the EA (nos. 2, 3 and 4) exist in the Draft EIS.</p>	<p>Comments 2, 3, and 4 were addressed in the responses to U-7, U-14, and U-4, respectively, of Dr. Coate's statement.</p>
EM-19	<p>The position that "National Security" also applies to maintaining public well-being of the public from operation of SRP is a view which needs to be stressed by more people. It relates to NEPA, the balancing of costs vs benefits.</p>	<p>See the responses to comments AB-4 and AB-5 regarding balancing and disclosure of classified information in this appendix.</p>
	<p>There is nothing in the NEPA law of 1969 which exempts DOE from full compliance with this federal law.</p>	
EM-20	<p>The Draft EIS as it now exists does not meet the requirements of the NEPA and the EA did not. Did the DOE have lawyers familiar with NEPA as advisors? What legal experience do the NUS Corporation consultants have? (36 of the preparers of the Draft EIS are with NUS Corp.)</p>	<p>See the response to comment AB-4 in this appendix regarding information in this EIS. The EA and the EIS were prepared by NUS under the technical direction of DOE, including the General Counsel from the DOE Savannah River Operations Office and DOE's Office of General Counsel. All these lawyers are familiar with the NEPA. The Office of the General Counsel approved the EA, FONSI, and Draft EIS. NUS Corporation is an engineering and environmental consulting firm with extensive experience in preparing environmental NEPA documents. NUS' legal experience has no bearing on its ability for preparing NEPA documentation.</p>

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EM-21	Citizens and citizens' organizations have the right to intervene and be parties to administrative hearings at which cross-examination and testifying under oath are helpful in resolving conflicting information. (Under the NEPA law.)	NEPA requires that the public be allowed to comment during the NEPA process (42USC.4332(2)(c)) and the Agency is required to respond to those comments (32 CFR 651.304). There is no statutory requirement for public hearings. (<u>Como-Falcon Community Coalition Inc. v. Dept. of Labor 609F2d 342 (8th Cir. 1979).</u> If a hearing is held, it is up to the agency to decide on the procedures.
EM-22	The Draft EIS appears to have as its main purpose to minimize the effects of restarting the L-Reactor and to minimize the damages which have already happened.	As discussed in Section 1.2 of the EIS, the purpose of the EIS is to analyze the potential environmental consequences of the proposed restart of L-Reactor in compliance with Section 102(2)(C) of the National Environmental Policy Act of 1969, as amended, and the Energy and Water Development Appropriations Act, 1984. The potential environmental impacts of the proposed restart of L-Reactor are described in the EIS and are based on projections of the effects of expected nonradiological and radiological operational releases on the current environmental baseline. Also see response to comment AT-3 in this appendix regarding the scope and content of this EIS.
EM-23	In the DOE's defense of the EA, chapters 3 and 4, the agency refers to the number of pages as if the quantity of material was the important criteria rather than the presentation of as complete and accurate a record of evidence as possible. (NEPA)	See responses to comments AT-3 and AB-1 in this appendix regarding this EIS and the EA.
EM-24	The alternative discussions of the Draft EIS are defective as noted in EI's Comment Letter.	See the responses to comments AB-5 through AB-19 in this appendix regarding alternatives in this EIS.
EM-25	We did not find the Johnson (1977) report listed in the Draft EIS nor did we find accounts of incidents, accidents, equipment failures, accidental releases. It is unclear what amounts of various radioactive gasses and fallout have been routinely released from reprocessing plants, other plants.	The Johnson (1977) report, in discussing 75 release incidents, was referring to 75 incidents in the solid waste burial ground which resulted in localized release of radioactivity (ERDA 1537, Chapter III, Section 2 (1977)). These involved burial of contaminated equipment, sand blasting to decontaminate equipment, burning organic solvent, and accidental fires. Contamination was confined to the burial ground except for three incidents which resulted in minor contamination outside the burial ground fence. Improved operating procedures have greatly decreased the frequency of abnormal incidents in recent years.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EM-26	The information about accidental tritium releases is incomplete. We could not locate among the references the approximately 200 documents related to tritium releases and referred to the DOE letter of October 4, 1983.	See the response to comment AB-10 in this appendix regarding tritium releases.
EM-27	What have been the routine and accidental releases of iodine from the SRP reactors? The fact that local milk samples have contained Sr-90 suggests other fission products were also released. Why wasn't milk checked for radiiodine each year the SRP facilities have operated? at local farms?	<p>The major sources of iodine releases are the Separations Areas. For the 10-year period 1971-1980 the three operating reactors at SRP released a total of 0.077 Ci of Iodine-131 to the atmosphere, 2.65 Ci to surface streams, and 0.32 Ci to seepage basins. (Reference: Ashley, C. Zeigler, C.C, and Culp, P.A., "Releases of Radioactivity at the Savannah River Plant 1954 Through 1980," DPSPU 81-25-1, 1982.)</p> <p>There has been no evidence that strontium-90 in locally produced milk is of SRP origin. Sr-90 and other radionuclides in milk (except H-3 and I-131 during specific periods) are attributed to fallout from nuclear weapons tests.</p> <p>In the early days of the nuclear industry, the importance of the iodine-cow milk exposure pathway was not recognized. Routine monitoring of cow milk began at SRP in early 1957.</p>
EM-28	At the Barnwell plant hearings, the Iodine-131 predictions were 50 times too low. What has been done to see if SRP predictions are off?	Releases of Iodine-131 at SRP are based on actual measurements and thus represent operating experience.
EM-29	Where in the Draft EIS is consideration given to the fact that people in the SRP area were exposed to the high Iodine-131 releases in the early years of the SRP as well as later releases in terms of the added radioactive pollution from the L-Reactor being an injury to those already harmed? Particularly, in relation to thyroid damage?	See the response to comment EM-27 in this appendix.
EM-30	The statements about reductions in the number of accidents and leaks conflicts with reports of there being more accidents in 1979-1980 - 108 each. *In 1975 there were 38) Richard Denise of DOE told the Atlantic Constitution that one reason was "personnel turnover."	<p>The DOE keeps records of all events which are outside of the normal operating conditions or deviate from normal operating procedures. Most of these events do not result in accidents or leaks. Any events which have an offsite effect are reported to the public in the annual report series entitled <u>Environmental Monitoring in the Vicinity of the Savannah River Plant.</u></p>

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EM-31	According to Wm. Stratten, reactor expert of Los Alamos, old nuclear plants require more maintenance than when they are new.	The Savannah River Plant has a continuing program to maintain production facilities in a safe operating condition. This includes replacement of equipment when necessary and updating equipment to stay abreast of improved technology.
EM-32	The Draft EIS makes no reference to iodine releases and other recorded releases as far as we can determine. The SRP Operations Office, 1982 does not appear to have been used as a reference by the preparers of the Draft EIS, nor Health Physics reports, nor all of the tritium documents.	Estimates of releases of radiiodine and other radionuclides (Chapters 4 and 5 of the EIS) from L-Reactor and support facilities are generally based on the most recent 3 years of operating experience and thus represent current technology and operating conditions.
EM-33	The report "Radioactive Exposure of the Population by Contaminated Air Emitted from Nuclear Plants in the Federal Republic of Germany" (1975) identifies radiiodine via the pasture-cow-milk pathway as the crucial exposure. Why wasn't this reference used? Were the people in SRP area given potassium iodine pills during the accidental releases of iodine and during the early years when I-133 releases were high?	The pasture-cow-milk pathway is the critical pathway for releases of radiiodine to the environment. This pathway is taken into consideration in calculating the radiological effects of operation of L-Reactor and associated facilities. The offsite doses to the thyroid and other organs via the pasture-cow-milk pathway are given in Appendix B of the EIS.
EM-34	It is our understanding that all tritium, K-85 and Carbon-14 are discharged to the air from reprocessing. If no equipment traps these gases and fallout particles, isn't this dumping?	Tritium, carbon-14, and Kr-85 from reprocessing are released to the atmosphere. At present, there are no practicable methods of removing these radionuclides which are in a dilute form in very large volumes of air. The releases have always been well below standards (i.e., offsite doses have always been well below accepted dose standards).
EM-35	What equipment has been added to SRP facilities? What reports document this? What amount of iodine in radioactive form was released prior to the addition of removal equipment? After? What documents include records of tests on milk for radiiodine?	Since startup of SRP, there has been a continuing program to upgrade equipment and facilities to reduce releases of radioactive and nonradioactive materials to the environment. These "state of the art" improvements are the result of research at SRP and elsewhere. Many of these improvements are described in ERDA-1537 (an EIS reference for Chapter 5). Improvements specifically for SRP reactors are also described in the EIS, Sections 2.2, 4.2, and Appendix J. As described in response to comment EM-27 in this appendix, SRP reactors are a minor source of releases of radiiodine to the environment.

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EM-36	Misleading statements are used in the Draft EIS including minimizing amounts released (page B-1 of VOI, 2) as well as minimizing detrimental effects.	The statement that the size of radioactive releases will be small (Page B-1 of the EIS) from operation of L-Reactor and its support facilities was intended to reflect the fact that the radiological impact will be small. See the response to comment EM-11. The word "small" in the first paragraph of Page B-1 has been removed.
EM-37	The presentations on tritium are particularly misleading, and in conflict with reports and studies. ("Sources of Tritium and Its Behavior Upon Release to the Environment," D. G. Jacobs, AEC, 1968, "Tritium Toxicity: Effect of Low-Level $^3\text{H}_2\text{O}$ Exposure on Developing Female Germ Cells in the Mouse," R. Lowry Dobson & Mary Cooper, Radiation Research 58, 91-100(1974)-A few examples. Evidence is needed in Draft EIS to support the statements that a majority of tritium released is in the less dangerous form.	Standard dosimetry models used by the Nuclear Regulatory Commission in regulating the commercial nuclear industry were used in EIS dose calculations (see Appendix B of the EIS). The dose models are based on recommendations of the International Commission on Radiological Protection. The EIS does not make the statement that the majority of tritium released by L-Reactor and its support facilities is in the less dangerous molecular form (see Sections 4.1.2.1, 5.1.2.2, and Appendix B of the EIS). Dose calculations were made on the basis that tritium releases are in the more easily assimilatable oxide form.
EM-38	Not enough samples are taken to justify reaching conclusions about accidental releases. Urine samples are only taken of SRP employees, we understand. If the predictions of the pathway are based on incomplete and inaccurate inf., they are not dependable.	Urine samples were analyzed for more than 300 people. This not only included people working at SRP but also members of the plume tracking team, families of SRP personnel living in the plume trajectory, and members of the public in 20 counties of eastern South Carolina and five locations in North Carolina [reference: W. L. Marter, "Environmental Effects of a Tritium Gas Release from the Savannah River Plant on May 2, 1974," DP-1369 (1974)]. Urine samples were also analyzed for on and off plant people during the 1975 tritium release [reference: W. R. Jacobsen, "Environmental Effects of a Tritium Gas Release from the Savannah River Plant on December 31, 1975," DP-1415 (1976)]. Also see the response to comment EM-48 in this appendix.
EM-39	The Draft EIS fails to provide the evidence to support the following statement similar claims.	Of the radionuclides normally released to the environment from SRP operations, only tritium is regularly detectable by routine monitoring procedures. Thus, it is necessary to calculate doses for known exposure pathways and known atmospheric dispersion. The dosimetry model used in the EIS is the same as used by the Nuclear Regulatory Commission for regulating commercial nuclear operations (see Appendix B of the EIS). Dispersion calculations have been confirmed by environmental measurements of tritium.

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EM-40	The Draft EIS doesn't explain why residents have not been warned when accident happen which result in more than routine amounts of radiation pollution being released, so they can reduce exposure.	DOE Orders require that DOE-SR notify potentially affected states of incidents at the SRP. It is the State's responsibility, as in the case of commercial nuclear power reactors, to "warn" people in designated zones near the plant in accordance with EPA guidelines. Guidelines for "warning" offsite persons of releases of "more than routine amounts" of radioactivity from SRP have never been approached. Therefore, required protective actions to "reduce exposure" have not been necessary. Though "warnings" have never been required, the DOE and its predecessor agencies, AEC and ERDA, have had memoranda of understanding with the States of South Carolina and Georgia since 1974 to "notify" responsible state agencies of unusual releases of radioactivity or accidents. As indicated in Appendix H of this Final EIS, which has been modified to include the current status of emergency planning activities, much more detailed notification agreements have recently been agreed to with the states and formal emergency planning was completed in March 1984.
EM-41	Draft EIS doesn't explain the contradiction between calculating a tritium cloud pathway and the fact that tritium doesn't necessarily follow wind direction. (Transcript of the Barnwell plant hearings 50-332)	The calculated tritium cloud pathway referred to was for short-term tritium release incidents. Initial direction and speed of travel of the plume was based on meteorological measurements and standard dispersion calculations. The calculations were confirmed by actual measurement of tritium in the environment following the releases.
EM-42	Why weren't the references cited here used in the Draft EIS? Or why weren't the contradictions between DOE's statements and the cited references explained?	See the response to comment EM-37 in this appendix.
EM-43	Draft EIS lacks adequate discussions of redistribution, through such means as by birds, other animals, insects.	Pathway analysis is included in the dosimetry model used (see Appendix B).
EM-44	The draft EIS uses this same approach of "misleading statements 'low-values'"	See response to comment EM-37 in this appendix.
EM-45	Monitoring did not protect the people's health, information wasn't available in time to reduce the inhaling and ingestion of tritium by humans or animals.	No steps were taken to evacuate people in the path of tritium releases to avoid inhalation or ingestion of tritium. It is unlikely that any tritium release from SRP will ever require such action because offsite doses would not warrant the action. Offsite doses were theoretically calculated immediately following the releases and extensive field monitoring was conducted to verify the calculations.

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EM-46	<p>Failure to include in the Draft EIS information sources identified here or explain why, or why the AEC reports and other studies disagree.</p> <p>Will the Final EIS correct this and statements which are either unsupported or contrary of evidence in studies, records, transcripts?</p>	<p>See the response to comment EM-2 in this appendix.</p>
EM-47	<p>The conclusion cannot be reached that tritium was carried in a northeastern direction since tritium doesn't follow wind direction. (See testimony of Barnwell plant hearing Docket No. 50-332)</p>	<p>See the response to comment EM-41 in this appendix.</p>
EM-48	<p>Sampling was done along predicted pathway and since the information on which such predictions were based was incomplete and in some regards incorrect the results of the testing are in question.</p> <p>1,000 samples is too small a number to base conclusions on anyway. 1,000 samples in 11 categories or approximately 90 of each. The Draft EIS also reaches conclusions based on inadequate information and sampling. No control groups are referred to.</p>	<p>The number of environmental samples following the tritium release incident was adequate to determine the area involved (pathway), levels of tritium in the environment, and offsite doses.</p>
EM-49	<p>The Draft EIS lacks evidence to support statements that new equipment and plant operation techniques have been added over the years. Budget information is needed to show how much was spent, when and on what, as well as detailed and documented information describing the changes. Statements about improvements conflict with public statements made by Richard Denise of DOE, when asked about the fact that the number of accidents at the SRP facilities has increased over the years, for example in 1979 and 80 there were 108 each year.</p>	<p>The continuing upgrade program for the SRP reactors, which was inaugurated immediately after reactor startup in 1953, is discussed in Appendix J. About 60 percent of the \$204 million spent on preparations for the L-Reactor restart went to modernize the reactor in the same way the operating reactors have been modernized during the L-Reactor standby period. It has been a continuing concern that the facilities be continually upgraded. To this end a five-part restoration program was undertaken for the period 1981-1987. A total of \$389 million was budgeted of which about \$164 million has been budgeted through 1983. This money is in addition to normal maintenance and new capital projects.</p>
EM-50	<p>In both EA and Draft EIS, preparers apply the "dilution theory" to an atomic age technology. This is inappropriate.</p>	<p>All releases from L-Reactor and its support facilities are monitored and controlled at the release source, i.e., before dilution. Measurements are then also made of the way these releases disperse into the environment.</p>

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Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EM-51	All tritium, K-85 and C-14 are released intentionally. Since these take time to decay to a safe level C-14 the longest 5,750 year half life, they are still a pollution problem.	Although tritium, Kr-85, and C-14 are released to the environment from operation of L-Reactor and its support facilities, offsite doses are small. Also see the response to comment EM-11 in this appendix. The population dose calculations include consideration of a 100-year environmental dose commitment as described in Appendix B.
EM-52	There are not adequate monitoring stations and provisions to determine the locations at which radiation build up has taken place. The Dept. of the Interior points out the limits of monitoring.	The Savannah River Plant has the most comprehensive environmental monitoring plan of any nuclear facility in the United States. There is no basis for the statement that monitoring stations are inadequate. Monitoring stations are at numerous locations so that there is little likelihood that there will be an undetected buildup of radioactivity. See Chapter 6 of the EIS.
EM-53	Agree that understanding of radiation and its harmful effects is substantial. There are animal studies, studies of X-ray patients, those by Gofman, Tamplin, of Nuclear workers-Macuso, radium dial painters, Japanese victims, and from these much has been learned. The Draft EIS fails to give adequate attention to this evidence and the evidence related to the effects of radiation damage to the unborn.	The National Academy of Sciences BEIR III Report (reference: "The Effects on Populations of Exposures to Low Levels of Ionizing Radiation: 1980," National Academy of Sciences, 1980) took into account the studies listed in this comment. The NAS Report was used as the basis for calculating the health effects of operation of L-Reactor and associated support facilities. Also see the response to comment EM-15 in this appendix.