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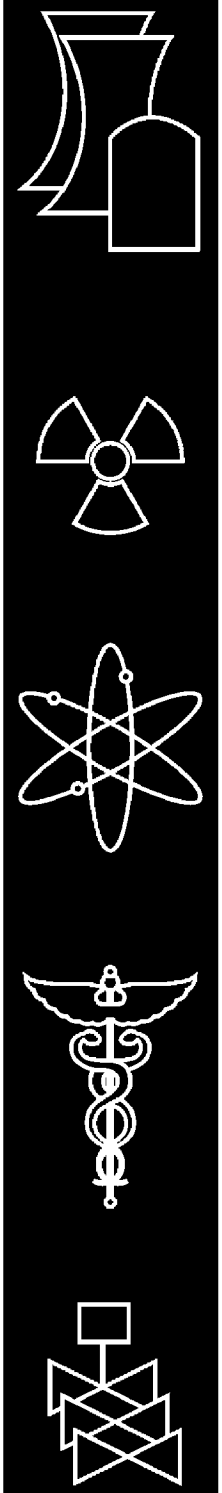

Environmental Impact Statement on the Construction and Operation of a Proposed Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina

Appendices F through L

Final Report

U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards
Washington, DC 20555-0001

NUREG-1767, Vol. 2

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Appendices F through L

Final Report

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APPENDIX F:

AIR QUALITY IMPACT ASSESSMENT

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F.1 Introduction

Air quality impacts are generally assessed by determining the concentrations of pollutants in the air caused by the major sources associated with an action. For an action proposed for the future, the assessment is based on projected pollutant concentrations determined by computer modeling. This projection involves three steps. First, the emissions of the sources are calculated. Most frequently, this calculation requires knowing the activity level of the source and applying an appropriate set of emission factors that specify the quantity of air pollutants emitted per unit of activity.

In the second step, the pollutant concentrations in the air associated with these emissions are determined for various locations (receptors) by using an air quality model. The model uses information on the emissions along with meteorological conditions, source and receptor elevations, and source characteristics to estimate concentrations. Meteorological conditions included in these calculations are ambient temperature, wind speed and direction, mixing heights, and atmospheric stability. Source characteristics include location, temperature, diameter, exit velocity, and height for stacks; size and orientation for area sources; and initial horizontal and vertical dispersions for volume sources.

Finally, the modeled concentrations are compared with standard measures of impact, typically ambient air quality standards set by regulatory agencies, such as the National Ambient Air Quality Standards (NAAQS) or state standards and Prevention of Significant Deterioration (PSD) increments. The standards and increments depend on the averaging time, with periods of 1, 3, 8, and 24 hours, and annual being specified in the NAAQS. The air quality model uses hourly emissions and meteorological data and can be executed to produce concentrations for periods corresponding to the selected impact measures.

For the Mixed Oxide Fuel Fabrication Facility (proposed MOX facility), the Pit Disassembly and Conversion Facility (PDCF), and the Waste Solidification Building (WSB), air emissions from construction activities and operations were estimated on the basis of standard references and site-specific data or were taken from previous work on the facilities. Ambient concentrations were then computed with a model recommended by the U.S. Environmental Protection Agency (EPA). Five years of meteorological data taken at locations near the Savannah River Site (SRS) were used in the modeling. Pollutant concentrations at the SRS boundary and at off-site receptor locations were modeled. Section F.2 discusses estimating emissions associated with the facility; Section F.3 discusses the air quality model, its data input, and modeling assumptions.

F.2 Emission Estimates

This section discusses the methods used to calculate emissions projected to be associated with construction and operation of the facility.

F.2.1 Construction Emissions

Construction fugitive dust, emissions from the concrete batch plant, and exhaust emissions from construction equipment were modeled for the construction phase. Emissions from fuel storage, refueling construction equipment, and worker and delivery vehicles were not modeled. Because of the low volatility of diesel fuel, emissions from storing diesel fuel and refueling construction equipment would be negligible. Emissions from worker and delivery vehicles would be dispersed along roadways around the site and would have lesser impacts than emissions from the limited construction area.

The activity levels, associated emission factors, and other data used to calculate emissions for the construction sources are shown in Table F.1. Construction of the proposed MOX facility is expected to disturb about 39 ha (96 acres), of which 28 ha (69 acres) would be located on the proposed MOX facility site itself, be contiguous to the site, or be used for fill on the PDCF site during proposed MOX facility construction (DCS 2002a). The remaining 11 ha (27 acres) would be used for ancillary activities, such as road work and utility corridors. Construction of the concrete batch plant would disturb an additional 4.0 ha (10 acres). Only limited portions of most of these areas would be disturbed at any time, and the disturbance of a given section would last only a short time. It was assumed that 50% of the contiguous 28-ha (69-acre) area would be disturbed at any one time and that heavy earth-moving activities would occur over a 6-month period. For the ancillary areas, emissions were estimated assuming that construction would last 6 months and that only about 10% of the area would be disturbed at any time. Modeling was carried out for the entire disturbed area. It was further assumed that 30% of the construction fugitive emissions would be particulate matter with a diameter less than or equal to 10 μm (PM_{10}) (EPA 1988) and that 15% would be $PM_{2.5}$ (Kinsey and Cowherd 1992). Disturbed areas would be watered to control dust emissions, reducing emissions by 50% (EPA 2002).

Construction of the concrete batch plant would disturb 4.0 ha (10 acres) (DCS 2002a). The entire disturbed area was assumed to be part of the contiguous site, and emissions calculation and modeling used the same assumptions as were used for the proposed MOX facility construction fugitive emissions.

Construction of the PDCF was assumed to disturb about 14 ha (35 acres) (DCS 2002b). The contiguous site area was assumed to account for about two-thirds of the total and dispersed ancillary activities the remainder. Emissions calculation and modeling used the same assumptions as were used for modeling MOX facility construction fugitive emissions.

Construction of the WSB was assumed to disturb about 2 ha (5 acres) (DCS 2002a). The entire disturbed area was assumed to be part of the contiguous site. Emissions calculations

Table F.1. Emission factors, activity levels, and emissions for facility construction

Source	Pollutant[a]	Emission factor	Annual activity: MOX	PDCF	WSB	Batch plant
Construction fugitives[b]	PM	0.6 tons/acre/mo[c]	Site: 69 acres; 5 months Ancillary: 35 acres; 6 months	Site: 23 acres; 12 months Ancillary: 12 acres; 6 months	5 acres; 5 months	10 acres; 5 months
	PM_{10}	-[d]				
	$PM_{2.5}$	-				
Batch plant[e]	PM	0.2 lb/yd^3[f]	NA[g]	NA	NA	62,500 yd^3/yr[h]
	PM_{10}	0.058[f]	NA	NA	NA	
	$PM_{2.5}$	NA	NA	NA	NA	
Equipment exhaust[i]	CO	14.67 kg/10^3 liters[j]	1,250,000 liters diesel fuel/yr[k]	495,000 liters diesel fuel/yr[l]	114,000 liters/diesel fuel/yr[m]	0[n]
	VOCs	3.76 kg/10^3 liters[j]				
	NO_x	38.75 kg/10^3 liters[j]				
	SO_x	3.74 kg/10^3 liters[j]				
	PM	3.20 kg/10^3 liters[j]				
	PM_{10}	3.20 kg/10^3 liters				
	$PM_{2.5}$	3.20 kg/10^3 liters				

		Annual emissions (kg/yr)				Hourly emissions (g/h)[o]			
Source	Pollutant[a]	MOX	PDCF	WSB	Batch plant	MOX	PDCF	WSB	Batch plant
Construction fugitives[b]	PM	103,000	79,900	6,800	13,600	49,400	38,400	3,270	6,540
	PM_{10}	30,800	24,000	2,040	4,080	14,800	11,500	981	1,960
	$PM_{2.5}$	15,400	12,000	1,020	2,040	7,410	5,760	491	981
Batch plant[e]	PM	NA	NA	—[l]	5,670	NA	NA	NA	2,730
	PM_{10}	NA	NA	—[l]	1,640	NA	NA	NA	790
	$PM_{2.5}$	NA	NA	—[l]	850	NA	NA	NA	409
Equipment exhaust[i]	CO	18,300	7,260	1,670	—[p]	8,810	3,490	801	—[p]
	VOCs	4,690	1,960	427	—[p]	2,260	894	205	—[p]
	NO_x	48,400	19,200	4,400	—[p]	23,300	9,220	2,120	—[p]
	SO_x	4,670	1,850	424	—[p]	2,240	889	204	—[p]
	PM	4,000	1,580	363	—[p]	1,920	761	175	—[p]
	PM_{10}	4,000	1,580	363	—[p]	1,920	761	175	—[p]
	$PM_{2.5}$	4,000	1,580	363	—[p]	1,920	761	175	—[p]

[a]PM = particulate matter with a diameter equal to or less than about 30 μm; PM_{10} = particulate matter with a diameter equal to or less than 10 μm; $PM_{2.5}$ = particulate matter with a diameter less than 2.5 μm; CO = carbon monoxide; VOC = volatile organic compound; NO_x = nitrogen oxides; SO_x = sulfur oxides.

[b]PM_{10} taken as 30% of PM (EPA 1988); $PM_{2.5}$ taken as 15% of PM (Kinsey and Cowherd 1992).

[c]*Source:* EPA (2002, Section 13.2.3) and a 50% reduction in emissions due to watering used to control dust.

Footnotes continue on next page.

Table F.1. Continued

[d]- indicates emissions calculated as percentage of PM.

[e]$PM_{2.5}$ taken as 15% of PM (EPA 2002, Category 3, Table B.2-2, Appendix B-2).

[f]*Source:* EPA (2002, Section 11.12).

[g]NA = not applicable.

[h]*Source:* DCS (2002a); includes concrete for both the proposed MOX facility and the WSB.

[i]All emissions assumed to be $PM_{2.5}$.

[j]*Source:* EPA (1985, Table II-7.1).

[k]*Source:* DCS (2002b, Table 5.5).

[l]*Source:* DOE (1999, Table 5.5).

[m]*Source:* DCS (2002b, Table G-4).

[n]Fuel use for construction of batch plant included in fuel use for the proposed MOX facility.

[o]Hourly emissions based on annual rates assuming construction activities occur 8 hours per day, five days per week, 52 weeks per year.

[p]Emissions included in emissions from the proposed MOX facility.

and modeling used the same assumptions as were used for proposed MOX facility construction fugitive emissions.

The concrete batch plant is expected to produce 47,800 m^3 (62,500 yd^3) of concrete annually (DCS 2002a). This amount would be sufficient for both proposed MOX facility and WSB construction. The emission factors used in the modeling represent the total particulate matter process emissions from concrete batching. $PM_{2.5}$ was taken as 15% of the particulate matter, on the basis of the cumulative weight-percent distribution for Category 3 in EPA (2002, Table B.2-2).

Information on the mix of construction equipment types that would be used at the site was not available. It was assumed that all construction equipment would be diesel powered. The factors presented in Table F.1 are averages over the different types of equipment listed in EPA (1985, Table II-7.1). Factors for off-highway trucks and the miscellaneous category were excluded from the averages. Particulate emissions from diesel engines are expected to have small diameters, so it was assumed that all particulate emissions would be in the $PM_{2.5}$ category.

Hourly emission rates for all three sources were calculated from annual rates on the basis of a construction schedule of 8 hours per day, 5 days per week, and 52 weeks per year. This assumption leads to higher hourly emissions and thus is more conservative than assuming a longer work day or a longer work week.

F.2.2 Emissions during Operation

Emissions from the facility processes and from operation of the emergency and standby generators were modeled for the operation phase of the facilities. As for the construction phase, emissions from worker and delivery vehicles were not included.

Table F.2 summarizes the activity levels and emissions from standby and emergency diesel-powered generators at the proposed MOX facility and WSB. There would be six engines at the proposed MOX facility expected to operate a total of 804 h/yr. Each engine would use about 522 L (138 gal) of diesel fuel per hour or 418,477 L/yr (110,550 gal/yr) for all six engines (DCS 2004a; DCS 2004b). Vendor-supplied emission factors were available for criteria pollutants. The calculation of air toxic emissions used standard emission factors from EPA (2002) and assumed a heating value of 137,000 Btu/gal for diesel fuel.

Detailed information on emergency generator use at the PDCF was unavailable. Total fuel use during operation is expected to be 37,998 L (10,038 gal/yr) (DOE 1999, Table E-7). Table G-59 in DOE (1999) gives the annual emissions of criteria pollutants from the PDCF. Annual toxic emissions from PDCF generators were estimated using standard emission factors from EPA (2002) and assuming heating value of 137,000 Btu/gal for diesel fuel. Annual operating hours were not available. Hourly emissions were calculated assuming 86 hours/yr of operation, the same as the annual operating hours for the standby generators in the MOX facility (DCS 2004b). This procedure may overestimate the PDCF emissions, because the annual PDCF fuel use includes diesel, fuel oil, and gasoline, not just fuel for the emergency generators.

The WSB is expected to have one emergency generator that will operate about 250 h/yr. Engine-specific emission factors were available for criteria pollutants (DCS 2002a). Air toxic emissions from proposed MOX facility emergency generators were scaled by the ratio of proposed MOX facility and WSB annual hours of operation to estimate WSB emergency generator emissions.

Table F.3 summarizes process emissions. The aqueous polishing process at the proposed MOX facility would emit nitrogen dioxide. The chlorine would come from chloride in the plutonium feedstock (DCS 2002b). Hourly emissions were based on 8,760 h/yr of continuous operation.

The PDCF would have no process emissions (DOE 1999, Table G-59). The WSB would emit particulates when the cement silo is operated and when cement is withdrawn into the weigh hopper and mixed during the waste cementation process. Hourly emissions are based on the assumption that silo operations, including cement delivery, would occur 12 times per year and would be completed in less than one hour. The WSB would process about 25 batches of waste per year. Each batch would require operating each of two hoppers for 1 hour and each of two mixers for 12 hours (DCS 2002a). Depending on the final process design, evaporation of acidic waste in the WSB could emit up to 9,175 kg/yr (20,230 lb/yr) of nitrogen dioxide. An amount of acetone would also be emitted.

Table F.2. Emission factors, activity levels, and emissions for emergency generators

Facility	Pollutant	Emission factor (lb/10^6 Btu)[b,c]	Activity	Emissions[a] (kg) Annual	Emissions[a] (kg) Hourly
MOX	CO	6.43	6 engines; 804 engine-hours/yr	2,350	17.5
	VOC	2.88		1,050	7.85
	NO_x	67.0		24,500	183
	SO_x	3.9		1,420	10.6
	PM	0.63		230	1.72
	PM_{10}	0.52[d]		189	1.41
	$PM_{2.5}$	0.49[e]		177	1.32
	Benzene	0.000776		5.33	0.0400
	Toluene	0.000281		1.93	0.0144
	Xylenes	0.000193		1.33	0.00990
	Propylene	0.00279		19.1	0.143
	Formaldehyde	0.0000789		0.543	0.00405
	Acetaldehyde	0.0000252		0.173	0.00129
	Acrolein	0.00000788		0.0542	0.000404
	Naphthalene[f]	0.00013		0.894	0.00667
	Total PAHs[g]	<0.000212		1.46	0.01
PDCF	CO		10,038 gal/yr fuel; 86 engine-hours/yr	520[h]	6.05
	VOC			58[h]	0.674
	NO_x			2,000[h]	23.3
	SO_x			34[h]	0.395
	PM			50[h]	0.581
	PM_{10}			41[d]	0.478
	$PM_{2.5}$			39[e]	0.448
	Benzene	0.000776		0.485	0.00563
	Toluene	0.000281		0.175	0.00204
	Xylenes	0.000193		0.121	0.00140
	Propylene	0.00279		1.74	0.0203
	Formaldehyde	0.0000789		0.049	0.000573
	Acetaldehyde	0.0000252		0.016	0.000183
	Acrolein	0.00000788		0.005	0.0000572
	Naphthalene[f]	0.00013		0.081	0.000944
	Total PAHs[g]	<0.000212		0.132	0.00154
WSB[i]	CO	24.92	1 engine; 250 engine-hours/yr	575	2.30
	VOC	5.07		50.0	0.20
	NO_x	1.62		2,830	11.3
	SO_x	0.44		184	0.735
	PM	4.24		481	1.93
	PM_{10}	4.07[d]		462	1.85
	$PM_{2.5}$	3.81[e]		433	1.73
	Benzene			1.66	0.0066
	Toluene			0.601	0.0024
	Xylenes			0.413	0.0017

Table F.2. Continued

Facility	Pollutant	Emission factor (lb/10^6 Btu)[b,c]	Activity	Emissions[a] (kg) Annual	Emissions[a] (kg) Hourly
	Propylene			5.97	0.024
	Formaldehyde			0.169	0.00068
	Acetaldehyde			0.054	0.00022
	Acrolein			0.017	0.00007
	Naphthalene[g]			0.278	0.0011
	Total PAHs[h]			0.454	0.0018

[a]If needed, a heating value of 137,000 Btu/gal was used for diesel fuel to calculate emissions.

[b]*Source* (unless otherwise specified): Criteria pollutants: DCS (2002a); Air toxics: EPA (2002, Section 3.4-5).

[c]Units: Criteria pollutants = lb/(engine-hour). Air toxics = lb/10^6 Btu.

[d]Based on a ratio of PM_{10}/PM factor in Table 3.4-2, EPA (2002).

[e]$PM_{2.5}$ taken as 90/96 of PM_{10} (Category 1, Table B.2-2, Appendix B-2, EPA [2002]).

[f]Included in total PAHs.

[g]PAHs = polycyclic aromatic hydrocarbons.

[h]*Source*: DOE (1999, Table G-59).

[i]Annual emissions of air toxics at the WSB were calculated from those at the proposed MOX facility based on the ratio of annual operating hours (= 250/804).

Storage of diesel fuel for use in emergency and standby generators would emit volatile organic compounds (VOCs) at each facility. Emission estimates from DCS (2004b) were used to estimate emissions from the other two facilities. Proposed MOX facility fuel storage emissions were scaled by the ratio of proposed MOX facility and PDCF annual fuel uses to estimate PDCF fuel storage emissions, and were scaled by the ratio of proposed MOX facility and WSB annual hours of operation to estimate WSB emissions.

F.3 Air Quality Modeling

This section presents information on the air quality model and modeling assumptions, meteorological data, source data, receptors, and terrain data used to estimate the air quality impacts of the facility.

Table F.3. Process emissions during operations

Facility	Operation	Pollutant	Emissions	
			Annual (kg/yr)	Hourly (g/h)
MOX[a]	Aqueous polishing	NO_2	4,480	511
	Chlorine in Pu	Chlorine	15	1.7
	Diesel fuel storage	VOC	1.03	0.12
PDCF	Diesel fuel storage	VOC	0.094	0.011
WSB[b]	Silo operations	PM	5.55	463
		PM_{10}	2.78	231
		$PM_{2.5}$	0.833	69.4
	Cementation	PM	0.450	5.14
		PM_{10}	0.225	2.57
		$PM_{2.5}$	0.068	70.2
		Acetone	2.93	9.75
	Acidic waste evaporation	NO_2	<9800	<30,600
	Diesel fuel storage	VOC	0.11	0.013

[a]*Source*: DCS (2004b, Table 5-7).

[b]*Sources:* DCS (2002a-c, 2004a,b).

F.3.1 Air Quality Model

Version 3 of the Industrial Source Complex Short-Term (ISCST3) model (EPA 1995) was used to estimate potential impacts of facility construction and operation on ambient air quality. ISCST3 has numerous options that can be set to make the calculations conform to the actual situation being modeled. The following options were used for the facility model runs: (1) the regulatory default options, (2) building downwash, and (3) rural dispersion.

In its guideline on air quality modeling, the EPA (1999) specifies ISCST3 as the "guideline" model for a wide variety of regulatory applications. The modeling guideline also specifies a set of "regulatory options," specific settings for some of the options included in the model. The model was always run using the regulatory options.

In addition, as specified in the guideline, effective building widths were included in the operation runs to account for building-induced downwash of pollutants released from the facility stack. These effective widths were calculated from the physical widths and heights by using EPA's Building Profile Input Program (BPIP) (EPA 1993). The physical dimensions for the proposed MOX facility and nearby buildings were taken from DCS (2002a). No information was available in the dimensions of the PDCF. Dimensions for the WSB were taken from DCS (2002a).

The way air pollutants disperse differs between predominantly urban and predominantly rural areas. The SRS and the surrounding area are generally rural rather than urban in character, so the model was run in the rural mode.

F.3.2 Meteorological Data

The ISCST3 code uses hourly surface data (wind speed, wind direction, ambient temperature, and atmospheric stability) and twice-daily mixing-heights. Modeling for the facility used 5 years of surface data collected at Columbia, South Carolina, for the period from 1990 through 1994. Mixing height data came from Athens, Georgia, for the period from 1990 through August 1994. The Athens site was moved to Atlanta, Georgia, in September 1994.

F.3.3 Source Data

The characteristics used to model the sources are listed in Table F.4. Volume source dimensions were converted into the initial dispersion values in Table F.4 on the basis of the suggestions in EPA (1995).

F.3.3.1 Construction

Construction fugitive emissions were modeled as square area sources centered on the associated facility site and oriented with its sides parallel to the site's side. It was assumed that 50% of the area would be disturbed at any time.

Thirty-nine ha (96 acres) of the 43 ha (106 acres) disturbed during construction of the proposed MOX facility would be the site itself, contiguous areas, fill area on the PDCF site, and work on roads and utilities (DCS 2002a). This 39-ha (96-acre) area was modeled to estimate the impact of construction fugitives. One-half of this area corresponds to a square 441 m (1,450 ft) on a side. The remaining 4.0 ha (10 acres) of the disturbed area would be the site of the batch plant (whose construction fugitives were modeled as a square at the appropriate location).

The total area disturbed during PDCF construction is expected to be 36 ha (90 acres) (DOE 1996, Section 4). About two-thirds of this total, the same fraction as used for the proposed MOX facility, was modeled. One-half of this area corresponds to a square about 344 m (1,140 ft) on a side.

The modeled area for WSB construction was taken as one-half of the entire area of the site, 2.0 ha (5.0 acres), corresponding to a square about 101 m (330 ft) on a side.

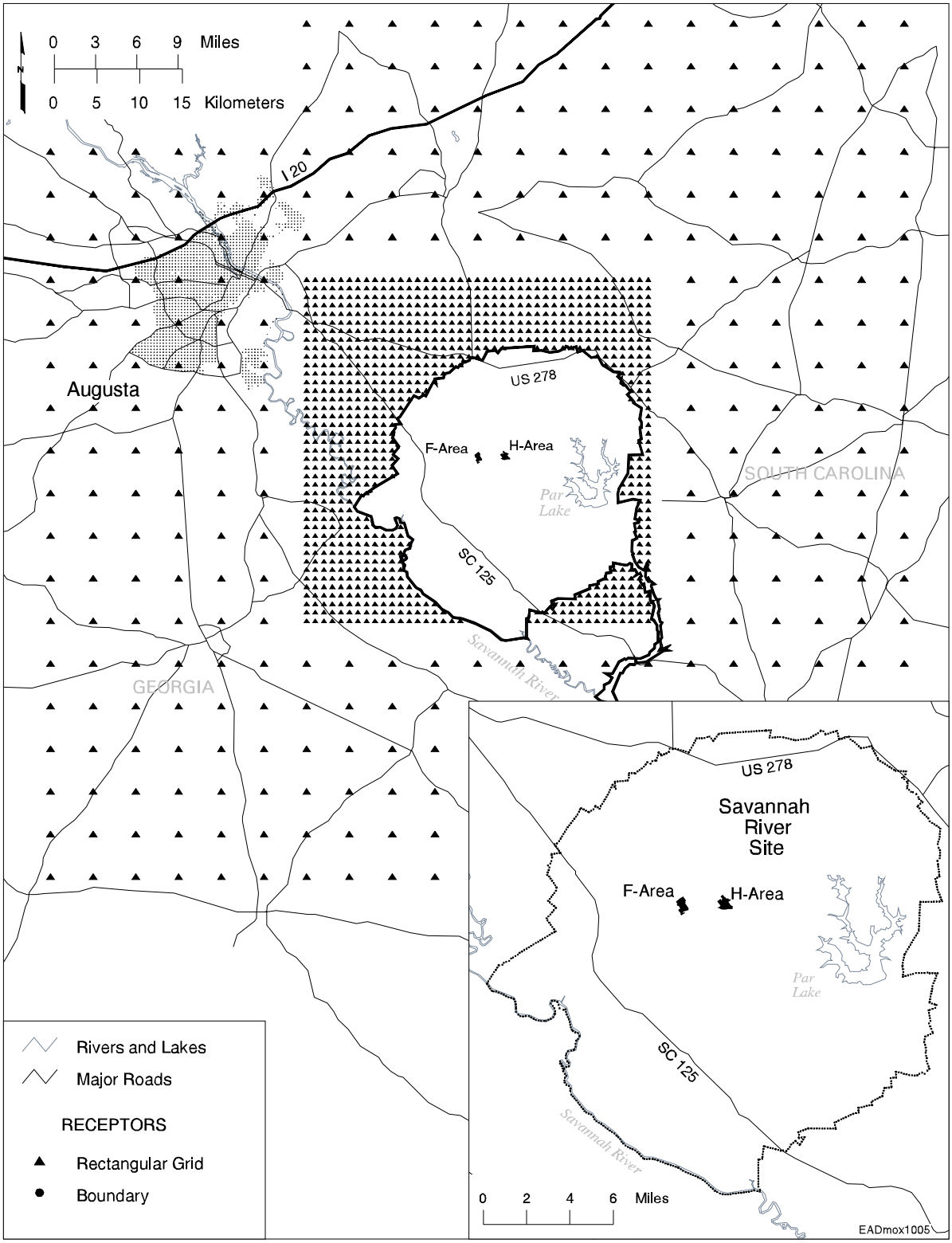

Figure F.1. Receptor locations used in air quality modeling.

Table F.4. Characteristics of modeled sources

Source	Source characteristics							
				Initial dispersion[a] (m)		Release characteristics		
	Modeled type	Release height (m)	Length (m)	Horizontal	Vertical	Temperature (K)	Velocity (m/s)	Diameter (m)
Construction fugitives-proposed MOX facility	Area	1	441	NA[b]	NA	NA	NA	NA
Construction fugitives-PDCF	Area	344	344	NA	NA	NA	NA	NA
Construction fugitives-WSB	Area	101	101	NA	NA	NA	NA	NA
Construction fugitives-batch plant	Area	142	NA	NA	NA	NA	NA	NA
Concrete batch plant	Volume	4.6	NA	7.5	2.1	NA	NA	NA
Construction equipment exhaust-proposed MOX facility	Volume	3.1	NA	87	1.4	NA	NA	NA
Construction equipment exhaust-PDCF	Volume	3.1	NA	80	1.4	NA	NA	NA
Construction equipment exhaust-WSB	Volume	3.1	NA	23	1.4	NA	NA	NA
Proposed MOX facility stack[c]	Point	36.6	NA	NA	NA	290.3	16.7	2.59
WSB silo stack	Point	15.2	NA	NA	NA	290.3	0.031	0.457
WSB mixer/hopper stack	Point	12.2	NA	NA	NA	290.3	0.031	0.203
WSB main stack	Point	24.4	NA	NA	NA	290.3	3.0	1.52
Emergency generators	Point	14.3	NA	NA	NA	1180	98.5	0.204

[a]Volume source dimensions were converted into the initial dispersion values using the suggestions in EPA (1995).

[b]NA = not applicable.

[c]*Source:* DCS (2001).

During operations, the concrete batch plant was modeled as a volume source. In ISCST3, volume sources are square in the horizontal plane. Batching activities were assumed to take place in a square about 32 m (110 ft) on a side, corresponding to an area of about 0.10 ha (0.26 acre). The plant structure was assumed to be about 9.1 m (30 ft) high. A release height of 4.6 m (15 ft) was taken as representative of all batching activities.

Emissions from construction equipment exhaust would be released over the same area as the construction fugitive emissions and were modeled as volume sources located at the center of the facility sites. An exhaust release height of 3.1 m (10 ft) was assumed for the construction equipment.

For short-term averages, all construction sources were assumed to operate 8 hours per day — from 8:00 a.m. to 12 p.m. and from 1 p.m. to 5 p.m. Emissions were assumed to be zero during other hours. Annual averages were calculated by assuming a construction schedule of 260 days per year as discussed in Section F.2.1.

F.3.3.2 Operation

Facility stacks were modeled as points (see Table F.4). There would be a single stack on the proposed MOX facility and two on the WSB. One WSB stack would exhaust the silo, another would exhaust hoppers and mixers, and the main stack would provide general building exhaust.

Emissions from the standby and emergency generators were modeled as points using representative release characteristics.

Different approaches were used to estimate short-term impacts for periods of 24 hours and less and annual impacts. The proposed MOX facility process was assumed to operate continuously, and the same rate was used for estimating both short-term and annual impacts. The WSB would operate in a batch mode, as discussed above. For short-term impacts, emissions were assumed to occur during a 12-hour period from 6 a.m. to 6 p.m. at actual rates. Annual impacts were estimated on the basis of 12 hours per day of operations at rates consistent with the expected annual emissions. The emergency and standby generators would operate intermittently for testing and for unscheduled emergencies. Short-term impacts were assessed by assuming that the generators for all three facilities would operate 24 hours per day to simulate an extended emergency. Annual impacts were assessed by assuming 8,760 hours per year of operation at rates consistent with the expected annual emissions.

F.3.4 Receptor Data

Two types of receptors were used in the analysis: boundary receptors and off-site receptors. The receptor network is shown in Figure F.1. The boundary receptors were located every 200 m (660 ft) along the SRS boundary. No boundary receptors were placed along the narrow section of the SRS extending south and southwest along Lower Three Runs Creek to the Savannah River. The off-site receptors consisted of two Cartesian grids oriented along the

north-south direction and extending 50 km (31 mi) in each direction from the facility site. From the SRS boundary out to 20 km (12 mi), the grid spacing was 1.0 km (0.62 mi). Farther out, the grid spacing was 5.0 km (3.1 mi).

F.3.5 Terrain Data

Terrain effects were included in all the modeling runs. Terrain data for sources and receptors were taken from electronic data available from the U.S. Geological Survey (2001) 1:24,000 scale (7.5-minute series) digital elevation model. The grade level for the proposed MOX facility was taken as 83 m (270 ft) above mean sea level (DCS 2002b).

F.4 References for Appendix F

DCS (Duke Cogema Stone, and Webster) 2001. *Changes to Mixed Oxide Fuel Fabrication Facility Environmental Report*. Letter with attachments submitted by P. S. Hastings (DCS, Charlotte, NC) to U.S. Nuclear Regulatory Commission (Washington, DC). Dec. 11.

DCS 2002a. *Responses to the Request for Additional Information on the Environmental Report Revisions 1 & 2*. DCS-NRC-000116, Docket Number 070-03098. Charlotte, NC. Oct. 29.

DCS 2002b. *Mixed Oxide Fuel Fabrication Facility Environmental Report Revision 1 & 2*. Docket Number 070-03098. Charlotte, NC.

DCS 2002c. *Corrections to Responses to the Request for Additional Information on the Environmental Report Revisions 1 & 2*. Letter with attachments from P. S. Hastings (DCS, Charlotte, NC) to U.S. Nuclear Regulatory Commission (Washington, DC). Nov. 15.

DCS 2004a. *Mixed Oxide Fuel Fabrication Facility Environmental Report, Revision 5.* Docket Number 070-03098. Charlotte, NC. June 10.

DCS 2004b. *Mixed Oxide Fuel Fabrication Facility Environmental Report, Revision 5, Responses to Request for Additional Information*. Docket Number 070-03098. Charlotte, NC. Sept. 17.

DOE (U.S. Department of Energy) 1996. *Storage and Disposition of Weapons Usable Fissile Materials Final Programmatic Environmental Impact Statement*. DOE/EIS-0229. Office of Fissile Materials Disposition, Washington, DC. Dec.

DOE 1999. *Surplus Plutonium Disposition Final Environmental Impact Statement*. DOE/EIS-0283. Office of Fissile Materials Disposition, Washington, DC. Nov.

EPA (U.S. Environmental Protection Agency) 1985. *Compilation of Air Pollutant Emission Factors, Vol. II: Mobile Sources*. AP-42, Fourth Edition. Office of Air and Radiation, Office of Mobile Sources, Test and Evaluation Branch, Ann Arbor, MI. Sept.

EPA 1988. *Gap Filling PM-10 Emission Factors for Selected Open Area Dust Sources*. EPA-450/B-88-003. Research Triangle Park, NC.

EPA 1993. *User's Guide to the Building Profile Input Program*. EPA-454/R-93-038 (revised Feb. 8, 1995). Office of Air Quality Planning and Standards, Research Triangle Park, NC. Oct.

EPA 1995. *User's Guide for the Industrial Source Complex (ISC3) Dispersion Models*. EPA-44/B-95-003a. Office of Air Quality Planning and Standards, Research Triangle Park, NC. Sept.

EPA 1999. *Appendix W to Part 51 — Guideline on Air Quality Models*. 40 CFR 51. Washington, DC. July 1.

EPA 2002. *Compilation of Air Pollutant Emission Factors, Vol. I: Stationary Point and Area Sources, Supplements A-F and Updates 2001 and 2002*. AP-42, Fifth Edition. Available at http://www.eap.gov/ttn/chief/ap42.html.

Kinsey, J.S., and C. Cowherd, Jr. 1992. "Fugitive Dust." In *Air Pollution Engineering Manual*. A.J. Bunicore and W.T. Davis (eds.). Van Nostrand Reinhold, New York, NY.

U.S. Geological Survey 2001. "7.5 Minute Digital Elevation Models (DEM)." Available at http://edcwww.cr.usgs.gov/doc/edchome/ndcdb/7_min_dem/states.html.

APPENDIX G:

ADDITIONAL IMPACTS OF THE NO-ACTION ALTERNATIVE

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Appendix G includes impacts of the no-action alternative that are not addressed in Chapter 4.[1] Technical areas included in the appendix are geology, seismology, and soils; noise; ecology; land use; cultural and paleontological resources; infrastructure; socioeconomics; and esthetics. Other potential impacts are addressed in Chapter 4.

G.1 Geology, Seismology, and Soils

In general, continued storage of surplus plutonium at current storage locations would have no impact on geology or seismology at the sites. If new construction was required to upgrade storage facilities at any of the sites, there could be localized, small effects on soils, such as compaction and erosion, as a result of construction activities.

G.2 Noise

The ongoing operations at the storage sites would result in no appreciable change from current levels of traffic noise and on-site operational noise. Nontraffic noise sources are far enough from off-site areas that the noise of operations would not be expected to cause annoyance to the public. However, some noise sources could be close enough to on-site noise-sensitive areas to result in impacts, such as the disturbance of wildlife.

G.3 Ecology

No construction or demolition of buildings is planned under the continued storage option. If any modifications were required to ensure safe storage, they would not result in appreciable change to current conditions. Therefore, continued storage would have negligible impacts on ecological resources. At Pantex, any upgrading of existing storage facilities would occur in an area that is currently disturbed, so small impacts to biota would occur. Also, no impacts to threatened and endangered species would be expected (DOE 1996, pg. 4-207). Regardless, the impacts of new construction would be addressed under a separate environmental review conducted by the U.S. Department of Energy (DOE).

[1] Terms used to categorize impacts are defined in Section 2.4.

G.4 Land Use

No new land use is planned in association with continued storage of surplus plutonium, except possibly at the Pantex site. If upgrading of the storage facility at Pantex was required, it would take place on previously disturbed land and would have minimal impacts on existing land use plans.

G.5 Cultural and Paleontological Resources

No impacts on cultural or paleontological resources are expected from the continued storage of surplus plutonium.

G.6 Infrastructure

Detailed data on infrastructure for the current storage sites are presented in the Storage and Disposition Programmatic Environmental Impact Statement (S&D PEIS) (DOE 1996, Section 4.2). The infrastructure of the sites would be capable of supporting all anticipated missions and functions associated with continued storage.

G.7 Socioeconomics

As stated in the S&D PEIS (DOE 1996), under continued storage, the existing storage facilities at the sites would remain operational. No new employment or in-migration of workers would be required.

G.8 Aesthetics

Continued storage would not result in any adverse impacts to visual resources at the storage sites.

G.9 Reference for Appendix G

DOE (U.S. Department of Energy) 1996. *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement*. DOE/EIS-0229. Office of Fissile Materials Disposition, Washington, DC. Dec.

APPENDIX H:

ADDITIONAL IMPACTS OF THE PROPOSED ACTION

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ADDITIONAL IMPACTS OF THE PROPOSED ACTION

Appendix H discusses impacts[1] of constructing and operating the proposed Mixed Oxide (MOX) Fuel Fabrication facility, the Pit Disassembly and Conversion Facility (PDCF), and the Waste Solidification Building (WSB) that are not addressed in Chapter 4. Technical areas included in the appendix are geology, seismology, and soils; noise; ecology; land use; cultural and paleontological resources; infrastructure; and socioeconomics. Other impacts of construction related to human health risk, air quality, hydrology, waste management, deactivation and decommissioning, environmental justice, and cost benefit analysis are discussed in Chapter 4.

H.1 Geology, Seismology, and Soils

H.1.1 Construction

Construction activities for the proposed action would have no effects on geology or seismology at the Savannah River Site (SRS). For example, no deep well injection of wastewater would occur that could modify seismic activity.

The proposed facilities would be constructed entirely within F-Area on the SRS. F-Area occupies about 160 ha (395 acres) of land within the 80,292-ha (198,400-acre) SRS. Activities such as clearing, excavating, compacting, and grading during construction would physically disturb a total of about 41.9 ha (103.5 acres) of land (DCS 2002). Of this disturbed area, 10.6 ha (26 acres) would be permanently altered by construction of buildings, roads, and paved parking lots. Construction of the facilities would, therefore, disturb about 26% of the land in F-Area (about 0.05% of the land area available at the SRS). This impact would be small and temporary; remediation following construction would return about 60% of the disturbed land to its original condition. The 10.6 ha (26 acres) of land permanently altered by construction would represent about 7% of the land available in F-Area (0.01% of the land area at the SRS). Because the soils that would be affected by construction activities are not unique within the SRS and the disturbed and permanently altered areas would represent a small percentage of the land area available, physical impacts on soil would be small.

In addition to physical disturbance, soils could be chemically impacted during construction of the facility. For example, contaminated material from the construction site could be mobilized by runoff water or transported by wind, and accidental releases of contaminated material could adversely affect soils. However, because good engineering practices would be used during construction, sediment detention basins would be constructed, and any accidental spills would

[1] Terms used to categorize impacts are defined in Section 2.4.

be promptly cleaned up as required by the DCS's Spill Prevention Control and Countermeasures Plan, chemical impacts on soils would be small.

H.1.2 Operations

Normal operation of the proposed facilities would have no impact on geology or seismology at the SRS (e.g., there are no planned deep well injections of effluents that could modify seismic activity), but normal operation could have localized, minor effects on soil.

The 10.6 ha (26 acres) of land covered by buildings, roads, and parking lots (DCS 2002) would remain physically altered. This land area would represent about 7% of the land area available in F-Area (0.01% of the land area at the SRS). Because the soils that would be altered are not unique within the SRS and the areas represent only a small percentage of the land available, overall physical impacts of normal operations on soil would be localized and small.

In addition to the physical alteration of soil, soils in the vicinity of the facility could be chemically impacted during normal operations. For example, contaminated material from the site might be mobilized by runoff water or transported by wind. However, with the use of good engineering practices during normal operations, chemical impacts on soils would be small.

H.2 Noise

H.2.1 Construction

Equipment and vehicle operation would be the primary sources of noise during construction. Soil movement, land clearing, and excavation activities typically generate noise levels in the 85- to 90-dBA range at a distance of 15 m (50 ft) from the source (EPA 1974). Noise levels decrease 6 dB for each doubling of the distance from a point source (MPCA 2001). The boundary closest to the proposed MOX facility site is about 8.7 km (5.4 mi) away. Thus, construction of the proposed MOX facility would cause noise levels of about 30 to 35 dBA at the closest boundary location. A second construction site for the PDCF and WSB would add at most 3 dBA.

This noise estimate is likely to be an upper bound because it does not account for additional attenuation due to noise absorption in the air and the effects of terrain and vegetation. The 33- to 38-dBA level is below the U.S. Environmental Protection Agency (EPA) guideline of 55 dBA for protection of the public and is less than the levels found along roadways around the SRS by more than 17 dBA (Section 3.4.4). If two sound levels differ by 10 dBA or more, adding the lower level contributes very little to the upper level. Thus potential noise impacts from construction activities should be small at all off-site locations.

H.2.2 Operations

Noise sources during operation of the three facilities would include outdoor air conditioning systems, transformers, fans, pumps, and vents for emergency and standby diesel generators. Noise levels from interior sources are expected to be damped to imperceptible levels outside the proposed MOX facility buildings (DCS 2002). Employee vehicles, delivery trucks, and material-handling equipment would also produce noise.

No measurements of noise associated with facility systems were available. As an example, however, sound-level measurements taken during operation of a chemical weapons incinerator in Toole, Utah, were less than 73 dBA within 30 m (100 ft) of the facility's abatement equipment (Andersen 2000). Noise levels decrease 6 dB for each doubling of the distance from a point source (MPCA 2001). The closest boundary is about 8.7 km (5.4 mi) from the proposed MOX facility. On the basis of the 73-dBA value for the Utah facility, operation of the proposed MOX facility might result in noise levels of about 25 dBA at the closest boundary location. Operations at the PDCF and WSB would add at most 4 dBA, giving a maximum noise impact of about 29 dBA. This estimate is likely to be an upper bound, because it does not account for additional attenuation from absorption in the air and effects of terrain and vegetation. The 29-dBA level is below the EPA guideline of 55 dBA for protection of the public and is more than 20 dBA less than the noise levels occurring along roadways around the SRS (Section 3.4.4). As mentioned above, if two sound levels differ by 10 dBA or more, adding the lower level contributes very little to the upper level. Thus, potential noise impacts from operation of the facility should be small at all off-site locations.

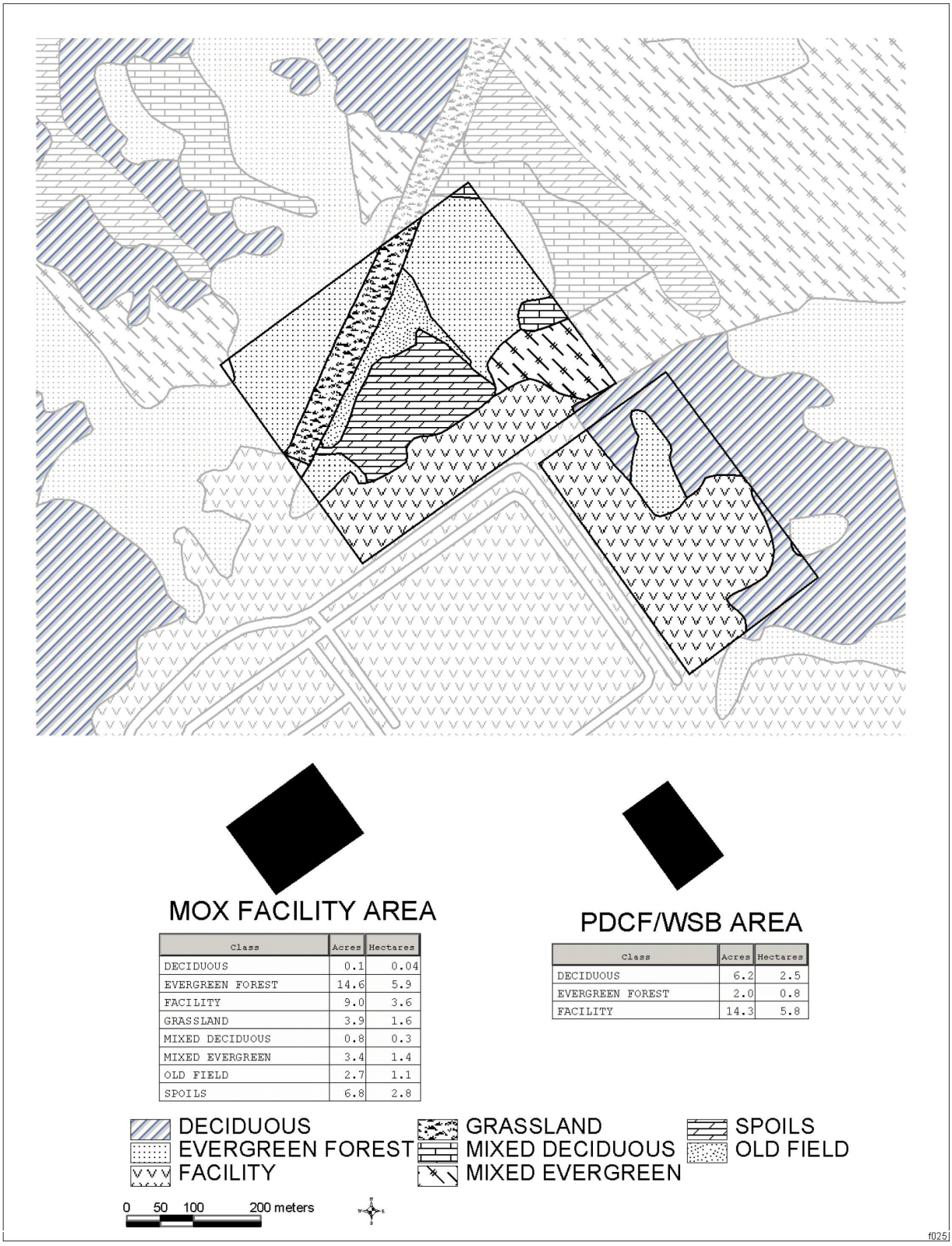
H.3 Ecology

H.3.1 Construction

H.3.1.1 Terrestrial

H.3.1.1.1 Vegetation

Impacts of facility construction to terrestrial resources would primarily result from the clearing and grading of the land for new facilities and infrastructure. A total land area of up to 50.0 ha (123.4 acres) would be affected by construction. About 26.2 ha (64.7 acres) would be cleared and graded within the areas designated for the proposed facilities (see Figure H.1). These site preparation activities would disturb 6.8 ha (16.9 acres) of pine forest, 1.4 ha (3.5 acres) of mixed pine forest, 0.3 ha (0.8 acres) of mixed deciduous forest, 2.6 ha (6.3 acres) of upland deciduous forest, 1.6 ha (4.0 acres) of grassland habitat, 1.1 ha (2.8 acres) of old field, 2.8 ha (6.9 acres) of spoils, and 9.5 ha (23.5 acres) of "facility" lands. An additional 3.6 ha (8.9 acres) would be graded around portions of the facility boundary. This grading would disturb mostly woodland vegetation. About 11.9 ha (29.5 acres) of the area within the facility site boundaries



Class	Acres	Hectares
DECIDUOUS	0.1	0.04
EVERGREEN FOREST	14.6	5.9
FACILITY	9.0	3.6
GRASSLAND	3.9	1.6
MIXED DECIDUOUS	0.8	0.3
MIXED EVERGREEN	3.4	1.4
OLD FIELD	2.7	1.1
SPOILS	6.8	2.8

Class	Acres	Hectares
DECIDUOUS	6.2	2.5
EVERGREEN FOREST	2.0	0.8
FACILITY	14.3	5.8

Figure H.1. Areas affected by facility construction activities.

would be developed with buildings, other facilities, and paving. The remainder of the areas would be landscaped (e.g., with grass) (DCS 2002). Thus, after construction, the proposed MOX and PDCF/WSB facility areas would be considered as part of the industrial/transportation land cover type, as described by DOE (2000b).

The maximum of 14.7 ha (36.4 acres) of woodlands cleared for the proposed facilities would be a comparatively small percentage of the 1,762 ha (4,350 acres) of timber harvested each year at the SRS. Furthermore, this annual timber harvest is only about 1% of the standing volume of commercial forest land at the SRS (DOE 2000b).

New, widened, and realigned roadways would be required for the facilities. Most of the roadways would be located within previously cleared road rights-of-way. However, about 2.0 ha (5.0 acres) of new roads would be located in two areas of evergreen forest. The existing storm-water outfall and drainageways would need to be relocated. New storm-water basins would likely be constructed southeast of the proposed MOX facility. The storm-water basin would be located within the area cleared and graded for the proposed MOX and PDCF/WSB facilities. The existing 0.2-ha (0.6-acre) F-Area storm-water basin would be graded and resized to create the new 0.6-ha (1.5-acre) MOX facility storm-water basin. Drainage from this storm-water basin would flow toward an unnamed tributary of Upper Three Runs Creek (see Figure 3.3). This storm-water basin would not be located within a designated wetland area. About 0.6 ha (1.5 acres) would be disturbed for the waste pipeline to the WSB. The pipeline would be located within the industrial/transportation land cover type. A portion of the 115-kV electric transmission line would need to be relocated. This relocation may occur within the area disturbed for the proposed MOX facility. Otherwise, an additional 4.5 ha (11.0 acres) may need to be disturbed for the relocation. The area for this relocation has not been specified, but it would probably be within upland wooded areas. Similarly, 4.0 ha (10 acres) could be disturbed for the batch plant and less than 3.8 ha (9.5 acres) for miscellaneous utilities along the perimeter road.

Other possible adverse construction effects to vegetation could include the localized deposition of dust and other particulate matter from the operation of vehicles and machinery. This deposition could inhibit photosynthesis and, if chronic, could kill affected plants. In addition, soil compaction caused by heavy machinery could destroy the ground flora and indirectly damage roots of trees (by reducing soil aeration and altering soil structure). These potential impacts would be localized in the areas immediately outside the facility site boundary.

H.3.1.1.2 Wildlife

The primary construction impacts on terrestrial wildlife would result from the temporary to permanent loss and alteration of up to 50.0 ha (123.4 acres) of habitat for the facilities and associated infrastructure. Clearing and grading prior to actual construction would have localized adverse effects on animal populations on the SRS. Less mobile animals (e.g., some reptiles, amphibians, and small mammals) within the project area could be destroyed during land-clearing operations. Before construction activities (including clearing) began, the site would be surveyed for nests of migratory birds to ensure that such species would not be

affected (DCS 2002). Larger and more mobile wildlife in the area would be disturbed by these activities and move to other available habitats.

Construction noise and human activity would cause additional impacts to wildlife. On the basis of noise level information provided in Section H.2, construction noise levels at about 122 m (400 ft) could still be as high as 80 dBA. This level of noise could startle or frighten birds and small mammals (DOE 2000a). Although noise levels would be relatively low beyond this distance, the occurrence of human activity could also displace some wildlife. Some wildlife might be driven from the area permanently, while others might become accustomed to these disturbances and return to the area. Generally, these disturbances would be short-term and localized (DOE 2000a). Increased traffic could also increase the number of animals killed while crossing roads.

Following construction, all but about 11.9 ha (29.5 acres) cleared and graded for the proposed facilities would be landscaped (e.g., grass with scattered bushes and small trees). This landscaping would provide habitat for some wildlife species (Mayer and Wike 1997). Clearing of 2.0 ha (5.0 acres) of evergreen forest for roadways would eliminate a minimal amount of wildlife habitat at the SRS. Overall, the adverse impacts of construction are expected to be limited to the immediate project vicinity and should not affect the viability of any wildlife populations at the SRS.

H.3.1.2 Aquatic

Construction of the facilities would eliminate a small storm-water basin located near the southern boundary of the proposed MOX facility. This basin is shallow with little vegetation and mostly bare shoreline, thus providing minimal value to wildlife. Its loss would not jeopardize any species at the SRS. Additionally, this loss would be compensated for by construction of the new storm-water basins. The new basins would potentially be a more viable aquatic habitat than the existing storm-water basin. No direct impacts to streams (such as rerouting or channelization) would result from facility construction. Water required for construction would be drawn from existing groundwater wells in F-Area (Section 4.3.3.2.1). Indirect aquatic impacts could occur if unprotected soils eroded into the unnamed tributary of Upper Three Runs Creek that is located adjacent to the construction site. Such erosion could increase stream sedimentation and turbidity, possibly degrading water quality and adversely affecting aquatic organisms. However, use of standard erosion-control techniques as required by the South Carolina Department of Health and Environmental Control (SCDHEC) would be implemented to minimize erosion and subsequent potential increases in turbidity to the unnamed tributary of Upper Three Runs (see Section 4.3.3.1.1).

H.3.1.3 Wetlands

Direct impacts (such as dredging or filling) to wetlands from facility construction would be small. Indirect impacts could occur if unprotected soils eroded into wetlands adjacent to the construction site and adversely affected hydrological and ecological conditions there. However,

erosion control techniques would be implemented to prevent construction-related runoff of soils (see Section 4.3.3.1.1). Careful attention to sediment and erosion control during site preparation and construction would protect wetland resources near the facility site (Wike and Nelson 2000). The impacts of construction on wetlands would be small.

H.3.1.4 Protected Species

Construction activities are not expected to have direct impacts on any of the federally listed species on the SRS because they have not been reported to occur in the areas to be disturbed by construction. Indirect impacts could occur to listed wildlife species from disturbance (e.g., noise and human presence). Also, clearing would eliminate habitat that could provide support to some of the species. In particular, the pine trees that would be removed could provide forage habitat for the red-cockaded woodpecker. However, the pines to be removed are a negligible portion of those present throughout the SRS. Also, the facility site is not located within either the red-cockaded woodpecker management area or the supplemental management area.

Transmission line rights-of-way provide suitable habitat for the smooth coneflower. Therefore, the right-of-way for the proposed MOX facility was surveyed, and no smooth coneflowers were observed. The U.S. Fish and Wildlife Service has concurred that the proposed action will not affect any resources under their jurisdiction (Duncan 2001).

Implementation of standard erosion-control practices would prevent potential impacts (see Section 4.3.3.1.1) to protected fish species (i.e., shortnose sturgeon) or wildlife species that utilize or forage in aquatic habitats (e.g., wood stork and American alligator) in potential suitable habitat in surface waters receiving runoff from the facility sites.

H.3.2 Operations

Within the facilities' boundaries and in most associated infrastructure areas, vegetation would be limited to landscaped lawns. A more diverse vegetation community (e.g., grassland/forb/ scrub-shrub land cover) would be maintained within the transmission line right-of-way.

Noise would probably be the most notable impact of routine operation of the facilities on wildlife and would be localized to within a radius of about 61 m (200 ft) of the facility. Scrubbers and filters would be used on the facilities, so no impacts to wildlife would be expected from airborne releases of contaminants (DCS 2002). The presence of the facilities would increase the potential of bird collisions with structures (Klem 1990). However, this source of bird mortality would not cause impacts at the population level.

No liquid process effluents would be directly released by operation of the PDCF and the proposed MOX facility. Liquid effluents would be treated at the WSB. There would be no impacts to aquatic or wetland biota from these effluents. Storm water would be collected and routed through the existing SRS NPDES-permitted outfall or new outfalls, and sanitary

wastewater would be treated in the sitewide treatment system (DCS 2002). Thus, adverse impacts to aquatic or wetland biota would be small. Detention ponds and associated drainage ditches would provide habitat that could support a number of wildlife species (Mayer and Wike 1997).

No adverse impacts to protected species would be expected from facility operations because of the suitable habitats and minimal facility releases to the environment. Habitat suitable for the smooth coneflower would develop within the rerouted segment of the transmission line right-of-way, but the potential for a population of that plant to develop in this area is remote.

H.4 Land Use

H.4.1 Construction

Up to 50 ha (123.4 acres) of F-Area would be disturbed during construction of the facilities. Land use of the entire F-Area at the SRS, including the areas of proposed construction for the facilities, is classified as developed/industrial. Thus, the proposed use of the project area is consistent with this classification and with the SRS Long Range Comprehensive Plan (DOE 2000b). No adverse effect to land use would result from construction of the facilities.

H.4.2 Operations

The proposed facilities are industrial, and their operation would be consistent with the classification of the F-Area land use as developed/industrial. Therefore, there would be no adverse effect to land use as a result of routine operation of the facilities.

H.5 Cultural and Paleontological Resources

H.5.1 Construction

H.5.1.1 Archaeological Resources

Construction of the proposed facilities would directly affect two prehistoric archaeological sites that are eligible for listing on the *National Register of Historic Places* (NRHP) (Sites 38AK546/547 and 38AK757). Data recovery plans detailing the proposed mitigation for the adverse impacts to Sites 38AK546/547 and 38AK757 have been prepared and accepted by the South Carolina State Historic Preservation Office (SCSHPO) (Gould 2001; Marcil 2001). Site 38AK546/547 was excavated according to the data recovery plan to mitigate the adverse effects to that site from construction of the proposed MOX facility. Data recovery for Site

38AK546/547 was completed April 19, 2002. Site 38AK757 was excavated according to its data recovery plan to mitigate the adverse effect to that site from construction of the PDCF. Data recovery for Site 38AK757 was completed September 15, 2002. Monitoring of fill removal on the sites during construction is also expected to occur as part of the planned mitigation (Gould 2002). Concurrence of the SCSHPO that these investigations have met the obligations set forth in the data recovery plans was provided in November 2002 (Long 2002).

Five additional eligible sites are located in the vicinity of the construction area (Sites 38AK106, 38AK155, 38AK563, 38AK564, and 38AK581), but no direct impacts to these sites are expected as a result of facility construction. Mitigation measures might be needed to avoid the possibility of indirect effects to these sites. Such measures could include conducting awareness training for workers so they would not inadvertently disturb the sites and possibly imposing restrictions regarding where heavy machinery is allowed. Mitigation might also include periodic monitoring to check for possible erosion caused by surface runoff during construction or evidence of other impacts resulting from an increase in F-Area activities (e.g., unauthorized pedestrian or vehicular activity at the archaeological sites). The potential exists for erosion to occur along the current drainage at the outfall east-northeast of the proposed facilities that may affect eligible sites (38AK106, 38AK563, and 38AK564). Minor erosion potential at another small drainage may affect Site 38AK581. Although direct impacts are not expected to Site 38AK155, the site is located very near an area previously identified as grading area for the proposed MOX facility. Depending on the final footprint of the grading and fill area for the proposed MOX facility, Site 38AK155 may require monitoring to ensure avoidance of the site to prevent any direct or indirect impacts from construction activities. An updated contour map of the proposed grading area was not available at the time this EIS was being prepared. A memorandum of agreement with the SCSHPO stipulating avoidance of the site and how it is to be implemented could be required. Specific mitigation measures would be determined in consultation with the SCSHPO.

H.5.1.2 Historic Structures

No structures are located in the facility project area; therefore, no impacts to historic structures would occur during the construction of the facilities.

H.5.1.3 Traditional Cultural Properties

No traditional cultural properties have been identified near the proposed facilities. Consultation with appropriate Native American groups has been initiated to request information on any concerns regarding the potential for the MOX facility to affect traditional cultural properties. Copies of the consultation letters are presented in Appendix B.

H.5.1.4 Paleontological Resources

No fossil-bearing strata are known to exist within the F-Area; therefore, no impacts to paleontological resources are expected during construction.

H.5.2 Operations

Archaeological resources are unlikely to be affected by routine operation of the facilities. Ground disturbance and outdoor activities outside of the original construction footprint are not part of routine operations.

Traditional cultural properties and paleontological resources are not known to be present in F-Area, and, thus, none would be affected during routine facility operations.

H.6 Infrastructure

H.6.1 Construction

Construction activities are not expected to adversely impact current SRS infrastructure. The maximum water and electrical power demands during construction of the facilities were estimated by DOE in the Surplus Plutonium Disposition Environmental Impact Statement (SPD EIS) (DOE 1999) and by DCS (DCS 2002). Electrical power needed during construction of the facilities is estimated to be 17,700 MWh/yr. This power represents only about 3.7% of the current electrical power available (482,700 MWh/yr) at the SRS (DOE 1999). Maximum water requirements are not projected to exceed 139 million L/yr (37 million gal/yr), or about 3.3% of the A-Area loop excess capacity.

No new off-site roads would be constructed or improved to bring construction materials or workers to the SRS from local communities. An additional 4.8 to 6.4 km (3 to 4 mi) of roadways would be necessary to support facility construction activities within the F-Area.

The existing SRS road network plus the additional roads in F-Area needed for construction site access can readily accommodate the additional traffic expected during construction of the facilities. Some workers are expected to carpool during construction. During peak construction and assuming all three facilities are constructed simultaneously, the increase in the number of average daily one-way traffic on the roads leading to F-Area is expected to be about 30%.

The total diesel fuel required for a 5-year construction period is estimated to be about 7,624,000 L (1,960,000 gal). On-site storage of this volume of fuel is not anticipated because the majority of diesel fuel would be used in construction equipment that would likely be refueled each day by tanker trucks.

The surplus plutonium disposition program at the SRS would require a coordinated upgrading of the infrastructure to support the proposed MOX facility, the PDCF, and the WSB (DCS 2002). A storm-water retention pond and a sedimentation basin will be developed to handle runoff from all three of these facilities that are planned to be constructed in the same general vicinity within the F-Area.

H.6.2 Operations

The SRS infrastructure would not be adversely affected by operations of the proposed facilities. Infrastructure for the facilities would be modified and upgraded before and during construction to accommodate operational needs. Electrical power required during operation of the proposed facilities is estimated to be 186,000 MWh/yr, or about 36.4% of the available electrical capacity in the F-Area (DCS 2002).

Service and process water usage in the F-Area is currently about 374 million L/yr (98.8 million gal/yr) (DCS 2002). The available capacity is 4.2 billion L/yr (1.1 billion gal/yr), and the annual water demand for facility operations would be about 76 million L/yr (20.1 million gal/yr). Water needs for the proposed facilities would represent about 2% of the excess A-Area loop capacity.

Fuel oil would be used to test the diesel generators that would provide emergency power for operations in the event of a failure of the electrical supply system. An estimated 430,100 L/yr (179,000 gal/yr) of diesel fuel would be needed for generator testing (DCS 2002; DOE 1999).

The traffic from 510 permanent workers traveling to and from the facility might cause some impacts during peak travel periods. Local roads providing access to the SRS and on-site roadways experience traffic congestion during peak commuter periods. If individuals elect to participate in carpools, the impact on traffic flow and volume would tend to be reduced.

H.7 Socioeconomics

H.7.1 Construction

This section discusses the potential socioeconomic consequences from constructing the proposed MOX facility, PDCF, and WSB at the SRS. The socioeconomic analysis includes the effects on employment, income, and regional growth in a 15-county regional economic area (REA) and on population, housing, and community resources in a 4-county region of influence (ROI). Impacts on traffic are provided for the road network in the vicinity of the SRS in Aiken County. Impacts from construction are summarized in Table H.1.

In addition to the impacts shown in the table, minor impacts would also occur to agriculture in the REA and commercial fishing downstream of the SRS as demand for the products of these

Table H.1. Effects of construction on socioeconomics[a]

Impact category	Impacts
Employment (number of jobs in REA)[b]	
Direct	1,010
Indirect	810
Total	1,820
Income (millions of 2003 $)	
Direct	51.0
Indirect	40.9
Total	91.9
Population (number of new ROI residents)	350
Housing (number of ROI units required)	130
Public Finances (% impact on fiscal balance)	
Cities in ROI[c]	<1
Counties in ROI[d]	<1
Schools in ROI[e]	<1
Public service employment (number of new employees in ROI)	
Police officers	1
Firefighters	0
General	2
Physicians	1
Teachers	1
Number of new staffed hospital beds in the ROI	1
Traffic (impact on current levels of service in Aiken County)	None

[a]Impacts are shown for the peak year of construction (2005).

[b]Employment data based on DCS (2002) and NNSA (2002).

[c]Includes impacts that would occur in the South Carolina cities of Aiken, Jackson, New Ellenton, North Augusta, Wagener, Barnwell, Blackville, Williston and the Georgia cities of Grovetown, Harlem, Augusta, Blythe, and Hephzibah.

[d]Includes impacts that would occur in Aiken and Barnwell Counties in South Carolina and in Columbia and Richmond Counties in Georgia.

[e]Includes impacts that would occur in Aiken County, Barnwell County #19, #29, #45, Columbia County, and Richmond County school districts.

industries increases with the growth in REA payroll and salary expenditures resulting from the construction of the facilities.

The potential socioeconomic impacts from constructing the facilities would be relatively small. Construction activities would create direct employment of approximately 1,010 people in the peak construction year and an additional 810 indirect jobs in the REA (see Table H.1). Construction activities would increase the annual average employment growth rate by less than 0.1 of a percentage point over the duration of construction. Facility employment and associated wages and salaries would also produce about $88 million of income in the peak year of construction.

In the peak year of construction, about 350 people would move to the ROI (in-migrate) (see Table H.1). However, in-migration would have only a marginal effect on population growth and would require only 2% of the vacant rental housing in the ROI during the peak year. No significant impact on public finances would occur as a result of in-migration, and five additional local public service employees would be required to maintain existing levels of service in the various local public service jurisdictions in the ROI. In addition, on-site employee commuting patterns would have no impact on levels of service in the local transportation network surrounding the site.

H.7.2 Operations

This section presents the potential socioeconomic consequences from operating the proposed facilities at the SRS. As for the construction evaluation, the socioeconomic analysis for operations covers the effects on employment, income, and regional growth in the 15-county REA and on population, housing, and community resources in the four-county ROI. Impacts on traffic are provided for the road network in the vicinity of the SRS in Aiken County. Impacts from operation are summarized in Table H.2.

In addition to the impacts shown in the table, insignificant impacts would also occur to agriculture in the REA and commercial fishing downstream of the SRS as demand for the products of these industries increases with the growth in REA payroll and salary expenditures resulting from the operation of the facilities.

The potential socioeconomic impacts from operating the facilities would be relatively small. Operational activities would create about 490 direct jobs annually and an additional 780 indirect jobs in the REA (see Table H.2). The facilities would produce $64 million in direct and indirect income annually during operations.

About 180 people would move to the area at the beginning of facility operation (see Table H.2). However, in-migration would have only a marginal effect on population growth and would require less than 1% of the vacant owner-occupied housing in the area during facility operations. No significant impact on public finances would occur as a result of in-migration, and two new local public service employees would be required to maintain existing levels of service in the various local public service jurisdictions in the ROI. In addition, on-site employee

Table H.2. Effects of operations on socioeconomics[a]

Impact factor	Impacts
Employment (number of jobs in REA)[b]	
Direct	490
Indirect	780
Total	1,270
Income (millions of 2003 $)	
Direct	24.6
Indirect	39.6
Total	64.2
Population (number of new ROI residents)	180
Housing (number of ROI units required)	70
Public finances (% impact on fiscal balance)	
Cities in ROI[c]	<1
Counties in ROI[d]	<1
Schools in ROI[e]	<1
Public service employment (number of new employees in ROI)	
Police officers	0
Firefighters	0
General	1
Physicians	0
Teachers	1
Number of new staffed hospital beds in the ROI	0
Traffic (impact on current levels of service in Aiken County)	None

[a]Impacts are shown for the first year of operations (2008).

[b]Employment data taken from DCS (2002).

[c]Includes impacts that would occur in the South Carolina cities of Aiken, Jackson, New Ellenton, North Augusta, Wagener, Barnwell, Blackville, Williston and the Georgia cities of Grovetown, Harlem, Augusta, Blythe and Hephzibah.

[d]Includes impacts that would occur in Aiken and Barnwell Counties in South Carolina, and in Columbia and Richmond Counties in Georgia.

[e]Includes impacts that would occur in Aiken County, Barnwell County #19, #29, #45, Columbia County, and Richmond County school districts.

commuting patterns would have no impact on levels of service in the local transportation network surrounding the site.

Any impacts that would occur with the transportation of MOX fuel, including impacts on property values, would be minimal. This conclusion is reached because it is likely that the current transportation of other hazardous materials and the risk of accidents involving those materials are already captured in housing values in the vicinity of transportation routes. An accident involving MOX fuel may only create significant additional impacts on the housing market if residents were prevented from quickly returning to their homes.

H.8 Aesthetics

H.8.1 Construction

During construction of the proposed facilities, large construction cranes and fugitive dust produced by earthmoving equipment may be visible to the general public from the nearest publicly accessible viewpoint, located on State Highway 125 and SRS Road 1, both more than 6.5 km (4 mi) away. Once the proposed facilities were constructed, however, the height, size, and appearance of the new structures would be similar to existing buildings adjacent to the F-Area site and would therefore maintain the industrial nature of F-Area and be consistent with the current VRM Class IV designation of the site. The newly constructed facilities themselves would not generally be visible from off-site, with visibility restricted by the undulating terrain and the forested nature of the landscape.

H.8.2 Operations

During operations, it is unlikely that any additional visual impacts would occur beyond those resulting from the presence of the facilities. Exhaust stacks located on or near the proposed facilities would not generally be visible to members of the public because of the undulating, forested nature of the landscape. While any emissions from these stacks, as well as other evidence of operations at each facility (such as area lighting), might be visible from the nearest viewing point, these aspects of facility operation would be some distance away and therefore would not affect the current VRM Class IV designation of the site.

H.9 Accident Impacts

H.9.1 Geology, Seismology, and Soils

Accidental releases of contaminated material might adversely affect soils. However, use of good engineering practices and implementation of appropriate cleanup procedures following the accident would result in small chemical impacts on soils.

H.9.2 Ecology

An operational accident at the facility could potentially impact biota in natural plant communities and streams near the facility. The degree to which impacts would occur would depend on the type of accident, kind and amount of contaminants released, and wind direction at the time of release. Natural areas likely to experience the greatest impact would be those located immediately north and northeast of the facility. Prompt action to clean up or otherwise mitigate contaminants released during an accident would reduce the likelihood of contaminant bioaccumulation and biomagnification in the food chain. No protected species are known to occur within these areas (see Section 3.5.4 and Appendix A).

H.9.3 Land Use

An operational accident at the facility would be unlikely to affect land use within the F-Area, the SRS, or the region. The entire F-Area would remain developed/industrial land use if an operational accident were to occur. Access to the area might be temporarily restricted during cleanup operations following an accident. Minor impacts to lands outside of the SRS might be anticipated in the event of a worst-case accident, but most impacts would remain within the SRS boundary. Future use of the central portion of the SRS, which includes the F-Area, is expected to be maintained by the federal government as industrial (DOE 2000b).

H.9.4 Cultural and Paleontological Resources

An operational accident at the facilities might affect significant archaeological resources in the vicinity of the project area by restricting access to sites that currently require regular monitoring. This impact would likely be temporary, depending on the duration of cleanup after the accident.

It is possible that important nuclear production facilities that have historic value related to events during the Cold War could be temporarily affected during an operational accident. It is also possible that traditional plant resources of concern to Native Americans could be affected during an operational accident. No other traditional cultural properties that could be affected have been identified to date but may be identified as a result of the ongoing consultation.

Paleontological resources are unlikely to be affected by an operational accident at the facilities.

H.9.5 Socioeconomics

An operational accident at the facilities could impact the workforce if the accident was severe enough to result in lost work time. The extent of impacts to the local economy would depend on employment income losses during closure of the facilities following an accident. An accident involving fresh MOX fuel during transport might create significant additional impacts on the housing market only if residents were evacuated and prevented from quickly returning to their homes.

H.10 References for Appendix H

Andersen, P. 2000. Personal communication from Andersen (EG&G, Toole, UT) to Y.-S. Chang (Argonne National Laboratory, Argonne, IL). Oct. 4.

DCS (Duke Cogema Stone & Webster) 2002. *Mixed Oxide Fuel Fabrication Facility Environmental Report, Revision 1 & 2*. Docket Number 070-03098. Charlotte, NC.

DCS 2004. *Mixed Oxide Fuel Fabrication Facility Environmental Report, Revision 5.* Docket Number 070-03098. Charlotte, NC. June 10.

DOE (U.S. Department of Energy) 1999. *Surplus Plutonium Disposition Final Environmental Statement*. DOE/EIS-0283. Office of Fissile Materials Disposition, Washington, DC. Nov.

DOE 2000a. *Savannah River Site High-Level Waste Tank Closure Draft Environmental Impact Statement*. DOE/EIS-0303D. Savannah River Operations Office, Aiken, SC. Nov.

DOE 2000b. *Savannah River Site Long Range Comprehensive Plan*. Savannah River Site, Aiken, SC. Dec.

Duncan, L. 2001. Letter from Duncan (U.S. Fish and Wildlife Service, Charleston, SC) to A.B. Gould (U.S. Department of Energy, Aiken, SC), June 30.

EPA (U.S. Environmental Protection Agency) 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. EPA-550/9-74-004. Washington, DC.

Gould, A.B. 2001. Letter from Gould (Director, Environmental Quality Management Division, DOE, Savannah River Operations Office, Aiken, SC) to N. Brock (Review and Compliance Coordinator, South Carolina Department of Archives and History, Columbia, SC). March 12.

Gould, A.B. 2002. Letter from Gould (Director, Environmental Quality Management Division, DOE, Savannah River Operations Office, Aiken, SC) to C. Long (South Carolina State Historic Preservation Office, Columbia, SC). Oct. 24.

Klem, D., Jr. 1990. "Collisions between Birds and Windows: Mortality and Prevention." *Journal of Field Ornithology* 6(1):120-128.

Long, C.C. 2002. Letter from Long (South Carolina State Historic Preservation Office, Columbia, SC) to A.B. Gould (Director, Environmental Quality Division, DOE, Savannah River Operations Office, Aiken, SC). Nov. 21.

Marcil, V. 2001. Letter from Marcil (Staff Archaeologist, South Carolina State Historic Preservation Office, Columbia, SC) to A.B. Gould (Director, Environmental Quality Management Division, DOE, Savannah River Site, Aiken, SC). April 11.

Mayer, J.J., and L.D. Wike 1997. *SRS Urban Wildlife: Environmental Information Document*. WSRC-TR-97-0093. Westinghouse Savannah River Company, Savannah River Site, Aiken, SC. May.

MPCA (Minnesota Pollution Control Agency) 2001. *An Introduction to Sound Basics*. Available at http://www.honoise.org/sndbasic/sndbasic.htm.

NNSA (National Nuclear Safety Administration) 2002. *Report to Congress: Disposition of Surplus Defense Plutonium at Savannah River Site*. Office of Fissile Materials Disposition, Washington, DC. Feb.

Wike, L.D., and E.A. Nelson 2000. Memo from Wike and Nelson to J.S. Roberts (Westinghouse Savannah River Company, Aiken, SC). March. 30.

APPENDIX I:

SCOPING SUMMARY REPORT

DOCKET 70-3098

ENVIRONMENTAL IMPACT STATEMENT SCOPING PROCESS

SCOPING SUMMARY REPORT

Mixed Oxide Fuel Fabrication Facility
Savannah River Site

August 2001

U.S. Nuclear Regulatory Commission
Rockville, Maryland

TABLE OF CONTENTS

ABBREVIATIONS

ADAMS	Agency wide Document Access and Management System
CAR	Construction Authorization Request
DCS	Duke Cogema Stone & Webster
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ER	Environmental Report
H&S	human health and safety
HEPA	high-energy particulate air
HLW	high-level (radioactive) waste
MINATOM	Ministry for Atomic Energy of the Russian Federation
MOX	mixed oxide
MOX FFF	Mixed Oxide Fuel Fabrication Facility
MT	metric tons
NEPA	National Environmental Policy Act
NAACP	National Association for the Advancement of Colored People
NMSS	Nuclear Material Safety and Safeguards (part of the Nuclear Regulatory Commission)
NRC	U.S. Nuclear Regulatory Commission
NOI	Notice of Intent
ROD	Record of Decision
SER	Safety Evaluation Report
SPD	surplus plutonium disposition
SRS	Savannah River Site
YMP	Yucca Mountain Project

1. INTRODUCTION

On March 7, 2001, the United States Nuclear Regulatory Commission (NRC) issued a notice of intent (NOI) in the *Federal Register* (66 FR 13794) to prepare an environmental impact statement (EIS). As indicated in the NOI, the proposed major federal action requiring the EIS is the construction and operation of a mixed oxide (MOX) fuel fabrication facility (MOX FFF) at the Savannah River Site (SRS) near Aiken, South Carolina. If authorized under the requirements of 10 CFR Part 70, Duke Cogema Stone & Webster (DCS), a contractor chosen by the United States Department of Energy (DOE), would build and operate the proposed MOX FFF. The EIS will examine the potential environmental impacts of manufacturing MOX fuel from surplus weapons-grade plutonium. The potential impacts associated with processing 36.4 tons (33 metric tons (MT)) of this surplus plutonium will be evaluated. The evaluation of these impacts will be based on the proposed maximum annual MOX FFF capacity of 3.5 MT.

Under the present technical review schedule, the EIS will be used to support a decision in 2002 by the NRC whether or not to authorize construction of the proposed MOX FFF. The current schedule is to publish the draft EIS in February 2002. Following a public comment period, the draft EIS would be revised, and a final EIS would be published in September 2002. No cooperating agencies have been identified during the scoping process. NRC, as the lead agency, will prepare the EIS with the assistance of Argonne National Laboratory.

In addition to the EIS for the MOX FFF, NRC will prepare two safety evaluation reports (SERs) on health and safety issues raised by the proposed action. The first SER will evaluate such issues raised by the construction authorization request submitted by DCS in February 2001. A second SER will evaluate health and safety issues raised by the DCS request for authority to operate the proposed MOX FFF, which DCS plans to submit in July of 2002. The SERs document our evaluation of the safety of DCS's applications and compliance with applicable regulations. As discussed later in Section 3, the EIS will analyze both construction and operation impacts.

In the NOI, NRC announced plans for two scoping meetings: one in North Augusta, South Carolina, on April 17, 2001, and another scoping meeting in Savannah, Georgia, on April 18, 2001. In a second *Federal Register* notice on April 11, 2001 (66 FR 18223), NRC announced that a third scoping meeting would be held in Charlotte, North Carolina, on May 8, 2001. Announcements of the meetings were also made on the World Wide Web at the NRC MOX FFF Information Home Page, (http://www.nrc.gov/NRC/NMSS/MOX), through an electronic newsletter, through radio advertisements, through press releases, and through direct mailing to individuals who had attended past meetings associated with MOX. Announcements of the meetings were also made in the following local newspapers:

- The Augusta Chronicle (Thursday, April 12, & Sunday, April 15)
- Aiken Standard (Thursday, April 12, & Sunday, April 15)
- North Augusta Star (Thursday, April 12, & Sunday, April 15)
- Savannah Morning News (Thursday, April 12, & Sunday, April 15)
- The State News, Columbia, SC (Sunday, May 6)
- The Charlotte Observer (Sunday, May 6)

The three scoping meetings were held as planned. At each meeting, the NRC staff distributed background materials on the MOX fuel program and NRC's plans for conducting licensing and environmental reviews for the MOX FFF. An open house held before each meeting provided attendees an opportunity to view informational materials and talk informally with NRC staff. During the meeting, the NRC staff presented an overview of NRC'S role in the MOX FFF licensing process and described NRC'S approach to meeting its obligations under the National Environmental Policy Act (NEPA). The presentations were followed by a question and answer period in which the NRC staff responded to questions from attendees. The majority of time at the meetings was devoted to allowing individuals to express their views on the scope of the EIS. Transcripts of the meetings can be viewed on the World Wide Web at the NRC MOX FFF Information Homepage (http://www.nrc.gov/NRC/NMSS/MOX).

A total of about 300 individuals attended the three scoping meetings, and about 80 of them asked questions or provided oral comments at the meetings. In addition, approximately 60 individuals or organizations submitted written comments to NRC by regular mail, fax transmittal, e-mail, or in person at the meetings. Some of the individuals who provided written comments also spoke at the meetings. Some individuals attended and offered comments at more than one meeting.

The public comments are discussed in Section 2 of this summary. All comments received through May 21, 2001, the date announced in the NOI for closing of the scoping period, were considered. Comments received after this date were considered to the extent possible in preparing this report. The comments have been categorized by subject under the following issue headings:

- NEPA Issues
- Policy Issues
- Alternatives
- Ecology, Air and Water
- Cultural Resources
- Cumulative Impacts
- Human Health Impacts
- MOX Fuel Processing
- Transportation Issues
- Waste Management
- Socioeconomics
- Security and Terrorism
- Environmental Justice
- Decommissioning vs. Deactivation
- SRS Infrastructure and Existing Conditions
- Reactor Use Issues
- Lead Test Assemblies

The scope of the EIS and summary of issues that will be addressed in the EIS are discussed in Section 3. Although issues raised during the scoping period will be considered in the preparation of the MOX FFF EIS, some of those issues will either be analyzed in less detail or will not be analyzed at all, depending on their relevance to the proposed action and the anticipated impacts. Issues that will be considered, but not analyzed in detail, are summarized in Section 4. The preliminary outline for the EIS is included as Attachment A.

2. SCOPING COMMENT SUMMARY

2.1 INTRODUCTION

Several commenters voiced their support for the MOX fuel option, stating that it was the best option for using excess plutonium. They cited the commercial MOX reactors in Europe along with an experimental MOX program in the United States as evidence that MOX technology is both safe and feasible. They also believed that converting the plutonium to MOX fuel would make it more difficult to recover the plutonium for future use in nuclear weapons than if it were disposed of by immobilization (i.e., conversion of surplus plutonium into plutonium oxide and then into a ceramic or glass form suitable for disposal in a geologic repository). These commenters also supported the SRS as the best location for the MOX FFF, citing experience, expertise, and existing infrastructure.

Although they were in favor of reducing quantities of weapons-grade plutonium, other commenters felt that the MOX program was not the best method for addressing non-proliferation. These commenters preferred immobilization or continued storage to the MOX alternative. These commenters believed that immobilization would offer the greatest deterrent to terrorism and felt that proceeding with the MOX project would lead to widespread reprocessing of spent nuclear fuel. Several commenters voiced their opposition to the project, but did not provide any basis or provide comments on the scope of the EIS.

Several commenters had specific questions or comments on the Environmental Report (ER) and Construction Authorization Request (CAR) prepared by DCS. These comments will be considered in NRC's review of the ER and in the preparation of the EIS and Safety Evaluation Report (SER).

The following summary groups the comments received during the scoping period, both at scoping meetings and through written submittals to the NRC, by technical area and issue.

2.2 SUMMARY of COMMENTS

2.2.1 NEPA Issues

Consideration of Reactor Use Impacts: A few people commented that NRC should limit the scope of the MOX FFF EIS to the environmental impacts of constructing, operating, and deactivating the MOX FFF. They believed that analyzing impacts of the reactors using the MOX fuel as part of the current MOX FFF EIS would create a "double jeopardy" for DCS in that the company would have to provide data twice: now for MOX FFF licensing and again during the license amendment process for the reactors in which the fuel was to be used. One commenter noted that in order to avoid being accused of segmentation (not looking at the full consequences of an action) the EIS must include reactor impacts in its analysis. Several commenters wanted a supplemental EIS to be prepared for the reactor sites if reactor impacts are not addressed in the MOX FFF EIS. Further discussion of reactor use impacts is provided in Section 2.2.16.

NEPA Coverage for Actions in a Foreign Country: A few commenters believed that the link between the U.S. and Russian programs is so strong that, under NEPA, the United States would be obligated to consider environmental impacts of MOX in Russia. One organization indicated that there was a precedent for conducting a NEPA analysis for a major federal action

having a significant impact in a foreign country. (No specific example was provided.) Another commenter stated that environmental impacts occurring outside the United States and within the borders of a sovereign nation are outside the scope of NEPA.

Supplemental EIS: Several commenters thought that DOE's Surplus Plutonium Disposition (SPD) EIS should be supplemented. They contended that the original EIS did not adequately address the need for the action and the alternatives and that DOE did not conduct an adequate life-cycle analysis of the all-MOX option and the all immobilization option. They maintained that if DOE does not prepare a supplemental EIS, NRC needs to evaluate the full range of alternatives related to the MOX program.

Proprietary Information: A few commenters wanted NRC to evaluate the harm to the public caused by withholding information labeled proprietary. They claimed that there was not enough technical information to adequately evaluate the CAR, especially with respect to health and safety. For example, a complete list of source terms was not available. They would also like to examine the types of information that can be categorized as proprietary.

Use of Existing DOE Documentation and Decisions: A few commenters wanted NRC to make full use of environmental documentation already prepared by DOE and avoid reevaluation of issues where DOE has already made a decision. This position includes adopting the DOE decision that the need for the MOX FFF has been established.

Additional Scoping Meetings: Several commenters asked for additional scoping meetings: at reactor sites, along transportation routes, and specifically at Columbia, South Carolina. In addition, several commenters asked that the scoping period be extended beyond the May 21 deadline.

Communicating Information to the Public: A number of people commented on NRC's efforts to communicate information to the public. There were complaints that ADAMS (Agency wide Document Access and Management System), the system that NRC uses for viewing documents, is not user friendly and that since it was implemented the local public reading rooms at nuclear power plants were eliminated. These commenters felt NRC should provide a computer at the NRC reading room and that the CAR and ER should be made available free of charge. One commenter asked for more informational meetings before the draft EIS is issued. Another commenter wanted NRC to indicate how it will handle distribution of MOX information to the public in the future. A request was made for NRC and DCS to define terms such as "highly unlikely" and "unlikely" and to involve the public in determining the appropriateness of these definitions.

2.2.2 Policy Issues

Price Anderson: The Price-Anderson Act limits the liability of organizations in the event of an incident involving nuclear materials. A commenter asked NRC to put a license condition on the MOX fuel project that MOX fuel cannot be covered by Price-Anderson. A commenter wanted the EIS to include a full disclosure of who is legally (and financially) responsible for MOX fuel accidents, including transportation impacts and reactor accidents.

NRC's Role as Lead Agency: A commenter stated that NRC was too closely tied to the nuclear power industry to impartially evaluate the plutonium fuel project. A commenter stated the belief that NRC receives funding from this regulated community and, at times, acts as an

advocate for nuclear power. A commenter asked that NRC support an independent review of DOE's plutonium work, as recommended by the National Research Council in March 1988.

NRC Experience and Precedent: Several commenters thought that NRC was not qualified to regulate and oversee weapons-grade plutonium. They contended that there is no precedent for NRC to analyze reactor impacts as part of a licensing action for a fuel fabrication facility.

Conflict of Interest: A few commenters expressed concern that NRC may not be sufficiently independent from DOE to review the DCS application. Another commenter asked if using Argonne National Laboratory (a DOE Laboratory) as the contractor preparing the NRC EIS represented a conflict of interest.

Agency Interactions: Some commenters thought that the interactions of NRC, DOE, SRS, and DCS should be considered, particularly in terms of their regulatory roles. One commenter thought the EIS should address the question of who owns the MOX fuel at each stage of the process. Commenters were particularly concerned because both DOE and NRC have regulatory roles related to waste disposal. A commenter wanted to know which agency would have jurisdiction over the waste at each stage of the MOX process. Another commenter stated that the commercial and military nuclear waste materials should remain separate.

Non-Proliferation: A comment was made that the United States should reevaluate its non-proliferation agreement with Russia. A commenter argued that MINATOM (Ministry for Atomic Energy of the Russian Federation) intends to take money from the United States and other western countries and build a plutonium fuel infrastructure and export plutonium fuel.

Another commenter thought that the EIS should consider the proliferation impacts of constructing a MOX FFF, which (according to the commenter) violates a long-standing U.S. policy of separating civilian use and military applications of nuclear technology. According to this commenter, MOX would encourage other countries to develop reprocessing, which would have serious non-proliferation consequences. The possible use of the .polishing. portion of the facility for missions other than purifying plutonium for MOX use was also a concern.

Savannah River Site (SRS) Cleanup Funds: Some commenters wanted the EIS to consider the impacts of recent cuts in cleanup and restoration funds to the SRS. One commenter viewed this as the transfer of funds from the SRS cleanup to plutonium production.

Changes in Project Direction: Some commenters wanted the EIS to consider the impacts that would result if the proposed pit disassembly facility was canceled in favor of using existing infrastructure at the SRS. Another commenter felt that this issue had been adequately explored in the DOE SPD EIS and that NRC should be limited to evaluating the cumulative impacts of this related action.

A commenter asked that the EIS consider the impacts of building a MOX facility and then indefinitely suspending or canceling its use if the Russian political situation changes. Another commenter wanted the EIS to determine the cost of the MOX project if the Russian program were canceled.

Some commenters wanted the EIS to assess the impacts on the MOX program caused by delaying immobilization, in particular the impacts of indefinitely storing the plutonium. Commenters were also concerned that delaying or canceling the immobilization project could lead to greater quantities of MOX fuel.

A commenter thought the EIS should consider the environmental impacts of new reprocessing missions at the SRS that could be triggered by the MOX project. A commenter noted that commercial reprocessing is proposed in legislation in Congress and that the current ban is being reviewed by the Bush administration.

International Implications/Treaties: A commenter pointed out that there were several international treaties that must be identified and analyzed for impacts of MOX commercialization in the United States, including the Nuclear Non-Proliferation Treaty of 1968, the Stockholm Declaration on the Human Environment, and the Law of the Sea Convention.

2.2.3 Alternatives

No-action - Continued Storage: Some commenters wanted NRC to fully develop and advance the No-action Alternative. They pointed out that the Bush administration has questioned the U.S. government's commitment to a dual track approach to plutonium disposition and that it is not clear that the MOX program will go forward in Russia. Furthermore, the immobilization program has been postponed. Given this situation, the MOX program could be subject to continued review, making status quo (continued storage) a likely No-action Alternative. Therefore, some commenters wanted the EIS to consider the implications of the SRS becoming a long-term storage facility for the nation's surplus plutonium if the MOX program did not proceed.

One commenter wondered if adopting the No-action Alternative would be a tacit (indirect) way of saying that the MOX process cannot be done safely. Some commenters wanted NRC to explore the effect the No-action Alternative would have on proliferation and acts of terrorism.

No-action - 100 Percent Immobilization: Several commenters wanted the EIS to consider the costs and programmatic requirements of a 100 percent immobilization alternative. They believed that this was a viable alternative if the MOX project was not licensed. A few commenters specifically thought the EIS should consider (1) cost savings from not pursuing the MOX program, (2) the short- and long-term storage and monitoring requirements of plutonium pits and oxides until immobilization is complete, and (3) decreased waste volumes as compared to the MOX process. Another commenter felt that considering a 100 percent immobilization alternative would be inappropriate since DOE has already set surplus plutonium disposition policy.

One commenter wanted the alternatives to include building an immobilization (vitrification) plant at the Nevada Test Site to minimize transportation distances and maximize distances to population centers.

Conversion of All Surplus Plutonium to MOX Fuel: A few commenters wanted the EIS to consider the impacts of an all-MOX alternative. Many commenters wanted the EIS to be very specific in the quantity of plutonium that would be converted to MOX fuel. These commenters believe that addressing the quantity generically or leaving it open ended could lead to widespread reprocessing of spent nuclear fuel. A commenter wanted the EIS to consider a range of plutonium quantities for processing, suggesting that the amount may ultimately be greater than the 50 metric tons specified by the SPD EIS.

Range of Alternatives: A few commenters wanted to restrict the scope of the NRC EIS to the Proposed Action, the No-action Alternative, siting alternatives within the F-Area, and a reasonable range of MOX FFF design alternatives. They also stated that the official statement

of proposed action and no-action should be broadened to include the issuance of a license to possess and use special nuclear material at the MOX Fuel Fabrication Facility. Other commenters wanted to make sure that the no-action alternatives were considered viable options. That is, the no-action alternatives should be defined so that the EIS could select a no-action alternative and not just do an analysis because it was required by law.

The Parallex Project: Some commenters stated that the No-action Alternative from NRC could mean 100 percent immobilization and immobilization has already been delayed. These commenters wanted the EIS to consider the possibility that DOE would export the surplus plutonium to Canada under the Parallex Project. [Note: The Parallex (parallel experiment) Project would be a joint agreement between Russia, Canada, and the United States to demonstrate the feasibility of burning MOX fuel in a heavy-water-moderated reactor, located at Chalk River, Ontario. The project would use MOX fuel made in the United States and Russia from surplus weapons-usable plutonium out of both countries' nuclear stockpiles.]

Aqueous vs. Dry Purification Process: Some commenters wanted NRC to evaluate both the wet and the dry plutonium purification processes. The analysis should include a cost/benefit analysis that weighs the effectiveness of the process against the costs, the effects the impurities have on the MOX fuel use, waste streams, quantities of waste, etc.

Contingency Issues: One commenter wanted to make sure that the impacts of unusable MOX fuel were assessed, noting that historically MOX production has exceeded use and that if the MOX fuel is stored too long, the plutonium converts to americium, which ruins the reactivity.

2.2.4 Ecology, Air, and Water

Surface Water Impacts: One commenter pointed out that the choice of F-Area for the MOX facilities would probably hasten whatever impacts there would be to Upper Three Runs Creek. The commenter wanted the impact analysis to consider the current conditions of the F-Area, pointing out that it was already contaminated.

Groundwater Quality: A number of commenters expressed concerns about potential contamination of groundwater by plutonium, especially since there are a number groundwater aquifers beneath the F-Area. The Floridian aquifer was specifically mentioned. The point was made that there is already existing groundwater contamination from radioactive releases (primarily tritium) from the SRS (communities downstream from the SRS in both South Carolina and Georgia have already been affected; tritium has been found in wells and surface water). Commenters pointed out that there is the potential that liquid radioactive waste generated by the MOX process, which would contain plutonium, would be stored in the same tanks that "caused" the tritium releases. One commenter pointed out that plutonium studies at the Nevada Test Site and at West Valley in New York have shown that plutonium has migrated much faster than predicted. A commenter wondered if the contaminated water would move between the soil and aquifers via the deep rock borings at the SRS.

Several commenters were concerned that any further contamination of the Savannah River could push the ecosystems "over the edge" and cause serious long-term consequences for human health and the economy that depends on resources from the river. They stated that existing water quality in the Savannah River, and Georgia in general, is compromised and that according to U.S. Environmental Protection Agency (EPA) data the Savannah River is already among the 10 most contaminated rivers in the country.

One commenter wanted the EIS to look at the effects of radioactive storm-water runoff on the ecology of the surrounding area. This commenter thought that storm-water runoff from retention ponds should be captured, not released to creeks.

HEPA vs. Sand Filters: Several people commented on the decision to use high-efficiency particulate air (HEPA) filters instead of sand filters for air filtration in the MOX facility. The point was made that the SRS prefers sand filters which are more efficient, safer and more reliable than HEPA filters. They wanted the EIS to consider the use of sand filters in its analysis.

Air Emissions: A commenter stated that the EIS should look at all air contaminants released by the MOX process, how contaminants will be removed and scrubbed from the air stream, and the probable path of contamination spread through the air. Other commenters noted that over the years, tritium had been released through the air pollution stacks and had fallen back to Earth as radioactive tritiated water, which contaminated the region's well water and agricultural products. One commenter questioned why the MOX FFF would be exempted from the National Emission Standards for Hazardous Air Pollutants as was suggested in the ER prepared by DCS. Another commenter stated that the EIS should consider air emissions from the emergency generators and volatile organic compounds from diesel storage tanks.

Tidal Wetlands: Some commenters were concerned about impacts to tidal wetlands along the Georgia coast, stating that they represent about one-third of the remaining tidal wetlands along the Atlantic shore of the United States. A commenter noted that in addition to ecological impacts, there is the potential for economic impacts to fisheries and other natural marine resources, as high as $1 billion annually.

General Ecological Impacts: Several commenters felt the ecological impacts were very important and that the EIS should look at the ecological impacts of the proposed facility. One commenter suggested using an ecological system upstream from the site as a benchmark; other commenters stated the impacts to endangered species and habitat should be re-evaluated given the changes to MOX design from what was presented in the DOE SPD EIS, in particular the changes in the waste streams and incremental volumes of waste.

2.2.5 Cultural Resources

One commenter thought the EIS should discuss the impacts of having deadly radioactive wastes in proximity to ancient cultural archeological sites. Another commenter questioned how cultural resources could be managed without a programmatic memorandum.

2.2.6 Cumulative Impacts

Some commenters wanted cumulative impacts to consider all existing (baseline) contamination and future actions at the SRS. Another commenter suggested that this should include all the auxiliary facilities associated with the MOX project. Chemical as well as radiological impacts should be evaluated. One commenter noted that any radioactive contamination of natural resources could have a cumulative adverse effect on businesses that rely on natural resources. Another commenter noted that cumulative build up of contaminated sediments could directly impact human health. It was noted that the Savannah River is currently among the 10 most contaminated rivers in the country and that further contamination would "push the ecosystem over the edge." A commenter thought cumulative impacts would be the appropriate place to consider the impacts on existing SRS infrastructure if construction of the pit disassembly facility was canceled.

2.2.7 Human Health Impacts

Safety Record: Several people expressed concern that DCS did not have an environmental and safety compliance record specific to DCS; there were only individual records for Duke, Cogema, and Stone & Webster. Commenters thought that it was inappropriate for DCS to use the safety data from the Westinghouse contract site. They pointed out that DCS has not established a safety culture; probability assessments and reliance on the fact that nothing bad has happened yet do not prove acceptability. Commenters wanted the EIS to evaluate Cogema's safety record in Canada and France.

Risk Determination: A commenter wanted the degree of uncertainty associated with the risk calculations used in models to be included, especially when data used to support the models were not based on weapons grade plutonium. Another commenter wanted the health-based standards to be based on EPA's 1 in 1 million accepted deaths rather than the 1 in 10,000 allowed by NRC.

Radiation Hazards: A commenter stated that in addition to looking at cancer fatalities, the EIS should address noncancer effects resulting from ionizing radiation exposures, such as immune deficiencies and genetic defects. A commenter thought that accident impacts should consider radiation exposure impacts to all individuals (including children, the unborn, the sick, and the elderly), not only the "standard man."

A commenter wanted the EIS to assess the dose to workers that would result from the MOX process. The analysis should include every worker involved: those at the MOX facility, workers at nuclear laundries, workers at reactor sites, workers at waste disposal sites, etc. A few commenters wanted to know what measures would be taken to protect MOX construction workers from the existing contamination at the MOX site.

Chemical Hazards: A commenter wanted the EIS to include the health effects of chemical exposure both during normal conditions and accident scenarios. The EIS should consider the fact that there will be a radioactive component to the chemical exposure.

Emergency Preparedness: Several commenters were concerned that DCS had not prepared an emergency management plan for the MOX facility. According to commenters, DCS claimed that a plan was not needed because its models showed that the public radiation dose during a major accident would be within regulatory limits. These commenters wanted the EIS to address the implications of running the MOX program with and without an emergency management plan.

A few commenters wanted the EIS to address the SRS Emergency Management Plan. One commenter expressed concern about impacts to the public from a rupture of a high-level waste tank containing MOX waste.

One commenter wanted to be assured that the SRS would communicate safety related information to the public in a timely manner. According to this commenter, there had been a situation where SRS had failed to warn the public about a tritium release that came downstream from the site.

Some commenters thought that the EIS should evaluate the impacts (costs) of having to upgrade the emergency response equipment and train emergency responders in the communities surrounding the SRS and the reactors and along transportation routes. One

commenter made the point that many of the emergency responders are volunteers. Some commenters wanted the EIS to identify the capabilities of local, regional, and national medical facilities to manage acute and long-term casualties resulting from an accidental release. It was noted that medical facilities along transport routes are seldom adequately equipped to treat radiation victims.

A few commenters thought that using computer models to predict possible releases was inadequate and wanted the EIS to include the costs of purchasing and maintaining monitoring equipment on-site and off-site out to 40 miles. This would include monitoring of air, ground, water, vegetation, and livestock. The instrumentation should cover all forms of radiation, including alpha. A commenter stated that it was in the public's interest to know the measured amount of radiation as opposed to a calculated amount.

One commenter stated that an iodized prophylaxis, which could be used to prevent thyroid damage (including cancer), had been approved by the NRC. This commenter wants sufficient quantities to be in place in the event of an accidental release from the MOX FFF. (Note: An iodized prophylaxis is a non-radioactive form of iodine that is administered before exposure to saturate the thyroid and prevent the later uptake of any airborne radioactive iodine that might be dispersed in a nuclear accident. Any additional iodine that is later inhaled or ingested is eliminated by the kidneys.)

Accidents Related to the MOX Process: A commenter wanted the EIS to discuss the worst-case scenario for an accident related to plutonium processing and the safety factors that would be used to protect the public. All the consequences, not just the probability-weighted risks from accidents, need to be considered. Doses to populations as well as to individuals should be provided. Another commenter thought that the EIS should analyze the impacts caused by a criticality accident due to dust accumulation in the air ducts. There was a comment that the accident analyses should include a plutonium fire, given that plutonium is highly flammable in several of its states. A few commenters wanted the EIS to consider the impacts of accidents involving ruptures or explosions of the tanks used to store liquid radioactive waste. One commenter stated that power outages to the tanks could eventually lead to conditions that could cause the tanks to explode.

Other Accident Issues: Some commenters felt that accident analyses in DOE's EIS were inadequate and that detailed accident analyses should be done for the MOX FFF EIS.

Commenters expressed concern that the design basis earthquake assumed by DCS was not as severe as the one normally assumed by DOE for the SRS; this could also be true for the high winds or tornado design basis. A commenter felt that corners were being cut by using less stringent parameters.

A commenter wanted the EIS accident analyses to include scenarios like plane crashes, insider sabotage, missile attacks, truck bombings, the facility dropping into a sinkhole (there are soft zones near the MOX FFF location), and events happening in other nearby areas that could cripple the facility. One commenter wanted the EIS to provide details on the most probable accident.

One commenter thought that human error should be considered in accident analysis, noting that hazards in nuclear power plants are a combination of human and technical errors and that human failings cannot be completely eliminated by using engineering controls.

2.2.8 MOX Fuel Processing

Concerns were raised about the safety of the proposed design for the MOX FFF, in particular the sintering (baking) process that converts the MOX fuel pellets to a ceramic form. Commenters felt that the design for furnace confinement did not adequately protect the public from a plutonium release. A commenter stated that heating the plutonium in an inert atmosphere that contains some hydrogen could result in a hydrogen burn or an explosion if certain controls were violated. Commenters pointed out that similar work at the SRS is carried out in glove boxes, which provides additional containment in case of an accidental release.

A commenter wanted NRC (and the DOE) to conduct a thorough review of all MOX fuel specifications and quality control procedures. This commenter stated that failure to do so would compromise nuclear safety. In addition, the specifications and procedures must be provided to the public.

2.2.9 Transportation Issues

General Transportation Issues: A commenter wanted to know what security measures will be taken to protect the public during MOX fuel transport. In addition, the commenter also wanted the EIS to look at the impacts of transporting the surplus plutonium and the uranium hexafluoride gas to the SRS and of transporting the spent fuel to the storage facility. One commenter asked if the current transportation casks would work for the MOX spent fuel rods.

Some commenters wanted to know how the transport of nuclear materials related to the MOX project would affect traffic and emergency vehicles and if certain highways (specifically Highway 73) would be closed during transport.

A commenter asked what corporate entity would be responsible for the transport of MOX fuel through North and South Carolina and if they would be exempt from liability insurance for transport as they are exempt from liability in operations under Price-Anderson.

A few commenters believed it was not appropriate for NRC to rely on the DOE transportation analyses.

One state agency wanted NRC to consider their comments on the DOE Surplus Plutonium Disposition Final EIS (DOE/EIS-0283) when conducting the MOX FFF EIS analysis and safety review, particularly with respect to transportation and emergency preparedness.

Risks from Transportation Accidents: Some commenters thought that the EIS should evaluate the impacts of transportation accidents on communities in the transportation corridors. Impacts from both truck and rail accidents should be included. In addition to human health impacts, the effects on homes, schools, churches, etc. need to be considered.

One commenter wanted to make sure the transportation risk analysis was put in the proper perspective; for example, the exposure to the public in the event of an accident would be equivalent to that of a dental x-ray. Transportation risks should be compared to those of an exploding gas truck (again, for perspective). DOE's transportation statistics should be compared to those from the Department of Transportation.

2.2.10 Waste Management

Wastes Associated with the MOX FFF: Several commenters expressed concerns about high activity alpha liquid radioactive wastes resulting from the aqueous process that is proposed for removing gallium and other unwanted material from the weapons-grade plutonium. Commenters wanted the EIS to look at the types of wastes produced by this process (solid, liquid, and gaseous), waste storage, treatment, and ultimate disposal; they also wanted details included on the radiological and chemical character of the waste.

There were concerns that not enough waste tanks exist at the SRS to store the large quantities (estimates were as high as 81,000 gallons annually) of liquid radioactive waste that would be generated. One commenter suggested that the existing liquid waste (35 million gallons) be vitrified. Another asked if there would be liquid waste storage tanks dedicated to the MOX FFF.

High-Level Waste: A few commenters raised concerns over waste material supposedly leaking from high-level waste (HLW) storage tanks at the SRS. One commenter noted that 95 percent of the HLW generation from 2000 to 2070 would be from the SRS and wanted the EIS to determine what percentage will be from the plutonium processing facilities.

Low-Level Waste: One commenter stated that NRC must consider the fact that North Carolina will soon be excluded from using the Barnwell site for low-level waste disposal.

Wastes Associated with Converting DUF_6 to DUO_2: A commenter requested that the EIS consider wastes associated with converting depleted uranium hexafluoride to depleted uranium dioxide.

Spent Fuel Storage: Several commenters were concerned that a final waste site for spent fuel rods has not been determined and that reactor sites currently have spent fuel rods with no place to go. The EIS should address the impacts from the storage of spent MOX fuel at the reactor sites.

Secondary Wastes: A commenter wanted the EIS to include the chemical and radiological character, quantities, treatment methods, and destination of waste produced by the treatment of the original waste (secondary waste). The details should be comparable to those used for primary waste.

2.2.11 Socioeconomics

Economic Effects of Radioactive Contamination on Natural Resources: Some commenters wanted the EIS to assess the economic damage that would result from any radioactive contamination of natural resources. They maintained that the contamination would have a lasting, possibly cumulative, adverse effect on businesses that would not be solved by "cleanup" alone. A commenter pointed out that the economy of the Savannah region was very dependent on natural resources. According to this commenter, about one out of five jobs is related directly or indirectly to natural resources: commercial and recreational fishing, tourism, and seafood processing. About $1 billion in business is associated with these industries; even a reduction of 1 percent would be $10 million.

Cost/Benefit Analysis: Some commenters thought that a full cost/benefit analysis of the MOX program should be conducted, including use of MOX as a fuel. The analysis should extend beyond the usual "region of influence" to include national and international impacts as well. The analysis should also be looked at from the perspective of the taxpayer. A national-scale study of costs of the MOX program should be prepared as a report to the General Accounting Office.

Several commenters wanted the EIS to consider the cost of using MOX fuel in a reactor. They stated that Cogema in France recently admitted that the reactor fuel made with separated plutonium was three to four times more expensive than the conventional fuel made with low-enriched uranium. They also pointed out that the cost of using blended highly enriched uranium is lower, as would be the cost for mined uranium, and even uranium processed from the sea.

Costs of the MOX Program: A commenter noted that over the past four years, the estimated cost of the MOX program has doubled. The concern was that in a risk/benefit culture the environment is often compromised to keep expenses down. This commenter did not want the environment to "take the hit" for higher costs.

Electricity Rates: A commenter wanted the EIS to assess costs associated with the MOX program. There were concerns that project cost overruns would be passed on to consumers in the form of rate increases, as has happened, according to the commenter, in the past with the Vogtle nuclear power station.

Government Subsidy of Nuclear Power: A commenter was concerned about the impacts that "yet another" subsidy (funding) of nuclear power would have on the whole energy economy. Would the utilities be paid twice for the same kilowatt hour, once by taxpayers and again by ratepayers? That is, the taxpayers would be paying to produce the MOX fuel, and ratepayers would still be charged the same for electricity from fuel paid for by them (taxpayers). This commenter thought that the plutonium fuel subsidy would give an unfair advantage to nuclear energy suppliers in contrast to the nationwide effort to create a level playing field for energy producers. Also, the subsidy would put other sustainable energy technologies (solar and fuel cells) at a disadvantage. A comment was made that the MOX program no longer had a non-proliferation mission; it was really a subsidy to build a fuel infrastructure in this country using non-proliferation funds.

Land value: Some commenters wanted the EIS to consider the economic impacts on landholders along transportation routes. This would include transportation during all phases: delivery of the surplus plutonium to the SRS; transport of the MOX fuel to the reactors; and transport of the spent fuel to the repository.

2.2.12 Security and Terrorism

Many commenters were concerned about the increased threat of terrorism that would result from the transport of weapons-grade plutonium. A comment was made that the MOX program causes unnecessary transportation of nuclear material, thereby increasing the risk of accident or interception by terrorists. Commenters suggested that both the Proposed Action and the No-action Alternatives should look at the environmental and human impacts resulting from an act of terrorism, including the detonation of a nuclear weapon. One commenter suggested that the EIS should evaluate both foreign and domestic terrorism. Another felt that NRC regulations governing security were inadequate.

Some people thought that immobilization was the best technology for making weapons-grade plutonium less attractive to terrorists. Their arguments included the following: (1) immobilized plutonium would still be highly radioactive, thus making it more theft proof; (2) MOX fuel is very vulnerable to theft since it is not highly radioactive; the plutonium can be separated chemically and is still weapons grade; and (3) plutonium processing cannot properly account for all the plutonium that passes through the fuel cycle; incremental amounts can be systematically removed and used to make terrorist weapons. Other commenters felt that converting the surplus plutonium to MOX fuel was the more effective means of making it unavailable to terrorists.

2.2.13 Environmental Justice

General Comment: One commenter indicated that the National Association for the Advancement of Colored People (NAACP) would be monitoring the environmental justice part of the MOX project carefully. Another commenter pointed out that most African American workers in the area are a captive workforce since few companies are willing to move near the SRS; the same is true for poor whites. Some commenters suggested that the environmental justice analysis in the EIS evaluate the decision making to locate the proposed MOX FFF in the South.

Communicating Information: Concern was expressed that information related to the MOX project was not reaching the African American community. It was suggested that information be conveyed directly via their churches or the NAACP rather than expecting people to search the *Federal Register* for information.

Applicable Geographic Area: One commenter stated that it was not clear how environmental justice would be used in the decision making process. Some commenters thought that the geographic area considered for environmental justice should include communities both downwind and downstream of the MOX FFF. It should also include communities along transportation routes and near reactors. One commenter questioned why NRC had changed the region of analysis from a 4-mile radius to 50-mile radius from the MOX facility. Another commenter encouraged NRC to apply the guidance of the NMSS Policy and Procedures Letter 1-50, Rev 2, “Environmental Justice in NEPA Documents,” to its MOX FFF EIS. According to this commenter, the document recommends that a 4-mile radius be used for evaluating Environmental Justice when a facility is in a rural area; evaluations beyond this distance are not warranted.

Subsistence Fishing: A few commenters stated the EIS should consider the effects of radioactive contamination on subsistence fishing. A commenter stated that people of modest income often depend on fishing local rivers for a greater proportion of their nutrition. This could lead to a situation where impacts to surface water could result in a greater than average risk to those modest income individuals.

Civil Liberties: A commenter expressed a general concern about the effects that the use of MOX fuel would have on civil liberties in local, regional, national, and international communities. Infringements on the civilian population due to the security necessary to guard the plutonium was specifically mentioned.

2.2.14 Decommissioning vs. Deactivation

Some commenters thought that the EIS should analyze the impacts of MOX FFF decommissioning (not just deactivation) and any site remediation following decommissioning. Issues such as how the closure and removal will be funded need to be addressed. The terminal facility condition should be compared to its present condition. The NRC should have regulatory responsibility for the facility through the entire project life, including decommissioning. One commenter felt that consideration of decommissioning impacts at this time would be too remote and speculative, pointing out that since the CAR called for the MOX facility to be turned over to DOE at the conclusion of the contract and prior to decommissioning, decommissioning should not be within the scope of the MOX FFF EIS.

2.2.15 SRS Infrastructure and Existing Conditions

Infrastructure: Several people wanted the EIS to address MOX FFF impacts on existing infrastructure. Some commenters wanted the EIS to consider the impacts of processing weapons-grade plutonium at a 50-year-old site with reported cracks in the concrete. There were also commenters who thought the EIS should compare the impacts of the MOX FFF being a dedicated site (including waste storage tanks) to those associated with using existing SRS infrastructure.

Existing Conditions: One commenter thought that the description of existing conditions at the SRS should include the status of all nuclear materials on site, with a discussion of criticality issues.

2.2.16 Reactor Use Issues

General: A commenter noted that in order to avoid being accused of segmentation (not looking at the full consequences of an action) the EIS must include reactor impacts in its analysis. Other commenters wanted assurance that the MOX FFF EIS would be specific to the reactors actually designated to use the MOX fuel and would not ultimately be transferable to all United States reactors. They indicated that, if reactor impacts are not specifically addressed in this EIS, that EIS's should be performed for each reactor site prior to allowing use of MOX fuel.

Another commenter stated the prospect of analyzing reactor impacts as part of the current MOX FFF EIS would create a double jeopardy for DCS in that the company would have to provide data twice: now for MOX FFF licensing and then again during the license amendment process for the reactor.

Reactor Program Licensing and Implementation: A commenter wanted to know what the impacts would be if the Duke reactor license expired before the MOX fuel was used, if the reactors could not meet licensing requirements, or if Duke decided to shut its reactors down early because they were too expensive to run. A commenter wanted the EIS to consider the impacts that would result if the reactor portion of the MOX program was never implemented. Another commenter asked if the MOX FFF EIS would consider impacts of using MOX fuel and the revisions to the existing operating licenses at the Catawba and McGuire plants.

Plutonium Purification: A commenter asked that the EIS assess the impacts on the environment from imperfect gallium removal and the potential of the fuel's "falling apart in the reactor." This commenter noted that both the dry and the aqueous process for removing impurities from the weapons-grade plutonium have their faults . the aqueous process is environmentally destructive (it creates large quantities of high-level alpha liquid waste) and the dry process does not remove gallium as effectively. The tolerance level for gallium in the fuel should be determined.

Use of MOX Fuel in Reactors: Many commenters wanted the EIS to include a thorough investigation of the impacts of using weapons-grade plutonium in commercial reactors. Several commenters wanted the analyses to be specific to the reactor designs at the Catawba and McGuire plants. Commenters contended that weapons-grade plutonium has never been fabricated into fuel before and has never been used in a commercial reactor. They felt it was inadequate to use the MOX program experience in Europe as an analog in safety and performance analyses because the plutonium for MOX fuel in the European reactors comes from spent fuel from nuclear reactors, not weapons-grade plutonium. It was pointed out that the plutonium from dismantled weapons contains a different mix of isotopes than plutonium obtained from reprocessing spent fuel. It was also stated that the experience with low-enriched uranium fuel was not directly applicable because of the different mix of plutonium in that type of fuel and because of differences in performance of the two fuels. The commenters wanted NRC to evaluate the performance of the MOX fuel made specifically with weapons-grade plutonium at the concentrations proposed by DCS.

A few commenters stated that the DOE SPD EIS had already specifically evaluated the use of MOX fuel in the McGuire Nuclear Station and Catawba Nuclear Station reactors, which are the proposed mission reactors. They stated additional evaluations would be more appropriately made at the time of reactor operating license amendment application and that including reactor impacts in the MOX FFF EIS would delay the MOX FFF licensing process, increasing government costs with no commensurate benefit to public health and safety.

Thermal Pollution: Some commenters were concerned about the impacts of thermal pollution from reactors using MOX fuel. They stated that since the temperature in MOX fuel will be hotter, more ice and water will be needed for cooling and the temperature of water at Lake Norman will increase. One commenter maintained that this hotter water is changing the ecology, even down to the microscopic level of the food chain. This commenter stated that even now Lake Norman is warm enough for at least one alligator to survive.

Evacuation Issues: Many commenters were concerned about whether the population could be evacuated in time, should an accidental release occur. Traffic on the exits to Interstate 77 around Lake Norman was mentioned as being particularly bad; exit 28 was also mentioned. Another commenter felt that evacuation plans should go beyond the 10-mile radius that the NRC mentions in its publications.

Risks from Reactor Accidents: Several commenters stated that DOE's Surplus Plutonium Disposition EIS addressed generic reactor impacts rather than those specific to the Duke Power reactors that would be using the MOX fuel. They wanted reactor design-specific impacts to be addressed, rather than addressing the accident impacts generically.

Some commenters expressed concern that reactors used at Catawba and McGuire posed a greater likelihood for an accident than did other types of reactors currently in use in this country. Of particular concern were safety issues related to the use of ice condensers for cooling and

the so-called "eggshell" containment at Catawba and McGuire. The point was made that ice condenser reactors lack steel-reinforced containment domes. In addition, a commenter pointed out that there had been violations involving Duke Power's failure to ensure that ice condenser inlet doors would be able to open if needed, and a forced outage could occur due to a blocked flow channel in portions of the ice condenser.

Comments were made that the Duke Power reactors were already suffering from embrittlement (a condition that causes materials to break without bending). There were concerns that the MOX fuel would cause a higher rate of embrittlement because it burns at such high temperatures. A more specific comment focused on analyzing accident consequences due to loss of power (including backup power) at the reactors.

One commenter pointed out that a severe accident at the Catawba reactors could result in a 25 percent increase in the latent cancer fatalities downwind of the reactor, resulting in anywhere from hundreds to thousands of additional cancer deaths. Another commenter wanted the EIS to consider the impacts of using plutonium fuel rather than uranium oxide fuel. A commenter stated that even DOE has admitted that the operation of nuclear power plants with plutonium fuel rather than uranium oxide fuel increases the deaths in certain accident scenarios. According to a commenter, one accident scenario had 8 percent more deaths from use of plutonium fuels rather than uranium fuel; another had 14 percent.

2.2.17 Lead Test Assemblies

Some commenters wanted NRC to fully provide and review all procedures for the fabrication of the lead test assemblies, including review of all the facilities involved, their records, quality control procedures, and the transport implications.

3. SCOPE OF THE EIS AND SUMMARY OF ISSUES TO BE ADDRESSED

The NEPA (Public Law 91-90, as amended), and the NRC's implementing regulations for NEPA (10 CFR Part 51), specify in general terms what should be included in an EIS prepared by the NRC. Regulations established by the Council on Environmental Quality (40 CFR Parts 1500-1508), while not binding on the NRC, provide useful guidance.

Pursuant to 10 CFR § 51.71(a), in addition to public comments received during the scoping process, the contents of the draft EIS will depend in part on the December 2000 environmental report submitted by DCS. Pursuant to 10 CFR § 51.71(b), the draft EIS will consider major points of view and objections concerning the environmental impacts of the proposed action raised by other Federal, State, and local agencies, and by any affected groups of Native Americans. Pursuant to 10 CFR § 51.71(c), the draft EIS will list all Federal permits, licenses, approvals, and other entitlements which must be obtained in implementing the proposed action, and will describe the compliance status with these requirements. Any uncertainty as to the applicability of these requirements will be reflected in the draft EIS.

Pursuant to 10 CFR § 51.71(d), the draft EIS analysis will include a consideration of the economic, technical, and other benefits and costs of the proposed action, and alternatives to the proposed action. In the draft analysis, due consideration will be given to compliance with environmental quality standards and regulations that have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection, including any applicable zoning and land-use regulations and water pollution limitations or requirements

established or imposed pursuant to the Federal Water Pollution Control Act. The environmental impact of the proposed action will be considered in the draft analysis with respect to matters covered by such standards and requirements regardless of whether a certification or license from the appropriate authority has been obtained. Compliance with the environmental quality standards and requirements of the Federal Water Pollution Control Act (imposed by the United States Environmental Protection Agency or designated permitting states) is not a subject for and does not negate the requirement for NRC to weigh all environmental effects of the proposed action, including the degradation, if any, of water quality, and to consider alternatives to the proposed action that are available for reducing adverse effects. While satisfaction of NRC standards and criteria pertaining to radiological effects will be necessary to meet the licensing requirements of the Atomic Energy Act, the draft analysis will, for the purposes of NEPA, consider the radiological effects of the proposed action and alternatives.

Pursuant to 10 CFR § 51.71(e), the draft EIS may include a preliminary recommendation by the NRC staff respecting the proposed action. Any such recommendation would be reached after considering the environmental effects of the proposed action and reasonable alternatives, and after weighing the costs and benefits of the proposed action.

The scoping process summarized in this report helped to determine the scope of the MOX FFF EIS and identified the significant issues to be analyzed in depth. For instance, in response to comments received during the scoping process, the EIS will evaluate the potential impacts of using sand filters instead of HEPA filters, and the potential impacts of using both wet and dry plutonium purification processes in manufacturing MOX fuel. Other options may be identified and analyzed. The EIS will also evaluate the degree to which impacts would vary depending on where within the SRS F-Area the proposed MOX FFF may be located. This will include consideration of surface water impacts as suggested by a commenter. Cumulative impacts of the proposed action will be addressed in detail.

The No-action Alternative, not licensing the MOX FFF, was also refined through the scoping process. In addition to the potential environmental impacts of the proposed action, the EIS will evaluate two no-action alternatives: (1) continued storage of all of the surplus weapons-grade plutonium at the present DOE sites in an unaltered form; and (2) immobilizing all of the surplus weapons-grade plutonium at the SRS site. Other alternatives may be identified and analyzed during the preparation of the draft EIS.

Issues to be analyzed in depth pertain to the construction, operation, deactivation and decommissioning of the MOX FFF, and transportation of fresh MOX fuel. Ordinarily, an NRC environmental impact statement also discusses in detail the need for the proposed action. Here, however, DOE has already addressed the need for the MOX FFF (*see* Section 2.2 of the DCS Environmental Report), and the EIS will reference the purpose and need analyses performed by DOE pursuant to NEPA. Impacts associated with transportation of materials to the SRS for the purpose of manufacturing MOX fuel, impacts of converting the depleted uranium, impacts of reactor use of MOX fuel, and the transportation and disposal of spent MOX fuel will be discussed. The EIS will recognize previous NEPA analyses performed by the DOE, including (1) the *Surplus Plutonium Disposition Final Environmental Impact Statement* (SPD EIS) (DOE/EIS-0283); *(2) Final Programmatic Environmental Impact Statement for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride* (DOE/EIS-0269); *(3) Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye*

County, Nevada (YMP EIS) (DOE/EIS-0250D); and (4) the Supplement to the Draft YMP EIS (DOE/EIS-0250D-S). Discussion of impacts associated with the two No-action Alternatives will be based largely on the SPD EIS.

Our goal in writing the EIS is to set forth the impact analyses in a manner which is readily understandable by the public. Decisions and the rationale for those decisions will be described in sufficient detail early in the EIS. Significant impacts will be discussed in greater detail in the body of the EIS. Topical areas whose impacts are less significant will be discussed in appendices to the EIS, with an explanation of why they were found to be less significant. This should allow readers of the body of the EIS to focus on issues that were important in reaching the conclusions of the EIS. The following topical areas and issues will be analyzed in the EIS:

- ***Geology and Seismicity*.** The EIS will describe the geologic and seismic characteristics of the proposed site. Evaluation of the potential for earthquakes, ground motion, soil stability concerns, surface rupturing, and any other major geologic or seismic considerations that would affect the suitability of the proposed site for the construction of the MOX FFF will be addressed primarily in the construction SER and summarized in the EIS. The EIS will not, however, evaluate the safety aspects associated with these site characteristics which will be addressed in the SER.

- ***Hydrology.*** The EIS will assess the potential impacts of the proposed project on surface water, storm-water runoff, and groundwater resources including the Floridian aquifer. The assessment will consider water resources, water quality, water use, flood plains, and the probable maximum flood (the largest flood that is likely to occur). The environmental mobility of the significant radionuclides, including plutonium, will be assessed. The EIS will not, however, evaluate the safety aspects associated with these site characteristics which will be addressed in the SER.

- ***Air Quality.*** Potential air quality impacts of the proposed project will be evaluated in the EIS. The evaluation will include potential impacts resulting from construction activities and operation (both with HEPA filters and sand filters) and will compare the anticipated air quality impacts, if any, with relevant standards.

- ***Ecology.*** The EIS will assess the potential environmental impacts of the proposed facility on ecological resources, including wetlands, plant and animal species, and threatened or endangered species and critical habitat that may occur in the area. As appropriate, the assessment will include potential effects on wildlife migration patterns; mitigation measures to address adverse impacts will be analyzed.

- ***Land Use.*** An analysis of impacts of accidents on existing land use along transportation corridors will be conducted. The EIS will also discuss the impacts of the MOX FFF on future land use on the SRS.

- ***Cultural Resources.*** The EIS will assess potential impacts of the proposed project on the historic and archaeological resources of the area. The EIS will also describe the programmatic framework of how cultural resources are evaluated at SRS and for the MOX FFF.

- ***Transportation.*** As discussed above, the transportation impacts of shipping MOX feedstock to SRS and shipping spent MOX fuel to a geologic repository will be discussed. The EIS will contain an analysis of potential impacts resulting from the transportation of fresh MOX fuel, and will assume (for purposes of ensuring that NEPA's objectives are met) that one or more commercial power reactors will later be authorized to use MOX fuel. Accordingly, the EIS will consider relevant aspects of both rail and truck transport of the fuel from the proposed MOX facility to the Catawba and McGuire reactors. The EIS will discuss the number, type, and frequency of shipments, as well as routing considerations and the quantities of MOX fuel being shipped. The impacts of transportation will be evaluated primarily in terms of radiological exposure risk to the population during normal transportation (including handling, transfer, and inspection) and under credible accident scenarios. The non-radiological impacts of transportation will also be identified and evaluated. The impacts on the usability or level of service of the roads, particularly near the SRS (such as Highway 73), will also be evaluated.

- ***Infrastructure.*** The EIS will address issues related to availability and adequacy of the infrastructure at the SRS such as waste treatment, and utility services to handle the needs of the proposed facility. The EIS will also consider impacts from any upgrades to these infrastructure.

- ***Waste Management.*** Waste management was identified as a significant issue by many commenters. The EIS will document the quantities, types, treatment, and disposal of the various potential waste streams. The EIS will also consider the impacts of storage of waste, such as the impacts on the existing high level waste tanks at SRS. The EIS will analyze the incremental impacts of MOX FFF wastes to existing facilities at SRS and at other DOE and non-DOE facilities. The EIS will evaluate the impacts of wastes generated at the MOX FFF either specifically or through incorporation of reference material from existing NEPA documents that analyze the overall waste management impacts at the SRS.

- ***Socioeconomics.*** The socioeconomic issues that fall within the scope of the EIS include the direct and indirect economic impacts on city, county, and school district revenues and expenditures, property values, residential and commercial development, housing, and public services in a four county region surrounding SRS. In addition, the economic effects on employment (including agricultural employment), unemployment and income in a 15-county region will be evaluated. These would include potential economic impacts to commercial fishing downstream of SRS. The EIS will include an analysis of the impacts on these resources that would result from the construction and operation of the proposed facility. National level impacts will be discussed under cost-benefit analysis.

- ***Environmental Justice.*** Potential for disproportionately high or adverse human health or environmental impacts on the minority and low-income populations will be evaluated and discussed at the census block level. Environmental justice will not be evaluated in detail along transportation routes because of the uncertainty associated with routing.

- ***Aesthetics.*** The EIS will analyze the visual impacts from the MOX facility being constructed in the F-Area at the SRS.

- ***Human Health Impacts.*** The potential human health impacts of the proposed facility on the workers and the general public will be evaluated for normal operations (including handling, transfer, and inspection activities) and under accident conditions. Potential exposures to radioactive elements and to chemicals will be considered. Both cancer and non-cancer health effects will be evaluated, as appropriate. Calculations for the general public account for sensitive populations as well as normal healthy adults. Models, assumptions, and supporting data used to develop the impacts from these potential exposures will be clearly described. The SER will assess the impacts associated with all credible accidents at the proposed facility, both from natural events and human activities. The EIS will analyze the potential environmental impacts resulting from bounding credible accidents at the proposed facility.

  Emergency preparedness and environmental monitoring were raised as significant issues by several commenters. The need and extent for emergency preparedness and environmental monitoring, in context of the EIS, would be considered as mitigation measures for potential impacts. These issues may be discussed in the EIS to the extent that they are required as mitigation measures. Emergency preparedness and environmental monitoring will be addressed in greater detail in the operation SER .

- ***Decommissioning.*** The December 2000 Environmental Report (ER) submitted by DCS considered only deactivation. Evaluating the impacts of decommissioning was identified during the scoping process as a significant issue and is required by NEPA. The EIS will evaluate the impacts of deactivating and decommissioning the proposed MOX FFF.

- ***Cumulative Impacts.*** The EIS will analyze the potential cumulative impacts of the proposed facility when added to other past, present, and reasonably foreseeable future actions. This will include impacts from auxiliary and infrastructure facilities associated with the MOX project. It will also include impacts to resources such as the Savannah River.

- ***Unavoidable Adverse Environmental Impacts.*** A discussion will be provided on the potential environmental impacts that could not be avoided if the proposed action were to be implemented.

- ***Irreversible and Irretrievable Commitment of Resources.*** The irreversible and irretrievable commitment of resources, including land use, materials, and energy will be discussed. Potential waste minimization and pollution prevention activities and mitigation measures will be discussed.

- ***Cost/Benefit Analysis.*** The EIS will include a cost/benefit analysis that summarizes the environmental and other costs and benefits of the proposed action.

- ***Compliance with Applicable Regulations.*** The EIS will present a listing of the relevant permits and regulations that are believed to apply to the proposed facility.

Pertinent proprietary information, although not available to the public, will be reviewed by the NRC in preparing the SERs and the EIS. As indicated above, all available documentation generated by DOE and other agencies that is related to dispositioning of surplus weapons-grade plutonium and MOX fuel production will be used, as appropriate.

4. ISSUES CONSIDERED PERIPHERAL, OUTSIDE THE SCOPE OF THE PROPOSED ACTION, OR COVERED BY PRIOR ENVIRONMENTAL REVIEW

Issues raised during the scoping period for the MOX FFF EIS are summarized in Section 2. Section 3 outlines the subjects and issues that will be addressed in depth in the EIS. Issues raised during the scoping period have been considered in the preparation of this scoping report and are reflected in Section 2. As discussed below, certain issues will not be addressed in depth in the EIS. Major categories of these issues and the reasons for not analyzing them in detail in the EIS are explained below. In general, these issues are not directly related to the assessment of potential impacts from the proposed major federal action now under consideration. The lack of in depth discussion in the EIS, however, does not imply that an issue or concern lacks value. Issues beyond the scope of the EIS may be appropriately discussed and decided in other venues. For example, many commenters were concerned about the lack of a safety record for DCS. This issue will be addressed in the SERs.

4.1 PREVIOUS DOE DECISIONS

A number of commenters requested that the SPD EIS prepared by DOE be supplemented and many of the decisions already made by DOE be revisited. Because the scope of the MOX FFF EIS is limited to the licensing action now under review by NRC, which is specific to the MOX FFF, issues pertaining to decisions already made by DOE will be addressed by referencing the appropriate DOE analysis.

4.2 INTERNATIONAL AGREEMENTS AND NATIONAL, STATE, OR LOCAL LAWS, STATUTES, AND REGULATIONS

Comments that seek to alter international treaties or affect national, state, or local laws, statutes, or regulations (e.g., comments that asked to alter Price-Anderson Act limits) will not be addressed, because they do not pertain to reasonably foreseeable impacts arising from the proposed construction and operation of the MOX FFF.

4.3 REACTOR USE OF MOX FUEL

Comments on the scope of assessing reactor use impacts in the EIS for the MOX FFF were varied (see Section 2.2.16). The NRC will consider the environmental impacts resulting from the use of MOX fuel, pursuant to 10 CFR Part 51, if and when nuclear power plant operators apply for a license amendment to use such fuel. Nevertheless, since a MOX FFF is expected to fabricate fuel for use in one or more nuclear power reactors, it is reasonable to consider the impacts of reactor use as an indirect impact in the EIS. At this time, NRC is aware that two plants, McGuire and Catawba, are considering using MOX fuel under the DOE program. The NRC is aware that DOE has analyzed the reactor use impacts of MOX fuel in its SPD EIS. Scoping comments related to reactor use impacts that were determined to be beyond the scope of this EIS will be forwarded to the appropriate NRC offices.

4.4 COST AND READINESS TO RESPOND TO EMERGENCIES

A number of commenters requested that the MOX FFF EIS analyze the impacts of having to upgrade the emergency response equipment and retrain emergency responders in the communities around the SRS, at the reactors, and along transportation routes. Other commenters requested that the EIS identify capabilities of local, regional, and national medical facilities to manage the casualties resulting from potential accidental releases and assess the readiness of communities to evacuate certain areas along the transportation routes in case of an accident. The human health impacts of potential accidents will be analyzed in the EIS. However, the costs associated with emergency preparedness and capabilities of local, regional, and national communities to respond to emergencies will not be analyzed, because such impacts are not specific to the proposed action. It is not anticipated that activities related to the proposed action will require any emergency response capabilities among communities beyond what they already have for similar purposes. Issues related to general emergency preparedness of communities are outside the scope of this EIS.

4.5 POTENTIAL DELAYS IN DOE PROGRAMS

Several commenters wanted to know what would happen if the DOE programs related to weapons-grade plutonium disposition and the opening of the HLW repository were delayed. Any such potential delays are either speculative or do not clearly affect the licensing review of the MOX FFF by the NRC. Unless it is reasonably foreseeable that a change in a DOE program or that of any other federal agency (e.g., a formal decision either has been announced or is expected to be announced soon) will have a substantive effect on the licensing of the MOX FFF, the EIS process will continue as scheduled, and the impacts of potential delays will not be analyzed in the EIS.

4.6 IMPACTS FROM TERRORISM

Many commenters raised a number of different issues concerning terrorism. However, the EIS will not address the impacts of terrorism, because these impacts are not considered to be reasonably foreseeable as a result of the proposed action.

4.7 IMPACTS OF ACTIONS IN THE RUSSIAN FEDERATION

All activities in the Russian Federation related to manufacture of MOX fuel from Russian-origin weapons-grade plutonium as part of an agreement between that country and the United States are being undertaken by the Russian authorities. They are not subject to NEPA and, therefore, will not be analyzed in the EIS.

4.8 PROPRIETARY INFORMATION

NRC will evaluate all pertinent proprietary information in its decision to grant authorization to construct the MOX FFF and to grant a license to DCS to possess special nuclear material. However, by law, NRC has to protect the proprietary information from public disclosure. Therefore, proprietary data will not be released to the public.

Attachment A

Preliminary Outline for the Mixed Oxide Fuel Fabrication Facility EIS

Summary

Table of contents, Glossary, and list of acronyms

1.0 Purpose of and Need for proposed action

1.1 Introduction
1.2 Description of the Proposed Action
1.3 Need for the Proposed Action
1.4 Scope of the EIS
1.5 Scoping Process
1.6 Cooperating Agencies
1.7 Other State and Federal Agencies
1.8 References

2.0 Proposed Action and Alternatives to the action

2.1 Proposed Action
2.2 No-action Alternative
- 2.2.1 Immobilization of all Surplus Plutonium
- 2.2.2 Continued Storage of Surplus Plutonium at Present DOE Sites

2.3 Proposed Action - Description of Mixed Oxide Fuel Fabrication Facilities and Processes
2.4 Comparison of Alternatives
2.5 References
2.6 Preferred Alternative

3.0 Affected Environment

3.1 General Site Description
3.2 Geology, Seismology, and Soils
- 3.2.1 Geology
- 3.2.2 Seismology
- 3.2.3 Soils

3.3 Hydrology
- 3.3.1 Surface Water
- 3.3.2 Groundwater

3.4 Meteorology, Emissions, Air Quality, and Noise
- 3.4.1 Meteorology
- 3.4.2 Emissions
- 3.4.3 Air Quality
- 3.4.4 Noise

4.2.3 Emissions, Air Quality, and Noise
4.2.4 Ecology
4.2.5 Land Use
4.2.6 Cultural and Paleontological Resources
4.2.7 Transportation
4.2.8 Infrastructure
4.2.9 Waste Management
4.2.10 Human Health Risk
4.2.10.1 Radiological Risk
4.2.10.2 Chemical Exposure and Risk
4.2.11 Socioeconomics
4.2.12 Environmental Justice
4.2.13 Aesthetics

4.3 Proposed Action - Operation Impacts
(Routine and Accident subheadings will be used where appropriate in the following sections)
4.3.1 Geology, Seismology, and Soils
4.3.2 Hydrology
4.3.3 Emissions, Air Quality, and Noise
4.3.4 Ecology
4.3.5 Land Use
4.3.6 Cultural and Paleontological Resources
4.3.7 Transportation
4.3.8 Infrastructure
4.3.9 Waste Management
4.3.10 Socioeconomics
4.3.11 Human Health Risk
4.3.11.1 Radiological Risk
4.3.11.2 Chemical Exposure and Risk
4.3.12 Environmental Justice
4.3.13 Aesthetics

4.4 Transport of Fresh MOX Fuel
(Routine and accident impact subheadings will be used as appropriate in the following sections; some topics may not require analysis)
4.4.1 Geology, Seismology, and Soils
4.4.2 Hydrology
4.4.3 Emissions, Air Quality, and Noise
4.4.4 Ecology
4.4.5 Land Use
4.4.6 Cultural and Paleontological Resources
4.4.7 Transportation
4.4.8 Infrastructure
4.4.9 Waste Management
4.4.10 Human Health Risk
4.4.10.1 Radiological Risk
4.4.10.2 Chemical Exposure and Risk
4.4.11 Socioeconomics
4.4.12 Environmental Justice
4.4.13 Aesthetics

4.5 No-action
(Routine and Accident impacts associated with the two No-action Alternatives will be based on the results provided in the DOE SPD EIS and will be presented in summary form)
4.5.1 Immobilization of All Surplus Plutonium
4.5.2 Surplus Plutonium Remains at DOE Sites

4.6 Indirect Effects

4.7 Deactivation and Decommissioning

4.8 Cumulative Impacts

4.9 Unavoidable Adverse Environmental Impacts

4.10 Irreversible and Irretrievable Commitments of Resources
4.10.1 Land Use
4.10.2 Materials
4.10.3 Energy
4.10.4 Waste Minimization and Pollution Prevention

4.11 Cost-Benefit Analysis

4.12 Mitigating Actions

4.13 References

5.0 Environmental Regulations and Permits

6.0 List of Preparers

7.0 Substantive Comments on draft EIS and Staff Responses (to be included in final EIS)

8.0 Index

9.0 Appendices

Appendix A - Ecology
Appendix B - Consultation Letters
Appendix C - Transportation
Appendix D - Socioeconomics
Appendix E - Radiological Analysis

APPENDIX J:

PUBLIC COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT AND NRC RESPONSES

APPENDIX J:

PUBLIC COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT AND NRC RESPONSES

J.1 Overview

The U.S. Nuclear Regulatory Commission (NRC) issued the Draft Environmental Impact Statement (DEIS) for public review and comment in February 2003 in accordance with Title 10, Parts 51.73 and 51.74 of the *Code of Federal Regulations* (10 CFR 51.73 and 51.74) and 40 CFR 1503.1. The NRC provided a 75-day public comment period (which ended May 14, 2003) on the DEIS. The length of the comment period exceeded the minimum of 45 days specified in 10 CFR 51.73.

During the comment period, the NRC held three public meetings to receive oral comments regarding the contents of the DEIS. These public meetings were held on March 25, 2003, in Savannah, Georgia; March 26, 2003, in North Augusta, South Carolina; and March 27, 2003, in Charlotte, North Carolina. The NRC published notice of these meetings in the *Federal Register* (68 Fed. Reg. 97208, February 28, 2003), on its Web site, and in local newspapers.

Approximately 45 people provided oral comments at the public meetings. A certified court reporter recorded the oral comments and prepared written transcripts. The transcripts of the public meetings are part of the public record for the proposed project and were used in developing the comment summaries contained in this appendix. In addition to oral comments received at the public meetings, the NRC received written comments, letters, facsimile transmittals, and e-mails regarding the DEIS and associated issues. The written comments and transcripts are reproduced in Appendix L.

The NRC has reviewed each comment letter and all transcripts of the public meetings and has grouped comments relating to similar issues and topics, as permitted by the Council on Environmental Quality's (CEQ's) National Environmental Policy Act (NEPA) regulations and the NRC regulations at 10 CFR 51.91 and 40 CFR 1503.4(b). Because the comments were voluminous, this appendix provides summaries of all substantive comments received on the DEIS. The NRC then prepared responses to each of the comments or summaries of comments. Commenters are identified in each summary with a commenter number. Appendix K contains an index of commenter names, commenter numbers, and the Agency-wide Documents Access and Management System (ADAMS) accession number. ADAMS is the NRC's document management system that is available through NRC's Web site (www.nrc.gov). The accession number would be used to locate specific documents in the ADAMS system.

Many of the comments specifically addressed the scope of the environmental review, analyses, and issues contained in the DEIS, including existing conditions, potential impacts, proposed

mitigation, the NRC review process, and the public comment period. Detailed responses to each of these comments are provided in this appendix.

Many comments addressed topics and issues that were not part of the environmental review process for the proposed action. Those comments include questions about the NRC's safety evaluation of the proposed mixed oxide (MOX) fuel fabrication facility, general statements of support or opposition to nuclear power, observations regarding past Savannah River Site (SRS) activities, comments on the NRC regulatory process in general, and comments on policies of the NRC and the U.S. Department of Energy (DOE). This appendix includes summaries of these comments. It does not, however, include detailed responses to such comments because they address issues that do not directly relate to the environmental effects of the proposed action and are outside the scope of the NEPA review of the proposed action.

The following sections present the comments, or summaries of those comments, along with the NRC's responses to them. When comments have resulted in modification or supplementation of information presented in the DEIS, those changes are noted. All changes made to the DEIS are indicated by side bars in the margin of the Final Environmental Impact Statement (FEIS). In some cases, the comments do not warrant a detailed response; in those cases, an explanation is provided as to why no further response is necessary. In all cases, the NRC sought to respond to all comments received during the public comment period. The sections referenced in the comments pertain to the DEIS. In general, the term "EIS" is used to apply to both the DEIS and FEIS. The term "FEIS" is used when noting that changes were made in the DEIS, or where section numbers have changed from the DEIS to the FEIS. Similarly, the term "SER" (safety evaluation report) is used to apply to both the SER for construction and the SER for operations.

J.2 Noteworthy Changes from the Draft Environmental Impact Statement

Several noteworthy changes have occurred since the issuance of the DEIS. Those changes include revisions to the human health risk of the proposed action, environmental justice impacts, and mitigation measures. These changes have resulted from (1) errors identified in the DEIS, (2) resolution of open issues in the draft SER (DSER), (3) changes to the Duke Cogema Stone & Webster (DCS) Environmental Report (ER), and (4) comments received on the DEIS. Section J.2.1 summarizes each of these causes, and Section J.2.2 summarizes changes in the human health risk, environmental justice, and mitigation sections of the FEIS.

J.2.1 Causes of Changes in the DEIS

J.2.1.1 Errors in the DEIS

After publishing the DEIS, the NRC identified an error in the accident analysis for the proposed action. On March 6, 2003, the NRC sent a letter to stakeholders who were sent a copy of the

DEIS to inform them of the calculational error. The NRC also published a notice of the error in the *Federal Register* (68 FR 12720). This error was associated with a flaw in the tritium model option in a computer code, GENII version 1.485, used by the NRC staff. The staff used the tritium model in its analysis of a large accidental tritium release from the Pit Disassembly and Conversion Facility (PDCF). During a review of this error, the NRC staff identified an additional error in Table D-1 of the DCS ER. This table presents a statistical summary of meteorological data over a 5-year period at the SRS. As part of this summary, wind speed ranges were incorrectly labeled as "meters per second" instead of "miles per hour." These errors affected the radiological doses from normal operations and from potential accidents. The NRC discussed these errors at the public meetings on the DEIS in March 2003. The NRC also issued errata sheets to stakeholders and posted these data on its MOX Web site.

J.2.1.2 Resolution of Open Issues in the NRC's Safety Review

Several open issues were identified in Appendix A of the DSER for construction of the proposed MOX facility issued on April 30, 2003. These open issues were areas where the NRC staff concluded that DCS had not met the requirements in 10 CFR 70.23(b). One of these issues (open item VS-1) related to the use of a leak path factor for two banks of high-efficiency particulate air (HEPA) filters under accident conditions. The leak path factor is an estimate of the percentage of contamination that would pass through the confinement systems during an accident. DCS had suggested using a leak path factor of 1×10^{-4}. In the DEIS, the NRC used a leak path factor of 1×10^{-2} in its accident analysis (see DEIS, Table E.12) for hypothetical internal fire and explosion events. As discussed in the DSER for construction, the NRC staff concluded that a leak path factor of 1×10^{-4} was appropriate for hypothetical internal fire and explosion events.

J.2.1.3 Changes to the DCS Environmental Report

On June 20, 2003, DCS submitted Revision 3 of its ER, on August 13, 2003, DCS submitted Revision 4 of its ER, and on June 10, 2004, DCS submitted Revision 5 of its ER. These revisions are summarized in the following sections.

Revision 3 Updates

The ER was updated in Revision 3 to include (1) responses to requests for additional information, (2) corrections to Revisions 1 and 2, (3) corrections resulting from an error in Table D-1 (see Section J.2.1), and (4) the latest design information for the Waste Solidification Building (WSB). In addition, DCS provided confirmation from the South Carolina Department of Health and Environmental Control that the proposed MOX facility does not need a Clean Water Act 401 Certification. DCS had previously replied to NRC requests for additional information in letters dated October 29, 2002, December 10, 2002, and December 12, 2002. The responses to the request for additional information were considered in the preparation of the DEIS.

Corrections to ER Revisions 1 and 2 consisted of clarifying Table 3-3 on page 3-53 of the ER. That table presents the aqueous polishing waste streams. The first column lists the names of several waste streams. The second column of the table originally showed a volume associated with a waste stream and another volume that was noted as "(max)." The second column in Revision 3 of the ER provides the same volumes; however, it has been clarified that the original number in column 2 applies to waste that would be generated from plutonium coming from the PDCF, and the "(max)" volume pertains to waste that would be generated from the alternate feedstock plutonium (see Section 2.2.3.2.1 of the EIS). The volumes in the original and revised Table 3-3 are the same, except that the high-alpha waste from PDCF plutonium changed from 54,135 L/yr to 58,136 L/yr (14,301 gal/yr to 15,358 gal/yr), and the liquid low-level (radioactive waste) (LLW) to the effluent treatment facility (ETF) from PDCF plutonium changed from 1,280,340 L/yr to 1,105,340 L/yr (338,230 gal/yr to 292,000 gal/yr).

As discussed above (Section J.2.2), errors were identified in the wind data contained in Table D-1 of the ER. The table has been corrected. These wind data were used in calculating the radiation dose associated with normal operations. Subsequently, DCS corrected the normal operational radiation doses of the ER (see pages 5-19 and 5-21, and Table 5-11 [page 5-85] of the ER).

Appendix G of the ER was revised to reflect the information for the preliminary design of the WSB. Appendix G of the ER Revisions 1 and 2 was based on conceptual design information. The following discusses noteworthy changes. The WSB will now process three waste streams (i.e., high-alpha-liquid waste from the MOX facility, stripped uranium waste from the MOX facility, and laboratory liquid waste from the PDCF). The WSB will no longer process the laboratory concentrated liquid waste stream from the PDCF. This waste stream will be processed at the PDCF. In evolution from conceptual design to preliminary design, the process changed slightly, and some of the tank sizes and numbers of tanks changed. The maximum capacity of high-alpha waste increased by 3,785 L (1,000 gal), and the maximum capacity of low-activity waste increased by 11,356 L (3,000 gal). The size of the low-activity waste evaporator capacity increased from 1,893 L to 2,271 L (500 gal to 600 gal). In addition, all waste transfers between facilities (i.e., MOX facility to WSB and PDCF to WSB) via pipelines would use a single flush of the pipeline instead of the two flushes originally proposed for transfers from PDCF, and no flushes for transfers from the proposed MOX facility.

Some of the impacts estimated for the WSB were also revised. In some cases, the impacts from the plutonium immobilization facility presented in the DOE Surplus Plutonium Disposition Environmental Impact Statement (SPD EIS) were used as bounding estimates for impacts from the WSB. The impacts for the WSB in the revised ER no longer reference the SPD EIS. In other cases, the impacts have changed as a result of the evolution of the WSB design. The water usage during construction was revised from 95 million L/yr to 1,968,414 L/yr (2.5 million gal/yr to 520,000 gal/yr). The water usage during operation was revised from 110 million L/yr to 19 million L/yr (29 million gal/yr to 5 million gal/yr). Nonhazardous liquid waste generated during construction was changed from 21 million L/yr to 240 million L/yr (6 million gal/yr to 63 million gal/yr). Air quality impacts were revised to eliminate the stand-by diesel generator and fugitive emissions from fuel storage tanks and to add emissions from cement storage tanks. Utility infrastructure demands (Table G-4 of the ER) were typically significantly lower.

The americium quantity in the final Waste Isolation Pilot Plant (WIPP) waste container was revised from 0.02 kg to 0.18 kg (20 g to 180 g).

The concentrations of various materials were also revised as a result of design changes and to reflect a more accurate representation of waste expected to be received by the WSB. The estimated concentration of PDCF laboratory liquids (Table G-8 of the ER) increased by approximately 1.6 times. The estimated concentration of the MOX stripped uranium waste stream (Table G-10 of the ER) increased by approximately 1.25 times, with the exception of uranium-235. The concentration of uranium-235 decreased to account for the waste acceptance requirement at the WSB that the uranium-235 percentage be less than 1% by weight. The estimated concentration of the MOX high alpha waste stream (Table G-11 of the ER) increased by approximately 3 times, with the exception of uranium-234 and uranium-235. The uranium-234 concentration increased by about 2 times, and the uranium-235 concentration increased by about 4.6 times. The estimated concentration of waste being processed (Table G-12 of the ER) varied slightly; however, the americium concentration increased by about 3 times in the feed, 2 times in the bottoms concentration, and by about 1.5 times in the overhead concentrations.

Radiation doses to the public from the WSB increased from 5×10^{-6} mSv/yr to 0.29 mSv/yr (5×10^{-8} mrem/yr to 2.9×10^{-3} mrem/yr) for normal operations. Radiation doses for facility workers were estimated as being below 2.0 person-Sv/yr (200 person-rem/yr), with a commitment that the average annual dose to workers would be below 5.0 mSv/yr (500 mrem/yr). The accident scenarios changed and the bounding accident also changed. Previously, three potential accidents at the WSB were considered: a fire in the low-activity area of the building, an explosion in the high-activity evaporator, and a facilitywide loss of confinement event caused by natural phenomena or an external event. The loss of confinement and fire accident events were revised with changes in the volumes and radionuclide concentrations of the waste streams involved in the accidents. This included the release of approximately 2 Ci and 1 Ci of americium to the environment for the loss of confinement and fire accidents, respectively. The original WSB explosion accident was removed from consideration because sufficient controls were determined to be in place to prevent such an occurrence. The postulated earthquake, previously considered to be a potential cause of the loss of confinement accident discussed above, was revised to include a fire event in conjunction with the loss of confinement. Thus, the postulated earthquake was added as a separate evaluation, the impacts being the sum of those estimated for the loss of confinement and fire accidents.

Revision 4 Updates

The ER was updated in Revision 4 to include revised design information for the WSB. These updates included an increase in the volume of solid LLW from 175 m^3 (228 yd^3) to 205 m^3 (265 yd^3). The volume of nonhazardous liquid waste was changed from 240 million L/yr to 21 million L/yr (63 million gal/yr to 6 million gal/yr). The annual consumption of cement at the WSB increased from 227,000 kg to 340,000 kg (500,000 lb to 750,000 lb), and the on-site inventory of nitric acid decreased from 8,000 L to 1,000 L (2,000 gal to 350 gal). The WSB accident source terms were revised in Revision 4 of the ER. The changes in the WSB design

were made to preclude the release of americium to the environment. Tables G-13 and G-14 were added to provide the material released to the environment from a postulated accident. The consequences of the accident analysis are summarized in Table G-16. The maximum estimated impact to a site worker changed from 0.788 Sv to 0.00529 Sv (78.8 rem to 0.529 rem). The maximum estimated impact to a member of the public at the SRS site boundary changed from 1.35×10^{-3} Sv to 9.8×10^{-6} Sv (1.35×10^{-1} rem to 9.8×10^{-4} rem).

Revision 5 Updates

The updates in Revision 5 of the ER concerned modifications to the WSB facility design to accommodate changes in waste volumes. Volume changes were primarily a result of the impacts from process optimizations, the removal of the silver recovery process, and the decision to route the liquid LLW streams to the WSB for treatment rather than the SRS Effluent Treatment Facility. However, discharges of the treated liquid effluents to surface water for the proposed action would remain approximately the same. Radiation doses to facility workers were not affected because administrative limits were used to compute exposure. Waste volumes during the 10-yr operation period were revised from: 23,500 m^3 to 20,800 m^3 for liquid LLW, 3,900 to 6,468 m^3 for solid LLW, 1,030 to 120 m^3 for hazardous/mixed waste, 5,180 to 4,431 m^3 for TRU waste, 43,500,000 to 602,000 m^3 for nonhazardous liquid waste, and 39,900 to 41,000 m^3 for nonhazardous solid waste.

Further information on TRU waste treatment plans was incorporated into Revision 5 of the ER. Current plans call for volume reduction of the TRU waste before packaging and shipment to WIPP. An upper bound of approximately 8,240 m^3 would be generated over the project lifetime if volume reduction at the WSB were not considered. The bounding impacts for shipment of the non-reduced TRU waste to WIPP were added to provide a potential range of transportation impacts. The number of TRU waste shipments over the WSB operating lifetime ranged from 299 to 2,314. No accidental fatalities or latent cancer fatalities from radiation exposure were estimated. Up to one latent fatality from vehicle emissions was estimated for the bounding case.

Revision 5 of the ER also removed references to the controlled area boundary. No changes to impacts presented in the EIS were required as a result of this administrative change.

J.2.1.4 Comments on the DEIS

Comments received in the areas of (1) accident scenario and assumptions, (2) mitigation measures, (3) air quality, and (4) waste management resulted in noteworthy changes to the DEIS. Specific comments are discussed below. A summary of all the comments is provided in Section J.3.

Accident Scenario and Assumptions: Comments on the DEIS varied from stating that the accidents analyzed were overly conservative to stating that the accidents underestimated the potential impacts. Many commenters questioned the assumption in the 1-year exposure scenario that people would be allowed to ingest contaminated crops. Questions were raised

regarding the computer code that was used to estimate the impacts from hypothetical accidents. It was stated that the accident scenarios lacked realism.

Additional text was added to Section 4.3.5 to clarify the assumptions used in the accident analysis. In addition, a third accident scenario was included. This scenario assumes a 1-year exposure period; however, crop ingestion is not included. The inhalation pathway immediately following the accident and direct radiation pathway from contaminates deposited on the ground from the hypothetical plume are included. The NRC reviewed the comments concerning the use of the GENII code and determined that using the code was appropriate for purposes of estimating impacts in the EIS from hypothetical accidents. The results of the accident analysis are discussed in Section J.2.2.1 below.

Mitigation: Comments on the DEIS varied from stating that the proposed mitigation measures were overly prescriptive to stating that the proposed mitigation measures were inadequate and lacked detail. Commenters stated that the NRC used an overly broad definition for mitigation such as stating that compliance with regulations was considered mitigation. The mitigation, measures proposed for the potential environmental justice impacts were viewed by some commenters as being unacceptable or inadequate.

The NRC determined that applying a broad definition of mitigation was consistent with CEQ regulations and guidance. The mitigation discussion (Chapter 5) was revised to better identify the proponent of the mitigation. As noted above, the impacts resulting from potential accidents has changed in the FEIS. The rationale for developing mitigation measures for potential environmental justice impacts has been added to the FEIS.

Air Quality: The statements in the DEIS regarding existing exceedances of the $PM_{2.5}$ (particulate matter with a diameter less than or equal to 2.5 micrometers) standard for both the 24-hour and annual averaging periods, and the adequacy of the air quality data used to establish background values were questioned. The DEIS data were based in part on an air quality monitoring station that was a source-oriented, special-purpose monitor and thus not appropriate for developing a background value of $PM_{2.5}$. Data from air quality monitoring stations greater than 80 km (50 mi) from the SRS were also improperly used to establish background values in the DEIS.

The background data were reanalyzed using updated data (see Section 3.4.3 and Table 3.3 of the FEIS). Table 3.3 in the FEIS presents the results of this update and includes both the highest and lowest ambient levels; the DEIS presented only the highest level. The air quality impact analysis in Sections 4.3.2.1 and 4.3.2.2 (Tables 4.6 and 4.8) were revised using the new background values. The FEIS concludes in Section 4.3.2 that the $PM_{2.5}$ standard levels would not be exceeded in the vicinity of the proposed MOX facility.

Waste Management: Commenters felt that the waste management section was confusing and difficult to follow. The DEIS reported liquid waste volumes in cubic meters (m^3) rather than gallons (gal) or liters (L). The waste management section in the FEIS (Section 4.3.4) has been revised to describe how the waste is generated from each facility, how the waste will be

processed or treated by the SRS, and what the overall impacts of the proposed action are to SRS waste management capabilities.

J.2.2 Changes in the DEIS

J.2.2.1 Revisions to the Human Health Risk of the Proposed Action

Human health risk impacts are discussed in Section 4.3.1 of the EIS. In the DEIS, radiological and chemical impacts from the construction and operation of the PDCF, the proposed MOX facility, and the WSB were estimated to be well within regulatory limits for both workers and members of the public. The same outcome was determined in the revised analysis, which used the corrected wind speed data, resulting in an increase in impacts to SRS employees and the public, and which used lower ingestion rates of root vegetables, fruit, and grain for a maximally exposed member of the public for the radiological impacts, resulting in lower impacts.

The accident with the highest radiological impacts in the DEIS was the hypothetical explosion at the proposed MOX facility, with up to 50 latent cancer fatalities (LCFs) in the collective population estimated as a result of the short-term exposure, and up to 200 LCFs if all the contaminated crops were assumed to be eaten. The NRC has since allowed more credit (a factor of 100) to be given to the HEPA filtration system in the proposed MOX facility for the reduction in the amount released in both the hypothetical explosion and fire accidents at the proposed MOX facility. Thus, the impacts of these accidents were estimated to be a factor of 100 lower in the reanalysis for the FEIS. In the interim, the WSB accident analysis was revised on the basis of new scenarios and/or source terms, resulting in lower impacts by a factor of 2 or more.

J.2.2.2 Revisions to the Environmental Justice Impacts

Environmental justice impacts are discussed in Section 4.3.7 of the EIS. The DEIS concluded that the no-action alternative would have no disproportionately high and adverse effects on minority and low-income populations. The DEIS concluded that construction and operation of the proposed facilities would not result in disproportionately high and adverse effects on minority and low-income populations. On the basis of the accident analysis in the DEIS, the DEIS concluded that there was a potential for low-income or minority communities to be disproportionately impacted. Mitigation measures were proposed in Section 5.2.12 of the DEIS.

As discussed above, the NRC revised its accident analysis based on several factors. On the basis of the revised analysis and information in the ER, the NRC concludes that the impacts from potential accidents to low-income and minority populations could be high and adverse. The NRC believes that it is appropriate to mitigate these potential impacts. The NRC has revised the suggested mitigation measures for potential environmental justice impacts in Chapter 5.

J.2.2.3 Revisions to Mitigation Measures

Mitigation measures are discussed in Chapter 5 of the EIS. The NRC revised the mitigation discussion to state that mitigation measures for the PDCF were previously evaluated by the DOE and are not discussed further by the NRC. Therefore, the mitigation discussion is limited to the proposed MOX facility and WSB. Text has been added to clarify mitigation measures that are required by laws and regulations, those that are suggested by DCS as good practices, and those that were identified by the NRC.

The NRC staff has reviewed the mitigation measures and has concluded that no additional mitigation measures are required beyond the regulatory requirements and those measures identified by DCS.

J.3 Public Comments and NRC Responses

Sections J.3.1 and J.3.2 discuss comments related to general opposition or general support for the MOX project, respectively. Sections J.3.3 through J.3.11 cover policy issues, including purpose and need (J.3.3), the NEPA process (J.3.4), and the NRC licensing process (J.3.5). Comments on the scope of the EIS are covered in Sections J.3.6 through J.3.9. Sections J.3.10 and J.3.11 discuss the alternatives to the proposed action. Sections J.3.12 through J.3.29 discuss pertinent comments on technical issues and follow the order that such issues are discussed in the draft EIS. The last section (J.3.30) responds to editorial comments.

Readers can use Appendix K to link comment numbers to commenters. For example, for the comments number 10-002, the document number is 10 and the individual comment number is 2. Appendix L prints each comment document and indicates comments and comment numbers in the margin.

The following acronyms appear frequently and are not spelled out with each use:

DCS	Duke Cogema Stone & Webster
DEIS	draft environmental impact statement
EIS	environmental impact statement
FEIS	final environmental impact statement
MOX ER	Mixed Oxide Fuel Fabrication Facility Environmental Report
MOX facility	Mixed Oxide Fuel Fabrication Facility

J.3.1 General Opposition

J.3.1.1 Comments: 10-002 79-001 116-004
44-002 83-001

Comment: Opposition to the proposed MOX project was expressed because it was viewed as experimental. It was stated that, for experimental programs, prototype models are usually developed before final designs. It was noted no similar facility exists in this country. Because of this, it was suggested that the Nuclear Regulatory Commission (NRC) proceed with caution.

Response: The technology for the proposed MOX facility is based on two existing facilities in France. This technology has been adapted to comply with U.S. requirements or incorporate U.S. preferences. U.S. requirements include requirements in the areas of contracts, regulatory compliance, quality, design codes and standards, site and utility interface, security, and safety practices and principles. U.S. preferences refer to differences in the U.S. MOX design compared to the French design, including different throughputs, differences resulting from isotopic differences in the plutonium, component selection, and maintenance and operation. The design has progressed from a conceptual design, where differences in the U.S. and French technology were identified, to a preliminary design. The NRC is reviewing the principal structures, systems and components of the proposed MOX facility to assure that its design is adequately safe. The NRC staff's findings to date will be discussed in the safety evaluation report (SER) for construction. The NRC will review the final design if and when DCS submits a license application. The NRC's review of the final design will be documented in the SER for operations. For further information see Section 1.1.2 of the EIS.

J.3.1.2 Comments: 66-001
91-007

Comment: Opposition to the proposed MOX facility was expressed. It was believed that the assumptions and critical aspects of the analysis in the DEIS were flawed. Immobilization was considered to be a legitimate alternative that should have been assessed in more detail.

Response: The Nuclear Regulatory Commission (NRC) acknowledges the concerns expressed in the comments. The assumptions and critical aspects of the analysis for the proposed MOX facility were based on sound engineering and scientific principles. Immobilization was considered (see Section 2.3.3 of the EIS) but was not considered a reasonable alternative.

There the NRC sets forth two reasons why immobilization of plutonium is no longer a reasonable alternative to the proposed action (building and operating the proposed MOX facility).

First, immobilization of the 34 MT (37.5 tons) of surplus plutonium would not meet a key element of the purpose and need for the proposed action, as described in Section 1.3. Due to budgetary constraints, the DOE decided to cancel the immobilization portion of the surplus plutonium disposition program and adopt a MOX-only approach. The DOE determined that in order to make progress with available funds, only one approach could be supported. The DOE stated that after evaluating the feasibility of implementing two disposition approaches, it believed that the best way to make the most progress with available funds while maintaining Russian interest in and commitment to surplus plutonium disposition was to pursue a MOX-only disposition strategy. The DOE further stated that Russia does not consider immobilization alone to be an acceptable approach. In the DOE's judgment, reliance by the United States on immobilization would therefore cause Russia to abandon its plutonium disposition efforts. Because immobilization fails to degrade the isotopic composition of the plutonium, Russia distrusts the immobilization alternative as it would leave open the possibility of future retrieval and reuse of the plutonium in nuclear weapons. As discussed further in Section 1.1.1, the DOE therefore concluded that reliance on a MOX-only approach is the key to successfully completing the September 2000 agreement between Russia and the United States.

The second reason that immobilization is no longer a reasonable alternative to the proposed action is its connection with the conduct of United States foreign policy. Evaluating the immobilization alternative now would involve the NRC in foreign policy matters that the DOE has been conducting on behalf of the United States. In the NRC's view, an alternative that would block the implementation of an agreement with another country involves foreign policy matters that are outside NEPA's scope. Therefore, the NRC concludes that immobilization is not a reasonable alternative requiring detailed analysis in this FEIS.

J.3.1.3 Comments: 2-004 61-001 105-001
24-009 64-001

Comment: The Nuclear Regulatory Commission (NRC) should not approve the construction and operation of the proposed MOX facility.

Response: The NRC acknowledges the concerns expressed in the comments. Section 1.3 of the EIS discusses the need for the proposed action, particularly as part of a larger strategy for plutonium disposition. This strategy is intended to protect against the proliferation of material capable of being used in weapons of mass destruction.

J.3.1.4 Comments: 4-005 85-002
20-001 96-001

Comment: The proposed MOX project will contribute to the legacy of radioactive and chemical contamination at the Savannah River Site (SRS).

Response: The Department of Energy (DOE) is currently involved in treating and restoring contaminated sites at the SRS. Section 3.9 of the EIS discusses the current waste management program in place at the SRS. The program consists of waste minimization,

characterization, treatment, storage, transportation, and disposal. Section 4.3.4 of the EIS discusses waste management associated with construction and operation of the proposed MOX facility, the Pit Disassembly and Conversion Facility (PDCF), and the Waste Solidification Building (WSB). All wastes associated with the project would be treated and/or disposed of in accordance with applicable regulations. This issue is further discussed in Comment J.3.7.4.

J.3.1.5 Comments: 8-001 30-001 46-001 12-001 32-004 99-001

Comment: Opposition was expressed for any activity that involves the manufacture, processing, and transportation of radioactive materials. Local communities should not have to be exposed to increased nuclear contamination or waste.

Response: The Nuclear Regulatory Commission (NRC) acknowledges the commenters' opposition to activities that involve the transportation, handling, and processing of nuclear materials. The EIS describes the actions that would be undertaken to protect the safety of both workers and the public. This includes following all applicable NRC regulations and Department of Energy orders pertaining to the transport, storage, handling, and processing of special nuclear materials.

J.3.1.6 Comments: 10-006 69-001 90-001 106-001 10-022 71-004 98-001 109-001 22-003 77-009 98-010 110-001 44-006 84-001 104-001 112-001

Comment: Several commenters opposed the proposed project believing it to have an unacceptable level of risk to humans and the environment. The safety of the proposed MOX facility was questioned, particularly in regards to terrorist threats. Safety considerations were also expressed concerning the transportation of special nuclear materials. It was stated that the MOX facility would be counterproductive in reducing nuclear risks because it would allow plutonium to enter civilian commerce and the international marketplace. Instead of the proposed project, safer and cleaner alternatives (i.e., immobilization or no action) should be pursued.

Response: The Nuclear Regulatory Commission acknowledges the commenters' opposition to the proposed action as a means of surplus plutonium disposition. The goal of the surplus plutonium disposition program is to securely dispose of surplus plutonium and thereby reduce the threat of nuclear weapons proliferation.

The proposed action fulfills the goal of the surplus plutonium disposition program. The design, construction, and operation of the proposed MOX facility are expected to be within reasonable cost limits. Further, MOX fuel production benefits national security by reducing plutonium supplies. National security would improve because the number of locations where plutonium is currently stored would be reduced. Thus, converting surplus plutonium

to MOX fuel was viewed by the Department of Energy (DOE) as a means of ensuring that the plutonium would not be obtained by rogue states and terrorist groups.

For a full discussion of the proposed action alternative and the immobilization alternative, see Sections 2.2 and 2.3.3 of the EIS, respectively. The impacts of the proposed action are discussed in Section 4.3 of the EIS.

Continuing research and development activities are expected to minimize technical risks of the proposed action. Further, the MOX Facility would be contained within the SRS, which is a secure DOE site.

Transportation of nuclear materials to or from the MOX Facility would be done in accordance with applicable orders and regulations. Couriers would be required to pass a background investigation, receive DOE's highest security clearance, be certified to operate safe, secure trailer/Safeguards Transporter, possess mental alertness, and meet physical performance requirements. Couriers are also trained in firearms, tactics, and driving. Furthermore, couriers receive specialized training in physical fitness, communications, radiation, and hazards detection. Emergency management training for couriers includes the above-mentioned areas, nuclear weapons safety, hazardous materials safety, emergency response training, general firefighting, and fire prevention explosive hazards. Any licensee seeking authority to use MOX fuel in a commercial reactor must apply to the NRC for a license amendment. Any such use of MOX fuel would involve a once-through cycle with no reprocessing of the spent MOX fuel.

J.3.1.7 Comment: 105-014

Comment: Stakeholders, who are concerned and alarmed by the proposed actions, are supposed to be protected by an impartial, unbiased and fair assessment performed by our government protectors (e.g., DOE, NRC, etc.). This DEIS fails to demonstrate that the public will be protected. The DEIS is biased in favor of the proposed action. This is illegal and fails the spirit of the laws meant to protect the citizens of this United States of America. It should be clear that the Nuclear Regulatory Commission (NRC) has good reasons to reject the requested license.

Response: The NRC has prepared this MOX facility EIS in accordance with the provisions of the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.) and the related Council on Environmental Quality (CEQ) and NRC implementation regulations (40 CFR 1500 – 1508 and 10 CFR Part 51). As discussed in Section 1.1.2, this EIS is part of the NRC's decision making process regarding the potential licensing of the proposed MOX facility. The primary objective of the EIS is to provide a comprehensive description of the proposed action, alternatives, and the potential environmental impacts. Section 1.1.1 of the EIS provides an overview of the Surplus Plutonium Disposition Program and the steps that have led to the MOX fuel approach being selected as the preferred alternative by the DOE in its program for reducing the supplies of weapons-grade plutonium. The previous EISs evaluated relevant alternatives that resulted in the decision to proceed with the MOX facility as the preferred alternative. Section 2.3 of the EIS explains why several alternatives were

not analyzed in detail in the current EIS. The no-action alternative, which is assessed in the current EIS, is the continued storage of surplus plutonium at seven DOE facilities. This alternative was analyzed in detail in the Surplus Plutonium Disposal EIS prepared by DOE in 1999.

J.3.2 General Support

Comments:	11-001	17-001	26-001	51-001	57-001	63-001
	14-001	21-001	49-001	54-001	59-001	86-001
	16-001	25-001	50-001	55-001	60-001	

Comment: Commenters indicated general support for the proposed MOX facility, including issuing the license for its construction and operation in a timely manner. The proposed MOX facility will contribute to worldwide safety and security by making nuclear materials unusable as weapons. Additionally, construction and operation of the proposed MOX facility will provide benefits to the local economy. The proposed MOX facility will also provide a source of clean fuel for generating electricity. It is believed that the proposed MOX facility will operate safely. Confidence was also expressed in the technical abilities of all parties involved with the proposed MOX facility.

Response: The Nuclear Regulatory Commission acknowledges the comments in support of the proposed action and the agencies and organizations that are involved in the project.

J.3.3 Purpose and Need

J.3.3.1 Comments: 37-003
53-010
72-003

Comment: Reliance on the United States-Russia Agreement for the purpose and need statement was questioned. This reliance has resulted in the dismissal of other alternatives. The statements made by the U.S. Department of Energy that Russia will only proceed with the agreement if the United States disposes of its excess plutonium through MOX fuel production are unsupported. The NRC's reliance on the DOE's statements, that MOX was the only practical alternative that Russia would accept, limited the NRC's detailed consideration of other alternatives. The commenters questioned the NRC's elimination of other alternatives, solely to avoid violating the United States-Russia Agreement. The status of the agreement should be addressed in the DEIS. It was felt that the NRC's hiding behind the United States-Russia Agreement was misleading because the United States does not follow international nuclear treaties. The U.S. government has pulled out of several international treaties. Therefore, stating that the United States does not want to interfere with the United States-Russia Agreement is erroneous.

Response: Section 1.3 of the EIS discusses the purpose and need for the proposed NRC licensing action (authorizing the construction and operation of a facility to make MOX fuel). This action is part of the larger surplus plutonium disposition program being implemented by the U.S. Department of Energy (DOE). As described in Section 1.1.1 of the EIS, the DOE program stems from decisions made by the United States and the Russian Federation to mutually reduce each nation's stockpiles of weapons-grade plutonium. In September 2000, the United States and the Russian Federation agreed to disposition 34 metric tons (37.5 tons) of surplus weapons-grade plutonium from each nation's stockpiles. In implementing its part of this agreement on behalf of the United States, the DOE in 2002 decided that for budgetary reasons it could no longer pursue its planned hybrid approach under which part of the 37.5 tons of surplus weapons-grade plutonium would have been immobilized. In addition, the DOE in its Amended Record of Decision (ROD) stated that a MOX-only approach best ensures the joint reduction of existing plutonium stockpiles and is the key to successfully completing the United States-Russia Agreement. Accordingly, the DOE canceled its plans to build and operate a plutonium immobilization plant. Instead, the proposed MOX facility – if it is built and operated – would convert the 34 metric tons (37.5 tons) of surplus weapons-grade plutonium into MOX fuel. This fuel would then be irradiated in nuclear reactors authorized to use such fuel, thereby making the plutonium component of the fuel inaccessible for reuse as nuclear weapons material. As stated in Section 1.3 of the EIS, the general purpose of and need for the proposed MOX facility is thus to help reduce the threat of nuclear weapons proliferation by ensuring that surplus weapons plutonium is converted to a proliferation resistant form.

The statement of purpose and need is used to differentiate alternatives that should be analyzed in detail from those that do not need to be analyzed in detail. While national policy does not generally preclude alternatives that can be considered in an EIS, an EIS need not consider alternatives that would change U.S. foreign policy. Therefore, the NRC concluded that the proposed action to build and operate a MOX facility and any reasonable alternatives to that proposed action should be consistent with the United States-Russia Agreement and the goal of both the United States and Russia disposing of surplus plutonium. The fact that the United States has, in some cases, withdrawn or not fulfilled unrelated agreements or treaties in the past is not germane.

Additional comments were received relative to the United States-Russia Agreement. These comments and their responses can be found in Section J.3.7, Scope - DOE Policy and J.3.11, Alternatives - Immobilization.

J.3.3.2 Comment: 96-022

Comment: Concern was expressed that a new plutonium pit disassembly and conversion facility (PDCF) would be constructed at the Savannah River Site.

Response: The PDCF is needed to remove the plutonium from weapons pits and convert it to a form that can enter the proposed MOX facility for conversion to reactor fuel.

J.3.4 NEPA Process

J.3.4.1 Comments: 5-002 5-003 7-003 32-001 45-003 45-002 46-002 77-008 96-004 96-009 96-015 96-015

Comment: The lack of influence of the general public opinion on the National Environmental Policy Act (NEPA) process and Nuclear Regulatory Commission (NRC) decision making was raised. It was stated that the NRC does not care about the more than 200,000 people living in Savannah and Chatham County or those Georgians and South Carolinians living downwind and downstream of the Savannah River Site (SRS). Individuals believed that everyone in Savannah could be opposed to the proposed MOX facility and this issue would not affect the NRC's decisions. Some comments indicated the decision was already made and the NRC was just going through the motions. It was stated that the MOX DEIS was a clear violation of NEPA. This raised the issue that the NRC licensing process was not a democratic process. Furthermore, the decision of whether to move forward with the proposed MOX facility would be decided by people who will not be living near the proposed facility. It was also felt that the people who could be affected by the proposed MOX facility should be notified and that additional outreach to disadvantaged or vulnerable communities should be done.

Response: The NRC has a well defined process for determining whether to grant a license for the proposed MOX facility. The NRC follows a process required by federal regulations and NEPA. For the proposed MOX facility, the NRC's decision making process included the preparation of an environmental impact statement (EIS) that seeks the opinions of affected stakeholders. In determining the scope of the environmental review, the NRC contacted affected communities, including disadvantaged and vulnerable communities, to determine significant issues prior to conducting any analysis (See Section 1.4 of the EIS). Additional meetings were held with stakeholders to inform them of the progress of the NRC's environmental review and to solicit comments on the DEIS after it was published. The NRC advertised the availability of the DEIS and mailed copies of the DEIS to approximately 600 people. The NRC will take into consideration the FEIS findings and safety analyses before any final decisions are made.

J.3.4.2 Comments: 61-006 64-003 96-010 96-023 96-024 97-001

Comment: The timing of the environmental impact statement (EIS) in the overall licensing process was questioned. It was suggested that the Nuclear Regulatory Commission (NRC) should do another EIS because of the uncertainty about what the actual process, parameters and scope will be. It was also suggested that the NRC extend the comment period on this DEIS until the safety evaluation report (SER) for the operating license is complete. It was stated that the NRC might need to redo its analysis as future decisions unfold if the report is to be fully responsive to the proposed actions. In addition, there may be a potential segmentation problem with regard to the way the NRC has chosen to evaluate this particular action. Specifically, there was a concern about the adequacy of the

NRC's evaluation of connected actions, such as the use of MOX fuel and the effects of accident sequences at the McGuire and Catawba reactors.

Response: The EIS includes construction, operation and decommissioning impacts associated with the proposed action. Impacts include those from connected actions as discussed in Section 1.2.2 of the EIS. The connected actions included impacts from using MOX fuel in reactors. As discussed in Section 4.4.3 of the EIS, the impacts from using MOX fuel are presented in a generic fashion and include impacts from normal operations at reactors as well as impacts from potential accidents.

Although many of the design details for the proposed MOX facility have yet to be finalized, the impacts associated with operating were analyzed based on experience from similar facilities in France. The estimated impacts provided by DCS were reviewed and found to be sufficient for purposes of preparing the EIS. If, later in the process, the impacts are greater than those presented in the EIS, the NRC would determine whether a supplemental EIS would be required.

J.3.4.3 Comments: 9-004
35-006
43-006

Comment: It was suggested that the Nuclear Regulatory Commission (NRC) conduct an independent external review of the DEIS.

Response: Part of the National Environmental Policy Act (NEPA) process is a review of the DEIS preliminary findings by the public and other stakeholders. The DEIS is published for public comment, and comments received by the NRC are considered in finalizing the EIS. This process provides for independent external review by the public. In addition, there was a concern raised during a scoping meeting regarding a potential conflict of interest because the NRC is using Argonne National Laboratory to assist in preparing the EIS of a Department of Energy (DOE) linked facility. To allay any concerns about the use of Argonne, the NRC hired the Center for Nuclear Waste Regulatory Analysis (CNWRA) to conduct an independent external review of the DEIS, the comment response document, and the FEIS. The CNWRA is a non-profit, independent group that was established to assist the NRC in reviewing high level waste documents prepared by the DOE and its contractors. The CNWRA has been shown to not have any conflicts of interest with respect to the DOE.

J.3.4.4 Comments: 10-007 66-006 97-001
44-007 96-008 97-006

Comment: An extension of the formal comment period beyond the adjusted May 14, 2003, deadline was requested. The reasons for the requests included the timing of information provided by the Nuclear Regulatory Commission (NRC) regarding two errors in the DEIS and the complex nature of the DEIS. Also it was stated that the public should be given the opportunity to compare the DEIS and the safety evaluation report (SER) together and be allowed to have a 30-day overlapping period.

Response: The NRC considered the requests for extending the comment period and determined that 75 days was adequate to allow stakeholder review and comment (10 CFR 51.73). Although the radiological dose values changed as a result of errors identified by the NRC, the revised values did not change the conclusions and preliminary recommendation of the DEIS.

J.3.4.5 Comments: 5-003, 7-001, 13-002, 19-001, 23-001, 45-003, 47-003, 55-002, 61-002, 62-001, 62-003, 66-006, 75-001, 96-023, 96-024, 96-028

Comment: In accordance with the National Environmental Policy Act (NEPA) process, citizens must be informed of the proposed action and provided the opportunity to comment when the DEIS is published. The citizens in the area surrounding the Savannah River Site (SRS) felt the NRC did not sufficiently inform the local citizens about the public meetings. Some individuals believed the meetings were held only to tell the public what will be done next, and the citizens had no input in the process. There were general requests to hold additional meetings so citizens would not be rushed in reviewing the DEIS. There were also requests to hold meetings in Columbia and Charleston, SC. Several individuals requested additional meetings be held in North Augusta, which is in the area most highly affected by the proposed MOX facility. Likewise, commenters indicated additional meetings should be held in black communities, which also would likely be affected. It was recommended that the Nuclear Regulatory Commission (NRC) delay its decision until environmental justice communities' input could be considered in the decision making process.

Response: The NRC acknowledges the concerns expressed by the commenters. The NRC considers the distribution of the DEIS and the public meeting notification process to be adequate.

In accordance with NRC regulations, the NRC staff published a notice of availability for the DEIS in the Federal Register (68 Fed. Reg. 9728, February 28, 2003). In the notice, the NRC staff provided information on how to obtain a free copy of the DEIS, listed contact people, and listed information about the public meetings. From February 28, 2003, to May 2003, the NRC distributed over 750 copies of the DEIS to state and local government officials and to the general public. Due to the vast amount of material in the DEIS, the NRC extended the comment period to May 14, 2003, and notified the public of the extension in the Federal Register (68 Fed. Reg. 12720, March 17, 2003).

During the comment period, the NRC held three public meetings regarding the DEIS (March 25, 2003, Savannah, GA; March 26, 2003, North Augusta, SC; and March 27, 2003, Charlotte, NC) to receive oral public comments on the DEIS. The NRC sent out invitation letters to over 550 citizens informing them of the meetings. The NRC also advertised the meetings in the local papers and on the local government television channels in Savannah, North Augusta, and Charlotte. These meetings were held to give interested citizens an opportunity to ask questions and to offer comments. Based on the number of commenters, it was necessary to limit the length of each comment in order to provide as many people as

possible with an opportunity to speak. When announcing the time limitations, the agency emphasized that detailed comments could be submitted in writing.

The NRC staff selected the meeting venues in an effort to reach those members of the public who would most likely be affected by any impacts of the proposed action. The NRC staff participated in one meeting hosted by the Imani Group and the Citizens for Environmental Justice to provide additional project information to members of the community concerned with environmental justice. Based on these public involvement activities, the NRC considers the public meetings for the DEIS sufficient to fulfill its NEPA requirements.

J.3.4.6 Comments: 8-002 96-008
46-003 96-031
95-001

Comment: It was stated that the DEIS was difficult to understand and form impressions about. It was stated that the DEIS should be more "community and user friendly" by clearly stating what is proposed, why, and potential real impacts on the environment, health, economy, and ecology of the operation of the proposed MOX facility. A specific case was mentioned with the use of the words significant and insignificant, indicating that a definition of significant would be helpful.

Response: The Nuclear Regulatory Commission (NRC) staff notes the comments about document readability and shares the commenters' belief that an EIS should be written in plain language. The NRC believes that the EIS is written in plain language. However, the NRC recognizes that the EIS contains highly technical aspects that may be difficult to understand. In preparing the EIS, the staff attempted to write to as broad and diverse an audience as possible. The way impacts have been characterized has been changed from significant or insignificant in the DEIS to small, moderate and high. Definitions for these qualifiers are provided in Section 2.4 of the FEIS.

J.3.4.7 Comments: 10-007 44-007 96-003 96-029
13-002 59-002 96-018

Comment: It was felt that the DEIS presented misleading information, particularly the environmental impact portion of the DEIS. It was stated that documents must not be published for comment with incorrect calculations, and if this occurs the process for commenting must be extended. Given the errors in the DEIS, it was questioned how the public could be sure that the information was correct. In addition it was stated that the DEIS was published containing large computer errors miscalculating high death counts in low income, minority communities. It was also stated that there may have been a number of inadequacies found that causes even more concern about the concreteness of the data. It was suggested that the Nuclear Regulatory Commission (NRC) did not adequately inform local communities about the error or provide sufficient opportunity for them to comment on these errors. It was suggested that additional public meetings needed to be held.

Response: The NRC shares the concern about having mistakenly published erroneous information. The NRC identified the errors shortly after the DEIS was published. When the NRC discovered the errors, it took steps to quickly notify stakeholders and provide corrected information. Moreover, the NRC extended the comment period by 30 days. The NRC published in the Federal Register (68 Fed. Reg. 12720, March 17, 2003) information pertaining to the errors, explaining the errors and providing information on how to contact the NRC staff for additional information. At the subsequent public meetings, the NRC identified additional errors and informed the public that errata sheets would be mailed. The NRC staff mailed over 700 copies of the errata sheets to the public after these meetings were held.

J.3.4.8 Comment: 116-001

Comment: Arbitrary deadlines appear to be the managing force behind the MOX safety review. Deadlines should take a back seat to safety, so that the public develops confidence that the Nuclear Regulatory Commission (NRC) is protecting them.

Response: We agree with the commenter. The NRC's primary mission is the protection of public health and safety and the environment. As discussed in Section 1.1.2 of the EIS, the NRC's licensing decisions are based on an environmental review and a safety review. The NRC does not permit regulated action to be taken until both reviews are completed and any outstanding safety issues are satisfactorily resolved. While internal schedules must be established to manage projects, the NRC's decisions are not based on schedules.

J.3.4.9 Comment: 116-018

Comment: The terms "unlikely," "highly unlikely," and "incredible" should be associated with quantitative criteria that meet some standard.

Response: The Nuclear Regulatory Commission (NRC) has not associated quantitative criteria with the terms "unlikely," "highly unlikely" or "incredible." The regulations in 10 CFR

Part 70 allow applicants to propose definitions for these terms, which may be qualitative or quantitative. The applicant, DCS, has defined "unlikely" to mean events that are not expected to occur during the lifetime of the facility but may be considered credible. "Highly unlikely," as defined by the applicant, means events originally classified as not unlikely or unlikely to which sufficient principal structures, systems and components are applied to further reduce their likelihood to an acceptable level. The applicant also defined "not credible" events as those natural phenomena or external man-made events with an extremely low initiating event frequency and process events that are not possible.

J.3.5 Licensing Process

J.3.5.1 Comments: 13-001 80-001 93-001
61-003 81-003 103-001
78-002 92-001

Comment: The use of a two part licensing process (construction and operation) for the proposed MOX facility was of concern to stakeholders. Several comments indicated that both construction and operation were not adequately addressed in the DEIS. The comments reflected that the MOX application was split into two parts (construction and operation), but the DEIS contained no review of the operations data. Separating these two parts of the licensing process was considered irresponsible. It was felt that the environmental impacts of operation must be considered before the DEIS process is complete. Stakeholders felt that the Nuclear Regulatory Commission (NRC) was going to sign off on the DEIS before operational plans were taken into consideration and environmental impacts of operation were analyzed.

Response: The ER submitted by DCS (as revised) contains sufficient information to analyze the potential environmental impacts of constructing and operating the proposed MOX facility. On the basis of this information, the EIS sets forth the NRC's environmental analysis. The NRC's NEPA regulations do not call for delaying the NRC's environmental review until completion of its operational safety review. On the contrary, to meet its NEPA obligations, the NRC must begin its environmental review early enough to allow completion before any action is taken that would significantly affect the environment. With respect to the proposed MOX facility, the environmental effects would begin with construction, and are not confined to operation. Accordingly, the NRC has properly completed its environmental review at the pre-construction stage.

J.3.5.2 Comment: 29-003

Comment: Questions were raised about the financial responsibility of the MOX project. A question was raised about who would be responsible for the decontamination of the four Duke reactors in the event of a financial collapse. In addition it was asked, whether the Duke reactors provide enough spent fuel to make MOX fabrication economical if the demand for electricity decreases.

Response: The financial health of Duke Power has no bearing on whether DCS has demonstrated that it will be able to obtain funds sufficient to build, operate, and decontaminate the proposed MOX facility in accordance with Nuclear Regulatory Commission (NRC) regulations on the environmental impacts of the proposed action's costs or benefits. NRC regulations (10 CFR 50.75) require existing reactor licensees, such as Duke Power, to provide financial assurance for decommissioning power reactors. The amount is based on either a standard NRC formula provided in the regulation or a plant specific cost estimate performed by the licensee. The funding must then be set aside as prepayment or in an external sinking fund such as a trust or escrow account or by other guaranteed method. The existing reactor licensee must report to the NRC every two years on the status of the decommissioning fund (every year after decommissioning has begun) and the NRC reviews these reports. Additionally, there are limitations on the amount of the decommissioning funds which may be spent until the existing reactor licensee has submitted a post-shutdown plant specific decommissioning cost estimate.

Although the rate has varied, the demand for electricity in the U.S. has steadily increased. The NRC expects that the Duke reactors will provide a reliable demand for the MOX reactor fuel.

J.3.5.3 Comment: 76-001

Comment: The EIS addresses the question of cost versus benefits throughout the document. Because of the consideration of cost and benefits, it raises the question of whether the Nuclear Regulatory Commission (NRC) is not a promoter of nuclear energy. As such, it was further questioned whether the NRC could act impartially and would act in the public interest.

Response: The Energy Reorganization Act of 1974 established the NRC as an independent government agency whose mission is the protection of public health and safety and the environment from the commercial uses of nuclear materials. Prior to 1974, the Atomic Energy Commission, the predecessor agency to the NRC and the Department of Energy, was criticized for both regulating and promoting nuclear energy. Therefore, the NRC was established as an independent agency that reports to Congress rather than the Executive Branch.

J.3.5.4 Comment: 95-003

Comment: The Nuclear Regulatory Commission (NRC) should use its influence on other policy-makers to review what is being proposed and redirect the surplus plutonium disposition program in a way that addresses the legitimate concerns of those living downstream of the Savannah River Site (SRS).

Response: As discussed in Section 1.1.2 of the EIS, Congress gave the NRC licensing and related regulatory authority over the proposed MOX facility. As part of its mission to protect public health and safety and the environment, the NRC is preparing a safety review

and an environmental review of the proposed MOX facility, in accordance with NRC regulations, the National Environmental Policy Act, and the Atomic Energy Act.

As noted in the comment, the NRC does not have jurisdiction over the SRS. However, part of the EIS process includes consideration of alternatives and impacts that may be outside an agency's regulatory authority. As discussed in Section 1.2.2 of the EIS, the NRC has included the impacts of connected DOE facilities. Furthermore, the existing environmental conditions at the SRS have been presented in Chapter 3 of the EIS. Another part of the EIS process is issuing the EIS in draft form for public comment. This includes seeking comments from other federal and State agencies, such as the Department of Energy, the Environmental Protection Agency, and the South Carolina Department of Health and Environmental Control. In addition, the NRC has proposed mitigation measures in Chapter 5 of the EIS to reduce potential impacts from the proposed action, including connected DOE facilities.

J.3.5.5 Comment: 116-005

Comment: The Nuclear Regulatory Commission (NRC) is licensing the proposed MOX facility and is not licensing the Waste Solidification Building (WSB) or the Pit Disassembly and Conversion Facility (PDCF). The proposed MOX facility will generate chemical and radioactive waste, which is then transferred to unlicenced facilities for disposal. Given the polluting history of the Savannah River Site (SRS), it was suggested the NRC get involved with the proper disposal of the wastes generated by MOX. Incineration, burial, and transport of chemical and radioactive wastes require the NRC to become involved through the EIS in a proper outcome. The NRC should reconsider the bounds of its EIS.

Response: As noted in the comment, the NRC does not have regulatory (licensing) authority over the Department of Energy's PDCF, WSB, or waste processing and disposal facilities. Section 1.2.2 of the EIS discusses connected actions that are considered in the EIS. These include impacts from the PDCF, WSB, and waste processing and disposal facilities. Impacts for various resource areas from the PDCF and WSB are discussed in Chapter 4 and Appendix H of the EIS. The impacts associated with waste management are discussed in Section 4.3.4. Existing contamination at the SRS is discussed in the affected environment portions of the EIS (Chapter 3). The impacts referenced by the commenter are discussed in the EIS. Under NEPA, the NRC is obligated to consider impacts of connected actions such as waste management. However, acting on the suggestion that the NRC get involved with the DOE's waste disposal efforts would be outside of the NRC's regulatory authority.

J.3.6 Scope – General

J.3.6.1 Comments: 5-004 32-002 56-005 19-008 45-004

Comment: The use of a 50-mile radius as a boundary to assess impacts was questioned. It was stated that a major accident could impact an area greater than 60 miles, and the Chernobyl accident was cited as an example. The DEIS does not address the environmental impacts on the Savannah area. It was suggested that the evaluation of environmental justice impacts should be expanded to include impacts to downstream communities regardless of their racial or income demographics.

Response: The geographic area, in which impacts are assessed, varies depending on the type of technical area being evaluated. For example, cultural resource impacts are evaluated only in the vicinity of the site, because constructing and operating the proposed MOX facility would not impact cultural resources at a great distance from the proposed MOX site. But, air quality impacts are evaluated both on local and regional scales, and the cost-benefit analysis evaluates impacts on national and regional scales. The geographic area used to assess human health impacts to the public was selected to be a 50-mile radius from the proposed MOX site. The estimated doses to the public would decrease with distance from the site, because accident impacts to the public result from airborne plumes and the concentration of the plume decreases significantly with distance. The 50-mile area was considered sufficient to reasonably bound the impacts from a postulated accident without diluting collective doses to the public. This 50-mile area was also used in assessing the environmental justice impacts.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* issued in 1994, directs executive branch agencies to address, as appropriate, any disproportionately high and adverse human health or environmental effects of their actions, programs, or policies on minority populations and low-income populations. Guidelines for performing environmental justice reviews are described in the Nuclear Regulatory Commission's NUREG-1748. The first step in the process is to determine if a site has a potential environmental justice concern based on the identification of low-income and minority populations that could be affected by the proposed action. The next step is to determine whether possible impacts would disproportionately impact these populations. Finally, if it is determined that there would be a potential impact, as assessment would be made as to whether the impact of any aspect of the construction or operations of the proposed facilities (including accidents) on low-income or minority populations would be both "high and adverse." (See Section 4.3.7.1 for a more detailed description.)

As discussed above, the 50-mile area was considered sufficient to reasonably bound the impacts to human health. Savannah, Georgia, is located just outside the 50-mile radius and is not expected to be significantly impacted by airborne release from the most severe accident evaluated. As discussed in Section 4.3.7.3, the EIS considered impacts to downstream communities, including impacts to surface water quality of the Savannah River.

(Also, see Comment J.3.29.1 for further information.) The scope of the EIS is thus considered sufficient.

J.3.6.2 Comments: 33-001 77-001
72-014 96-033

Comment: The scope of the DEIS and the range of impacts assessed was considered to be too limited and not broad enough in scale. For example, an assessment of risk for humans and the environment should be done to include all the processes involved in the MOX production, in its transport, and in its use as a fuel. It was felt that the reactor use evaluation should include impacts on affiliated nuclear services such as nuclear laundries, component repair, decontamination services, and decommissioning. It was suggested that a programmatic EIS must be conducted that considers and addresses all parts of the MOX related activities which includes the current MOX EIS, supplemental EIS for the license renewal for the four Duke nuclear power plants, the lead test assemblies, MOX use in reactors and new plutonium processing. It was felt that the cost benefit analysis should include other types of costs.

It was stated that information in the DEIS was presented in a fragmented manner and that it is very difficult to see the whole picture.

Response: The scope of the proposed action is described in Section 1.2 of the EIS. It includes impacts for transportation of feedstock material, conversion of depleted uranium, processing of metal plutonium into powder at the Pit Disassembly and Conversion Facility, fabrication of MOX fuel at the proposed MOX facility, waste management, transport of fresh, unirradiated fuel, use of MOX fuel in reactors, transportation of spent MOX fuel, and decommissioning the surplus plutonium disposition facilities. This range of activities is considered sufficient to reasonably bound the full range of impacts associated with the potential construction and operation of the proposed MOX facility. The cost benefit analysis is presented in Section 4.6 of the EIS and includes a variety of costs on both the national and regional scale. It is not clear from the comments which other costs should be considered. While the impacts associated with various resource areas are discussed in detail in Chapter 4 of the EIS, a concise summary of the impacts of the proposed action and no-action alternatives is provided in Section 2.4.

As discussed in Section 4.4.3, the impacts associated with using MOX fuel are discussed in the Department of Energy's (DOE) Surplus Plutonium Disposition (SPD) EIS. The DOE's analysis is provided in Section 4.28 and Appendix K.7 of the SPD EIS and includes the areas of concern to the commenter.

As discussed in Section 1.1 of the EIS, the DOE is responsible for the overall surplus plutonium disposition program. Pursuant to Congressional mandate, the NRC is responsible for only a small portion of the surplus plutonium disposition program, namely regulatory authority over the proposed MOX facility. It would be inappropriate for the NRC to conduct a programmatic EIS, duplicating analyses previously performed in the SPD EIS. The NRC is performing a separate National Environmental Policy Act (NEPA) review

pertaining to the pending license amendment request to use MOX lead test assemblies at those reactors.

J.3.6.3 Comments: 14-004 89-008
63-004 89-014

Comment: The inclusion of impacts from the Pit Disassembly and Conversion Facility (PDCF) and Waste Solidification Building (WSB) was questioned. It was stated that the DEIS places unwarranted emphasis on impacts associated solely with the PDCF. The PDCF is not necessarily solely required to support the proposed MOX facility. The Nuclear Regulatory Commission (NRC) creates the implication that impacts from the PDCF will not occur if the MOX construction authorization is denied. PDCF and MOX are two separate actions. The DOE has previously prepared an EIS for the PDCF, with the finding that the facility provides adequate protection to the public and the environment. The NRC should not subject the PDCF facility to National Environmental Policy Act (NEPA) double jeopardy. It was further stated that the NRC should not have re-analyzed impacts associated with the PDCF, because the EIS is limited to the licensing action now under review. It was also stated that the EIS presents the impacts associated with the WSB out of context. It was stated that the WSB is part of the PDCF complex and should be discussed as such. Both the proposed MOX facility and PDCF comprise major production buildings and several smaller associated buildings. Similar waste from the PDCF and proposed MOX facility that would have been processed separately is now processed in a single WSB, thereby reducing the amount of space and equipment needed for both the proposed MOX facility and PDCF. The DEIS should be revised so as not to give the impression that the WSB is a major stand-alone facility.

Response: Section 1.1.2 of the EIS discusses connected actions to the proposed action (i.e., potential licensing of the proposed MOX facility). In determining that the PDCF and WSB are “connected actions,” the NRC found that in order for the proposed MOX facility to fulfill its functions, the DOE would need to build and operate the proposed PDCF and WSB. As discussed in Section 1.4, the NRC concluded that because of the Department of Energy’s (DOE’s) decision to pursue a MOX-only approach, the PDCF no longer had independent utility apart from the proposed MOX facility. The impacts for the PDCF were taken from the DOE Surplus Plutonium Disposition EIS, except where the impacts were reanalyzed to be consistent with the methodology used by the NRC for the proposed MOX facility. The NRC determined that presenting impacts derived from inconsistent methodologies would not be helpful to the public in understanding the overall impacts associated with the potential construction and operation of the proposed MOX facility. It is recognized that the PDCF would be a DOE facility and as such could be used by the DOE to perform other missions as appropriate. However, the PDCF impacts associated with the proposed action have been appropriately included here to avoid an improper segmentation of the potential impacts discussion.

The NRC recognizes that waste processing at the proposed MOX facility and the PDCF was included in previous DOE EISs. However, the previous DOE EISs did not consider the WSB as a separate facility. Issues associated with waste management are a significant

concern to stakeholders. The NRC believes that presenting the impacts associated with the WSB separately will add to the understanding of the overall impacts related to managing wastes associated with the proposed action. The impacts of the WSB were provided by the applicant in Appendix G of its ER. The WSB is discussed in the EIS in terms of being a "support" facility to the proposed MOX facility and PDCF. Therefore, the scope of the EIS appropriately includes impacts from the PDCF and the WSB.

J.3.6.4 Comment: 77-007

Comment: It was suggested that either the Department of Energy or the Nuclear Regulatory Commission (NRC) should prepare an EIS on the waste management in the manufacture and use of MOX fuel.

Response: The impacts on waste management associated with making MOX fuel are discussed in Section 4.3.4 of the EIS. The EIS concludes that the waste management capabilities at the Savannah River Site (SRS) and within the DOE complex (e.g., the Waste Isolation Pilot Plant) are adequate to handle the estimated types and volumes of waste associated with the proposed action. As discussed in Section 4.4.3 of the EIS, the impacts associated with using MOX fuel in reactors are based on the Department of Energy's Surplus Plutonium Disposition (SPD) EIS. Section 4.28.2.2 of the SPD EIS states that the volume of waste from reactors is not expected to increase as a result of reactors using MOX fuel. It further states that waste handling processes at reactors would also not be expected to change as a result of reactors using MOX fuel. The scope of the EIS is sufficient to address this comment.

J.3.6.5 Comment: 93-003

Comment: Concern was expressed that the DEIS will provide a substrate for future MOX fuel fabrication facilities that the Nuclear Regulatory Commission (NRC) might license. As such, it is important to note that the plutonium under consideration is from dismantled warheads that were once from reprocessed irradiated fuel. The current proposal is not representative of any other MOX fuel fabrication facility that might be licensed in the future under Part 70, where waste reprocessing would be an integral part of the proposal and need to be considered. In this case, the Pit Disassembly and Conversion radiation doses and other impacts must be considered a part of the current process.

Response: This EIS evaluates impacts of the proposed action (i.e., potential licensing of the proposed MOX facility at the Savannah River Site) and alternatives to the proposed action. The impacts of the proposed action are facility and site specific, and include, as the commenter suggested, impacts from the Pit Disassembly and Conversion facility and other impacts considered part of the current process. While some impacts such as MOX fuel transport and MOX fuel use in reactors are presented on a generic basis, this EIS is not considered to be broad enough in scope to be considered suitable to support any future consideration of a generic MOX fuel fabrication. Further, as noted by the commenter, there are significant isotopic differences in plutonium from surplus nuclear weapons and plutonium derived from reprocessing spent nuclear fuel that would require substantial

design changes for any mixed oxide fuel fabrication facility that would use plutonium derived from reprocessing.

J.3.6.6 Comment: 97-013

Comment: The DEIS appears to use averages. Frequencies and likelihoods do not appear to be incorporated. This DEIS pertains to a proposed facility that would be licensed under 10 CFR Part 70, which included consequence and likelihood bins (e.g., see the Construction Authorization Request and the safety evaluation report). The DEIS should explicitly consider consequences and likelihoods.

Response: In general, the EIS assumes that a potential consequence would occur (i.e., a probability of one). Conservative models and parameters are used in estimating the potential consequences. For example, meteorological data used in the air transport model would only be exceeded 5% of the time. In evaluating the consequences of potential accidents, the Nuclear Regulatory Commission assumed that accidents could be possible, even though the applicant has proposed controls to reduce the likelihood and severity of accidents. In other words, the impacts discussed in the EIS are based on radiation doses and chemical exposures, were an accident to occur. No estimates of accident probability or likelihood are used in the calculation of these doses and exposures. Therefore, no consideration of probability or likelihood is required to estimate the environmental impacts presented in the DEIS.

J.3.6.7 Comment: 98-009

Comment: The DEIS must address the full impacts of the proposed action including how it is likely contributing to the eventual production of nuclear weapons components at the Savannah River Site (SRS) and the use of the site for permanent nuclear waste burial. A full accounting of what and how much plutonium is coming from where and being used for what project when it arrives should be done and made available to the public.

Response: The scope of the proposed action is described in Section 1.2 of the EIS. The scope of the proposed action includes connected actions that are closely related to the proposed action (i.e., potential licensing of the proposed MOX facility). The connected actions include impacts from some Department of Energy activities at the SRS such as the proposed construction and operation of the Pit Disassembly and Conversion Facility and the Waste Solidification Building, and related infrastructure upgrades at the SRS. However, this EIS does not address DOE activities that are not connected to the proposed action such as consideration of facilities to produce nuclear weapons or waste disposal not directly related to the proposed action. The consideration of actions suggested by the comment are outside the scope of this EIS. Related issues are discussed in Comment J.3.7.6.

J.3.6.8 Comment: 86-007

Comment: Section 1.4.1, page 1-12 of the DEIS states "Because the scope of this DEIS is limited to the licensing action now under review by the NRC, which is specific to the proposed MOX facility, issues pertaining to decisions already made by the DOE are addressed by referencing the appropriate DOE analysis." The statement is misleading. Although the Nuclear Regulatory Commission (NRC) indicated that they would rely on the appropriate Department of Energy (DOE) analyses, the NRC recalculated accident analyses described in the DOE Surplus Plutonium Disposition (SPD) EIS using extremely conservative models and assumptions resulting in significantly different impacts than in the DOE SPD EIS.

Response: As discussed in Section 1.2.2 of the EIS, two DOE facilities (Pit Disassembly and Conversion Facility and Waste Solidification Building) would support the proposed MOX facility and are considered to be connected actions. The impact assessments and information supporting the impact assessments from the DOE EISs were used in the estimation of impacts in the DEIS. In some cases, the impact values used are taken directly from the DOE EIS. In other cases, because the NRC used different codes, models and scenarios in estimating the human health impacts (such as referred to in the comment) the NRC used supporting data from the DOE EIS to estimate impacts from these facilities that was consistent with the methodology used to estimate the impacts from the proposed MOX facility.

J.3.6.9 Comments: 12-004 24-004 64-004 92-003
13-004 30-003 71-009 93-010

Comment: The use of a generic analysis was questioned, given the unique nature of the proposed Catawba and McGuire candidate reactors ice condenser type containment and the population surrounding these reactors. It was felt that the DEIS for the proposed MOX facility both could and should include an analysis of the use of MOX fuel at the Catawba and McGuire reactors. Concern was expressed that the MOX EIS may be the only opportunity for the public to comment on using MOX fuel in reactors, unless interveners force the Nuclear Regulatory Commission (NRC) to prepare an EIS when the NRC considers a specific license amendment to use MOX fuel in a reactor. In that light, it was stated that the DEIS fails to analyze weaknesses in Catawba and McGuire ice condenser type reactors. These reactors have thin containment which is more likely to rupture in case of a severe accident. Issues related to reactor aging and MOX fuel use should be evaluated, including the impact of large component replacement after using MOX fuel. Given the past drought conditions in the south, thermal impacts of using MOX fuel should be evaluated for these reactors, including impacts on Lake Wylie, the Catawba River, and Lake Norman. The DEIS should acknowledge that Catawba and McGuire have higher latent cancer fatalities from accidents compared with other reactor sites in the country. It was stated that the Charlotte, North Carolina area could become a nuclear wasteland for decades if a worst-case accident happened.

Response: As discussed in Section 4.4.3 of the EIS, the generic analysis is based on an assessment presented in the DOE's Surplus Plutonium Disposition (SPD EIS) (Section 4.28 and Appendix K.7 of that document). In the SPD EIS three reactor stations (Catawba, McGuire and North Anna) were evaluated. The reactor use impacts presented in the DEIS present an aggregate of the range of impacts. Therefore, specific attributes and limitations of these reactors were considered in determining the impacts of using MOX fuel. For example, the impacts included projection of population growth surrounding these reactors. The text in Section 4.4.3 has been revised to reflect the basis of the generic impact assessments. Impacts of thermal discharges to surface waters were not evaluated as part of the generic analysis. These impacts are considered to be reactor site-specific, and therefore, would be evaluated within the scope of the NRC consideration of site-specific requests to use MOX fuel. The NRC staff believes that the impacts presented in the DEIS are a reasonable estimate of the potential impacts of using MOX fuel in reactors. As discussed in EIS Section 4.4.3, the NRC will perform its own site-specific National Environmental Policy Act (NEPA) and safety review in evaluating whether any specific reactor could use MOX fuel. Therefore, the scope of the EIS is considered adequate to bound the impacts raised in the comments.

J.3.6.10 Comment: 77-003

Comment: The use of lead test assemblies (LTA) was not addressed in the DEIS. This would include impacts associated with transporting the lead test assemblies to the reactor and using the lead test assembles in the reactor.

Response: The use of lead test assemblies was not specifically addressed in the DEIS. However, the Department of Energy assessed the impact of the LTA program in its Surplus Plutonium Disposition EIS. The LTA program is considered to be independent of the proposed action. Text as been added to Section 4.4.3 of the FEIS to clarify this point.

J.3.7 Scope – DOE Policy

J.3.7.1 Comments: 19-010 56-006
47-001 82-006

Comment: The surplus plutonium program in the United States is connected through agreements to a similar program in the Russian Federation. The Russian MOX program is not moving as quickly as the U.S. program. The question of whether the Russian Federation was in violation of the United States-Russia Agreement was raised. It was felt that the U.S. MOX program should be delayed until the Russian program was fully funded and proceeding on track. Given the changes the Department of Energy (DOE) made in the surplus plutonium disposition program and the uncertainties with the future of this program, the timing of the Nuclear Regulatory Commission's (NRC's) action was questioned. It was felt that the DOE should clearly state what is really going to be done with the surplus plutonium and other facilities supporting this program before the NRC considers authorizing Duke Cogema Stone & Webster (DCS) to construct the proposed MOX facility. It was also

felt that given the ongoing war and state of the world that the overall surplus plutonium program and DEIS should be put on hold.

Response: As noted in Section 1.1.1 of the EIS, the MOX program is one part of the overall U.S. surplus plutonium disposition program. The DOE is responsible for fissile material in the United States including the disposition of surplus weapons plutonium. Coordination and implementation of the disposition agreement with Russia is the responsibility of the DOE. Because the applicant, DCS, is a DOE contractor, any decision by the DOE to delay or cancel the surplus plutonium disposition program would be relayed to DCS as appropriate. The NRC does not have a role in establishing foreign policy or in defining the surplus plutonium disposition program. Rather, the NRC deals with the regulation of nuclear materials and facilities. With regard to the proposed MOX facility, the NRC has received an application from DCS and has decided to prepare an EIS. The NRC is required to review the application and make a decision regarding whether the proposed facility can be constructed and operated safely. If DCS, as directed by the DOE, decides to withdraw its application, the NRC would cease work. The NRC cannot unilaterally stop work on a project based on international policy grounds that deal with issues outside the scope of the NRC's mission. Furthermore, if the DOE makes changes to the surplus plutonium disposition program that would affect the impacts associated with the proposed MOX facility, then the NRC would consider those changes when they occur and take appropriate action. Therefore, these comments are considered beyond the scope of the EIS.

J.3.7.2 Comments: 48-001
61-008
93-008

Comment: The United States-Russia Agreement allows for immobilization. Specifically, Article 3 of the agreement allows for disposition by one of the following methods: irradiation, immobilization, or any other method agreed to by the parties in writing. The DEIS should acknowledge that the immobilization alternative is allowed under the United States-Russia Agreement. It was stated that Russia declined immobilization for itself, but would accept the U.S. immobilizing its plutonium. It was also stated that Russia should not dictate how the U.S. disposes of its surplus plutonium and that the U.S. should select a method that provides for environmental protection.

Response: The United States-Russia Agreement is discussed in Section 1.1.1 of the EIS. The EIS states that "Under this agreement, disposition may be accomplished either by immobilization or by MOX fuel fabrication and subsequent irradiation." Text in the FEIS has been added to more accurately describe that immobilization of plutonium is allowed by the United States-Russia Agreement.

The Department of Energy's (DOE's)surplus plutonium disposition program and the United States-Russia Agreement are the basis for determining the purpose and need of the proposed project. Once the purpose and need of the proposed project is established, the Nuclear Regulatory Commission (NRC) must determine which alternatives are considered reasonable and would accomplish the purpose and need of the project.

Because the purpose and need is based on the DOE's surplus plutonium disposition program, the DOE's amended Record of Decision (ROD) affected the purpose and need of this EIS. In the amended ROD, the DOE stated that budgetary constraints no longer allowed it to pursue the hybrid approach for disposition of surplus plutonium. The DOE determined that for budgetary reasons it needed to select a single disposition approach. In the DOE's judgment, Russia did not consider immobilization alone to be an acceptable approach for achieving joint disposition of excess plutonium. The DOE indicated that Russia may abandon its plutonium disposition efforts if the DOE selected an immobilization only approach. Thus, the DOE selected the MOX-only approach because in the DOE's judgment it was the key to successfully completing the United States-Russia Agreement

The DOE decided to pursue a MOX-only approach in its amended ROD, and the NRC has no reason to question the validity of a DOE policy decision regarding a DOE project and foreign policy matters.

Additional comments were received relative to the purpose and need, and the immobilization alternative. Responses to these comments are in Sections J.3.3 and J.3.11, respectively.

J.3.7.3 Comments: 10-010 48-002 98-003
44-010 96-032

Comment: The status of the Department of Energy (DOE) National Environmental Policy Act (NEPA) review for the Pit Disassembly and Conversion Facility (PDCF) and the Waste Solidification Building (WSB) is not covered in the MOX DEIS in sufficient detail. Furthermore, legal issues may be raised if the MOX DEIS NEPA review is used by the DOE for the WSB. Considering these issues and given all the changes in the Surplus Plutonium Disposition (SPD) program, the DOE should supplement its NEPA analyses to include consideration of the immobilization alternative, the PDCF and the WSB facilities. If the DOE fails to supplement its NEPA analyses, the Nuclear Regulatory Commission (NRC) should deny the application because the DOE did not comply with the NEPA requirements.

Response: NEPA requires federal agencies, including the DOE and the NRC, to consider environmental impacts in their decision making processes. If an agency action is considered to be a major federal action, the agency must prepare an environmental impact statement. Each agency is responsible for its own NEPA documentation.

The DOE has prepared two EISs for the surplus plutonium disposition program. The impacts for the PDCF were covered in DOE's *Surplus Plutonium Disposition Final Environmental Impact Statement* (DOE/EIS-0283). The NRC used appropriate materials from the DOE EISs in the preparation of its environmental impact statement. This is discussed in Section 1.4.4 of this EIS.

As discussed in Sections 1.2.2 and 2.2 of the EIS, the WSB and PDCF are considered connected actions to the licensing of the proposed MOX facility. Therefore, impacts associated with those facilities are included in the discussion of impacts for the proposed

action. It is important to note that while there is an overlap in the consideration of environmental impacts for the WSB and PDCF, the NRC does not have safety or licensing authority over those proposed DOE facilities. The impacts of building and operating the WSB were addressed in DCS's Environmental Report and are covered in the MOX EIS. The NRC believes that the impacts associated with the WSB are sufficiently addressed in its EIS to allow the NRC to make a decision as to whether construction of the proposed MOX facility should be authorized. Whether the DOE performs an independent NEPA analysis for its own project is not within the NRC's discretion. Therefore, these comments are beyond the scope of the NRC EIS.

The DOE issued a Supplement Analysis (SA) on April 17, 2003, to its amended Record of Decision (ROD) of April 19, 2002. This SA evaluated the changes to the surplus plutonium disposition program announced in the amended ROD. The SA's purpose was to determine whether the SPD EIS, prepared by the DOE, should be supplemented, whether a new EIS should be prepared, or whether the DOE found in the SA that no further NEPA documentation on its part was required. The DOE concluded that changes in the surplus plutonium disposition program do not result in impacts that are significantly different from those evaluated in the SPD EIS; therefore, no further NEPA documentation is required.

J.3.7.4 Comments: 3-001 39-003 93-006
5-006 45-006 114-006
38-001 48-005

Comment: Concerns were expressed about how the Department of Energy (DOE) should best allocate funding for its various missions. The comments suggested using funding for clean up activities at the Savannah River Site (SRS) in contrast with long-term funding for the surplus plutonium disposition program. Funding clean up activities was preferred because they would benefit the local Augusta and Aiken economies without subjecting surrounding communities to toxic and nuclear waste generated by the surplus plutonium disposition program. Concern was expressed regarding the availability of long-term funding for the surplus plutonium disposition program and that lack of funding could result in indefinite storage of the depleted uranium and surplus plutonium at the SRS. It was also stated that the proposed MOX facility should not be built until nuclear material in Russia is secured and that the limited funds should be used for that purpose. An additional concern was the possible U.S. funding of the Russian plutonium disposition program.

Response: The costs of the NRC's proposed action are discussed in the cost-benefit analysis section of the EIS (Section 4.6). The DOE has budgetary responsibility for the surplus plutonium disposition program, including any possible funding of the Russian MOX program, as well as clean up activities at the SRS. Costs and funding issues other than those associated with the NRC's proposed action are beyond the scope of the EIS.

J.3.7.5 Comments: 48-003 93-009 114-001
61-004 98-003 114-002

Comment: The quantity of surplus plutonium in the disposition program was questioned. The comment raised the legal basis for 34 metric tons (37.5 tons) of surplus plutonium being considered in the MOX DEIS verses 27 metric tons (29.7 tons) of plutonium that has been declared surplus by the Department of Energy (DOE). In addition, the quantity of plutonium that would be shipped from DOE's Rocky Flats site to the Savannah River Site (SRS) was questioned. The Surplus Plutonium Disposition (SPD) EIS prepared by the DOE evaluated the impacts of up to 50 metric tons (55 tons) of plutonium. The fate of the remaining surplus plutonium was questioned. Concerns were expressed that this plutonium would go to the SRS for long-term storage. In addition, because the Pit Disassembly and Conversion Facility (PDCF) would not be operational at the start of the proposed MOX facility, concern was expressed over what plutonium would be used initially by the proposed MOX facility. It was further questioned on what basis the Nuclear Regulatory Commission (NRC) assumes that there will be any surplus plutonium.

Response: The quantity of plutonium evaluated in the NRC DEIS is 34 metric tons (37.5 tons). The quantity is based on the application submitted by DCS (Construction Authorization Request and Environmental Report). The specific source and form of surplus plutonium was not specified. General locations and quantities of surplus plutonium are provided in Table 1.1 of the EIS. The plutonium may be in metal form that would be processed by the PDCF prior to being received by the proposed MOX facility or it may be alternative feed stock that could go directly to the proposed MOX facility. As discussed in Section 1.2.2, the EIS assumes that 25.6 metric tons (28.2 tons) of plutonium that would be used by the proposed MOX facility would be in the form of plutonium dioxide from the PDCF. The remaining quantity of plutonium would be "alternate feedstock" that could be used by the proposed MOX facility without being processed by the PDCF. The DOE will determine which specific plutonium is used to obtain the 34 metric tons (37.4 tons) and how any remaining surplus plutonium (i.e. 50 metric tons noted in the comment) will be handled. Additionally, at the Savannah public meeting, a representative from the Department of Energy discussed the quantity of plutonium to be shipped from the Rocky Flats site to the SRS. The DOE decided in its amended Record of Decision to transfer that material from the Rocky Flats site to the SRS. This decision was independent of the proposed action.

J.3.7.6 Comments: 05-008 10-021 44-008 71-013 72-012 93-009
10-008 12-002 44-009 71-015 77-004 98-004
10-009 24-008 45-008 72-011 93-008

Comment: The conflict in national policy between the consideration to build a modern pit facility and the Surplus Plutonium Disposition program arose. It was stated that the surplus plutonium disposition program is no longer swords into plow shares. It was also stated that the U.S. has no cohesive surplus weapons disposition policy. The decisions in the DEIS regarding which alternatives were evaluated were based on the desire to not conflict with foreign policy. Given this apparent conflict, it was suggested that the Nuclear Regulatory

Commission (NRC) should delay its decision until the EIS on the modern pit facility is issued and commented on.

There was concern about the amount of plutonium that would eventually be located at the Savannah River Site (SRS), the area of the country where it would be coming from, and how the plutonium would be used (dispositioned as surplus or used to make new nuclear weapons). The possibility that the proposed MOX facility could be used to produce new plutonium for weapons or reprocessing existing commercial spent nuclear fuel was a concern. This concern was tied with the Tennessee Valley Authority tritium production program. There was also a concern that the Pit Disassembly and Conversion Facility (PDCF) could be used for processing plutonium that would be used to make new nuclear weapons. It was noted that the risk of an accident at the PDCF would increase by processing more plutonium, thereby increasing exposure to workers and the public. It was suggested that another Department of Energy (DOE) EIS is necessary for a complete assessment of the plutonium missions at the SRS. The EIS for the proposed MOX facility should include impacts associated with using the proposed facility as part of making new nuclear weapons.

Response: The DOE prepared a programmatic EIS for Stockpile Stewardship and Management (SSM PEIS) in 1996. In September of 2002, the DOE National Nuclear Security Administration (NNSA) issued a notice of intent to prepare a supplemental programmatic EIS to the SSM PEIS regarding a modern pit facility. The new supplemental programmatic EIS (SPEIS) is intended to support two NNSA decisions: (1) whether to proceed with a modern pit facility, and (2) if so, where to locate it. The DOE recently (May 30, 2003) issued the draft SPEIS for public comment. The draft SPEIS states that the preferred alternative would be to construct and operate a new modern pit facility but did not select a preferred host site. The preliminary project schedule indicates that the planning and definition phase would continue through 2006 followed by an execution phase through 2016. The proposed modern pit facility would not start operating until 2018.

The concern that building a MOX facility to disposition surplus weapons plutonium conflicts with building a modern pit facility to make new weapons pits is a national policy issue that rests with the Department of Energy. Thus, the comments addressing the DOE decisions are beyond the scope of this EIS. The concerns that the proposed MOX facility could be used in the process of making new weapon pits is speculative at this point. Moreover, the current plan presented by DCS, under review by the Nuclear Regulatory Commission (NRC), is limited to making MOX fuel from 34 metric tons (37.5 tons) of surplus weapons plutonium. Therefore, these comments are beyond the scope of this EIS.

J.3.7.7 Comments: 10-011 92-004 96-019
13-005 96-019 114-003
44-011 98-005

Comment: Four reactors at the Catawba and McGuire stations are potential candidates to use (irradiate) MOX fuel. However, additional reactors, that have not been identified in the surplus disposition program, will be required to use the remaining fuel. The DEIS fails to

acknowledge the possibility of insufficient reactor capacity to keep pace with the production of MOX fuel. Concern was expressed regarding the impacts if the Vogtle Plant, which is located near the Savannah River Site (SRS) and had previously expressed interest in using MOX fuel, was selected to use MOX fuel in the future. The DEIS should state the environmental risk, if there is one, from failure to promptly use the proposed quantity of MOX fuel. Having an excess of MOX fuel at the SRS may also pose security risks.

Response: For the purpose of this EIS, it was assumed that the Department of Energy (DOE) would identify additional reactors that would irradiate MOX fuel beyond that amount which the four units at Catawba and McGuire nuclear power stations could accommodate. This bounds the environmental impacts of the proposed action, such as impacts resulting from the transportation of feedstock to the proposed facilities, processing and manufacturing activities at the proposed facilities, transportation of MOX fuel, and waste generation. If the DOE does not later identify additional reactors to use MOX fuel and the impacts were limited to those resulting from the disposition of only 25.6 metric tons (28.2 tons) of surplus plutonium, environmental impacts would be lower. Before any particular reactor (e.g., the Vogtle Plant) is authorized to use MOX fuel, the NRC would perform a site-specific environmental review. Such site-specific impacts are outside the scope of this EIS.

J.3.7.8 Comments: 2-002 71-011 24-005 72-004

Comment: Concerns were expressed that the proposed action would not eliminate the plutonium. Instead, the use of MOX fuel in reactors would produce more plutonium. This idea would be counter to the non-proliferation strategy of converting surplus plutonium into MOX fuel. The availability of plutonium will increase as both the United States and Russia use plutonium as reactor fuel. Placing the material in commercial power plants would further nuclear weapons proliferation and not safeguard the plutonium from use in weapons of mass destruction. Concerns were also expressed that MOX fuel will be irradiated in reactors other than those in Russia and the United States. Specifically, MOX fuel may be used in nuclear reactors of countries that trade with Russia and are viewed as “evil” or “rogue” nations by the United States. The question was raised why the U.S. would accept a program that would send weapons grade plutonium to other countries including Iran and Syria if Russia will not accept alternatives that do not isotopically degrade weapons plutonium.

Response: Irradiating MOX fuel in reactors would produce more plutonium. However, this plutonium would be highly radioactive and thus unavailable for unauthorized use. This would help reduce the threat of nuclear weapons proliferation by ensuring that surplus plutonium is converted to proliferation-resistant forms. The Department of Energy (DOE) decided, in previous National Environmental Policy Act (NEPA) documentation and based, in part, on the recommendations of the National Academy of Sciences in the *Management and Disposition of Excess Weapons Plutonium* (NAS 1994), that the manufacture and use of MOX fuel poses an acceptable disposition approach that creates a proliferation-resistant form of plutonium. Further consideration of the adequacy of this approach is beyond the

scope of the Nuclear Regulatory Commission's environmental review (see EIS Appendix I, Section 4.1).

J.3.7.9 Comments: 10-005
44-005

Comment: It has been the national policy to separate the military and civilian uses of nuclear materials. The use of surplus weapons plutonium in civilian reactors blurs the distinction between the military and civilian nuclear programs.

Response: This national policy (embodied in the Energy Reorganization Act of 1974) remains the same. In 1974, Congress created the Energy Research and Development Administration (which later became the Department of Energy [DOE]) to oversee the military uses of nuclear materials, among other functions. The Energy Reorganization Act of 1974 also established the Nuclear Regulatory Commission (NRC) as an independent regulatory agency that is separate from the DOE. The NRC was created to regulate the commercial use of nuclear materials. The NRC does not view its licensing authority over the proposed MOX facility as changing the above-described separation of functions enacted by Congress in 1974.

J.3.7.10 Comments: 8-004 34-001 95-002
32-003 36-001 105-006

Comment: Several previous and future Department of Energy (DOE) decisions were questioned. The question of locating the proposed MOX facility at the Savannah River Site (SRS) was raised. It was felt that since most of the surplus plutonium is located in Texas and Colorado that the proposed MOX facility should be located closer to these locations to minimize transportation impacts. It was questioned if political or socioeconomic and demographic characteristics were the reason for selecting the SRS. It was suggested that the DOE should hold public meetings to answer questions relative to the surplus plutonium disposition program that are outside of the Nuclear Regulatory Commission's (NRC's) domain. Future decisions relative to the ultimate fate of the surplus plutonium disposition facilities were questioned. It was stated that the DOE had sworn to decommission these facilities at the end of the mission. It was questioned as to what guarantees the public has that this is true. It was also stated that the facility should be located farther away from large cities to reduce the risk to people from accidents.

Response: The DOE in its Surplus Plutonium Disposition (SPD) EIS looked at the impacts of siting the surplus plutonium disposition facilities at numerous locations. The SPD EIS concluded that the facilities should be located at the SRS. The basis of this decision is presented in the SPD EIS. As discussed in the March 7, 2001, Notice of Intent to prepare an EIS, issues pertaining to decisions already made by the DOE will not be revisited by the Nuclear Regulatory Commission (NRC). Therefore, consideration of locating the proposed MOX facility at another location is beyond the scope of the EIS.

The EIS includes the impacts of decommissioning the surplus plutonium disposition facilities. As discussed in Section 4.3.6.1, the contract between DCS and the DOE calls for DCS to deactivate the proposed MOX facility and place it in safe-shutdown once operations have ended. The ultimate fate of the surplus disposition facilities would be the responsibility of the DOE. NRC regulations require the facilities it licenses to be decommissioned in a timely manner. DCS would be required to get an exemption or other waiver from the NRC to transfer the facility to the DOE prior to decommissioning. Since this has not been requested, the EIS includes impacts from decommissioning the facility.

J.3.7.11 Comment: 87-001

Comment: The Waste Solidification Building (WSB) is part of the Pit Disassembly and Conversion Facility (PDCF), which will be constructed after the proposed MOX facility is operational. The Department of Energy (DOE) has changed the design of the proposed MOX facility, which was originally to include equipment to solidify radioactive liquid waste, but now, according to the DOE's Supplement Analysis and Amended Record of Decision of April 2003, this equipment is to be located in the WSB. The DOE's current schedule, laid out in its February 15, 2002, Report to Congress, calls for construction of a MOX facility 2004-2007, once licensed by the Nuclear Regulatory Commission (NRC), with operations beginning in 2007. The PDCF will be constructed from 2006-2009, with startup in 2009. Furthermore, it is unclear which DOE plutonium stocks would be processed at the proposed MOX facility until the PDCF is completed. Clearly the DOE cannot use plutonium metal until the PDCF is completed. The remaining plutonium stocks have a variety of impurities which will require aqueous polishing which will create waste streams. The DEIS does not address the issue of what will happen to these waste streams in the interim. The DEIS should address the scheduling issues with regards to the treatment of radioactive waste.

Response: As discussed in Section 1.2.2 of the EIS, the impacts of the proposed action evaluated in the EIS are based on the assumption that approximately 25.6 metric tons (28.2 tons) of the plutonium will be processed as plutonium dioxide from the PDCF. The remaining 8.4 metric tons (9.4 tons) would be alternate feedstock. The NRC has evaluated the impacts based on the applicant's request of 34 metric tons (3.5 tons). Should the quantity of pit and alternative feedstock plutonium change in the future, the NRC would evaluate these possible changes on the environmental impacts and determine if additional analyses were required. The current plan is that the proposed MOX facility and WSB would be completed about the same time. Therefore, waste facilities would be operational prior to processing any alternative feedstock. It is anticipated that the proposed MOX facility, if its operation is authorized by the NRC, would begin processing alternative feedstock. The PDCF does not need to be operational to process alternate feedstock. Therefore, the scope of the EIS is considered adequate to address the issOctober 28, 2004ues raised in the comment.

J.3.8 Scope – Safety Evaluation Report

J.3.8.1 Comments: 10-020 62-003 97-003 105-005
18-001 96-035 97-005

Comment: Concern was expressed that the distinction between the Safety Evaluation Report (SER) SER and the Environmental Impact Statement (EIS) was confusing and needed to be simplified. The DEIS does not discuss if the Nuclear Regulatory Commission (NRC) finds the technical designs proposed by DCS to be adequate. It was suggested that the DEIS should contain a detailed evaluation of the proposed facilities against guidance for radiological facilities, including design criteria, technical specifications, and American National Standards Institute (ANSI) standards. It was stated that compliance with NRC risk goals and metrics should be provided in the DEIS. Furthermore, the DEIS lacks sufficient information on design bases to judge the operability of the facilities, general safety, and validity of projected off-site effects of accidents. Given the large number of process steps and complexity to make MOX fuel, it was questioned if this could be done safely. It was also stated that there must be no acceptance of any number of potential deaths. The DEIS focuses on programmatic and administrative controls for many hazards including potential accidents that could produce serious injuries and/or fatalities with relatively high likelihoods. The DEIS does not emphasize actual mitigation and/or prevention of the hazardous phenomena.

Concern was also expressed about having the opportunity to comment on the SER. It was suggested that comments or questions raised during the DEIS comment period pertaining to the SER should be transferred to contacts within the NRC working on the SER. It was further stated that the person who made the comment be included in a pool of participants interested in the SER. In addition, the SER needed to be throughly studied by the NRC before making any decisions.

Response: In evaluating applications, the NRC conducts an environmental review. An environmental review is documented in the EIS, and a safety review is documented in the safety evaluation report (SER). A discussion of the NRC's decision making process regarding the potential licensing of the proposed MOX facility is provided in Section 1.1.2 of the EIS. Text has been added in the FEIS to better discuss the relationship between the content of the SER and the EIS. The clarifying text describes the different purposes of an SER and an EIS. Generally, the purpose of an SER is to evaluate the safety of an applicant's proposed action. The purpose of an EIS is to evaluate environmental impacts of a proposed action and alternatives.

Where safety measures proposed by an applicant would have no direct environmental impact, the staff's evaluation of such measures is set forth only in the SER. Similarly, environmental issues carrying no safety significance (e.g., displacement or damage of archeological resources) are only discussed in the EIS. However, if there is a nexus between safety and potential environmental impacts, such as the human health and environmental consequences of potential accidents, these issues are described in both the SER and the EIS.

The SER for the construction of the proposed MOX facility evaluates safety systems and controls against the safety basis in NRC regulations. Many of the comments were general in nature and pertained to the safety discussions in the SER. The NRC staff safety evaluations are not repeated in the EIS. Some comments pertained to specific topics discussed in the SER that are beyond the scope of the EIS (see below). As requested, comments on the DEIS that pertain to the SER rather than the EIS have been forwarded to appropriate NRC staff for consideration in preparing the SER. As discussed in Section 1.1.2 of the EIS, the NRC takes into consideration findings in both the SER and EIS prior to making any licensing decisions.

J.3.8.2 Comments: 4-004 74-001 96-012 116-011
43-003 82-003 96-025
52-002 88-002 96-036

Comment: Concern was expressed about the adequacy of the emergency plans. Commenters indicated that an emergency plan for evacuating the Savannah and Chatham area must be evaluated. Having a tested and certified evacuation plan, to include areas downwind and downstream of the proposed facility, must be a prerequisite to going forward with the licensing process. If there is no evacuation plan, then the Nuclear Regulatory Commission (NRC) should deny the license. When the emergency plan is put into effect, it was questioned whether the surrounding areas near the Savannah River would receive the emergency plan after it is evaluated. The at-risk population should be educated about the emergency plan, and this should include drills and exercises. Another area of concern was the absence of an off-site emergency plan by DCS for any accident scenario. Concerns were expressed that NRC had stated that general emergency preparedness of communities is outside the scope of this EIS.

Response: The concerns expressed in the comments address safety issues that are outside the scope of the EIS. The baseline design criteria for emergency capability are stated in 10 CFR 70.64(a)(6). The design of the proposed MOX facility must provide for emergency capability to maintain control of (1) licensed material and hazardous chemicals produced from licensed material; (2) evacuation of on-site personnel; and (3) on-site emergency facilities and services that facilitate the use of available off-site services. In Chapter 14 of the applicant's Construction Authorization Request, DCS committed to providing an evaluation demonstrating that an off-site emergency plan is not required. Such an evaluation will be part of the DCS application for a license to possess and use special nuclear material, which has not yet been submitted. The NRC found this approach acceptable. The NRC, as part of its review of any such license application, would evaluate whether an off-site emergency plan is required. DCS has further committed to establish a protocol with the DOE to integrate its emergency plans with the existing Savannah River Site (SRS) emergency preparedness program. This protocol would be reviewed by the NRC as part of its evaluation of any later DCS application for a license to possess and use special nuclear material. The commitment by DCS to integrate its emergency plans with the existing SRS emergency preparedness program has been identified as a mitigation measure to mitigate potential impacts of a chemical accident. Mitigation of chemical impacts is further discussed in Section 5.2.8 of the EIS.

J.3.8.3 Comments: 4-002 44-012 73-003
10-020 56-003 105-003
19-009 65-004

Comment: Concerns were raised about the safety and environmental record of entities associated with the MOX project. Specifically, the involvement of COGEMA in the consortium of DCS caused significant concern. It was stated that COGEMA is an irresponsible company and should not be involved in the project because of sites like La Hague that have had poor environmental and safety records. It was stated that it may not be possible to get adequate information about COGEMA because France is far less open than the United States about its nuclear operations. Furthermore, it will be difficult to know if DCS will do it right, since it did not exist before the proposed plutonium fuel project.

Concern was expressed that our government is not concerned with the previous track record of COGEMA, Stone & Webster, and Duke Energy in handling commercial plutonium and nuclear waste. It was stated that evaluating issues associated with safety records in the EIS is permitted under the National Environmental Policy Act (NEPA). It was felt the DEIS should include background discussions on the entities composing DCS. Furthermore, the DEIS should examine the entities financial stability and environmental and safety records.

Response: These comments raise issues which are beyond the scope of the EIS. An applicant is required to demonstrate its qualifications in a license application. Nuclear Regulatory Commission (NRC) staff will document its evaluation of the applicant's qualifications in a safety evaluation report (SER). Related safety issues regarding the applicant's qualifications are discussed in Chapter 4 and 15 of the draft SER issued in April 2003. NEPA and implementing regulations by the NRC (10 CFR Part 51) and the Council on Environmental Quality (40 CFR Part 1500) do not require consideration of an applicant's qualifications in an EIS.

J.3.8.4 Comments: 67-003 96-021
93-002 116-010
93-015

Comment: Concerns were raised regarding the safeguarding of MOX material to prevent theft or loss during its processing, use, and storage. The issue of safeguarding MOX material was not addressed in the DEIS. Likewise, comments indicated concerns about tracking the inventory of plutonium and any other radioactive materials involved in the process. The DEIS did not reference problems in materials accounting at other U.S. facilities such as Rocky Flats. The problems at Rocky Flats led to spontaneous plutonium combustion. These safeguard issues are not addressed in the DEIS; and therefore, the DEIS does not fully document all the environmental impacts of the proposed MOX facility. An additional concern involved who would be responsible for plutonium security at the Savannah River Site.

Response: These comments raise issues which are beyond the scope of the EIS. The issues referenced above would be addressed in an SER, if DCS later files an application for a license to possess and use special nuclear material at the proposed MOX facility.

J.3.8.5 Comments: 18-001
116-012

Comment: The design bases and the analysis of criticality for the construction and operation of the proposed MOX facility were not addressed in the DEIS. In terms of accidents, only "generic accidents" were considered. Furthermore, "generic" was not described. Pertinent descriptions of the "generic" accident should include the bounds and bases for the assumed number of total fissions, peak pulse, and duration of the incident. A discussion of the observed differences between solution and solid incidents should be provided in the DEIS. It should be shown that the design provides criticality controls against all foreseen accidents, but also will mitigate consequences for the types of incidents that have occurred. Concern was expressed regarding a criticality event in pipes, especially between facilities. It was questioned whether the Nuclear Regulatory Commission (NRC) had complete jurisdiction to review these scenarios.

Response: These comments raise issues which are generally beyond the scope of the EIS. Nuclear criticality safety design issues, including the relevant bases, criticality analysis, and differences between solution and solid incidents, are discussed in Chapter 6 of the draft SER (safety evaluation report) issued in April 2003. The potential impacts of a criticality accident are discussed in Section 4.3.5 and Appendix E of the EIS. The amount of special nuclear material considered in the hypothetical accident is provided in Table E.12 of the EIS. NRC regulations require that criticality events be made highly unlikely. As discussed in Section 1.1.2 of the EIS, the NRC will prepare two safety evaluation reports. The SER for construction evaluates the safety systems and controls. The detailed review of the criticality safety program, which will include evaluating criticality in pipes, will be performed if and when DCS submits an application for a license to possess and use special nuclear material at the proposed MOX facility. Prior to authorizing construction or issuing an operating license, NRC staff will determine if the criticality safety program meets the NRC regulations.

J.3.8.6 Comments: 100-001 111-001
105-003 113-001

Comment: The DEIS should include a containment chapter. This chapter would include a discussion of the need for preventing the release of plutonium under all conceivable conditions and the need for measures that maintain plutonium management under all possible conditions. Given the hazardous nature of plutonium, precautions should be specified to prevent inadvertent releases of plutonium. Inadvertent releases have occurred in the past at the Kerr McGee Cimarron, Oklahoma site; the Nuclear Fuel Services West Valley, New York site; the Midwest Fuel Recovery near Morris, Illinois; and at the LaHague and Sellafield sites in Europe.

Response: These comments raise issues which are generally beyond the scope of the EIS. The applicant has proposed features in the MOX facility to both maintain confinement of radioactive material and minimize contamination of the facility. These features are designed with consideration of past experiences with handling plutonium. Some of these features are reusable storage cans to transfer material between process areas, gloveboxes, welded tank and piping in certain process areas, process cells with robust access controls, and multiple ventilation confinement zones throughout the facility. The staff's evaluation of these features is described in Chapter 11 of the draft SER issued in April 2003. The impacts of a loss of confinement accident are discussed in Section 4.3.5 and Appendix E of the EIS.

J.3.8.7 Comment: 116-014

Comment: DCS plans to use both preventive and mitigative measures in accident evaluations. The EIS should have considered a more conservative approach that would allow for the accident and mitigate the consequences while simultaneously designing to prevent the accident.

Response: Nuclear Regulatory Commission (NRC) safety regulations require that the risk of high and intermediate consequence events be limited. To meet these performance requirements, applicants may either prevent such accidents or mitigate the consequences of the accidents. Even though the probability of the accident occurring is unlikely or highly unlikely, for the purposes of the EIS, it is assumed that the accidents will happen, and the estimated consequences of the accidents are presented without taking credit for preventive measures. Mitigation measures, including mitigation features for accidents, are presented in Chapter 5 of the EIS. The principal structures, systems, and components (PSSCs), including PSSCs to prevent accidents and mitigate consequences for the proposed MOX facility, are evaluated in the draft SER issued in April 2003.

J.3.8.8 Comment: 116-020

Comment: It was questioned whether both off-site and on-site radiation monitors are planned. Details on the types and capability of the monitors to measure the various types of radiation (e.g., alpha, beta, gamma, and neutron) and the calibration frequency of the monitors were requested.

Response: These comments raise issues which are beyond the scope of the EIS. As discussed in Section 1.1.2 of the EIS, two safety evaluation reports will be issued by the Nuclear Regulatory Commission (NRC) prior to making decisions on whether to authorize construction and operation of the proposed MOX facility. Effluent and environmental monitoring are discussed in Chapter 10 of the draft SER for construction issued in April 2003. Radiation monitoring was not identified by DCS as a principle safety system component; and therefore, details requested in the comment have not been developed. Effluent and environmental monitoring are required by NRC regulation (10 CFR Part 20), and the details and adequacy of such monitoring systems and programs would be

evaluated if and when the NRC receives a DCS application for a license to possess and use special nuclear material.

J.3.8.9 Comments: 53-011
99-002

Comment: Concerns were expressed regarding the foreign ownership, control, and influence in the MOX project. It was stated that this is a French project that primarily benefits the French government. It was questioned whether a French company should be involved with handling plutonium.

Response: These comments raise issues which are beyond the scope of the EIS. Related safety issues regarding foreign influence and control are discussed in Chapter 1 of the draft SER issued in April 2003.

J.3.9 Scope – Terrorism

J.3.9.1	Comments:	5-005	24-010	56-001	71-010	88-001	112-004
		10-001	30-002	58-001	71-012	91-006	114-009
		13-007	44-001	65-002	77-006	93-005	114-013
		19-002	45-005	66-008	82-001	96-020	116-002
		24-002	52-001	68-002	85-004	103-004	

Comment: The treatment of terrorism or lack thereof in the DEIS was a significant concern with many commenters. There was a concern with the Commission decision addressing whether terrorism must be considered in an Environmental Impact Statement. It was stated in the Commission decision (CLI-02-24, December 2002), that the Nuclear Regulatory Commission (NRC) is not obligated to consider risks associated with terrorism in any environmental impact statement. It was felt that this ruling sets a dangerous precedent and that the NRC is ignoring the imminent danger of terrorism.

Terrorism was not examined in the broad sense. It was stated that terrorist activities had not been evaluated with regard to accident scenarios, latent cancer fatalities, and costs in the DEIS. The comments stressed that the threat of terrorism cannot be ignored. Citizens felt the DEIS did not address a terrorist attack on the proposed MOX facility to the extent that it should have considered increased risk of terrorism in the world today. Citizens also felt that the DEIS did not address environmental risk from sabotage or malevolent attacks. It was stated that not addressing terrorism was unacceptable. A question was raised about how the terrorism issue was going to be addressed. It was stated that the issue of terrorism is supposedly going to be addressed in agency reviews.

The DEIS fails to acquaint the public with dangers associated with the possible impacts of terrorist events. It was stated that recent simulations of terrorist attacks strongly suggest that conventional methods for defending nuclear facilities are inadequate, and therefore it is reasonable to conclude that risk assessment strategies are woefully insufficient as a basis

for making decisions such as those inherent to the proposed MOX facility. It was felt that the public needs to be given information that will allow them to help themselves in case of a terrorist event, because there is danger in ignorance. Concern was expressed in Charlotte that with its large population and with it being a financial center, it may be even more of a target, if the Duke reactors used MOX fuel. A question was also posed about who will protect us if the NRC doesn't take into consideration all the possible risks.

Response: These comments raise issues which are beyond the scope of the EIS. But, as stated in CLI-02-24, although the NRC has declined to consider terrorism in the context of NEPA, the NRC is devoting substantial time and attention to terrorism-related matters. For example, as part of fulfilling its mission to protect public health and safety and common defense and security pursuant to the Atomic Energy Act, the NRC staff is conducting vulnerability assessments of commercial uses of radioactive material. The NRC has assessed potential vulnerabilities of radioactive dispersal devices, dirty bombs, and other diversion type activities. The NRC has issued interim compensatory measures and a number of other orders imposing enhanced security requirements on its licensees. Also, the NRC has acted to increase security awareness in its applicants.

J.3.9.2 Comments:

2-001	19-004	41-001	58-002	71-012	114-011
4-003	19-005	47-002	65-001	91-006	
10-001	24-010	56-001	68-002	93-019	
15-002	39-002	56-002	71-003	114-009	

Comment: The proposed MOX facility would be the central point for storing uranium and plutonium. Concern was expressed that having 100 percent of the plutonium in the U.S. in one location, rather than spreading out the plutonium at numerous locations is a prime situation for a terrorist attack. There was concern expressed about shipping of the plutonium and uranium to the Savannah River Site (SRS) and the possibility of a terrorist attack. It was felt that the risk of terrorism would be increased during the shipment process. A question was raised regarding the logic of the Nuclear Regulatory Commission (NRC) stating in the DEIS that terrorism is not reasonably foreseeable and therefore would not be analyzed. The comments indicated that the transportation, storage, and processing of 34 metric tons (37.5 tons) of plutonium makes the plutonium a target of terrorism. The logic of shipping plutonium in the western part of the United States to the southeastern part of the United States was also questioned. Concern was expressed as to whether there would be protection during the transport of the plutonium. It was felt that the public outcry in the Northeast, Southwest, Northwest, and West has managed to prevent a license being issued for plutonium storage in those areas. Concern was also expressed about shipping the MOX fuel to commercial reactors in the Southeast which would be an open invitation for terrorism.

Response: These comments raise issues which are beyond the scope of the EIS. As discussed in Section 1.2.2 of the EIS, surplus weapons plutonium is currently stored at seven Department of Energy (DOE) sites. It should be recognized that the DEIS discusses DOE plutonium that has been declared as surplus for national defense and does not address other plutonium stockpiles within the DOE complex. In its amended Record of

Decision, the DOE stated 6.6 metric tons (7.3 tons) of surplus plutonium would be shipped from the Rocky Flats site to the SRS.

The transport of the surplus plutonium and fresh, unirradiated MOX fuel would be conducted by the DOE, and the DOE is responsible for ensuring its protection. This type of transport has been used to ship nuclear weapons, nuclear components, and special nuclear material for close to 50 years. This type of transport is discussed in Section 4.4.1 and Appendix C of the EIS.

J.3.10 Alternatives – General

J.3.10.1 Comments: 5-009 72-002 73-002
45-009 72-015 105-009

Comment: The no-action alternative was supported over the preliminary recommendation of the proposed action. The no-action alternative would save a great deal of money, not result in transporting plutonium at this time of war, and get us back on the right track on how to deal with dismantling weapons of mass destruction here in the United States. It was suggested that Congressman Max Burns, and Congressman James Clyburn should intervene and stop this project from proceeding forward. The $309 million in the 2004 budget appropriation for the plutonium disposition program could be much better spent in some other area.

Response: Section 1.3 of the EIS discusses the need for the proposed action, particularly as part of a larger strategy for plutonium disposition, under international agreements. The strategy is intended to protect against proliferation of materials capable of making weapons of mass destruction. The no-action alternative would not meet the purpose and need of this project. The NRC staff's NEPA recommendation regarding the proposed action is discussed in Section 2.5.

J.3.10.2 Comments: 2-003
87-004

Comment: Off-specification MOX and immobilization alternatives should be considered in the DEIS. It was suggested that the off-specification MOX alternative could be expanded to include using other materials as a radiation barrier other than spent nuclear fuel. Most reactors do not have facilities to separate fuel pins from assemblies, which would be required by countries that do not have large quantities of high-level waste waiting to be vitrified. Instead of using spent fuel, one could adopt a variant of the can-in-canister approach planned for the immobilization facility. One could emplace the pellets of off-spec MOX into high-level waste glass, for instance.

Response: In Section 2.3.4 of the EIS, the Nuclear Regulatory Commission (NRC) considers the off-specification alternative and concludes that the direct radiation hazard to

workers and the public in implementing this alternative would be greater than the hazards of the proposed action. For example, the activities associated with the off-specification fuel alternative (fuel fabrication, MOX fuel transportation, and handling off-specification rods at the reactor site and at a geologic repository or Independent Spent Fuel Storage Installation) would result in greater direct radiation hazards. Also, the benefit of producing electricity from MOX fuel would not occur with the production of off-specification fuel. Placing off-specification fuel in waste glass would result in an additional processing step compared to production of MOX fuel. Worker risks from handling radioactive materials would be increased, as would costs of vitrifying off-specification fuel.

In Section 2.3.3 of the EIS, the NRC sets forth two reasons for not considering immobilization of plutonium a reasonable alternative to the proposed action (building and operating the proposed MOX facility). First, immobilization would not satisfy the purpose and need of the proposed action, because Russia does not consider immobilization alone to be an acceptable approach for achieving joint disposition of excess plutonium. The United States-Russia Agreement (White House 2000) discusses several approaches including immobilization. However, the Department of Energy (DOE) indicated that Russia would abandon its plutonium disposition efforts if the DOE selected an immobilization-only approach. Because of budget constraints, the DOE only had the ability to select one method for disposal of surplus plutonium. The DOE selected the MOX-only approach based on its judgment that it was the key to successfully completing the United States-Russia Agreement.

The second reason for no longer considering immobilization to be a reasonable alternative relates to the conduct of U.S. foreign policy. In the NRC's view, an alternative that would block the implementation of a foreign policy agreement between the U.S. and another country involves matters outside the scope of the National Environmental Policy Act.

J.3.10.3 Comments: 72-001 74-002
72-005 93-007

Comment: The Nuclear Regulatory Commission (NRC) could further point out to the Department of Energy (DOE) that it could facilitate the isotopic degradation with no reactor use and also reduce a proliferation threat by acquiring reactor grade plutonium from other countries and mixing U.S. and Russian surplus plutonium with these stocks. At that point it would be possible to immobilize or make off-spec MOX with this plutonium. Irradiated fuel could be used as the radiation barrier for this waste form.

Response: Text has been added in Section 2.3.6 of the FEIS to discuss the alternative suggested in the comment.

J.3.10.4 Comment: 19-003

Comment: Under the National Environmental Policy Act (NEPA) a range of other options including no action should be presented. This DEIS offers only the preferred option versus no option. The same should be true for the choice of the F-Area.

Response: The commenter used the term “options” presumably referring to the number of alternatives that are required by NEPA. The Nuclear Regulatory Commission (NRC) and Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA do not specify the number of alternatives that must be addressed in an EIS. The NRC chose to evaluate, in detail, the no action alternative and the proposed action. Section 2.3 of the EIS discusses a number of alternatives that were considered but were not evaluated in detail for the reasons discussed in the individual subsections. DCS conducted a siting study for the proposed MOX facility at the Savannah River Site (SRS) and reported its methodology and basis for choosing F-Area for a MOX fuel fabrication facility in Section 5.7.2.3 of the Environmental Report. The NRC evaluated the DCS Siting Study and concluded that F-Area is the most suitable location on the SRS for the proposed MOX facility.

J.3.10.5 Comments: 82-005
84-003
88-004

Comment: Cheaper and safer methods of achieving the same ends have not been thoroughly explored. The DEIS should consider other alternatives that would less negatively impact our environment.

Response: The Nuclear Regulatory Commission (NRC) considered other alternatives for disposing of surplus weapons grade plutonium that may have been more cost beneficial but they did not qualify as reasonable alternatives under the National Environmental Policy Act (NEPA). Immobilization was considered but was not evaluated in detail for the reasons discussed in EIS Section 2.3.3. The NRC also evaluated the no action alternative of leaving the plutonium at existing Department of Energy installations.

J.3.10.6 Comment: 116-006

Comment: The Nuclear Regulatory Commission (NRC) should alternatively consider a self-sufficient MOX facility with a Waste Solidification Building (WSB) and Pit Disassembly and Conversion Facility (PDCF) totally separate and independent of the remainder of the Savannah River Site (SRS). The necessary design changes should be included and reviewed at this time with a revised EIS.

Response: The NRC has no legal basis to authorize the building and operation of an independent WSB and PDCF. Moreover, such facilities would require separate support services that would substantially increase the impacts (both environmental and monetary) associated with the alternative without clear benefit over the proposed action. Therefore, the suggested alternative is not considered to be a reasonable one under NEPA.

J.3.10.7 Comments: 14-002
63-002

Comment: The safety and environmental risks associated with the no action alternative have been significantly understated. The no-action alternative assumes that the Department of Energy's (DOE's) surplus plutonium would remain in storage at seven DOE sites. The DEIS does not state the period of storage, and it appears that impacts are near-term and based on maintaining the status quo. We believe current methods of storage are only valid for a limited and finite time frame; storage without subsequent actions is not realistic for time frames of 100 years plus. At some time in the future, actions will be required to either repackage or disposition stored materials. The no-action alternative should assess the incremental added risk resulting from (1) actions to periodically process and repackage materials in long-term storage and (2) actions to eventually remove the materials from storage and preparation for disposition.

Response: The analysis of the no-action alternative impacts in the DEIS was based on all ongoing activities at each of the storage sites (and thus, the impacts are likely overestimated rather than underestimated for current storage activities). The impacts associated with possible future repackaging of some containers to maintain their integrity and with preparation of materials for disposition have not been included, since the extent of these hypothetical future activities cannot be known at this time. However, these activities would be conducted by radiation workers, with doses monitored to remain below DOE administrative limits. (For example, rotation of workers could be employed to minimize annual doses). All current storage locations are in secure areas without public access. By maintaining and monitoring the inventory, any exposures of the general public would be avoided. Therefore, it is not necessary to quantify the risk from repackaging and material preparation for the no-action alternative.

J.3.10.8 Comments: 10-016 97-017 115-002
73-005 97-018 116-013

Comment: It was recommended that both a sand filter and high-efficiency particulate air (HEPA) filters be used to protect workers at the Savannah River Site (SRS). The validity of the statement in the DEIS that the use of sand filters would not clearly result in lower net environmental impacts as compared to the use of HEPA filters was questioned considering that HEPA filters require administrative controls to maintain their efficiency. The brief discussions in the DEIS regarding the use of sand and HEPA filters imply better performance from sand filters, particularly during accidents. It is recommended that approaches more consistent with Nuclear Regulatory Commission (NRC) and nuclear industry practices in these areas, with reasonable mitigation, prevention and/or conservatism, be endorsed by the DEIS. The DEIS should include references and supporting information to support the conclusions regarding HEPA filters. Some individuals felt that HEPA filters are an unreliable means of controlling radionuclide emissions. Specifically, alpha emitters like plutonium can creep through multiple HEPA filters in sequence. The HEPA filter efficiency for plutonium is not known because of alpha migration, particle re-entrainment, and alpha recoil. A sand filter, unlike HEPA filters, is not

subject to deterioration from exposure to chemical emissions. The DEIS should include a discussion of measures the applicant plans to use to protect HEPA filters from chemical degradation.

Response: Consistent with the NRC's mission of protecting the public health and safety, the NRC regulations require that workers at the SRS and other members of the public be protected from routine facility emissions. The applicant has proposed using HEPA filters to reduce radionuclide emissions to acceptable levels. The NRC, in the draft SER issued in April 2003, has reviewed the use of HEPA filters and concluded that the proposed system provides adequate assurance of safety to members of the public, including SRS workers. Therefore, using both filtration systems is not required to achieve adequate protection of the public.

The conclusions relative to the technology option to install a sand filter are presented in Section 4.3.8 of the EIS. This section discusses administrative controls that are required to maintain HEPA filter efficiency. The assumption is that the HEPA filters would be maintained, similar to the assumption that a sand filter would be designed and constructed properly. Reliance on commitments to maintain safety is considered sufficient for estimating the environmental impacts from alternatives. Information used to support the safety basis of these commitments is discussed in Chapter 11 of the draft SER and is not repeated in the EIS. Text has been added to Section 4.3.8 of the FEIS to note the differences in sand and HEPA filter degradation and response to chemicals. The EIS states that by selecting sand filters, environmental impacts could be reduced in the specific areas of human health risk to the facility worker and accident mitigation. However, the sand filter option would not clearly result in lower net overall environmental impacts than the use of HEPA filters. Therefore, using a sand filter is not a clearly superior option.

J.3.10.9 Comment: 86-016

Comment: Section 2.2.5, page 2-18, line 29 of the DEIS states "Large fans or blowers are used to circulate the air through the sand filter media." The sentence is misleading and implies a re-circulating system rather than the "once through" system that is used. The blowers are used to draw air through the sand filter media.

Response: The text in Section 2.2.5 of the FEIS has been revised per the comment.

J.3.10.10 Comment: 86-017

Comment: Section 2.2.5, page 2-19 of the DEIS states "The facility is designed into numerous fire zones, in part to limit the exposure of individual banks of HEPA filters to failure." This sentence should read: "The facility is divided into numerous fire zones, to limit the amount of combustibles involved in a single fire which reduces the amount of soot reaching individual banks of HEPA filters and assures that the HEPA filters will not fail due to excessive plugging."

Response: The text in Section 2.2.5 of the FEIS has been revised per the comment.

J.3.11 Alternatives – Immobilization

J.3.11.1 Comments: 69-002
108-003

Comment: The immobilization of surplus weapons plutonium as a means of disposition was supported. It was stated that immobilization was the best option, rather than making MOX fuel.

Response: As stated in Section 1.1 of the EIS, the Department of Energy (DOE) is responsible for the surplus plutonium disposition program in the United States. As such, it is the DOE's responsibility to determine how surplus plutonium is dispositioned. The DOE has prepared two environmental impact statements for the surplus plutonium disposition program that evaluated a number of alternatives at a number of different locations within the DOE complex. The environmental impacts associated with immobilizing surplus plutonium have been previously considered by the DOE. The DOE decided in its April 2002 amended record of decision to pursue a MOX-only approach and to cancel plans to immobilize surplus plutonium. For more information on the DOE's decision to pursue a MOX-only approach, see Section 2.3.3 of the EIS and Comment J.3.7.2.

J.3.11.2 Comments:

4-001	37-002	64-002	81-002	96-006	112-002
10-023	37-004	68-001	87-003	96-027	114-008
13-003	40-001	71-013	87-005	103-002	
15-001	58-003	78-001	91-001	105-008	
24-007	61-007	80-003	92-002	105-010	

Comment: Failure to consider the immobilization alternative in detail, in the DEIS, was questioned. It was stated the Department of Energy's (DOE's) decision to cancel immobilization should not limit the Nuclear Regulatory Commission's (NRC's) analysis of the alternative. The DOE's decision was based on budget constraints not conflict with Russian and United States policy. This decision was considered to be abysmal. It was also stated that the DOE has additional surplus plutonium that it not suitable to be made into MOX fuel and that the DOE may later decide to pursue immobilization in the future. It was stated that the DEIS does not provide opportunity for stakeholders to comment on the immobilization alternative as a viable and cost effective option.

Immobilization would effectively achieve the MOX program's stated goal to safeguard weapons grade plutonium. It was felt that the DOE should fund this alternative and support it through further research and development to resolve outstanding technical issues with immobilizing plutonium. Immobilization was viewed as being superior to the proposed action (building and operating the proposed MOX facility) for a number of reasons. Immobilization was considered to be less costly and less risky while providing a large number of jobs in the area. Because immobilization is faster than making MOX fuel, immobilization was considered to be beneficial for limiting diversion, theft and accidents. Immobilization was considered to be more environmentally sound and safer to workers. Immobilization would help manage existing waste at the Savannah River Site while not

producing a significant amount of new waste. Immobilization, unlike storage, addresses proliferation concerns and provides jobs. Immobilization would make the plutonium less attractive to terrorists and saboteurs. For these reasons, it was felt that an in-depth comparison of immobilization and the proposed action was required by the National Environmental Policy Act (NEPA). It was also suggested because of the cost and complexity of the proposed MOX facility that immobilization could be implemented as an interim solution to allow for better science to be applied in the future.

It was stated that making MOX fuel would send the wrong message to the international community by setting an example for the civilian use of plutonium and advance the technology associated with using plutonium. Also, the MOX fuel program was seen as a stepping stone for future reprocessing in the United States. In contrast, immobilization did not have these perceived draw backs.

NRC solicited comments in the Spring of 2002 on whether the NRC should continue to consider immobilization as an alternative in the DEIS. The question of who commented and how those comments are considered was raised.

Response: The DOE is responsible for the surplus plutonium disposition program in the United States. As such, it is the DOE's responsibility to determine how surplus plutonium is dispositioned. The DOE has prepared two environmental impact statements for the surplus plutonium disposition program that evaluated a number of alternatives at a number of different locations within the DOE complex. The comparison of the environmental impacts between immobilization of surplus plutonium and making MOX fuel have been previously considered by the DOE. Therefore, they do not need to be reiterated in the FEIS.

Furthermore, as discussed in Section 2.3 of the EIS, the immobilization alternative is considered by the NRC, but not evaluated in detail. The rationale for deciding not to evaluate the immobilization alternative in detail is set forth in EIS Section 2.3.3.

As noted in the comment, the NRC solicited stakeholder views on whether the NRC should still consider immobilization as an alternative in the DEIS. This is discussed in Section 1.4.1 of the EIS. The NRC reviewed the written comments and oral comments made at three public meetings and determined that no persuasive reasons were identified requiring a detailed evaluation of the immobilization alternative.

Additional comments relative to the purpose and need can be found in Section J.3.3.

J.3.11.3 Comments: 5-001 58-003 93-004 105-012
45-001 72-013 98-002 114-007

Comment: The rationale for not considering the immobilization alternative to be reasonable based on a desire to keep the Russians at the negotiating table was questioned. The fact that Russia does not trust immobilization was not considered an acceptable reason to eliminate consideration of immobilization as an alternative. Additional arrangements could be made for Russia to verify the United States' disposal of the surplus plutonium.

Response: As discussed in EIS Section 2.3.3, part of the reason for eliminating detailed consideration of the immobilization alternative was based on the Nuclear Regulatory Commission's (NRC's) view that given DOE's 2002 amended ROD, a decision to consider the immobilization alternative would involve the NRC in foreign policy matters that are outside NEPA's scope. The Department of Energy (DOE) is the lead federal agency responsible for implementing national policy associated with the surplus plutonium disposition program and in implementing related agreements with Russia.

J.3.11.4 Comment: 86-002

Comment: The decision not to consider immobilization as an alternative to making MOX fuel (the proposed action) was supported. It was recognized that the Department of Energy, as the federal agency charged with developing the surplus plutonium disposition strategy, has already eliminated immobilization as a viable alternative.

Response: This comment is consistent with the EIS.

J.3.11.5 Comment: 105-002

Comment: The DEIS should select the cheapest disposition method as the preferred alternative. The Department of Energy (DOE) has stated that the immobilization plan is less expensive and has greater cost certainty. It was stated that the cost-benefit analysis ignores the cost to taxpayers. The cancellation of immobilization was viewed as a cost versus safety trade-off.

Response: Issues associated with not considering immobilization in the EIS are discussed in more detail in Comments J.3.11.1 and J.3.11.2. The decision on a preferred alternative is based on many factors, including costs. Other factors such as benefits, safety, and environmental harm are also considered. The cost-benefit analysis looks at both national and regional costs. The cost to taxpayers is evaluated in Section 4.6.2 of the FEIS.

J.3.12 Human Health Risk

J.3.12.1 Comment: 10-013

Comment: The Nuclear Regulatory Commission's (NRC'S) choice to use the less-protective health standard of 1 in 10,000 "accepted deaths" in the DEIS rather than the Environmental Protection Agency's 1 in 1 million was questioned.

Response: The basis for the commenter's view that the DEIS used a standard of 1 in 10,000 "accepted deaths" is not clear. In evaluating exposures to carcinogens, the Environmental Protection Agency (EPA) does consider an increased risk range of from 1 in 1 million to 1 in 10,000 additional cancers as a guideline to determine whether mitigation actions are needed. For example, mitigation actions are generally required if increased risks are greater than 1 in 10,000; mitigation actions are generally not required if increased

risks are less than 1 in 1 million, and mitigation actions may be discretionary or limited if they are within the risk range.

In the EIS, radiological doses under both the no-action alternative and the proposed action are compared with NRC standard and guideline levels. The NRC annual dose limit for exposures of any individuals in the general public is 1 mSv (100 mrem), used with the provision that doses should also be kept as far below these limits as is reasonably achievable. For comparison, the annual average individual exposure in the U.S. is 3.6 mSv (360 mrem) (3 mSv [300 mrem] from natural sources and 0.6 mSv [60 mrem] from man-made sources). The 1 mSv (100 mrem) per year dose limit corresponds to an increased latent cancer fatality (LCF) risk of about 6 in 100,000 for an individual. Estimated risks from radiological exposures for maximally exposed members of the general public under normal operations were 4 in 1 million and 4 in 1 billion additional chance of an LCF for the no-action alternative and the proposed action, respectively (see Table 2.1).

For exposures to chemicals under the no-action alternative, the increased cancer risks to the general public would be within the risk range of 1 in 1 million to 1 in 10,000 additional probability of developing cancer for an individual (see Section 4.2.2.2). The risk under the proposed action was not quantified, because the emissions would be small.

The EIS cites the standards and guidelines to use for comparison with calculated doses and risks, but the estimated values for both alternatives are meant to be compared with each other to facilitate decision-making for the proposed project.

J.3.12.2 Comments: 6-001
42-001
42-002

Comment: The proposed project has some risks associated with it. Safety and the health of employees, the general public, and animals should be a number one priority at the Savannah River Site (SRS).

Response: There is some level of human health risk associated with both the no-action alternative of continued storage, and also with the proposed action of constructing and operating the proposed MOX facility. Specifically, estimated risks from radiological exposures for maximally exposed members of the general public under normal operations were 4 in 1 million and 4 in 1 billion additional chance of a latent cancer fatality for the no-action alternative and the proposed action, respectively (see Table 2.1 of the EIS). The risks to the general public from exposures to chemicals under the no-action alternative were not explicitly quantified for the DEIS, but the increased cancer risks to the general public were estimated to be within the risk range of 1 in 1 million to 1 in 10,000 additional probability of developing cancer for an individual (see Section 4.2.2.2). The chemical risk to the general public under the proposed action was not quantified because the emissions would be small. The chemical and radiological risks for workers under the proposed action and the no-action alternative were within regulatory standard and guideline levels. Risks

from accidents are generally low, although some low probability accidents could result in injuries to facility workers and SRS employees.

J.3.12.3 Comment: 66-005

Comment: The data in the DEIS prevents corroboration of the human health impact figures. The document is therefore deficient and suspect because these values can not be corroborated and because of the inclusion of the Waste Solidification Building (WSB) and the Pit Disassembly and Conversion Facility (PDCF). It was suggested that additional and corrected data be provided so that the public can offer meaningful comments.

Response: It is unclear what the commenter means by "prevents corroboration of human health impacts figures." The intent of the document was to provide enough details on the methods used to estimate health risks so that readers could understand those methods. Details on the methods are discussed in Section 3.10 and in Appendix E of the EIS. Risks associated with the WSB and PDCF were included in the analyses.

J.3.12.4 Comment: 52-003

Comment: The environmental impacts, human health risks, and waste management of the Pit Disassembly and Conversion Facility (PDCF) and the proposed MOX facility must be specifically evaluated. Latent cancer facilities associated with the proposed Waste Solidification Building (WSB) and all substantial handling and transport are significant portions of the real cost of this mission and are minimized in the DEIS. The DEIS should be revised.

Response: The radiological human health risks associated with normal operation of the proposed MOX facility, PDCF, and WSB are evaluated in Section 4.3.1.1 of the EIS (see Table 4.3 for a summary); the chemical risks are evaluated in Section 4.3.1.2. The radiological risk estimates are based on estimated air emissions provided by the applicant, DCS. The applicant stated that emissions to water would be small because any liquid discharges from the WSB would be under the existing NPDES permit guidelines. Additionally, chemical emissions to air were stated to be small because process controls limit the release of chemicals to the environment, and engineering controls and personal protective equipment protect workers from significant exposures, as necessary. Therefore, human health risk from chemical exposures would be small.

Because facility solid and liquid wastes would be treated and/or disposed of in accordance with applicable Nuclear Regulatory Commission regulations and Department of Energy Orders, significant exposure of workers or the public to chemical or radiological materials in these wastes would not be expected to occur. The waste facilities to which these wastes would be shipped are permitted facilities required to handle incoming wastes in ways which minimize impacts to the environment (including minimizing the potential for human exposures).

J.3.12.5 Comment: 53-005

Comment: The affected environment chapter should state what the impacts are from chemicals released at the Savannah River Site (SRS), not which chemicals are being released at a rate of more than one ton per year.

Response: The air quality section of the Affected Environment (Section 3.4.2 of the EIS) discusses site emissions and gives the tons/year of toxic air pollutant emissions (Table 3.2). The Human Health Risk section (3.10.4.2) discusses the baseline environment for chemical exposures associated with the SRS site (for example, potential receptors, pathways of exposure, and exposure sources). For chemical exposures, modeling results for the SRS boundary ambient air concentration of toxic pollutants from SRS point sources are summarized and compared with health-based guideline levels.

J.3.12.6 Comment: 66-003

Comment: Any accident would not likely create a uniform offsite dispersion among the population limited to a 160 pound man with effects stopping at one year. Using Federal Guidance Report 13 (FGR 13), which does not consider gender, race, or age differences in response to radiation exposure, results in cumulative errors in the DEIS. Further, an actual accident may cascade into several of the scenarios illustrated in the EIS, compounding health effects. The impacts of the proposed MOX facility were questioned because the DEIS says that statistically no fatalities will occur during normal operations, while the figures say that 50 people will die by latent cancer fatalities. The DEIS must be corrected to reflect these concerns.

Response: The EIS provides a conservative estimate of accident impacts and an independent review of previous accident analyses performed for the MOX facility, the Pit Disassembly and Conversion Facility and the Waste Solidification Building. The accident results presented were for a given direction from the SRS estimated to provide the largest potential dose to the exposed population, with exposure decreasing as a function of distance from the accident location. The largest exposure for most accidents occurs in the short-term from inhalation. If ingestion is considered, the highest exposure also occurs in the first year. In either case, the potential internal intake of the radioactive contamination results in a long-term internal exposure that was taken into account by the 50-year dose conversion factors used.

The health risk conversion factor is not limited to a standard man. As discussed in EIS Section 3.10.3, the FGR 13 health risk conversion factor of 0.06 fatal cancers per person-Sv (0.0006 fatal cancers per person-rem) is from the latest available study that provides a combined gender, age-averaged risk coefficient deemed to be representative of the public.

It was estimated in the DEIS that up to 50 latent cancer fatalities (LCFs) from short-term exposure could occur. In the FEIS, the LCF estimates for the public varied from 3×10^{-5} to 3 for the short-term exposure scenario, and from 0.0001 to 100 for the 1-year exposure scenario (see Table 4.14 in the FEIS). However, conservative assumptions were used in

the analysis to provide an upper bound on the estimated consequences. In addition, the likelihood of such an accident is very small. Thus, the overall risk (consequence times probability of accident occurring) of anyone dying from LCFs related to potential MOX facility accidents during its operational lifetime is much less than one (see Table 4.15 in the FEIS).

J.3.12.7 Comment: 86-033

Comment: In Sections 3.10.4.2 and 4.3.1.2.2, the DEIS uses data completely out of context to reach erroneous conclusions on several points. The data presented in Table 3.11 for 'SRS maximum modeled ambient concentration' and 'SCDHEC standard' are maximum 24-hour averages; i.e., the maximum value that occurred at the Savannah River Site (SRS) boundary over a single 24-hour period for a one-year period of analysis. Conversely, the Environmental Protection Agency (EPA) risk guideline levels assume a long term exposure. Since the wind does not blow in the same direction all through the year, the long term (e.g., annual) average concentration for a pollutant will be much less than the maximum 24-hour average.

Table 3.11 and accompanying text should be revised to indicate clearly the context of the information that is being presented (i.e., averaging period) and to remove any implication that SRS air toxic emissions pose unacceptable risk to the public, or that (implicitly) the South Carolina Department of Health and Environmental Control (SCDHEC) standards to not adequately protect public health.

The DEIS is wrong to state (page 3-54, lines 24-25) that any of the modeled-estimated concentrations (24- hour) from the 1998 submittal to the SCDHEC exceeds ambient standards. The SCDHEC Air Pollution Control Regulation 61-62.5, Standard 8, states that model estimated concentrations for pollutants with a zero standard are to be rounded to the hundredths decimal place. By applying this guidance to the four pollutants for which the SRS allegedly exceeds the standard (see Table 3.11), the maximum site boundary concentration becomes 0.00. These pollutants, therefore, meet the SCDHEC standard of 0.00 in each case.

Response: The comparison of modeled ambient levels of toxic air pollutants (TAPs) at the SRS with health-based guideline levels is appropriate and has been retained. However, some of the revisions and qualifiers suggested have been added to the text, as detailed below. Also, the comment was correct in stating that, when rounding is conducted in accordance with SCDHEC instructions, no standards are exceeded. The suggested text and table change to delete reference to exceeding SCDHEC standards has been made.

The most recent available version of the SCDHEC Standard No. 8 for Toxic Air Pollutants (dated Oct 26, 2001; available at http://www.scdhec.net/eqc/baq/html/regulatory.html), gives no details on the criteria or methods used to develop the standard concentrations. Under National Environmental Policy Act regulations, it is generally recognized that comparison with regulatory standards is not sufficient to demonstrate the absence of adverse impacts, because many criteria are considered in establishing regulations. For example, maximum

contaminant levels (MCLs) for drinking water are enforceable standards established with consideration of adverse health impacts and best available treatment technology and cost considerations. Therefore, it is appropriate to compare the modeled ambient air TAP levels with levels known to be based only on the potential for adverse human health impacts. Furthermore, Standard No. 8 itself recognized the applicability of U.S. EPA reference concentrations in evaluating ambient air levels; several of the standards have a footnote that states "Verified reference concentration (RfC) established by the United States Environmental Protection Agency." However, there are many U.S. EPA RfC values that are not reflected in the SCDHEC standards. No information is given in the standard to explain this discrepancy.

Text has been added to Section 3.10.4.2 of the FEIS to clarify that the modeled concentrations are maximum 24-hour averages. The comment correctly pointed out that it is overly conservative to compare maximum 24-hr averages with the EPA guidelines for long-term exposures; however, it was deemed better to use a conversion factor of 0.2 (based on guidance in documentation for EPA's SCREEN3 model) rather than the suggested factor of 0.01.

J.3.12.8 Comment: 86-034

Comment: In Section 3.10.4.2, page 3-54 of the DEIS, the statutory authority for the statement "However, emissions of the pollutants listed in Table 3.11 may require further investigation by the Savannah River Site to determine that ambient levels are not of concern with respect to human health impacts" was questioned.

Response: The sentence referred to has been deleted from the text.

J.3.12.9 Comments: 86-037
86-040
86-041

Comment: Reliance on Occupational Health and Safety Administration (OSHA) and South Carolina Department of Health and Environmental Control (SCDHEC) regulations as mitigation during construction and operation was questioned. On page 4-11, Section 4.3.1.2.1, the DEIS discusses exposure to hazardous materials during construction. Exposure to hazardous materials used during construction will be minimized by following applicable OSHA regulations and precautions. No additional mitigations are necessary. Rather, the DEIS should state that exposure to hazardous materials used during construction will be minimized by following applicable OSHA regulations and precautions.

Similarly in Section 4.3.1.2.2, the DEIS states, "However, the workplace environment would be monitored to ensure that airborne chemical concentrations were below applicable occupation exposure limits." Exposure to hazardous chemicals used during operations will be minimized by following applicable OSHA regulations and precautions. No additional mitigation measures are necessary. Rather, the DEIS should state that exposure to hazardous materials used during operations will be minimized by following applicable OSHA

regulations and precautions. In addition, hydrazine emissions from the proposed MOX facility will be subject to South Carolina Department of Health and Environmental Control regulations. No additional mitigations are necessary; DCS will comply with SCDHEC air quality regulations.

Response: The text in Section 4.3.1.2.1 has been changed in the FEIS to indicate that exposure to hazardous materials used during construction (e.g., paints, solvents) would be limited by following applicable OSHA regulations and precautions, such as ensuring good ventilation and cleaning up small chemical spills as soon as they occur.

As indicated in Chapter 5, the Nuclear Regulatory Commission considers complying with OSHA regulations to be a form of mitigation. Following applicable OSHA regulations during operations includes monitoring the workplace environment to ensure that airborne chemical concentrations are within exposure limits. The text in Section 4.3.1.2.2 has also been changed to note that DCS will demonstrate that operational hydrazine emissions would be limited to levels that would not cause exceedance of the SCDHEC standards.

J.3.12.10 Comment: 86-038

Comment: In Section 4.3.1.2.1, page 4-12 of the DEIS, the statement, "The 29 October 2002 correspondence from DCS to NRC responding to requests for additional information included the results of the 'further sampling' referred to in the DEIS. The DEIS should have included the results of this report which confirm the previous DCS conclusion that there are no significant concentrations of radioisotopes or chemicals in the soil, that would be hazardous to construction workers health" is incorrect.

Response: The referenced characterization report (*Plutonium Disposition Program (PDP) Preconstruction Environmental Monitoring Report* [Fledderman 2002]) contained limited data for nonradiological constituents in soil (e.g., only 10 metals analyzed, no organic compounds analyzed), and only included shallow soil samples. The data from the report have been summarized and added to the discussion in Section 4.3.1.2.1 of the FEIS, but the conclusion that more testing may be required if evidence of possible contamination is encountered during excavation is retained.

J.3.12.11 Comment: 89-039

Comment: In Section 3.10.5, the DEIS states that a rate of 3.3 fatalities/l000 full-time equivalents (FTEs) and 4.6 injuries/100 FTEs is used based on Bureau of Labor Statistics/National Safety Council data. National safety statistics are not appropriate to represent baseline risks for estimating Savannah River Site (SRS) operations. There have been no fatalities for over 200,000 FTEs of operations or construction since 1989. The lost workday injury rate for SRS operations during the past 6 years (1997 – 2002) has averaged 0.38 cases per 200,000 hours (100 FTEs), less than 10% of the value cited in the DEIS.

Response: National statistics for physical hazards are used to estimate the risks from the no-action alternative and the proposed action, so these national rates are used in the

affected environment section (Section 3.10.5 of the EIS) to provide a baseline for comparison. However, text has been added to this section to acknowledge that actual injury rates at the SRS are lower than those predicted based on national averages.

J.3.12.12 Comment: 89-045

Comment: In Section 4.3.1.2.2, page 4-13 of the DEIS, the discussion of mixing and blanketing is unclear. A blanket of nitrogen above the hydrazine does not mix with the liquid hydrazine that is forwarded to the process.

Response: The text in Section 4.3.1.2.2 has been changed in the FEIS to clarify that the purpose of blanketing with nitrogen is to shield the liquid hydrazine from unwanted side reactions.

J.3.12.13 Comment: 89-050

Comment: It is not appropriate to assume in the DEIS that 240 gal of chlorine would be stored at the Pit Disassembly and Conversion Facility since the Surplus Plutonium Disposition (SPD) EIS indicates that the quantities of hazardous chemicals are generally small, and does not indicate that chlorine is an exception to that statement. The SPD EIS Table E-7 indicates that chlorine will be used in the pit conversion facility, and the discussion of the accident analysis on Page K-7 indicates that "On an industrial scale, the quantities of hazardous chemicals are generally small — No substantial hazardous chemical releases are expected."

Response: The SPD EIS Table E-7 lists an annual operational resource requirement of 62 m^3 of chlorine gas, which corresponds to approximately 240 gallons of liquid chlorine. The EIS accident analyses include all hazardous chemicals stored in any of the facilities in quantities greater than 10 gallons (see EIS Appendix E). Chlorine was assumed to be stored as a pressurized liquid, as is common in industrial facilities. The analyses showed that an accidental chlorine release would not have adverse impacts for the general public at the Savannah River Site (SRS) boundary, but that it could result in high adverse impacts for workers.

J.3.12.14 Comment: 97-009

Comment: A temperature of 25.8°C (78.5°F) is stated as an average. This is not a reasonable average nor does it provide any margin. Temperatures in excess of this would be anticipated to occur many times each year (i.e., an anticipated, annual event). In addition, solar heating effects on the structure (the Reagent Storage Building is a metal structure), other buildings and storage areas, and during deliveries could push local ambient temperatures in excess of 120°F. Thus, the assumed average temperature does not address anticipated conditions that occur annually nor do they provide any margin or conservatism. A higher temperature should be used for vapor pressures and release calculations.

Response: The 25.8°C (78.5°F) 95th percentile nighttime temperature is representative of conditions corresponding to the site-specific annual 95th percentile concentration determined from the radiological accidental release modeling. Review and analysis of on-site historical meteorological measurements taken at a nearby Savannah River Site operated tower shows that this temperature is exceeded only 5% of the time during nighttime low-wind speed conditions. The 95th percentile daytime temperature was found to be 30.8°C (87.5°F). Therefore, use of a value representing the 95th percentile is considered representative of a reasonable upper bound. These values were chosen to maintain consistency with the radiological accident assessment, and with Nuclear Regulatory Commission guidance. Details and rationale for the meteorological conditions assumed for accident modeling are provided in Appendix E, Section E.1 of the EIS.

J.3.12.15 Comment: 97-012

Comment: Nitrogen tetroxide is a chemical that requires great care during handling and use, as discovered from the space and missile programs. It boils at near ambient conditions and significantly dissociates into nitrogen dioxide at temperatures slightly above ambient, which greatly increases the effect of releases. It can also cause common mode failures. In addition, the nitrogen tetraoxide would be pressurized in the proposed MOX facility. The DEIS is not clear if this been accounted for in the analyses. The DEIS indicates an estimated concentration of 1,600 mg/m^3 at 100 meters. This is a potentially lethal concentration and would likely result in large numbers of serious injuries and fatalities if the release occurred at the proposed MOX facility, and could negatively impact adequate safeguarding of nuclear materials. The DEIS does not discuss adequate mitigation and/or prevention of such events. The DEIS should acknowledge and address these concerns.

Response: In EIS analyses, the accidental release of nitrogen tetroxide is modeled as a pressurized release. Nitrogen tetroxide is identified in the accident impacts, chemical human health risks section of the EIS (4.3.5.3) as a chemical which, if accidentally released, could cause high adverse impacts to workers. Nitrogen tetroxide would be regulated by the Occupational Health and Safety Administration (OSHA) under its Process Safety Management Rule (29 CFR 1910.119). The Process Safety Rule contains requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals. Under this rule, DCS would perform a hazard analysis, develop and implement written operating procedures that provide clear instructions for safely conducting activities involving process chemicals covered by the rule, develop and implement a training program, develop and implement an inspection and testing program, and develop and implement an emergency planning and response program. Text has been added to Table 5.1 to reflect these mitigation measures.

J.3.12.16 Comment: 107-002

Comment: The DEIS discusses the need to demonstrate that the offgas treatment system will limit hydrazine, (listed as a hazardous air pollutant under the Clean Air Act), to very low levels. The DEIS states that these levels would not cause adverse health impacts to members of the public or employees. Information about plans for monitoring the offgas treatment system for hydrazine should be included in the FEIS.

Response: During Clean Air Act permitting, it must be demonstrated that hydrazine emissions will not cause exceedance of the South Caroline Department of Health and Environmental Control ambient standard of 0.06 $\mu g/m^3$ at the Savannah River Site boundary. This may be demonstrated in a variety of ways. It is possible that mass balance calculations based on the annual usage of hydrazine, coupled with conservative assumptions on fugitive emissions and air dispersion modeling, would indicate that an offgas treatment system is not necessary. These issues would be further investigated by DCS during the permitting process.

J.3.12.17 Comment: 85-003

Comment: Concern was express regarding the safety and health of all the individuals in this area. Additional attention and study of these safety issues should be undertaken. The DEIS does not provide conclusive evidence that this site is currently “safe” for the community that lives around its borders, much less that the people will be safe when this facility is built.

Response: The methods used to estimate safety and health impacts in the EIS were designed to ensure – through uniform and careful selection of assumptions, models, and input parameters – that impacts would not be underestimated and that relative comparisons among the alternatives would be meaningful.

Based on these methods, the DEIS identified some level of human health risk to the off-site public associated with both the no-action alternative of continued storage, and also with the proposed action of constructing and operating the proposed MOX facility. Specifically, estimated risks from radiological exposures for maximally exposed members of the general public under normal operations were 4 in 1 million and 4 in 1 billion additional chance of a latent cancer fatality for the no-action alternative and proposed action, respectively (see Table 2.1 of the FEIS). For exposures to chemicals under the no-action alternative, the estimated increased cancer risks to the general public were within the risk range of 1 in 1 million to 1 in 10,000 additional probability of developing cancer for an individual (see Section 4.2.2.2 of the FEIS). The chemical risk under the proposed action was not quantified, because the emissions would be small. Risks from accidents are generally low, although some low probability accidents could result in increased cancer risks (from radiological exposures) or injuries (from chemical exposures) for facility workers and Savannah River Site employees.

Investigation of the health records of the surrounding communities is beyond the scope of the EIS. However, the human health impact assessment (discussed above) did not indicate that the proposed action would result in an increase in adverse health effects in the surrounding communities.

J.3.12.18 Comment: 86-039

Comment: In Section 4.3.1.2.2, page 4-12, lines 19-21 of the DEIS, the list is missing oxalic acid, sodium hydroxide, and sodium carbonate all of which were listed in MOX ER Table 3-2.

Response: The chemicals listed in the DEIS text were not intended to include all the chemicals used in the process. The text has been revised in Section 4.3.1.2.2 of the FEIS to add a reference to Appendix E, where all the chemicals used are listed. Appendix E also explains why accidental releases of some of the chemicals were not modeled (i.e., some were dropped because they would be stored in quantities of less than 10 gallons; some were dropped because a temporary emergency exposure limit-1 (TEEL-1) value of greater than 15 mg/m^3 indicated low toxicity).

J.3.12.19 Comment: 86-060

Comment: Table 4.16 presents a larger volume of nitrogen tetroxide (i.e. 240 gallons or 912 liters) in a storage/transportation cylinder than is planned to be used at the proposed MOX facility. DCS intends to use a storage/transportation cylinder containing 2000 lb (907 kg) of nitrogen tetroxide. This corresponds to 630 liters of nitrogen tetroxide.

Response: The assumed container sizes for accidental chemical releases were obtained from the October 31, 2002, revision of the Construction Authorization Request (CAR). Table 8-2a of the CAR gives a container size of 240 gallons (1 ton) for nitrogen tetroxide.

Although DCS may have now revised its plans for the nitrogen tetroxide cylinder size to be used at the facility, the outcome of the assessment would not change if the storage volume were reduced by approximately one third. That is to say, an unmitigated accidental release of either volume would not cause adverse impacts for the off-site general public, but could result in moderate to large adverse impacts for the Savannah River Site employee population. Preventive planning and mitigation measures in case of spill are required when extremely hazardous substances are in use at industrial facilities.

J.3.12.20 Comment: 97-008

Comment: Section 4.3.5.3, page 4-42 of the DEIS discusses the potential effects from chemical releases and accidents. The DEIS uses temporary emergency exposure limits (TEELs) which are adopted by the Department of Energy Subcommittee on Consequence Assessment and Protective Action (SCAPA). TEEL values also change frequently and may underestimate potential concerns and required mitigative or preventative methods. It is recommended that more conservative and regulator-endorsed values are used. This may

involve a methodology to select the lowest values from Acute Exposure Guideline Levels (AEGLs), Immediately Dangerous to Life or Health (IDLHs), Military Air Guidelines (MAGs), and National Institute for Occupational Safety and Health (NIOSH)/Occupational Safety and Health Administration (OSHA).

Response: It is agreed that certain acute exposure guideline values have received a higher level of research and peer review than others, and that those higher quality values should be used if available. Acute Exposure Guideline Level (AEGL) values would be the most preferable, because the AEGLs are derived by an independent panel of experts under the auspices of the National Research Council's Committee on Toxicology, and because the criteria for AEGL derivation take into account sensitive individuals (i.e., they would be protective for nearly all people). AEGL values are derived for three tiers of effects – essentially a threshold level below which no adverse effects would be expected (AEGL-1), a threshold level below which only minor adverse effects would be expected (AEGL-2), and a threshold level below which life-threatening effects would not occur (AEGL-3). AEGL values are currently available for only nine chemicals, and none of these are chemicals that would be used in the proposed facilities.

Of the 15 chemicals for which air dispersion modeling was conducted for the EIS accident analysis, 12 have IDLH values and two have NIOSH/OSHA ceiling values. Acute exposure guidelines not mentioned by the commenter are the Emergency Response Planning Guidelines (ERPGs) developed by the American Conference of Governmental Industrial Hygienists (ACGIH). These values are similar to the AEGL values in that three effect levels are derived for each chemical (with definitions similar to those for the AEGL values). The ERPG values are widely used for emergency response planning, because they are derived by panels of toxicologists reviewing all available data, and because they are well documented. ERPG values are available for about 100 chemicals. ERPG values were available for 6 of the 15 chemicals in the EIS analysis.

Temporary emergency exposure limit (TEEL) values are not intended to supercede values derived more rigorously through critical review of all available toxicity literature for a chemical. They are specifically "temporary emergency exposure limits" to be used only when other values (that is, AEGLs or ERPGs) are not available. In fact, whenever ERPG values are available for a given chemical, those values are adopted as the TEEL values. However, when data are lacking, the process of deriving TEELs is very similar to what the commenter suggested; there is a hierarchy that uses IDLH values to approximate the potentially life-threatening value (TEEL-3), uses IDLH/10 or ceiling values to approximate the irreversible injury threshold, and uses occupational short-term exposure limits to approximate the minor injury threshold. (Craig et al., 2000, "Derivation of Temporary Emergency Exposure Limits (TEELs)," J. of Applied Toxicology, 20, 11-20). Modified values from other countries, such as Germany's maximum allowable concentrations (MAKs) for occupational exposures, may also be used if no U.S. values are available. If none of these data are available, other data such as (lethal concentration) LC50 values are used. TEELs are now available for over 2000 substances. Because the TEEL values do incorporate readily available regulatory and guideline values, they are the best alternative for use in evaluating accidental exposures when AEGL or ERPG values are not available.

In EIS Appendix E, Section E.1 (Accidents, Chemical Human Health Risk), text has been added to explain the different acute emergency planning values that are available, and why the ERPG and TEEL values were chosen. An additional change that has been incorporated into the analysis is that the TEEL values used to evaluate the hypothetical hydrazine release have been changed from those for hydrazine hydrate to those for hydrazine. ERPG values are available for hydrazine (but not hydrazine hydrate), and the TEEL values are the same as the ERPG values. These ERPG (also TEEL) values are considered to better represent the toxicological database for hydrazine.

J.3.12.21 Comments: 86-114
86-115

Comment: In Table E.1 of the DEIS, the solution molecular weight (94 g/mole) and the solution density (2.13 kg/l) for hydrazine/sodium hydroxide appear to be incorrect.

Response: Table E.1 of the FEIS has been changed to reflect the correct molecular weights and densities for hydrazine and sodium hydroxide.

J.3.12.22 Comment: 86-116

Comment: In Table E.3 of the DEIS, evaporation rates and vapor pressures of evaporating chemicals appear to be incorrectly calculated for chemicals where mole fractions were used to calculate the vapor pressures, which in turn were used to calculate the evaporation rates.

Response: Mole fractions were estimated based upon the data provided on storage and process chemical compositions and concentrations.

J.3.12.23 Comment: 97-010

Comment: The chemicals are used in processes within the proposed MOX facility. Process temperatures will likely exceed ambient temperatures considerably. For example, solvent extraction processes routinely can exceed 50°C (122°F) , while evaporators can exceed 100°C (212°F). These higher temperatures should be used as appropriate for modeling the evaporation of process spills and may necessitate the use of other models (e.g., flashing and bulk convection) for estimating release rates.

Response: None of the bounding chemical accidents analyzed in the DEIS involved process accidents (i.e., accidents that occur during aqueous polishing or fuel fabrication at the proposed MOX facility). Therefore, the chemical accident analyses did not consider temperatures of chemicals during processing.

J.3.12.24 Comments: 86-058
89-049

Comment: The temporary emergency exposure limit (TEEL) values given for hydrazine hydrate in Table 4.16 are the TEEL values for hydrazine hydrate, aqueous solutions. DCS

plans to use hydrazine monohydrate. The TEEL values for hydrazine monohydrate should be used instead of hydrazine hydrate.

Response: The MOX ER (Rev 3, June 2003), Table 3-2 (Chemical Consumption and Onsite Inventory) lists hydrazine (35%) as a process chemical, with an annual usage of 530 gallons, and an onsite inventory of 126 gallons. The EIS uses the TEEL values for hydrazine hydrate, aqueous solutions, to evaluate an accidental hydrazine release. The assessment has been revised to evaluate an accidental release on the basis of comparison with the TEEL values for hydrazine, which are the same as the Emergency Response Planning Guideline (ERPG) values and have received thorough critical review. The ALOHA model used to estimate the downwind hydrazine concentrations takes into account the concentrations of the released chemical (in this case, 35%). The use of the peer-reviewed ERPG values for evaluating the hydrazine release is preferable to using either the TEEL values for hydrazine hydrate or for hydrazine monohydrate, which have not received the same level of review and may be based on default data (see Comment J.3.12.20 for more information).

J.3.12.25 Comments: 86-059
86-113

Comment: The DEIS appears to contain an erroneous calculation of solute mole fraction and vapor pressure for hydrazine/sodium hydroxide, hydrazine/hydroxylamine nitrate, hydrogen peroxide, hydroxylamine nitrate, nitric acid, which has resulted in significantly larger estimates of the modeled airborne concentrations and distances to reach the temporary emergency exposure limit (TEEL) limits.

Response: The assumptions and calculations made to estimate spill evaporation rates were based upon data supplied by DCS. The calculations were checked by the Nuclear Regulatory Commission and are consistent with the chemical inventory data supplied and the assumptions necessary to carry out the calculations. The commenter provided no supporting data or calculations to substantiate an error in the mole fraction calculations.

J.3.13 Human Health – Radiological Risk

J.3.13.1 Comments: 24-003
71-008

Comment: It was suggested that long-term, well-controlled, epidemiologic studies of workers and other potentially exposed populations be conducted by impartial, qualified scientists. Such studies should have been conducted on populations which might have been exposed through air, water and food ingestion. Such studies should not be prejudiced by prior assumptions, such as extrapolating data derived from the flawed studies of Hiroshima and Nagasaki, which were limited to the survivors of those acute massive exposures. It is difficult to justify the absence of such studies and further how a DEIS can be adequately carried out in the absence of such data. The DEIS would have more validity

if risk factors were based more upon such information. Effects of chronic low dose radiation have been reported by scientists such as Drs. Alice Stewart and Dr. Steve Wing (UNC Chapel Hill). Absent the use of such epidemiologic data, skepticism is warranted regarding the estimated health risks presented in the DEIS.

Response: Health effects of low levels of radiation exposure are not determined solely on the basis of the Hiroshima and Nagasaki studies. Other epidemiological studies are used as well, such as those on patients exposed during medical treatment, occupational exposures of workers in the nuclear industries, and exposures of people in high natural background radiation areas. These studies have been ongoing for a long time, some for close to half a century, and they have been periodically updated and reviewed by a number of organizations, including the National Academy of Sciences. To date, no excess cancers have been identified below a dose of about 5 rem that can be attributed to radiation exposure. However, current understanding of the initiation and development of cancer, as well as available data, do not support a reliable conclusion that there are no effects below this level. It is therefore the cautious policy of the Federal Government to assume that the risk of cancer at low-levels of radiation exposure increases linearly in proportion to the dose, with no cut-off level below which there is no risk. This assumption is conservative in that it is likely to overestimate the risks at low levels of radiation exposure, which may be zero, but is not likely to underestimate such risks.

J.3.13.2 Comment: 37-001

Comment: It was stated that comparing human dosage that we receive from natural sources and things that we cannot avoid or things that we choose to benefit our health, such as radiation from the cosmic universe, medical exams, chest X-rays, with dosage from harmful radioactive isotopes that we do not choose is an obfuscation of the impacts.

Response: The comparison of human dosage we receive from natural or medical sources is intended to provide a unit of measure, a sense of scale, that the public may use to assess the estimated risks presented in the EIS.

J.3.13.3 Comment: 53-004

Comment: The DEIS does not state what the radiological impacts are. It provides potential radiological doses, but does not state what the impact is in terms of specific measurements such as curies or becquerels. The DEIS should state the quantity of radioactive material that is being released.

Response: Estimated releases of radioactivity for normal operations and accidents are presented in Appendix E, in Tables E.5 (microcuries per year) and E.13 (curies), respectively.

J.3.13.4 Comment: 53-006

Comment: The DEIS does not discuss the impacts of americium. Americium is significant because it poses a risk that is disproportionate to the risk of plutonium and there will be large waste streams of americium. It was suggested that the americium could be used or recycled in smoke detectors or other commercial products. The DEIS should state the hazards of americium.

Response: Americium is a hazardous radioactive material similar to plutonium that has been accounted for in the impact analyses (See Tables E.5 and E.13). Americium is not any different in its radiation effects from other radioactive materials of the same category, namely alpha radiation emitters, and it poses the same types of hazards. The differences in risk between americium and other alpha emitters such as plutonium is factored into, and considered, in the calculation of dose. A given dose equivalent of radiation poses the same risk, regardless of the source of the radiation that causes it. The amount of americium in a smoke detector is very small, approximately 1 microcurie. The amount of americium estimated to be separated from the plutonium is orders of magnitude larger than needed for this application and must be disposed of properly.

J.3.13.5 Comments: 71-005
71-007

Comment: Building and operating the proposed MOX facility at the Savannah River Site would place workers' health at greater risk from unnecessarily increasing their plutonium exposure. It places populations in nearby areas at increased risks of exposure to plutonium and other byproducts of such a facility.

Response: All operations at the proposed MOX facility would be carried out in a manner that reduces the risks to workers, the public, and the environment in accordance with Nuclear Regulatory Commission regulations. The main difference between exposure to plutonium and exposure to any other radioactive material is that, because plutonium often produces higher doses from a given amount of material than many other radioactive materials, it must be kept at low levels throughout the work areas. This is taken into account in the design of the facility.

J.3.13.6 Comments: 71-001 86-069 94-001
72-009 86-112
86-056 93-014

Comment: Concern was expressed regarding the data and basis on which radiation exposure and health risks were determined. The use of "standard man" does not adequately reflect radiation impacts to young and old people that are at a much higher risk. It was stated that a millirem is not a millirem. The health risk depends on other factors such as age and sex. It was suggested that the Nuclear Regulatory Commission (NRC) should follow the Environmental Protection Agency (EPA) and adopt a separate set of evaluation

standards for childhood cancers. In addition, the use of the EPA Federal Guidance Report 13 (FGR 13) health risk conversion factor was questioned. The FGR 13 risk factor relies on studies not yet incorporated into international standards and is another overly conservative assumption used in the risk assessment that results in an order of magnitude higher risk.

Response: The effects of low dose radiation are still being debated in the international scientific community after decades of study. The current approach attempts to ensure that the assessed impacts do not underestimate any potential hazards. It is true that young people tend to be more susceptible to radiation than adults. The use of FGR 13 data takes this into account because these dose conversion factors consider exposure to all age groups in a typical US population and calculates the average risk to such a population. These factors take into consideration the risk of exposure from childhood for a lifetime for children, as well as lifetime exposure starting at adulthood. The FGR 13 health risk conversion factor of 0.06 fatal cancers per person-Sv (0.0006 fatal cancers per person-rem) used in the EIS is from the latest available study that provides a combined gender, age-averaged risk coefficient deemed to be representative of the public.

The FGR 13 health risk conversion factor is based on U.S. population mortality statistics, but incorporates many of the more recent recommendations from the International Commission on Radiological Protection (ICRP), such as ICRP publications 66 and 67, since ICRP Publication 60. ICRP Publication 60 recommended a factor of 0.05 fatal cancers per person-Sv (0.0005 fatal cancers per person-rem; see Table 3 of that publication) for the public. The FGR 13 value of 0.06 fatal cancers per person-Sv (the next possible higher value considering the uncertainties involved) is only 20% higher, not an order of magnitude higher as suggested in some comments. The use of the FGR 13 risk factor, rounded to one significant figure, has been used by the NRC and other Federal agencies and is considered to be an appropriate estimate of the risks associated with radiation dose.

J.3.13.7 Comments: 53-002
73-001
105-004

Comment: The public health effects from radiation exposure in the DEIS are expressed in terms of cancer effects. If that is the only health consequence that is going to be addressed, at least say why other consequences are not being addressed, what you know and what you don't know about the impacts of ionizing radiation. It was suggested that, based on research by Dr. John Gothman, ischemic heart disease should be considered. It was stated that in Barnwell County there is a 15% elevated level of ischemic heart disease above the average of the State of South Carolina. In addition, birth defects and mental retardation (genetic damages) are more prevalent than cancer, but because they occur in the children of the workers they are often overlooked.

Response: The only effect of concern at the low levels of radiation considered in this EIS are the development of cancer and possible genetic effects. Genetic effects have not been demonstrated to occur in humans, and the only effect of concern here is cancer. Other

radiation effects do occur, but at much higher doses than can arise in this case. Mental retardation also does occur, but again, only at much higher radiation levels than those considered here. To protect against these effects, female workers who are, or may be, pregnant are given the option of requesting to be assigned duties that involve much reduced radiation exposure levels, until the end of the pregnancy.

The extent to which low levels of radiation cause cancer is currently the subject of scientific debate. The NRC used conservative assumptions and values to estimate potential LCFs from hypothetical accidents so as not to underestimate potential impacts. Because statistical data on low level radiation exposure and from previous accidents are inconclusive as to the inducement of cancer, these assumptions were based on extrapolation of data from exposure of humans to high levels of radiation, much higher than members of the public would expect to receive if an accident occurred at any of the proposed facilities.

Ischemic heart disease has a variety of causes as does cancer. To determine if the 15% elevated level is even statistically significant, regardless of the cause, a detailed analysis of the other counties in the area and potential confounding factors would first have to be conducted. The text in Section 3.10.3 of the FEIS was revised to indicate that cancer is the primary risk from radiation and that hereditary risks are also possible.

J.3.13.8 Comments: 73-004
115-001

Comment: The national emission standards for radionuclides, other than radon, from Department of Energy facilities states that emissions of radio nuclides to the air shall not exceed that which would cause any member of the public to receive a dose of ten millirems per year. Emission measurements from the stacks are stipulated in the existing Title V permit. But the millirem standard for the maximum allowable dose to the public is an ambient standard, not an emission limit. The existing permit fails to require any direct measurement of radioactive dose to the public, and cannot be enforced as a practical matter. This is a serious problem for many of the radionuclide-emitting facilities, including the proposed MOX facility.

The Savannah River Site does not currently meet five Title V emission standards with the existing operations. The addition of the Pit Disassembly and Conversion Facility (PDCF), the Waste Solidification Building (WSB), proposed MOX facility, the potential the siting of the Modern Pit Facility, and the potential use of the incinerator during the term of operation of the proposed MOX facility may cause additional violations.

The EIS must show that any additional activities, and cumulative and additive activities would not result in exceeding the National Emission Standards for Hazardous Air Pollutant (NESHAPs) limit when combined with current operations. Further, the NESHAP is written in millirems to individuals off site. There is no current monitoring done by the DOE, or reported in the DEIS that can, in fact confirm public doses from all current sources of radiation exposure to the public at the Savanna River Site.

Response: The primary restriction placed by NESHAPS is the 10-mrem/yr dose to any member of the public from air emissions. Placing restrictions on emissions is an indirect way of ensuring that this restriction is met. Whether the restriction is placed on the dose, or on emissions, it is necessary to use dose models that allow calculation of the dose to the public resulting from the emissions, to show that this 10-mrem/yr value is met. The main aim, therefore, is to ensure that the total of all air emissions from the facility does not result in a dose that exceeds this value. Emissions are monitored or estimated, and even though direct limits may not be imposed on them in a manner similar to that in Title V, the monitoring data are used to calculate the public doses to show compliance with all applicable limits. If other facilities in the vicinity of the MOX facility also contribute to public dose, adjustments will be made to ensure that the total dose does not exceed any applicable limit.

Conservative assumptions in dose modeling are used to ensure that the calculated dose to a maximally exposed member of the public is not underestimated. A maximally exposed individual (MEI) of the public is expected to receive approximately 0.04 mrem per year as a result of air emissions from SRS operations as presented in Table 3.10 in Section 3.10.3. Using conservative assumptions, the estimated exposure to a public MEI from operation of the proposed MOX facility, PDCF, and WSB was 0.0025 mrem per year as presented in Table 4.3 in Section 4.3.1.1.2. The combined exposure to current SRS activities and the MOX facilities would be about 0.0425 mrem, or about 0.425% of the 10 mrem NESHAP standard.

J.3.13.9 Comment: 86-117

Comment: In Section E.2.l.2, page E-17, line 32, the DEIS states that "To obtain conservative estimates of potential exposure and doses, the SRS employees were assumed to be exposed to radiation from airborne emissions without any shielding by buildings or other structures." If factors of 0.5 and 0.7 from U.S. NRC 1.109 were used as stated on the next page, shielding was taken into account.

Response: The sentence in Appendix E, Section E.2.1.2, was removed from the text.

J.3.13.10 Comment: 86-118

Comment: In Section E.2.1.2, page E-18, line 37, the DEIS states that the total time of external exposure to a plume and contaminated soils for SRS employees was assumed to be 0.5 year. This is an incorrect interpretation of the 0.5 factor in U.S. NRC 1.109. The 0.5 accounts for shielding while the individual is present. When the individual is present approximately 23% of the time (2000/365/24), this factor is further reduced by 0.5.

Response: The factor of 0.5 does account for shielding while the individual is present. However, the bulk of the emissions from the MOX-related facilities during operations would occur while the Savannah River Site employees are present. Thus, it is not reasonable to assume a further reduction in exposure.

J.3.13.11 Comments: 86-119
86-120

Comment: In Section E.2.1.2, page E-18, line 45, the DEIS states that the total time of external exposure to a plume and contaminated soils for a maximally exposed individual was assumed to be 0.7 year. For the inhalation pathway, an exposure time of 1 year was assumed. This is an incorrect interpretation of the 0.7 factor in U.S. NRC Regulatory Guide 1.109. The 0.7 accounts for shielding while the individual is present. The individual is present approximately 23% of the time (2000/365/24) and this factor is further reduced by the 0.7 factor.

Response: The factor of 0.7 does account for shielding while the individual is present. However, the bulk of the emissions from the MOX-related facilities during operations will occur while the Savannah River Site employees are present. Thus, it is not reasonable to assume a further reduction in external exposure to the plume. The factor of 0.7 for external exposure to contaminated soil was retained as a conservative assumption that does not affect the estimated impacts. External exposure from the plume and soil was approximately 5 orders of magnitude less than the inhalation exposure.

J.3.13.12 Comment: 89-044

Comment: In Section 4.3.1.1.1, the number of facility workers at the proposed MOX facility should be stated as was done for the Pit Disassembly and Conversion Facility and the Waste Solidification Building.

Response: The number of facility workers at the proposed MOX facility was added to the discussion in Section 4.3.1.1.2.

J.3.13.13 Comments: 52-004 93-018
92-006 114-002

Comment: The DEIS assumes a 10-year MOX program but DCS plans to apply for a 20-year license. This assumption would tend to underestimate the human health impacts. Given the uncertainty in operational periods for the Pit Disassembly and Conversion Facility, the DEIS must analyze dose, risk and cost-benefit impacts of MOX production over 20-year duration.

Response: The rationale for assessing the 10-year operational period impacts is presented in Section 1.21 of the EIS (Proposed Action). As discussed, the minimum amount of time it would take the facilities to process the plutonium under consideration would be approximately 10 years, if the facilities were operated at their maximum design capacity. Thus, the highest human health impacts would occur on an annual basis as reported in EIS Section 4.3.1 (Human Health Risks) because a 10-year operational period was assumed. The assumption of a longer operational period, such as 20 years, would be less conservative because the annual impacts would be proportionately less since the impacts would occur over a longer period of time.

J.3.13.14 Comments: 1-001
116-017

Comment: The EIS estimates latent cancer fatalities (LCFs) from radiation exposure in a deterministic fashion without regard to any uncertainty in the estimate. Indeed, the estimate for the result of low doses should at least include the possibility of zero effect. The estimate of LCFs in the DEIS has already been the subject of media reports and public concern. This is an important issue that must be resolved.

The LCFs currently calculated in DEIS should be listed as the "upper limit." The number of LCFs should be expressed as a range that includes zero effect. This opinion is supported by the Health Physics Society position paper, *Radiation Risk in Perspective*, of January 1996, reaffirmed March 2001. The Society of Nuclear Medicine and the American College of Nuclear Medicine voted unanimously to support that position.

The potential for positive health benefits from radiation exposure should be included at least as a note to the LCF discussion. There are ample references for the basis of this point.

The European Committee on Radiation Risk (ECRR) has published a 2003 set of recommendations on health effects of ionizing radiation exposure at low doses for radiation protection purposes. Regulator's Edition: Brussels, January 2003. This information should be compared with the information the NRC uses and the NRC should indicate which is valid.

Response: The estimated risk of LCFs is likely to represent an upper limit, and it is possible that there are no such risks at these low levels of exposure, which the proposed action is expected to produce. However, current knowledge does not permit reaching such a conclusion. It is therefore Federal policy, as well as the recommendations of all national and international advisory organizations, to assume that there is a risk at any dose level, and that this risk increases linearly with dose. The opinion expressed in the Health Physics Society Position Paper appears to be reasonable, but it does not provide sufficient supporting data to permit adoption of this position in Federal regulatory policy.

J.3.13.15 Comment: 27-009

Comment: The pathways discussed in Section 3.10.1.1 do not identify atmospheric particulate matter that has settled on the ground and that can be introduced into groundwater by recharging precipitation in a recharge area, or if the deposits are washed into surface water by overland runoff in areas where the surface water is in hydraulic connection with the ground water. It is suggested that the potential for groundwater contamination from atmospheric particulate matter deposited on the land surface at the MOX or F-Area sites be addressed in the DEIS.

Response: The potential impacts from the pathway suggested in the comment (i.e., airborne release to soil deposition to groundwater to humans) was not explicitly considered in this EIS. There is the potential that contamination from atmospheric deposition could reach groundwater; however, the contribution of this pathway to human exposure would be

much less than the human health impacts presented in this EIS for several reasons. The upper aquifer at the SRS is not used for drinking water, and significant dilution of any contamination would occur before the groundwater exited the SRS. Therefore, any contamination of this aquifer would not contribute significantly to human health impacts. A detailed discussion of the many pathways from operations at the SRS is presented in the SRS annual environmental report (Arnett and Mamatey 2001b) (see reference section for Chapter 3). The pathway suggested by the commenter is not listed as a significant pathway from airborne releases.

J.3.13.16 Comment: 53-003

Comment: The DEIS should state the value of natural background radiation at the Savannah River Site (SRS), not the national level. Because of the lower elevation, the lower radon levels, and the small number of basements, the natural background is different from the national average. In addition, the harm and benefits caused by natural background radiation needs to be presented in the DEIS.

Response: Natural background radiation in the Savannah River Site area, which includes consideration of the site's elevation and radon levels, is expected to be near the national average as presented in Chapter 7 of the *Savannah River Site Environmental Report for 2000* (WSRC-TR-2000-00328). Natural background radiation has the potential to cause latent cancer fatalities as does man-made radiation.

J.3.13.17 Comment: 86-035

Comment: The requirement for additional soil sampling discussed in Section 4.3.1.1.1, page 4-8 of the DEIS was questioned. The October 29, 2002, correspondence from DCS to the Nuclear Regulatory Commission responding to requests for additional information included the results of the 'further sampling' referred to in the DEIS. The DEIS should have included the results of this report which confirm the previous DCS conclusion that there are no significant concentrations of radioisotopes or chemicals in the soil, that would be hazardous to construction workers' health.

Response: Although no contamination is expected, further sampling may be necessary. The text was revised to include the reference to the sample results described in the October 29, 2002, correspondence, but the results do not include samples to the depth that will be required for building foundations in the area of the spoils pile. Samples were only taken down to a depth of 12 inches. Samples were not taken at the depths required to sample both the entire extent of the spoils pile and the ground underlying the spoils pile in areas which could be disturbed by construction activities.

J.3.13.18 Comment: 86-036

Comment: The DEIS (Section 4.3.1.1.2, page 4-8 and in Appendix E, page E-16) includes internal exposures for workers from normal operations. Since internal exposures would only

result from breaches of containment, these exposures should not be considered as part of normal operations, but should be considered only in the accident impacts assessment.

Response: Ideally, internal exposures are not expected under a normal operating environment. In practice, there will be some internal exposure during the course of normal operations because of residual levels of contamination.

J.3.13.19 Comment: 86-123

Comment: The values of ingestion parameters in Table E.9 for the maximally exposed individual (MEI) and the general public were questioned. Each line repeats the same number (276 kg/yr for the MEI and 163 kg/yr for the population), when this should be the total for all three.

Response: The values used for ingestion parameters for root vegetables, fruit, and grain were taken directly from Appendix D, Table D-4 (page D-20), of the MOX ER (Mixed Oxide Fuel Fabrication Facility Report, Revision 1&2) submitted by DCS. The values have been revised as suggested in the comment based on Savannah River Site data.

J.3.13.20 Comment: 86-125

Comment: Table E.13 does not include uranium-238, 99% of uranium inventory.

Response: The comment pertains to accidents and not normal operations. MOX ER Table D-7 lists source terms for isotopes released during normal operations, not from accidents as listed in Appendix E, Table E.13. Uranium-238 was not listed in DCS 2002b (App. E reference) as a component of the waste streams involved in potential accidents at the Waste Solidification Building.

J.3.13.21 Comment: 93-011

Comment: It is not acceptable to sign off on the environmental impacts of construction of the proposed MOX facility without a more detailed explanation of the impact of bull dozer activity on this contaminated site. The movement of soil that is contaminated will have an impact not only on workers, but also on those off site because particulates will be lofted into the atmosphere. The DEIS states on page 4-8 that any doses to workers from such contamination would be assessed. The DEIS does not describe who will make this assessment of workers and why the assessment would not include the off-site public.

Response: Although no contamination is expected, further sampling may be necessary because samples were only taken down to a depth of 12 inches. Samples were not taken at the depths required to sample both the entire extent of the spoils pile and the ground underlying the spoils pile in areas which could be disturbed by construction activities. It would be the responsibility of DCS and the Department of Energy to assess the risks from movement of contaminated soil if any were to be found. Any assessment of risks would necessarily include impacts to the off-site population.

J.3.13.22 Comments: 101-002
102-002

Comment: An 11% increase in the cumulative and collective dose to workers at the Savannah River Site (SRS) as a result of the proposed MOX facility, the Pit Disassembly and Conversion Facility (PDCF), and Waste Solidification Building (WSB) operations, is alarming and significant.

Response: The contribution of the MOX program to the cumulative collective dose to SRS workers was revised from 11.4% to 9.3% in Table 4.25 in Section 4.5.1.1 of the FEIS. As discussed in Section 4.3.1.1.2, each of the workers at the PDCF and the WSB was assumed to receive less than the SRS guideline maximum exposure (0.5 rem/yr). Due to lack of operational data and a desire not to understate potential risks, the cumulative collective dose to SRS workers was based on this maximum exposure which resulted in the contribution of 9.3% by the PDCF, the proposed MOX facility, and the WSB. However, the average SRS worker involved in radiological operations receives approximately 0.048 rem/yr as presented in Section 3.10.3. This average dose is ten times less than the allowed maximum. Thus, the contribution of the proposed MOX facility (15 person-rem) with a more realistic estimate (10% of maximum allowed) for the PDCF and WSB (1.97 + 0.5 person-rem) would contribute about 17.5 person-rem (rather than 257 person-rem) to a revised annual site total of 2,572.5 person-rem, or about 0.7%.

J.3.13.23 Comment: 105-013

Comment: DCS uses data from the MELOX plant in Marcoule, France to estimate worker radiation dose at 0.009 latent cancer fatalities (LCF) per year. There is no way to confirm this data, and people who oppose the proposed action have no means to substantiate their claims. The 0.009 LCF per year estimate is not accurate, but opponents have been unfairly denied the means to prove it.

Response: The annual latent cancer fatality rate for MOX facility workers of 0.009 is a reasonable estimate for the 400 workers expected at the proposed MOX facility. If the average annual dose per worker at the Savannah River Site of 0.048 person-rem is assumed (see Section 3.10.3), an annual collective worker dose of 19.2 person-rem (0.01 LCF) is the result. Such a result is very close to the value of 0.009 LCFs.

J.3.14 Accidents

J.3.14.1 Comments: 10-012
64-006

Comment: The Nuclear Regulatory Commission (NRC) concluded that there are minimal risks to human health if plutonium fuel is produced at the Savannah River Site (SRS). It was noted that this project represents a real and unacceptable risk, especially to workers.

The report states that "credible" accidents will be studied in either the EIS or the safety evaluation report (SER). The DEIS should define the term "credible accident" and state what the impacts are for "non-credible accidents."

Response: The NRC does not evaluate the impacts of worst-case or non-credible accidents in its NEPA analyses. Credible accidents evaluated in the EIS include those caused by natural phenomena hazards and other possible process hazards. For NRC-licensed fuel-fabrication facilities, the risk of credible high and intermediate consequence events will be limited in accordance with 10 CFR Part 70. The principal structures, systems and components relied upon to reduce these risks are evaluated in the SERs.

J.3.14.2 Comment: 19-006

Comment: This DEIS estimated 400 deaths in the minority community based on computer modeling and is now coming back to revise that to 50. Although modeling is a valid technique for estimating the unknown, it must be based on realistic choices of variables and not too many of them. The assumptions need to be justified. A lot more information is needed about how the number were obtained.

Response: All assumptions and sources of data input into the computer models for radiological impacts were provided in Appendix E, Section E.2 of the EIS.

J.3.14.3 Comment: 53-008

Comment: Concern was expressed with a tritium accident. It was stated that there is not a list of the number of curies that are postulated to be released in an accident. Also, the routine releases at the pit disassembly and conversion facility were not documented. Three years ago it was about 1000 curies per year tritium being released. Concern was expressed regarding the amount of tritium already released by the Savannah River Site.

Response: The amount of tritium postulated to be released in the Pit Disassembly and Conversion Facility (PDCF) tritium accident was listed in Table E.13 in Appendix E. The amount of tritium assumed to be released from normal operations at the PDCF was listed in Table E.5 in Appendix E of the EIS.

J.3.14.4 Comment: 116-007

Comment: Concern was expressed about how to deal with natural phenomenon such as an earthquake. It is not obvious that the worst-case earthquake would not devastate the current MOX design. If principal system and structure components (PSSCs) survive an earthquake, non-PSSC equipment and structures might not survive and their destruction could have an adverse impact on the PSSCs. The worst-case earthquake could also cause explosions, spills, criticality accidents, fires, and leaks of radioactive material. The DEIS should review this worst-case scenario.

Response: The NRC does not evaluate worst-case scenarios in its NEPA analyses. But in developing its seismic safety design for the proposed MOX facility, DCS was required to consider the most severe documented earthquake for the site (the 1886 Charleston earthquake). Moreover, EIS Section 4.3.5.1.1 provides a bounding NEPA analysis for potential events up to and including design basis accidents. DCS has committed to design the proposed MOX facility to ensure PSSCs survive the design basis earthquake without subsequently exceeding the dose limits set forth in the 10 CFR Part 70 performance requirements.

J.3.14.5 Comment: 116-008

Comment: It was suggested that the postulated accidents should be evaluated in conjunction with a hurricane, when the winds are fiercest.

Response: As stated in Section 4.3.5.1.1 of the EIS, hurricanes were evaluated as the cause of accidents but were found not to be capable of causing a release of radioactive material to the environment. Most major operations at the Savannah River Site such as MOX operations would be expected to be shutdown or suspended pending the approach of a hurricane due to the potential disruption of electricity and supplies. Small environmental impacts might be expected if an accident were to occur simultaneously with a hurricane, but the winds associated with the hurricane would be capable of diluting any releases to the point where no appreciable dose to receptors more than a few hundred meters downwind would be expected.

J.3.14.6 Comment: 116-019

Comment: The DEIS should include the impact of the worst-case hydrogen explosion.

Response: The NRC does not evaluate worst-case scenarios in its NEPA analyses. As discussed in Section 4.3.5.1.1, the EIS attempted to provide a comprehensive, bounding analysis for all potential events up to and including design basis accidents. Impacts of the hypothetical hydrogen explosion accident postulated at the proposed MOX facility were given in Section 4.3.5.2.

J.3.14.7 Comment: 3-002

Comment: Concern was expressed regarding the impacts resulting from serious accidents in the area surrounding the Savannah River Site and in the Savannah area.

Response: Pursuant to the requirements of 10 CFR Part 70, the risk of credible high and intermediate consequence events at the proposed MOX facility must be reduced to acceptable levels before operation of the MOX facility would be authorized. As described in the draft SER for construction, DCS has identified principal structures, systems and components (PSSCs) to prevent or mitigate these events, and will maintain these PSSCs in accordance with an approved quality assurance program. To reduce the risk of accidents at the Waste Solidification Building and the Pit Disassembly and Conversion Facility, these

proposed Department of Energy facilities would have to meet the requirements of 10 CFR 830 for facility nuclear safety, 10 CFR 835 for worker protection, and other DOE orders and regulations.

J.3.14.8 Comments: 14-003 63-003 86-051 50-002 86-003 86-052

Comment: The risk to offsite population in the hypothetical accident analysis is significantly overstated. In analyzing the impact to off-site population from a hypothetical tritium release from the Pit Disassembly and Conversion Facility, the DEIS assumes and calculates a dose by ingestion during the one-year post-accident period. This scenario is simply not possible. An assumption that the South Carolina Department of Health and Environmental Control and the Georgia Environmental Protection Division would ignore contamination of agricultural products for one year is incredulous and an insult to their training, demonstrated performance and professional status. This impossible assumption must be eliminated and the analysis revised.

Response: In Section 4.3.5.2, the EIS discusses the possibility that the 1-year exposure accident consequences would be lower if contaminated food was not eaten. It further discusses the Food and Drug Administration protective action guides for interventions. A new 1-year exposure scenario without consideration of crop ingestion has been added to Section 4.3.5.2. The Nuclear Regulatory Commission recognizes that some interdiction would likely occur following a significant accident, even if contamination levels were below the protective action guides. Additional text has been added to clarify the reasonableness of the assumption regarding interdiction. Many stakeholders wanted to know what could happen if no interdiction of crops occurred. Therefore, the accident analysis also reports the 1-year exposure including the ingestion pathway. The 1-year exposure scenario including the ingestion pathway is provided as an upper bound estimate of the impacts of a potential significant accident. It should be recognized that many factors would result in a more realistic (lower) estimate of potential accident consequences. These include the selection of the computer code (See Comment J.3.13.16), and conservatism used in defining the potential accident scenario (See Comment J.3.13.9). However, for purposes of the National Environmental Policy Act, staff included a more realistic estimate of the impacts from potential accidents and an estimate that bounds the potential accident consequences.

J.3.14.9 Comments: 17-002 86-066 89-006 50-002 89-001 94-001 60-002 89-005

Comment: The DEIS has considered worst-case scenarios in the accident analysis. The likelihood of these accidents is extremely remote and cannot be considered “reasonably foreseeable” as required for a National Environmental Policy Act (NEPA) analysis. Furthermore, the assumptions made in performing the accident analysis were overly conservative by orders of magnitudes, leading to unrealistically high human health impacts. These assumptions include the use of the GENII code for performing the analysis as well as

ignoring engineered safety features or procedures such as permitting the ingestion of contaminated food.

Response: The NRC does not evaluate worst-case scenarios in its NEPA analyses. As discussed in Section 4.3.5.2, the EIS attempted to provide a comprehensive, bounding analysis for potential events up to and including design basis accidents. All accidents were taken from either the Surplus Plutonium Disposition EIS for the Pit Disassembly and Conversion Facility (PDCF) accidents or the MOX ER for the proposed MOX facility and Waste Solidification Building (WSB) accidents. No beyond design basis accidents for the PDCF were considered and no such accidents were considered in the MOX ER. However, the leak path factors for the MOX explosion and fire accidents were revised from 0.01 to 0.0001 to give more credit to the high-efficiency particulate air (HEPA) filters in reducing the amount of radioactivity released to the environment in the analyses as reported in Section 4.3.5.2.

The EIS provides a conservative estimate of accident impacts and an independent review of previous accident analyses performed for the proposed MOX facility, the PDCF, and the WSB. Concerns have been expressed about the use of the GENII code for accidents and the inclusion of ingestion doses in the impacts. As discussed in more detail in Comment J.3.14.20, the conservative nature of the GENII accident dispersion model was tempered by the use of direction-specific 95th percentile meteorology rather than 99.5th percentile as suggested by Nuclear Regulatory Commission Regulatory Guide 1.145. The rational for inclusion of ingestion doses in the impacts is discussed further in the response to Comment J.3.14.8.

Thus, the accident impacts presented in this EIS are conservative in nature. The accidents are reasonably foreseeable and not overly conservative by orders of magnitude. Additional text was added to Section 4.3.5.2 of the FEIS to discuss the uncertainties involved in the assumptions and calculations.

As discussed in Section 2.5, it is estimated that the construction and operation of the proposed MOX facility would have small radiological impacts on, and risk to, human health. This finding is borne out by the low impacts assessed while using conservative assumptions.

J.3.14.10 Comments: 22-001
53-002

Comment: Concern was expressed with the use of hypothetical rather than real data for accidents. It was stated that the DEIS should have used the facts from real radioactive accidents instead of hypothetical accidents. It was suggested that these accidents affected generations of Americans not just the generation living when the accident occurred. The DEIS should explain why the only health consequence that was considered was latent cancer fatalities.

Response: The accidents evaluated were those considered to be reasonably foreseeable given the processes and procedures needed at the proposed MOX facility, the Pit Disassembly and Conversion Facility (PDCF), and the Waste Solidification Building (WSB). Data based on actual accidents does not exist for many of the potential hazards evaluated in the EIS.

Genetic effects and the development of cancer are the primary health concerns attributed to radiation exposure. Latent cancer fatalities (LCFs) are the radiological health effect end point used in this EIS as a measure of human health impacts. Although radiation-induced genetic effects have been observed in laboratory animals (given very high doses of radiation), no evidence of genetic effects has been observed among the children born to atomic bomb survivors from Hiroshima and Nagasaki. Thus, there is no basis for estimating genetic effects in descendants of persons exposed to high doses of ionizing radiation.

The extent to which low levels of radiation cause cancer is currently the subject of scientific debate. The Nuclear Regulatory Commission (NRC) used conservative assumptions and values to estimate potential LCFs from hypothetical accidents so as not to underestimate potential impacts. Because statistical data on low level radiation exposure and from previous accidents are inconclusive as to the inducement of cancer, the NRC's assumptions were based on extrapolation of data from exposure of humans to high levels of radiation, much higher than members of the public would expect to receive if an accident occurred.

J.3.14.11 Comment: 25-002

Comment: The DEIS, which included both the MOX plant and the Pit Disassembly and Conversion Facility (PDCF), did not contain sufficient detail to allow an independent assessment of their analyses. However, its worse-case incident, which occurred in PDCF, not the MOX plant, seems grossly exaggerated. A fire in a modern plutonium cabinet or glove box would be unlikely to generate either the heat or the releases of plutonium and tritium that was assumed. Any plutonium in such a fire, if it occurred, would not dissipate to the public. The assumption was made that the government would not collect the contaminated food to keep it from being eaten was questioned. Surely this hypothetical incident scenario is supposed to be at least remotely possible. This draft EIS needs significant revision.

Response: The accident scenarios evaluated in the EIS are based on information in the MOX ER and the DOE's SPD EIS. This included a fire in a glovebox that released plutonium and tritium. All accident release source terms and site-specific input data necessary to perform an independent assessment were provided in Appendix E of the EIS.

As stated in response to many of the above comments, the accidents considered were not worst-case accidents. The response to Comment J.3.14 8 discusses why the food ingestion pathway was included.

J.3.14.12 Comments: 62-002
116-003

Comment: The DEIS states that credible or reasonably foreseeable accidents are considered. Several past accidents that were previously considered "incredible" including Three Mile Island #2 in 1979; Chernobyl in 1986, the N.Y. City Twin Towers in 1993 and again in 2001 were provided as examples. The probability that these events would happen in the manner in which they occurred (before they occurred) is very, very small. Yet, the incredible happened. The DEIS should also consider "incredible" events and worst-case accidents.

Response: Worst-case accidents and specific terrorist initiated events are not considered to be reasonably foreseeable and are therefore not considered in this EIS.

J.3.14.13 Comment: 97-004

Comment: The analyses in the DEIS do not appear to address uncertainties - including uncertainties in design, uncertainties and inaccuracies in models, uncertainties in input parameters, and excluded or overlooked effects. In addition, the sensitivity of the results to changes in assumptions and parameters is unclear. It is recommended that uncertainty and sensitivity be addressed and included in the DEIS.

Response: The analyses in the EIS are based on the best, current information available. If significant changes in design or function are made, a future supplement to the EIS might be required. Furthermore, conservative assumptions and input parameter values were used so as not to underestimate risks.

J.3.14.14 Comments: 97-007 101-001
97-015 102-001
96-017

Comment: Concern was expressed regarding the computer codes that were used to estimate radiological impacts, including errors miscalculating the number of deaths in low income, African American communities as a result of a severe MOX accident. It is not clear if the computer codes are endorsed by Nuclear Regulatory Commission (NRC) regulations and/or guidance, and if they meet NRC quality assurance requirements, including verification and validation for the specific site and application. Concern was also expressed regarding the uncertainty of additional errors in the DEIS.

Response: The computer codes selected for performing the analysis have a proven track record in accident analysis and National Environmental Policy Act compliance. The accident input parameters and assumptions provided by DCS for the MOX facility and Waste Solidification Building accidents as well as those for the Pit Disassembly and Conversion Facility accidents from the Surplus Plutonium Disposition EIS have been carefully scrutinized by the NRC as part of the licensing process for appropriateness and modified if necessary. The preparation of the EIS followed applicable NRC guidance and

regulations. The NRC reviewed analyses performed by the contractor, Argonne National Laboratory (ANL). ANL does have a quality assurance program that was followed in the preparation of the DEIS. In addition, the NRC retained the Center for Nuclear Waste Regulatory Analysis to review the DEIS prior to publication. A discussion of the quality assurance associated with the GENII code is provided in the response to Comment J.3.14.16.

J.3.14.15 Comments: 64-006
86-003
86-051

Comment: The bounding accident for the Mixed Oxide Fuel Fabrication Facility – an explosion in an aqueous polishing cell – was not properly characterized. The discussion provided in Section 4.3.5.2 and Table 4.12 fails to explain that the accident is prevented. See Draft Safety Evaluation Report on the Construction Authorization Request for the Mixed Oxide Fuel Fabrication Facility (SER for construction) Table 10.1-3, footnote b. The DEIS should clearly state that an explosion in an aqueous polishing cell is provided for illustrative purposes because, pursuant to NRC's own regulations, the design safety features, will prevent such an accident. The Draft EIS further fosters a misimpression on the public by postulating that, once this hypothetical accident occurs, neither DCS, the Department of Energy, the Nuclear Regulatory Commission, nor the States of South Carolina or Georgia would take any intervention to protect the public by removing contaminated food or soil. See Draft EIS page 4-36, lines 8-18. In fact, the document further assumes that contaminated food is distributed outside the immediate vicinity of the Savannah River Site. See Draft EIS page 4-41 lines 25-3 8. These assumptions are inconsistent with the NRC guidance to use "reasonably foreseeable" accident evaluations that are coordinated with the SER for construction. The DEIS should state the probability associated with the various accidents.

Response: The explosion event at the proposed MOX facility was characterized according to information in the MOX ER and considered to be "highly unlikely" because of the design features of the facility. However, as noted in Section 1.1.2, the EIS is broader in scope than the SER and has a different focus. The EIS assumes that an accident will occur and estimates potential impacts to human health and the environment from the accident. The likelihood of accident consequences is evaluated in describing the risk associated with a postulated accident. The FSER is concerned with documenting the NRC staff's safety findings of an applicant's application. As discussed in Section 1.1.2, information in the SER, that is not germane to environmental impacts, is not repeated in the EIS. Although conservative assumptions were applied to the source term and release fraction, the event would have been classified as "not credible" if the initiation of the event was totally out of the realm of possibility.

See Comment J.3.14.8 for the response to removing the ingestion pathway.

J.3.14.16 Comments: 86-053 89-007
86-066 94-001
89-002

Comment: The GENII code is not an appropriate model for estimating accident impacts to the collective public. A number of conservative assumptions compounded lead to excessively conservative results. Of major concern are 1) the use of the plume centerline air concentrations for the entire sector being analyzed, which results in unrealistically high impacts, and 2) the modeling of crop harvest immediately following an accidental release leads to excessive impacts from the food ingestion pathway.

Response: The GENII code was selected in order for the Nuclear Regulatory Commission (NRC) to perform an independent analysis of proposed MOX facility, Pit Disassembly and Conversion Facility (PDCF), and Waste Solidification Building (WSB) accidents. MACCS2 had been previously used to perform analyses for the proposed MOX facility and PDCF. These two codes were the only codes recommended for the DOE Safety Analysis Toolbox in the area of radiological dispersion and consequence analysis (WSRC-MS-2001-00091). The GENII code was developed under software quality assurance guidelines based on the American Society of Mechanical Engineers Nuclear Quality Assurance-1 (ASME NQA-1) standard. As with all accident analysis codes, both GENII and MACCS2 have been cited for problems with software quality assurance (WSRC-MS-2002-00118) which was an additional reason for using GENII as a peer-reviewed alternative to MACCS2. The error in the GENII tritium accident module regarding the use of the food grid was identified by the NRC during development of the EIS and a workaround developed in consultation with the code developer.

The GENII code has also been used in numerous previous environmental impacts statements in the analysis of accident impacts (e.g., DOE/EIS-0161, *Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling*; DOE/EIS-0200-F, *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*; DOE/EIS-0269, *Programmatic Environmental Impact Statement for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride*; DOE/EIS-0277, *Final Environmental Impact Statement on Management of Certain Plutonium Residues and Scrub Alloy Stored at the Rocky Flats Environmental Technology Site*).

Due to the conservativism inherent in the GENII accident population dose model, the direction-specific 95th percentile impacts were assessed rather than the direction-specific 99.5th percentile as suggested in Regulatory Guide 1.145. The response to Comment J.3.14.20 provides more information on this subject. In addition, it is not always apparent when the results from MACCS2 are conservative. For example, the site-wide 95th percentile result from the PDCF tritium accident from the Surplus Plutonium Disposition EIS (DOE/EIS-0283) was 110 person-rem in the short-term. Use of later 1987 weather data (worst-case for 1987 through 1996 as used in the MOX ER and in this EIS) in MACCS2 for the same accident results in a dose of approximately 70 person-rem, a 40% difference.

The accident analysis performed using GENII provided ingestion impacts for four different times during the year designated as “winter,” “spring,” “summer,” and “autumn” by the code. These four seasons represent different stages in the growth cycle of crops potentially affected over the course of a year by an accidental release of radioactive material. The impacts for “autumn,” representative of conditions immediately prior to harvest, were chosen for presentation in the DEIS. Such impacts were included to provide perspective on what could happen without the interdiction of crops or if contaminant levels fell below protective action guidelines.

In summary, the NRC performed an independent accident analysis with a computer code with an established track record in the area of accident analysis. Conservative assumptions were used but not to the extent that the analysis could be considered overly conservative.

J.3.14.17 Comment: 86-057

Comment: In Section 4.3.5.2 of the DEIS, the meteorological conditions for the proposed MOX facility hypothetical explosion involves winds directed to the west-northwest. The meteorological conditions for the Pit Disassembly and Conversion Facility hypothetical tritium release involves winds directed to the southwest. It is not intuitively obvious why both accident evaluations do not have the same meteorological conditions.

Response: As discussed in Section 4.3.5.2 of the EIS, the inhalation pathway dominates the short-term exposure. Thus, the west-northwest sector has the highest impacts because of the larger number of people in that direction. For the 1-year exposure, the ingestion pathway dominates. Because more crops are grown in the southwest, the highest impacts were estimated for this direction despite any differences in meteorological conditions such as stability frequency and wind speed and direction.

J.3.14.18 Comments: 89-003
89-007

Comment: The results reported in the DEIS errata sheets are not physically possible. The predicted doses for the explosion scenario for the proposed MOX facility would seem to require more plutonium to be ingested than would be released in the postulated accident. To result in the number of latent cancer fatalities attributed to the ingestion pathway, the calculations strongly suggest that the offsite population would be required to ingest contaminated food containing almost twice the amount of plutonium postulated by the Nuclear Regulatory Commission to have been released by this accident. In addition, DOE’s experience indicates that the realistic fraction of released contamination to be inhaled or ingested is several orders of magnitude less than these numbers indicate.

Response: The results reported in the errata sheets are physically possible. The claims of excessive conservatism are exaggerated in the comment. The internal dose conversion factors (DCFs) for ingestion and inhalation used by GENII and the DCFs in Federal Guidance Report 11 for ingestion and inhalation, are based on International Commission on

Radiological Protection (ICRP) Reports 30 and 48. The "worst case" solubility library as defined in GENII documentation (results in maximum dose) in GENII was used in the EIS accident analysis. If the entire amount of radioactive material released for the MOX explosion event (as reported in Table E.13 in the errata sheets) was assumed to be ingested, a 30,000 person-Sv dose would be expected using the worst case solubility values from Federal Guidance Report (FGR) 11 for each radionuclide. The dose reported in Table 4.14 of the EIS, 2,700 person-Sv, is 9% of the 30,000 person-Sv. Therefore, more plutonium is released than ingested.

Similarly, for inhalation, if all radioactive material released from the explosion was inhaled, a population dose of 3,650,000 person-Sv would result. Thus, the estimated dose in Table 4.14 of 910 person-Sv is only 0.025% of that expected if all of the material was inhaled, not 0.23% as suggested in the comment.

Much of the plutonium might settle to the ground prior to reaching 20 miles from the release point. However, under 95th percentile meteorological conditions, the contaminant plume will be more narrow and concentrated, resulting in higher concentrations downwind than for other conditions.

Finally, ingestion doses are routinely a small fraction of inhalation doses if the crop density ratio to population density is low in the areas considered or if direct deposition on crops is not considered. Neither condition applies to the analysis performed for this EIS.

J.3.14.19 Comment: 98-008

Comment: The original DEIS included significant errors in the calculation of latent cancer fatalities if there were an explosion at the proposed MOX facility – estimating nearly 400 deaths; the new calculations result in less fatalities, but we still consider 100 deaths to be significant and important enough to warrant denying approval.

Response: The calculation of 100 latent cancer fatalities (LCFs) involved the ingestion of all food crops that were assumed to be contaminated immediately prior to harvest. Text was added to Section 4.3.5.2 of the FEIS to explain the reasons for including the food pathway in the collective population 1-year exposure impacts. Impacts for the collective population 1-year exposure without ingestion have also been added to the impacts presented in Section 4.3.5.2.

One reason for inclusion of the ingestion dose was for perspective if interdiction of crops was not implemented. Because the Nuclear Regulatory Commission does expect interdiction to occur if potential crop contamination results from an accidental release, the primary focus is on the short-term exposures, which do not include ingestion, presented in Section 4.3.5.2 and in Table 2.1 in Section 2.4 of the EIS. The maximum short-term collective population exposure, assuming the accident occurs, results in approximately 3 LCFs. This estimate is the result of using conservative assumptions and represents small doses to all individuals in a large population. Moreover, the LCF estimate is a consequence of an accident with a very low probability.

J.3.14.20 Comments: 86-054
86-055
89-004

Comment: The use of the GENII computer code to calculate Chi/Q values in the DEIS for a single specific direction, without consideration of any other directions, will not produce a site-representative 95th percentile Chi/Q. Despite statements that population impacts in the DEIS are based on meteorological conditions at the 95th percentile, they may actually be based on conditions at the 99 to 99.5th percentile, leading to overly conservative collective dose impacts.

Response: The collective dose results from GENII are not overly conservative. For accident analyses, the Nuclear Regulatory Commission (NRC) accepts the maximum sector air concentration value or the overall site 95th percentile value, whichever is larger (Regulatory Guide 1.145). For this EIS, staff used the maximum sector value rather than the overall site 95th percentile value as discussed in the comment. The maximum sector air concentration value is determined by evaluating the impact in each of the 16 sectors. Using the guidance of Regulatory Guide 1.145, the 99.5th percentile value would be determined and the largest value for the 16 sectors selected. Because of the conservative nature of the assumptions used in the accident analysis, the maximum sector results were determined using the 95th percentile concentration values using GENII rather than the 99.5th percentile values. Use of the 99.5th percentile values would have resulted in larger estimated exposures that would have been overly conservative. Maximum short-term impacts were found to be to the WNW of the SRS, because that sector has the largest off-site population density. Maximum long-term exposures that included the ingestion pathway were found to be primarily to the SW of the SRS because that sector contains the the largest amount of crops in the area. Thus, accident impacts were assessed for all directions from the SRS. For each case, the impacts reported were for the sector with the largest impacts as suggested by NRC guidance.

J.3.14.21 Comment: 105-015

Comment: Plutonium is not the same as uranium. No mention in this DEIS is made for control of humidity, despite plutonium being much more reactive in a humid environment. Plutonium metal is also a concern in the Pit Disassembly and Conversion Facility (PDCF). From 6-1.3 of the Plutonium Handbook, “When a container is opened spontaneous ignition may then occur, usually resulting in destruction of the container and the scattering of metallic oxide (Pu) through the glove box train and the exhaust system.” The DEIS mentions no precautions to prevent this.

Response: Spontaneous ignition of plutonium (and alloys) requires plutonium to be in the form of metal turnings or powder that have higher surface areas than monolithic pieces (such as the plutonium pits). Spontaneous ignition is a result of the plutonium metal reacting with oxygen and/or water in the air to form an oxide. Neither the PDCF or the proposed MOX facility is expected to handle metal plutonium in powder form. The plutonium pits that the PDCF is expected to receive are in a bulk metal form. The proposed

MOX facility will handle plutonium in the oxide form that does not have the potential for spontaneous ignition.

J.3.14.22 Comment: 116-015

Comment: For airborne releases of radiation, in an accident, the maximally exposed individual (MEI) is at the north Savannah River Site (SRS) boundary. Yet the 1 year maximum dose is at the SSW boundary. It is not apparent why this is the case. For most of the year there are no prevailing winds at the SRS. It appears there is no real "safe" direction to evacuate to in the event of an accident.

Response: For accident releases, the MEI is located to the north-west of the proposed facilities. As discussed in Section 4.3.5.2 of the EIS, the MEI is a hypothetical person who is assumed to be located at the SRS and could receive the highest possible dose of radiation or of a hazardous chemical from a given event or process. Because the site boundary is closest to the proposed MOX facility on the north-west side of the SRS, as shown in Appendix E (Table E.11 in the DEIS), the MEI is located to the north-west. The maximum dose to the SSW is a 1-year collective population dose. It considers several pathways of exposure including direct radiation, inhalation and ingestion. The SSW sector has the highest crop production. As discussed in Section 4.3.5.2 of the EIS, the 1-year exposure estimate assumes that all the contaminated crops are eaten. For this sector, more crops are produced than could be eaten by the people living there. Therefore, it is assumed that the crops are eaten by others, and the exposure to those people is included in the 1-year exposure estimate for the SSW sector.

As discussed in Section 4.3.5 of the EIS, impacts from accidents would depend on the wind direction and speed following a hypothetical accident. Figure 3.5 presents the annual wind rose for the SRS. The prevailing wind directions are W to S and NNE to ENE. The least prevalent wind direction is to the N and NW. The SRS emergency response plan takes into account the prevailing wind direction at the time of an accident.

J.3.14.23 Comment: 86-122

Comment: The GENII code is not an appropriate model for estimating accident impacts to the collective public. A number of conservative assumptions compounded lead to excessively conservative results. Of major concern are 1) the use of the plume centerline air concentrations for the entire sector being analyzed which results in unrealistically high impacts, and 2) the modeling of crop harvest immediately following an accidental release leads to excessive impacts from the food ingestion pathway.

Response: The comment specifically references text in Section E.2.1.3 in Appendix E. However, the discussion in Section E.2.1.3 discusses the use of the GENII code for normal operations, not accident conditions. It is the same code used by DCS in their MOX ER for assessing the risks from normal operations. The statements made in the comment do not apply to the use of GENII for normal operations. A discussion on the appropriateness of using GENII for accident analyses is presented in the response to Comment J.3.14.16.

J.3.14.24 Comment: 86-124

Comment: Table E.12 indicates that the Nuclear Regulatory Commission (NRC) used a leak path factor of 0.01 for the internal fire and explosion events (See Section J.2.1.3 of the EIS). DCS used a leak path factor of 0.0001 for these events. DCS is currently discussing with the NRC safety analysis staff the appropriate leak path factor to use. If the NRC staff ultimately agrees to a leak path factor of 0.0001, DCS assumes the EIS staff will reevaluate the accident scenarios with this new leak path factor.

Response: The NRC has accepted the leak path factor of 0.0001 for the MOX internal fire and explosion events. The input data presented in Section E.2.2.1 in Appendix E and the accident impacts as presented in Section 4.3.5.2 have been revised to incorporate the change.

J.3.14.25 Comment: 97-011

Comment: The basis for uranium dioxide release estimates in Table 4.16 of the DEIS needs to be explained. The Nuclear Regulatory Commission (NRC) staff's Safety Evaluation Report of April 2002 identified this as an open issue and implied higher potential concentrations.

Response: In Section 8.1.2.3.3 of the April 2003 draft SER, the NRC staff evaluated the DCS's proposal for safe storage of uranium dioxide and found it acceptable. The NRC reviewed the risk of this event, and, as shown in Table 4.16 of the EIS, considers this a low risk event.

J.3.15 Air Quality

J.3.15.1 Comments: 8-003 89-010
86-021 89-011
86-031

Comment: The proposed MOX facility will result in exceeding the air quality limits at the Savannah River Site (SRS). The legality of the SRS exceeding the $PM_{2.5}$ standard was questioned. Also, in Table 2.1, it should be made clear that the $PM_{2.5}$ is a 24-hour limit and should not be compared to the annual standard.

The definition of 'vicinity of SRS' and the resulting selection of South Carolina Department of Health and Environmental Control (SCDHEC) monitoring stations to characterize the existing ambient air quality in Table 3.3 appears arbitrary and cannot support subsequent statements regarding air quality compliance. Data in Table 3.3 suggest that local air quality is not in compliance with the 24-hour and annual standards for PM_{10} and $PM_{2.5}$. Most of these noncompliant data are from the Cayce monitor located over 40 miles from the proposed MOX facility which is classified as "commercial, urban-city center." In contrast PM_{10} monitors near the SRS boundary in more rural Jackson and Barnwell locations report

PM_{10} values in compliance. Table 3.3 also lists a value of 71 micrograms per cubic meter from a rural monitor in Colleton County over 60 miles from SRS. This value was the absolute maximum for 2001, but the 98th percentile value should be used to evaluate compliance which was 27 micrograms per cubic meter for this monitor. Data for annual $PM_{2.5}$ in Table 3.3 is again from Cayce and exceeds the standard. In contrast, the Colleton monitor saw an annual average below the $PM_{2.5}$ standard.

As part of the discussion of environmental consequences in Chapter 4, Tables 4.6 and 4.8 use a more reasonable set of data for the existing 'background' air quality except for the $PM_{2.5}$ annual average. Again, the Cayce data are used to support the unwarranted conclusion (page 4-1, lines 28-31, and page 4-18, lines 30-32 of the DEIS) that 'measured values in the vicinity of SRS already exceed the annual standard.' This conclusion is repeated several times in Section 4.7.

The DEIS should be revised throughout to present conclusions regarding $PM_{2.5}$ that are based on more representative data. In addition, Tables 3.3 and Tables 4.6 and 4.8 and pages 3-22, 3-23, 4-11, 4-16 through 4-22, 4-89, and 4-90 should be revised to present consistent and more representative information where possible.

Response: The air quality data presented in Chapters 3 and 4 of the EIS are used for different purposes. Chapter 3 presents measured data chosen to establish the baseline the air quality conditions in the area around the SRS site. The data in Chapter 4 are chosen to estimate the background levels for use in modeling impacts of the proposed action. The data provided in the air quality section is not intended to demonstrate compliance with air quality standards. The air quality impacts assessment compares modeled air concentrations of air pollutants with EPA and SCDHEC standards as a measure of the magnitude of the potential impact. Under NEPA regulations, it is generally recognized that comparison with regulatory standards is not sufficient to demonstrate the absence of adverse impacts, because many criteria are considered in establishing regulations. In addition, a direct comparison of measured levels of the criteria pollutants with those specified in the standards do not necessarily constitute standards violations.

The data in Chapter 3 presents air concentrations from monitoring stations around the region. To reduce any problems associated with the choice of monitoring stations from the surrounding counties, Chapter 3 and Table 3.3 of the FEIS have been changed to use monitoring stations within 80 km (50 mi) of the proposed MOX facility site. This change eliminates the Cayce and Irmo sites from those presented in the DEIS. To provide a more comprehensive picture of air quality, both the minimum and maximum measured concentrations have been presented in Table 3.3.

As the comment noted, Table 3.3 might be interpreted as indicating that there are standard violations. As discussed above, the data provided in the air quality section is not intended to demonstrate compliance with air quality standards. The concentrations presented in Table 3.3 have been changed to be more in line with that of the corresponding standard. (For example, the 24-hr $PM_{2.5}$ maximum and minimum are now 98th percentile values.) In addition, attainment of the annual $PM_{2.5}$ standard requires a 3-year average of annual

values. The $PM_{2.5}$ standard has not yet been implemented and official determination of compliance with this standard has not been made. Construction and operation of the proposed facilities would increase $PM_{2.5}$ levels by small amounts (<0.1% of the standard value).

Except for $PM_{2.5}$, all the background values used in Chapter 4, came from SCDHEC's modeling summary for the SRS. As the comment noted, the Cayce monitor is not an appropriate choice for $PM_{2.5}$ background for use in the impact analysis in Chapter 4. A closer look at the Cayce monitor showed that it is a source-oriented, special-purpose monitor and hence not appropriate for presenting a general picture of air quality or for picking a background. $PM_{2.5}$ background levels were reassessed using monitors designated by the state as background sites. New values were chosen as the maximum concentrations measured in 2001 at the two rural background sites within 80 km (50 mi) of the MOX facility site. These values are 13.6 $\mu g/m^3$ annual average and 27 $\mu g/m^3$ 24-hr 98th percentile value. Tables 4.6 and 4.8 and the associated discussion in the FEIS have been updated using these values.

J.3.15.2 Comment: 47-004

Comment: The DEIS indicates that air flow is in a northeasterly direction. However, air flow data, from air quality monitoring systems, was gathered from the northwestern section of the Savannah River Site (SRS). It was questioned whether this was appropriate because the air would not be affected by the proposed MOX facility.

Response: The SRS has an air quality monitoring system that is used to verify air effluents are acceptable. This air quality monitoring system gathers data from all around the SRS. The data referred to in the comment is used for a different purpose than air quality monitoring. The purpose of the wind data is to characterize the air flow in the vicinity of the proposed MOX facility site. For modeling purposes, air flow data from the closest available meteorological station is typically used for assessment purposes. Given the proximity of H-Area to the proposed MOX facility site and the absence of significant terrain features, data from the H-Area meteorological station is considered adequate to characterize winds at the proposed site.

J.3.15.3 Comment: 86-042

Comment: In Section 4.3.2.2, page 4-23, line 9 of the DEIS, the discussion omits NO_2. The sentence should read: ". . .increments for SO_2, PM_{10} and NO_2."

Response: The text in the FEIS has been changed as suggested.

J.3.15.4 Comments: 19-007
56-004

Comment: Concern was expressed that the weather data used in the DEIS only covers a five year period. It was felt that this short period of time would not take into account some special South Carolina background. For example, it would not take into account effects of hurricanes such as Hurricane Hugo. It was suggested that the EIS consider a more expansive data set to cover weather patterns that have occurred in the Savannah River Site area and in South Carolina.

Response: Five years of data are frequently used to provide an overall picture of wind speed and direction. EIS Figure 3.5 presents such data. Five years of data are also suggested by the U.S. Environmental Protection Agency as the basis for dispersion modeling. Thus, the data set used is deemed adequate.

The time period for presenting extreme events such as hurricanes is longer because such events occur infrequently . Section 3.4.1 of the DEIS discussed tropical storms and hurricanes using data from 1700 to 1989. This has been supplemented with data for 17 storms from 1886 to the present.

J.3.15.5 Comments: 53-009
53-012

Comment: It was questioned whether the DEIS evaluated air quality impacts using actual air emission data from existing Savannah River Site (SRS) facilities or air emissions based on permit limits for those facilities. The consolidated incinerator facility is not currently operating. When this facility is operational, air emissions will be higher than reported in the DEIS. The DEIS should include emissions from the consolidated incinerator facility.

Response: As noted in Section 4.3.2, the air quality analysis adds the incremental impacts caused by the proposed MOX facility to the impacts of other sources. The impacts of other sources were taken into account by adding a maximum impact due to SRS sources and a background concentration representing the impact of non-SRS sources. The SRS maxima (See table 4.8) assume that all permitted sources, including the Consolidated Incineration Facility, operate at their permitted levels.

J.3.15.6 Comment: 86-126

Comment: In Section F.2.2, page F-7, line 11 of the DEIS, the sentence should be revised to read: “Engine-specific emission factors were not available for criteria pollutants.”

Response: Vendor factors were provided by DCS for the emergency generators. The text in the FEIS has been revised to reflect that vendor factors were used.

J.3.15.7 Comment: 107-001

Comment: The DEIS states that transuranic (TRU) and low-level radioactive wastes (LLW) will be generated during operation of the proposed facility. Exhausts from the proposed facility will be treated to remove radioactive materials before the exhaust is discharged to the atmosphere. Please provide further information in the FEIS regarding frequency and duration of air quality monitoring measures and monitoring of the facility's emissions to the atmosphere.

Response: DCS discusses air effluent monitoring in Section 10.2.1 of the Construction Authorization Request. DCS notes that airborne releases are controlled by the building and glovebox ventilation systems, process effluent offgas system, and stack high-efficiency particulate air (HEPA) filters. DCS states that two redundant continuous air monitors and two fixed airborne particulate samplers will monitor the stack effluents. In its later application for a license to possess and use special nuclear material, DCS has committed to providing (1) a description of the sampling, collection, and analysis procedures; (2) a description of the proposed action levels and actions to be taken when action levels are exceeded; and (3) a description of the recording and reporting procedures. As discussed in Chapter 10 of the draft safety evaluation report for construction, the NRC has found this acceptable for purposes of the construction authorization.

J.3.16 Hydrology

J.3.16.1 Comments: 7-004 43-001 99-003
10-018 98-007 101-003

Comment: Currently, the Savannah River Site (SRS) requires enormous amounts of surface and ground water, in the tens of billions of gallons, just to support currently established operations. The DEIS does not clearly account for how much ground and surface waters will be used additionally by the proposed MOX facility versus the proposed no-action alternatives, including immobilization. Concern was expressed about maintaining the aquifers beneath the SRS.

The DEIS states that groundwater beneath the site is listed as a Class II drinking source by the Environmental Protection Agency, meaning it has potential for existing and future drinking water needs. It later states that contamination is present beneath the entire site. This should be clarified in the DEIS.

Response: Water use for the proposed action at the SRS is discussed in Section 4.3.3. Construction of the MOX building, the Pit Disassembly and Conversion Facility (PDCF), and the Waste Solidification Building (WSB) would require 139 million L/yr (37 million gallons/yr); operation of the MOX building would require 9.1 million L/yr (2.4 million gal/yr), the PDCF would require 48 million L/yr (12.7 million gal/yr), and the WSB would require 19 million L/yr (5 million gal./yr). These volumes are much less (about 0.1% and 0.05%, respectively) of the total water use at the SRS mentioned in Table 4.2. All of this water

would be obtained from wells; no surface water would be used (Sections 4.3.1.3.2 and 4.3.2.3.2).

Although the percentage of water needed for constructing and operating the proposed MOX facility is small compared to total water use at the SRS, actual impacts to the groundwater system were more conservatively evaluated for this EIS by comparing the predicted water use to total water use for the A-Area loop and the groundwater capacity for the A-Area loop wells. The evaluations made in this EIS were made using these values because groundwater for constructing and operating the MOX facility would be obtained from a combination of wells in the F Area and A-Area (i.e., the A-Area loop).

Groundwater beneath the SRS is classified as Class II waters (i.e., a current and potential source of drinking water). However, about 10% of the water beneath the site is known to be contaminated. No direct releases of contaminants to the aquifer would occur during construction or operation of the MOX facility (Section 4.3.3.2.1). No accident scenarios have been identified that would directly or indirectly release plutonium to the groundwater. Thus, no changes to groundwater quality would be expected as the result of allowing the proposed MOX facility to operate.

J.3.16.2 Comment: 27-003

Comment: Discharge information, including permitted and streamflow discharges, should be described with the same units of measure as those for stream discharge. The use of standard units of measure reduces confusion and facilitates comparison of values. For example, using the same unit of measure to describe the magnitude of the Savannah River Site (SRS) contribution to total streamflow in the two paragraphs above lines 39 and 40 on page 3-9 of the DEIS would facilitate comparison. A standard unit of measure format should be used throughout the document, such as describing discharge in millions of gallons per day (MGD), cubic feet per second (cfs), or cubic meters per day (m^3/s). Options include either following the standard unit of measure with equivalent measures in alternate units in parentheses in the text, or adding an appendix with conversion tables, comparative table, or equations to facilitate reader comparison between and among units of measure. The standard unit of measure format should be consistently applied for linear distances, area, volume, and discharges.

Response: In EIS Section 3.3.1, discharge for the National Pollutant Discharge Elimination System (NPDES) permits has been changed to the same units as those used for reporting flows in Upper Three Runs Creek. Permitted outfall F2, therefore, is 0.0048 m^3/s (0.17 cfs) and permitted outfall F5 has a flow of 0.0013 m^3/s (0.046 cfs).

J.3.16.3 Comment: 27-005

Comment: The description of aquifers in Section 3.3.2 of the DEIS should be expanded to include aquifer properties, such as lithology, horizontal and vertical transmissivity, and storage. This information would allow estimating the extent and timing of potential

groundwater contamination that could travel and impact nearby rural or municipal groundwater users.

Response: For the proposed action, there would be no discharges to groundwater during construction or operation of the proposed MOX facility, Pit Disassembly and Conversion Facility, and Waste Solidification Building, and there have been no accident scenarios postulated that would release plutonium to the groundwater system. Because there would be no direct discharges to groundwater, there would be no impacts to nearby municipal or rural groundwater users. Indirect impacts to groundwater could occur during construction and operation activities. These indirect impacts would be derived from surface spills and subsequent mobilization by precipitation and infiltration of treated wastewater that would be released to nearby surface water under appropriate surface water discharge guidelines. The impacts of these releases are expected to be small, based on adherence to best management practices and prescribed surface release guidelines. Because there would be no direct impacts to groundwater, and because indirect impacts would be small, including detailed information on aquifer properties, such as lithology, horizontal and vertical transmissivity, and storage, is deemed not to be necessary for this EIS. See Comment J.3.16.6 for more information on aquifer properties and groundwater contamination.

J.3.16.4 Comment: 27-006

Comment: The description of groundwater flow in F-Area provided in Section 3.3.2 of the DEIS is incomplete. As written, the description is inadequate for estimating the likelihood of potential contamination of underlying aquifers from the surface. Groundwater flows from areas of recharge to areas of discharge; the report describes lateral flow direction and identifies discharge areas but does not mention recharge areas or recharge rates. If the F-Area is located on a groundwater divide and the top of the aquifer begins as close as 3 feet below land surface as described elsewhere in this section, it is probable that the proposed MOX facility, the Pit Disassembly and Conversion Facility (PDCF), and the Waste Solidification Building (WSB) are located in a recharge area.

Surface contamination or spills occurring in a recharge area can easily be introduced into a shallow aquifer, as indicated by the existence of contaminated groundwater from past operations in F-Area (pages 3-11 through 3-13 of the DEIS). This section should be expanded to provide information about recharge rates and location of recharge areas in F-Area.

Response: Text has been added to Section 3.3.2 that states that F-Area is in a region of groundwater recharge from precipitation. Text has also been added to state that the average recharge to the Upper Three Runs Aquifer is 35.6 cm (14 inches) per year.

Text in Section 3.3.2 has been changed to give more local analysis of the depth to groundwater at the location of the proposed MOX facility. Assuming 12.2 meters (40 ft) for excavation, the shallowest depth to groundwater would be about 11 meters (36 ft). For

these conditions, surficial spills would have little possibility for adversely affecting the underlying groundwater, as discussed in Sections 4.4.3.3.2.1 and 4.3.3.2.2.

J.3.16.5 Comment: 27-007

Comment: The discussions in Section 3.3.2 of the DEIS indicate that the Upper Three Runs Creek Aquifer is divided into two zones by the Tan Clay Confining Unit of the Dry Branch Formation. The two zones and the Tan Clay Confining Unit, however, are not depicted in Figure 3.4, "Underground Aquifers at the SRS." Without this information, it is not possible to visualize and understand the groundwater-flow system that underlies the proposed MOX facility. Specifically, it is not clear how the two aquifer zones and the Tan Clay Confining Unit within the Upper Three Runs Aquifer relate to the land-surface topography (outcrop areas), the Gordon Confining Unit, the Gordon Aquifer, and the Steed Pond Aquifer. Figure 3.4 should be redrawn or modified to reflect the text.

Additionally, the discussion regarding the occurrence of a water table in the lower aquifer zone beneath the Tan Clay Confining Unit is confusing. It raises the question whether there is a water table in the upper aquifer zone. Subsection 3.3.2 should be rewritten to eliminate the vague and incomplete description of the groundwater system underlying the proposed MOX facility in F-Area.

The text appears to refer to the Upper Three Runs Creek Aquifer and the Upper Three Runs Aquifer interchangeably. This is confusing and should be clarified. If the two names refer to a single geologic unit, then only one term should be used throughout the DEIS for consistency.

Response: Figure 3.4 is a generalized diagram of the groundwater system for the entire Savannah River Site (NW to SE transect). The figure is provided for general, not specific, information. The width of the figure, as shown at the top, is 70 miles. At this scale, F-Area and the location of the proposed MOX facility are not readily distinguishable and accurately splitting the Upper Three Runs Aquifer into two zones is not possible.

The text in EIS Section 3.3.2 discusses groundwater conditions beneath the location for the proposed MOX facility. The text states that the water table occurs in the lower aquifer unit beneath the Tan Clay. This occurs because, as stated in the text, the topography drops off sharply to the deeply incised Upper Three Runs Creek to the north (approximately 36.3 meters (120 ft) of incision) where the Upper Three Runs Aquifer discharges.

All references to "Upper Three Runs Creek Aquifer" were replaced with "Upper Three Runs Aquifer" as suggested in the comment.

J.3.16.6 Comment: 27-008

Comment: Section 3.3.2, page 3-13 of the DEIS indicates that groundwater in the Upper Three Runs Aquifer beneath the proposed MOX facility is contaminated with various heavy industrial and nuclear contaminants. Moreover, recent sampling indicates that groundwater

contamination is absent above the Tan Clay Confining Unit but is present in the lower aquifer zone beneath the confining unit. The discussion and analysis, as currently written, are inadequate for an assessment of the potential for additional contamination at the site relative to the contamination that already exists there, the spatial distribution of contaminated zones in the underlying aquifer, and the potential direction of groundwater movement and contribution to base flow in tributaries to the Savanna River near the F-Area.

We recommend improving the discussion to support this assessment. An adequate discussion should (1) explain why the upper aquifer zone is not contaminated, (2) identify the locations of the wells recently sampled for groundwater contamination at the MOX site, (3) identify the locations of sources that may have contaminated the lower aquifer zone, and (4) explain how the topography and surficial geology of the MOX site relates to the outcrops of the upper and lower aquifer zones.

Response: As discussed in Section 3.3.2, the direction of groundwater flow in the Upper Three Runs Aquifer is primarily to the north toward Upper Three Runs Creek, where it discharges. Contamination does not occur above the Tan Clay layer in this area because the groundwater table lies below the clay (the topography drops off sharply toward Upper Three Runs Creek as stated in the text, and the lower aquifer unit is near or outcrops at the base level of the creek). For clarity, reference to the Tan Clay confining layer was deleted.

A description of the existing groundwater contamination is also provided in Section 3.3.2. Contaminants of concern include gross alpha and beta activity, tritium, uranium, and trichloroethylene (TCE). These results are based on sampling 9 wells in the proposed location for the MOX facility. Text was added to Section 3.3.2 to state that 9 wells evenly distributed across the site were included in the sampling. Their specific locations, however, are not crucial to the argument presented.

New text was also added to state that the contaminant plume appears to originate inside the F-Area fence and is related to F-Area nuclear operations and waste management practices at the Old F-Area Seepage Basin (OFASB).

Additional details on hydrogeological properties, such as lithology, horizontal and vertical transmissivity, storage coefficient, effective porosity, and contaminant-specific distribution coefficients needed to perform independent assessments for contaminant transport are not included in this EIS because there would be no direct discharges to groundwater during construction or operation of the proposed MOX facility and there have been no accident scenarios postulated that would release plutonium to the groundwater system. Indirect releases to groundwater derived from surface spills and subsequent mobilization by precipitation could occur during construction and operation of the MOX facility. The impacts of these spills are expected to be small based on adherence to best management practices.

J.3.16.7 Comment: 27-010

Comment: Without further information in Section 4.3 about groundwater recharge and flow paths, there is insufficient information to determine whether all or any contaminants in a

hypothetical spill would be captured by base flow contributed to the Upper Three Runs Creek, or whether some could pass in groundwater that flows under the creek and continues downgradient. The DEIS should provide sufficient information to distinguish between these possibilities. The DEIS should also provide information on the ultimate fate of a hypothetical spill that is wholly or partly intercepted by the creek. We suggest that the DEIS provide information on processes that affect the transport and fate of these potential contaminants in the environment, for example, some forms of plutonium would be likely to sorb onto clay particles in subsurface materials or streambed sediments rather than travel with the water.

Response: The average recharge rate from precipitation for the Upper Three Runs Aquifer in the vicinity of the proposed MOX facility is 35.6 cm (14 inches) per year (WSRC 1997). This information was added to Section 3.3.2.

As discussed in Section 3.3.2, groundwater in the vicinity of the proposed MOX facility flows to the north toward the deeply incised Upper Three Runs Creek, where it discharges. On the basis of site topography, it is unlikely that water would underpass the Upper Three Runs Creek to any great extent because groundwater north of the creek is expected to flow to the south and discharge to the creek. Because the possibility of underpass is very unlikely, no additional text is required.

Because no accidents have been identified that would release plutonium to the groundwater and no direct or indirect releases of plutonium are planned, no additional discussion on its fate and transport following discharge to surface water is required.

Other surficial spills (e.g., oil) would have very little adverse impact on groundwater and even less impact on surface water following mixing and dilution and adherence to good engineering practices that would limit its initial mobilization and transport. Because the concentrations in groundwater derived from a typical industrial surficial spill would be very small and highly localized, there is no need to discuss the fate and transport of such material in tertiary receiving waters.

J.3.16.8 Comment: 43-005

Comment: The groundwater geology in this area is susceptible to variable conditions that are site-specific and cannot be accurately predicted. The consequences for those factors need to be taken into account in evaluating risk.

Response: Groundwater hydrology for the SRS and the F-Area are described in Section 3.3.2. Although groundwater hydraulic parameters are variable at the Savannah River Site and in the vicinity of F-Area, impacts of construction and operation on groundwater can be predicted with sufficient accuracy to ensure human and environmental safety (Sections 4.3.3.2.1 and 4.3.3.2.2) because there would be no direct releases to the groundwater. For such a situation, there would be no direct impacts. Indirect impacts to groundwater quality could also occur due to surficial spills. While precise pathlines and concentrations are difficult to predict accurately, their impacts are expected to be small

based on adherence to best management practices that would limit the quantity of contaminants reaching the groundwater system.

J.3.16.9 Comment: 86-027

Comment: The MOX ER Rev 2 discusses more recent subsurface analyses presented in WSRC 2002, *Work Task Authorization 06: Summary of Groundwater Quality of the Mixed Oxide Fuel Fabrication Facility Site*. A copy of this document was provided to the NRC with the references for the MOX ER Revision l & 2. The DEIS does not appear to account for this information. It is suggested that the last two sentences on page 3-12, lines 36-40 of the DEIS be deleted, and "Contaminated groundwater also exists beneath the Old F-Area Seepage Basin (OFASB)" be inserted at the beginning of the next paragraph.

Response: The text in Section 3.3.2 was changed to state that the source of groundwater contamination is from various heavy industrial and nuclear operations over the past 50 years in the F-Area. The contaminants plume appears to originate inside F Area and extend beneath the proposed MOX facility site with movement in a fan-like direction of groundwater flow under the proposed MOX facility site. Text was also added to state that contaminated groundwater also exists beneath the Old F-Area Seepage Basin.

J.3.16.10 Comment: 86-028

Comment: It is suggested that the text on page 3-12, lines 40-45 of the DEIS be changed to read: "The OFASB is located about 180 m (600 ft) north of F-Area, immediately adjacent to the western boundary of the MOX site. The OFASB has been remediated by filling the basin with clean soil, capping, and stabilizing the contaminated soil within the basin with grout (WSRC 1997a). Groundwater contaminants of concern at the OFASB include iodine-129, nitrate, strontium-90, tritium, and total uranium. Contaminants of interest include lead, radium-226, and radium-228. A small component of the contaminant plume from OFASB flows beneath the westernmost corner of the proposed MOX site. Groundwater is monitored on a regular basis with 15 wells. Contaminant fate and transport models predict that the aquifer is expected to return to an uncontaminated state (i.e., a condition in which no maximum contaminant levels are exceeded) within 2 to 115 years, depending on the specific contaminant."

Response: The text in Section 3.3.2 was revised as suggested in the comment.

J.3.16.11 Comment: 86-029

Comment: It is suggested that the first sentence on page 3-13, lines 1-5 of the DEIS be deleted. Change the next sentence to read: "The results of recent sampling in the compliance wells for the OFASB indicated that concentrations of several target constituents were above drinking water standards in several wells."

Response: The text in Section 3.3.2 was revised as suggested in the comment.

J.3.16.12 Comment: 86-030

Comment: It is suggested that the paragraph on page 3-13, lines 6-8 of the DEIS be appended with the following text: "There is, however, some uncertainty about whether these exceedances are related entirely to OFASB, to upgradient F-Area facilities, or to both."

Append to this paragraph the following text: "There is, however, some uncertainty about whether these exceedances are related entirely to OFASB, to upgradient F-Area facilities, or to both."

Insert a new paragraph: "The results of recent groundwater sampling at the proposed MOX facility site indicate that shallow groundwater (i.e., groundwater in the Upper Three Runs Aquifer) is contaminated. Gross alpha and beta activity, tritium, uranium, and trichloroethylene exceeded maximum contaminant levels for drinking water. Contamination is present beneath the entire MOX site, but is greatest beneath the western edge of the site. The contaminant plume appears to originate inside the F-Area fence and was and is related to F-Area nuclear operations and waste management practices at OFASB."

Make the following text the final paragraph of this section: "Groundwater in the Upper Three Runs Aquifer beneath the MOX site is contaminated with various heavy industrial and nuclear contaminants. The proposed construction activities will take place at least 9 m. (30 ft.) above the zone of contaminated groundwater."

Response: The text in Section 3.3.2 was changed as suggested in the comment.

J.3.16.13 Comment: 93-012

Comment: Page 4-18 of the DEIS states that water would be used to limit the amount of fugitive dust.. This water will however interact with any radionuclides or other contamination in the soil and contribute to the already acknowledged plume of contamination under the site (page 4-7). No characterization of this plume is provided. How will it be possible to determine in the future whether the proposed MOX facility has contributed to this problem unless the current analysis includes a detailed characterization of what is currently in the soil, in the vadose zone, in the groundwater, in the plume, and the direction and speed of this plume's movement.

Response: The newly added discussion on soil quality (Section 3.2.3) indicates that metal and radionuclide concentrations for near surface soils are well below the limits required by applicable regulations. Adding water to limit fugitive dust during construction would therefore have a small impact on groundwater resources.

As discussed in Section 3.3.2, a plume of contamination exists beneath the proposed location of the proposed MOX facility. This plume is moving north toward Upper Three Runs Creek where it discharges to surface water. Contaminants within the plume include iodine-129, nitrate, radium-226, radium-228, strontium-90, tritium, uranium (total), and lead.

Groundwater velocities in the Upper Three Runs Aquifer are on the order of several hundred feet per year. Due to sorption along the flow paths, however, contaminant velocities could be substantially less, depending on the degree to which they are sorbed to the surrounding material (contaminant-specific distribution coefficients). Because the proposed MOX facility would not discharge any contaminants directly into the Upper Three Runs Aquifer, it was determined that providing additional details on contaminant-specific velocities in the Upper Three Runs Aquifer was not required.

Surface spills could still lead to groundwater contamination. However, it is expected that the impacts of such spills would be small, based on adherence to best management practices.

J.3.16.14 Comment: 43-001

Comment: Concern was expressed about the quantity of surface and groundwater being used by the Savannah River Site (SRS). DEIS page 4-6 shows the annual usage and wastewater discharge for the sites of continued plutonium storage. The reported values for the SRS are 127,000 million liters from surface water and 13,247 million liters from groundwater. The discharge of liquid effluents is 700,000 million liters.

Response: As shown in Table 4.2, annual water use and wastewater discharges for the SRS is 140,247 million L/yr and 700 million L/yr, respectively. This table lists the total quantity of water used by the seven sites (Hanford, INEEL, Pantex, SRS, LLNL, LANL, and RFETS) at which continued plutonium storage is possible. Because the volumes of water are total quantities, they represent use from all ongoing activities at the sites. In all cases, the amount of water required exceeds the volume of water discharged. This difference occurs because water can be consumptively used by operations at the various sites that consume water, not just activities associated with continued storage of surplus plutonium. Because the water volumes listed in Table 4.2 are totals for all operations, they do not represent projected water use for constructing or operating the proposed MOX facility.

J.3.16.15 Comment: 86-099

Comment: The South Carolina Department of Health and Environmental Control (SCDHEC) informed DCS that a 401 Water Quality Certification is only required if a 404 Permit is issued by the Corps of Engineers. SCDHEC does not anticipate any requirement for a 401 Water Quality Certification for the proposed MOX facility.

Response: The text in the Protection of Water Resources section of Table 6.1 in the FEIS has been revised to indicate that the SCDHEC has notified DCS that a State Water Quality Certification in accordance with SC regulation R.61-101 is not required.

J.3.17 Waste Management

J.3.17.1 Comment: 86-045

Comment: The unit used in the DEIS on page 4-27, line 6 should be as follows: 47,000 yd^3 per year (9.5 million gallons per year or 36,000 m^3 per year).

Response: The values in question have been corrected. The value should have been 47,000 yd^3/year as noted. This waste volume is converted to 36 million L/yr (9.5 million gal/yr) for consistency.

J.3.17.2 Comment: 86-048

Comment: The footnotes for Table 4.10 (h) and Table 4.11 (i) should be deleted. Nonhazardous liquid waste (sanitary sewage) is not stored and is released to site streams after treatment.

Response: The footnotes have been deleted.

J.3.17.3 Comments: 67-001 108-001 92-005 115-004 93-016

Comment: The DEIS analysis of the large volume of liquid radioactive wastes to be generated in the MOX program is incomplete. There are already millions of gallons of radioactive nuclear waste stored in this country. Liquid radioactive waste is highly corrosive, and there have been problems with such wastes degrading their containment vessels. The estimates of impacts for the liquid radioactive waste are baseless and therefore not verifiable. The assumption that simply transferring this waste to the Savannah River Site (SRS) and the Department of Energy (DOE) is an end-point when it comes to environmental impacts is specious. For example, stating that the low-level wastes associated with the proposed MOX facility is some percentage of the low-level waste at the SRS implies that the proposed MOX facility is cleaning up the SRS. Any incremental increase to the radioactive burden on the banks of the Savannah River is an unacceptable impact for the future generations. The DEIS should state how much liquid waste is anticipated, how long it will be necessary to store this waste, and what the long-term costs will be for storing this waste.

Response: The discussions of the waste generation and further waste management have been revised to more clearly show which processes are generating what types of wastes, how those wastes will be treated, if necessary, and how those wastes will be disposed of. Specific references have been added to show the source of the values used in the waste management analysis. Text has also been added to discuss the human and environmental impacts from waste management activities.

The highly radioactive slurry (or liquid high alpha waste) that would be produced would be transferred to a proposed facility (i.e., the Waste Storage Building [(WSB]) for further

processing. This facility would be newly constructed with containment vessels designed for the types of wastes planned to be generated by the proposed MOX facility and Pit Disassembly and Conversion Facility (PDCF). The liquid waste would not go to the high level waste tanks that have experienced corrosion problems noted in the comment. The processing of the liquid high alpha waste would generate solid transuranic (TRU) waste and solid low level radioactive waste (LLW) as its final waste forms. The TRU waste from the proposed MOX facility would be handled at the SRS like other TRU waste generated from other SRS activities. That is, the TRU waste would be packaged for disposal at the Waste Isolation Pilot Plant (WIPP) consistent with the national policy for this particular type of TRU waste in this country. Solid LLW is disposed of on-site [see revisions to the environmental report] at the E-area waste vaults or off-site at an approved facility. Liquid LLW would be treated and discharged to Upper Three Runs per permit. Environmental impacts associated with existing waste management activities are presented in the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE 1997a). Because the waste generated from the proposed action would be managed by the SRS within its existing facility capacities, the impacts from DOE 1997a are considered acceptable and are considered to include and bound the impacts for managing wastes from the proposed action. Therefore, comparing the capacities is considered a reasonable assessment method for assessing the waste management impacts of the proposed action. The cost for implementing the waste management activities has been included in the budget planned for managing the surplus plutonium.

J.3.17.4 Comments:

10-003	44-003	71-014	96-007
10-017	66-007	79-002	96-016
24-006	71-006	90-003	

Comment: Concern was expressed regarding the production of additional radioactive waste at the Savannah River Site (SRS). The SRS is already plagued by enormous quantities of dangerous waste and previous contamination. Waste impacts associated with the proposed action were considered to only make the existing problems worse. The proposed MOX facility will produce waste for which there is no satisfactory solution. Concerns were expressed that transuranic (TRU) waste shipped to the SRS from other Department of Energy sites would delay the treatment of waste generated from the proposed MOX facility. The DEIS should include funds to address waste management.

Response: Existing waste management activities at the SRS are discussed in Section 3.9. Human health risks associated with existing waste management activities are included in the baseline human health risk discussed in Section 3.10. Environmental impacts associated with existing waste management activities are presented in the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE 1997a).

Waste generated from the proposed action is evaluated in the FEIS in terms of how it is going to be managed or handled (see Section 4.3.4), and what the impacts might be from transporting them to other locations for disposal (see Section 4.4.1). The cumulative

impacts associated with waste management activities are presented in Table 4.26 of the FEIS (DEIS Table 4.25). These evaluations indicate that the SRS has the resources and capacity for handling the additional waste. As discussed in Section 4.3.4 of the EIS and summarized in Table 2.1, the wastes generated by the proposed action are estimated to have a small to moderate impact on the waste management systems of SRS and WIPP.

The human health impacts from wastes are evaluated in terms of whether human exposure to the waste products would occur. Data provided for the proposed facilities indicate that no liquid discharges of waste would occur directly from the proposed MOX facility and the PDCF. Liquid discharges from the WSB would follow the NPDES permit guidelines. Data also indicate that air emissions impacts would be small . The waste streams generated would be disposed of at facilities designed and operated in accordance with Department of Energy (DOE) orders. Thus, disposal of these wastes is assumed to minimize human exposures to the wastes and have small impacts or no impacts on human health.

The DOE has budgeted for the surplus plutonium disposition mission including managing wastes from that mission. The cost of the proposed action discussed in Section 4.6 of the EIS includes costs for waste management activities.

J.3.17.5 Comments: 10-017 61-005
53-007 66-007

Comment: The clarity of the information in the waste management analysis was questioned. The DEIS does not adequately describe and track the various waste streams. A flow diagram would add to the clarity. The units in DEIS are not consistent. The liquid radioactive waste stream should be reported in liters and gallons. The human health effects associated with waste management activities are not addressed in the DEIS.

Response: The discussions of the waste generation and further waste management have been revised to more clearly show which processes are generating what types of wastes, how those wastes will be treated, if necessary, and how those wastes will be disposed. Specific references have been added to show the source of the values used in the waste management analysis. Text has also been added to discuss the human and environmental impacts from waste management activities. As suggested, Figure 4.1 has been added to the FEIS to help in the understanding of the process as to when and what types of wastes are generated and the ultimate disposition of these wastes. The FEIS has been revised to report liquid radioactive waste volumes in gallons and liters. The DEIS presented these volume in cubic meters for ease of comparison between various waste.

J.3.17.6 Comments: 13-006 103-003
97-016 112-003

Comment: The DEIS evaluates a proposal by DCS for the Department of Energy (DOE) to build a special waste building to handle the significant volume of highly radioactive liquid MOX wastes. The DOE has not yet generated any records or budget requests indicating acceptance of the MOX waste plan. The DEIS does not provide assurance that this can and will occur in a reasonable manner due to available and planned capacity, utilization, obligations, priorities, and acceptance criteria. The DEIS must discuss the environmental risks and consequences of DOE failure to implement MOX waste management. The DEIS should produce verifiable projections of waste volumes as well as discuss the environmental risks and consequences of DOE failure to implement MOX waste management.

Response: The DOE has included the construction and operation of the Waste Storage Building (WSB) into their planning for the proposed fabrication of the MOX fuel. The WSB is planned to be constructed and operated by the DOE to process the liquid high alpha waste from the proposed MOX facility. Because the WSB is required to be operational at the same time as the proposed MOX facility in order for the proposed MOX facility to operate, it is not reasonable to evaluate an alternative where this is not the case. See response to comment J.3.17.4 for additional information.

J.3.17.7 Comment: 116-016

Comment: The DEIS should clearly state how the high alpha waste will be treated and whether it would be classified as high-level waste, low-level waste, or mixed waste.

Response: The proposed plan for handling the liquid high alpha waste calls for transferring this waste stream from the proposed MOX facility to the Waste Solidification Building for further processing via a double-walled pipeline. The processing of the liquid high alpha waste would generate solid transuranic waste and low-level waste.

J.3.17.8 Comments: 86-019 86-050
86-047 86-073

Comment: The Savannah River Site (SRS) treatment capacity for nonhazardous liquid waste reported in Tables 4.10, Table 4.11, Section 2.4, and Section 4.3.4.2 of the DEIS is incorrect. The 35% value of the capacity of the Central Sanitary Waste Treatment Facility (CSWTF) was apparently calculated using values in Table 4.11. This is incorrect because treatment of waste from the proposed MOX facility, the Pit Disassembly and Conversion Facility, and the Waste Solidification Building requires much less that 35% of capacity. The correct value is closer to 10% (about half of the nonhazardous liquid waste from these facilities consists of non-process utility waters that will be released directly to permitted National Pollutant Discharge Elimination System (NPDES) outfalls).

The treatment capacity of the CSWTF is provided in the MOX ER on page 4-43 (1.1 M gals/day) or Table 5-6 (273M gal/yr). The permitted capacity is 1.05M gal/dy. The SPD EIS

(Table 3-41) reports CSWTF capacity as 1.45 Mm^3/yr (383 Mgal./yr). It is recommended that 273 Mgal/yr value be used in the DEIS.

Response: The treatment capacity of the CSWTF has been changed to 273 Mgal/yr as suggested by the comment. The percentage in question has been recalculated based on the revised capacities of the CSWTF (from 73Mgal/yr to 273Mgal/yr). The value is now approximately 6%. The MOX ER does not provide a breakdown as to how much of the projected liquid nonhazardous waste is sanitary wastewater as opposed to process wastewater; and therefore, as a conservative approach the evaluation of impact assumed all of the projected volume to go to the CSWTF and calculations were performed accordingly.

J.3.17.9 Comment: 87-002

Comment: The DEIS discusses a number of the liquid waste streams to be dealt with including chloride, americium, and uranium. However, the DEIS does not mention other impurities that exist in some of the plutonium oxide stocks. The DEIS should address how these wastes will be handled.

Response: The impurities mentioned in the comment are present in very low concentrations in the plutonium feedstock. The impurities would be removed as part of the MOX plutonium polishing process and would become part of the liquid high alpha waste stream. The processing of the liquid high alpha waste would generate solid TRU waste and solid low level radioactive waste (LLW) as its final waste forms. These impurities would not affect the classification of these final waste forms or the capability to properly dispose of these waste forms.

J.3.17.10 Comment: 86-009

Comment: In EIS Section 2.2.4.1, page 2-14, the DEIS states that most of the solid waste generated in the Waste Solidification Building (WSB) would be mixed with concrete and poured into approved containers. This is an incorrect statement. The processed liquid wastes will be mixed in the WSB with concrete and poured into containers to produce solid waste. The solid waste will not be mixed with concrete.

Response: The text in Section 2.2.4.1 has been revised as suggested to state that the processed liquid waste will be mixed in the WSB with concrete and poured into containers to produce solid waste.

J.3.17.11 Comment: 114-005

Comment: Hazardous and radioactive wastes are permitted to be burned in the H-Area Consolidated Incinerator Facility (CIF) (Unit ID # H-010). Although South Carolina Department of Health Environmental Control (SCDHEC) has stated that the CIF is not currently in operation, it recently granted DOE-Westinghouse Savannah River Company a new permit to operate the waste incinerator. The DEIS states that some waste will be sent

to other facilities at the Savannah River Site (SRS). The CIF is required to comply with 40 CFR 61 Subpart H, "National Emission Standards of Radionuclides Other Than Radon From Department of Energy Facilities." Although radionuclide emission rates from the stacks of the CIF and other sources are measured, the millirem standard for maximum allowable dosage to the public is an ambient standard, not an emission limit. Without ambient measurements, neither DOE nor Westinghouse Savannah River Company can assure that emissions of radionuclides are below 10 millirem per year to any member of the public. Likewise, the DEIS fails to cite any direct ambient measurement as a basis for estimates of radioactive dose to the public.

Response: There are two separate issues: (1) radiation exposure; and (2) the ambient levels of criteria pollutants. In Section 4.3.1.1.2 of the EIS, the exposure of the public maximally exposed individual (MEI) at the Savannah River Site boundary to emissions of radionuclides from the proposed facilities was estimated to be 0.0040 mrem/yr. This exposure is less than 0.1% of the standard under Subpart H. The levels of criteria pollutants have been reanalyzed and updated as discussed in response to Comment J.3.15.1.

J.3.17.12 Comment: 97-014

Comment: The DEIS appears to use single tank or container quantities for a large number of analyses. This does not seem reasonably prudent and conservative given that the facility is still being designed and common mode failures cannot be discounted (e.g., multiple tanks failed by the same event or leaks via common piping and valves). It is recommended that larger inventories (up to and including the site inventory, as necessary) be used for releases of chemicals from fluids.

Response: The assumption that the contents of one container would be released is generally conservative enough to bound potential accident impacts, because in general the estimated spill volume (given in Table E-1) was about the same as the anticipated on-site inventory (given in Table 3-2 of the June 2003 version of the DCS Environmental Report); that is, for most process chemicals, there would only be one storage container at the facility at a given time. The accident analyses also include other conservative assumptions, such as that the releases would occur outdoors. Very stable meteorological conditions, leading to high air concentrations, are also analyzed.

One chemical which will have many containers present on the site is depleted uranium oxide. Many drums of depleted uranium dioxide (UO_2) will be in warehouse storage. The accident assessment for uranium dioxide conservatively assumed partial release of material from 200 drums during a fire.

J.3.17.13 Comment: 86-043

Comment: The DEIS incorrectly describes the treatment of nonhazardous wastewater. Nonhazardous wastewaters, except for traditional sanitary wastewater, will either be sent to an appropriate permitted treatment facility at the Savannah River Site, or, in the case of

runoff and uncontaminated heating, ventilation, and air conditioning (HVAC) condensate, be discharged directly to a permitted National Pollutant Discharge Elimination System (NPDES) outfall. Sanitary wastewater will be sent to the Westinghouse Savannah River Company (WSRC) Central Sanitary Waste Treatment Facility.

Response: The text in Section 4.3.3.1.2 and Section 5.2.2 was changed to more accurately describe the treatment of nonhazardous wastewater.

J.3.18 Deactivation and Decommissioning

J.3.18.1 Comment: 86-062

Comment: Because the impacts of decommissioning the proposed MOX facility were included in the MOX Environmental Report, Rev. 1 & 2, and responses to two request for additional information (RAI) questions (July 12, 2001), it is suggested to delete the phrase "Although impacts of decommissioning the facilities were not included in the ER (DCS 2002a)..." on line 1-3, page 4-48 of the DEIS.

Response: The text in Section 4.3.6.1 of the FEIS referring to the ER has been revised to indicate that since the scoping process identified decommissioning as a significant issue, the potential impacts of decommissioning the facilities is presented in the EIS.

J.3.18.2 Comments: 7-002
89-012

Comment: It was questioned what would happen when the proposed MOX facility was useless or not functional and how damage would be compensated. The DEIS should be revised to indicate that the proposed MOX facility will not be decommissioned under its Nuclear Regulatory Commission (NRC) license. Further, any analyses or discussions relative to decommissioning, such as license termination and regulatory requirements, should be revised as necessary to reflect the appropriate end state for the operating license.

Response: It is true that final disposition of the facility will be within the purview of the Department of Energy (DOE), and the end state of the facility would not be determined until the end of the operational period. However, for the sake of this impact analysis, decommissioning for ultimate release for unrestricted use is assumed. This assumption is made to bound potential impacts arising from the possible end uses of the facilities. For the purpose of analysis, the appropriate NRC license termination and regulatory requirements are assumed to apply. Furthermore, NRC regulations require NRC licensed facilities to be decommissioned. To date, the applicant has not requested nor been granted an exemption from this regulation.

J.3.18.3 Comment: 86-064

Comment: Although DCS is the licensee, the current contract calls for deactivation of the facility and return to Department of Energy (DOE) for decommissioning or reuse. It is improper to include the costs associated with borrowing funds to finance the project since DOE is a government agency.

Response: Section 4.3.6.3.2 of the FEIS has been changed to reflect the information provided in the comment.

J.3.18.4 Comment: 86-063

Comment: There appears to be an inconsistency in the decommissioning waste section and the costs section. Although the section on waste management indicates that the quantities and classification of waste types cannot be determined at this time, the costs are, nevertheless, based on "…the volumes and types of waste generated during the decommissioning of those buildings... ."

Response: Although there is considerable uncertainty surrounding the waste types and volumes that would be found in a MOX facility at the end of operations, the analysis was able to estimate the direct decommissioning costs based on the costs of dealing with broadly similar facilities in Colorado. These estimates are not based on projections of waste types and volumes in a proposed MOX facility as is suggested in the comment.

J.3.19 Environmental Justice

J.3.19.1 Comment: 94-002

Comment: The Nuclear Regulatory Commission's (NRC's) evaluation of environmental impacts in licensing actions is not consistent with the terms of Executive Order 12898. By letter dated February 10, 2003, the Commission stated that it intended to reconsider its policy concerning the application of Executive Order 12898.

Response: The NRC has published its "Final Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions" on August 4, 2004 (69 FR 52040). The analysis in the EIS is consistent with the NRC's Final Policy Statement and is based on NRC's current guidance.

J.3.19.2 Comment: 22-002

Comment: It was questioned about whether the Nuclear Regulatory Commission did an environmental justice analysis of the area of "ethnic low-income groups" around Lake Norman.

Response: The analysis of environmental justice impacts of the use of MOX fuel in commercial reactors is beyond the scope of the EIS, which analyzes the construction and operation of the proposed MOX facility.

J.3.19.3 Comments: 28-001 64-007 79-003 88-003
28-002 70-001 81-001 93-017
39-004 78-003 82-004 96-011

Comment: It was stated that environmental justice impacts should be included in the EIS. The entire environmental justice section needs to be reviewed again, due in part to NRC-acknowledged incorrect accident consequences. Concern was expressed regarding potential impacts to environmental justice communities, which were viewed as unacceptably high. It was suggested that the license should be denied based on the results of the environmental justice analysis.

Response: A discussion of the potential environmental justice impacts is provided in Section 4.3.7 of the EIS. Estimates of latent cancer fatalities in the population as a whole in the event of an accident have been revised since the DEIS was published (see Section J.2.2.1). Accordingly, the analysis of potential accidents and their impact on low-income and minority populations has also been revised in the FEIS. With respect to low-income and minority populations around the SRS, the impacts from an accident at the proposed MOX facility are not considered to be high and adverse. The impact analysis for potential accidents at the Pit Disassembly and Conversion Facility and the Waste Solidification Building indicate the potential for high and adverse impacts.

J.3.19.4 Comments: 9-001 35-002 35-006 93-017 96-026
9-002 35-003 64-007 96-013 96-034
9-003 35-004 80-002 96-014 96-038
9-005 35-005 84-002 96-015

Comment: Concern was expressed regarding the appropriateness of proposed mitigation measures associated with potential environmental justice impacts. It was stated that the environmental justice mitigation measures were not adequate and should be stronger and more detailed. Mitigation should be to provide compensation or incentives to environmental justice communities. It was suggested that a health care center be built so that people who suspect that they are adversely affected can receive medical treatment. It was felt that the applicant should be made to meet and work with the environmental justice community. It was stated that some in the environmental justice community lack understanding of the proposed action. These communities should be educated and should be involved in developing any environmental justice mitigation actions.

Response: As discussed in Sections J.2.2.1 and J.2.2.2, the accident results have been revised based on errors found in the DEIS and resolution of issues identified during NRC's safety review. As such, the environmental justice section has been revised to reflect these changes. For environmental justice impacts from the proposed action, the FEIS concludes that although low-income and minority populations may, depending on wind direction, be

disproportionately impacted, that those impacts are not considered to be high or adverse for the proposed MOX facility. The impact analysis for potential accidents at the Pit Disassembly and Conversion Facility and the Waste Solidification Building indicates the potential for high and adverse impacts. Mitigation measures have been suggested to reduce these potential impacts.

In the event of an accident, general emergency response measures would occur at the Savannah River Site to protect the surrounding public. These are outlined in the response to Comment J.3.19.10.

J.3.19.5 Comments: 86-004 86-089
86-065 89-009
86-088

Comment: The accidents impacts presented in the DEIS that could cause a potential environmental justice impact are prevented by design safety systems; and therefore, should not be considered in the EIS. In addition, although these accidents may have significant consequences, the likelihood of such accidents are at very low frequencies, and hence they have minimal risk. The projection of an environmental justice impact and inclusion of these mitigative action requirements are inappropriate and inconsistent with the goal of the National Environmental Policy Act to provide the public with meaningful environmental analyses, and should be removed from the DEIS.

The DEIS provides no justification why DCS should provide local agencies or groups representing environmental justice groups with “public information “ on existing soil or groundwater contamination monitoring, or the nature, extent, or likelihood of surface releases. Providing such information is not mitigation action related to the proposed MOX facility, which has yet to be constructed. Similarly, the DEIS does not provide a justification why DCS should take the unprecedented initiative to create a spatial database for use by local authorities. In the event of any incident at the Savannah River Site, the authorities would alert all potentially affected communities, not just minority communities. For the Nuclear Regulatory Commission (NRC) to proscribe mitigative actions is beyond the statutory authority of NRC.

Although the DEIS states that the guidance in NUREG-1748 was followed, the DEIS, by using a 50-mile radius for environmental justice impacts does not follow the guidance of NUREG-1748, which proscribes a radius of 4 miles. Additionally the DEIS is directly contrary to specific guidance provided by NRC to DCS in the 11 Dec. 2000 letter from M. Galloway to R. Ihde. This guidance was that the 50-mile radius in NUREG-1718 was incorrect and DCS should follow the Office of Nuclear Material Safety and Safeguards (NMSS) Policy and Procedures letter proscribing a 4-mile radius. The DEIS should conform to NRC guidance and only analyze environmental justice impacts within a 4-mile radius of the proposed MOX Facility. If the FEIS will contain a larger area for environmental justice analyses in an effort to be overly conservative, the DEIS should acknowledge this, but not tie environmental justice mitigation to overly conservative analyses.

Response: Comments regarding accidents and the bases of the accident analysis are provided in Section J.3.14. In summary, the EIS attempted to provide a comprehensive, bounding analysis for all potential events up to and including design basis accidents. The EIS provides a conservative estimate of accident impacts and an independent review of previous accident analyses performed for the proposed MOX facility, the Pit Disassembly and Conversion Facility, and the Waste Solidification Building. The accident impacts presented in this EIS are conservative in nature, but not unreasonably.

The DEIS concluded that there was not an environmental justice concern for construction and operation of the proposed MOX facility. The DEIS further stated that there was a potential environmental justice concern, if an accident producing significant contamination occurred. The environmental justice section (Section 4.3.7.3) states that the risk to any population, including low-income and minority communities, is considered to be low. NRC proposed mitigation measures to reduce the potential impacts to low-income and minority communities. The mitigation measures proposed in the DEIS were based on the accident results published in the DEIS.

As discussed in Section J.2.2.1 and J.2.2, the accident results have been revised based on errors found in the DEIS and resolution of issues identified during NRC's safety review. As such, the environmental justice section has been revised to reflect these changes. Under 40 CFR 1500.2 (f), federal agencies shall to the fullest extent possible use all practical measures to avoid or minimize any possible adverse effects of their actions on the quality of the human environment. Mitigation measures were proposed in the DEIS consistent with the level of potential impact.

Although NRC guidance provides for the analysis of environmental justice impacts within a 4-mile radius of nuclear materials facilities, the guidance does allow for consideration of larger areas, as deemed appropriate. As discussed in the response to Comment J.3.6.1, the geographic area, over which impacts are assessed, varies depending on the type of resource. For human health risk, a radius of 50 miles was selected as appropriate to consider health impacts from the proposed MOX facility. Given these considerations, and the concern over environmental justice issues at the scoping meetings, it was decided to take a conservative approach to measuring the potential impacts of an accident on low income and minority populations by using a 80 km (50 mile) radius.

J.3.19.6 Comments: 31-001 64-005
35-006 96-002

Comment: Concern was expressed regarding the level of detail in the environmental justice analysis. It was stated that the environmental justice analysis is inadequate and needed additional details and explanation. It was requested that the EIS provide a table showing where low-income and minority people would die at the census block level. It was stated that this would add to the transparency of the document.

The data contained in the DEIS does not support the conclusion that there is an environmental justice concern. An independent analysis was provided by a commenter using a probabilistic approach and wind direction and probability (Figure 3.5), population by sector (Table E.8), and areas with disproportionate minority or low income population concentrations (Figures 4.1 and 4.2). For each sector, the number of low income and minority people were compared with the total the number of people. The commenter's analysis concluded that, if offsite health impacts result from windborne contamination, then there is no disproportionate impact on low income and minority populations.

Response: The environmental justice analysis was performed in accordance with Nuclear Regulatory Commission (NRC) guidelines (NUREG-1748). The analysis method is multi-step and consists of first determining if a site has a potential environmental justice concern based on demographics of low-income and minority populations. Next, the determination is made whether the impacts disproportionately impact low-income or minority populations. In cases where the environmental justice population is located next to the site, the impacts or potential for impacts will likely be disproportionate. In other cases, specific behavior of environmental justice populations, such as a greater portion of their diet consisting of crops grown at home, may result in a disproportionate impact. Finally, if it is determined that there is a disproportionate impact, the determination is made whether the impact to low-income or minority populations is "high and adverse." Additional text has been added to Section 4.3.6 to clarify the analysis method.

Sufficient data is provided in Figures 4.1 and 4.2 of the FEIS to establish the general distribution of the minority and low income population within a 50-mile radius of the proposed facility. Specific information on health impacts on minority or low income populations within any given block group cannot be provided as the actual distribution of population within the block group is not taken into account in the analysis. Entire block groups are simply classified according to the relevant minority and low income population concentration thresholds.

The analysis provided by the commenter is not consistent with NRC methodology. Disproportionate impacts are based on whether impacts are greater for environmental justice populations or if they experience impacts that non-environmental justice populations do not experience. Disproportionate impacts do not simply rely on the proportion of the total population that is potentially minority or low income in the area covered by the plume as a whole, as the commenter suggests.

J.3.19.7 Comments: 72-007
115-003

Comment: Concern was expressed that the environmental justice analysis shows that existing and past activities at the Savannah River Site (SRS) have impacted low income and minority communities surrounding the site.

Response: The DEIS concluded that there would not be an environmental justice concern for construction and normal operations of the proposed action. The DEIS further stated that there was a potential environmental justice concern, if an accident producing significant contamination occurred. The analysis does not imply that existing operations at SRS have caused environmental justice impacts. As discussed in Section 3.10, the human health risks for the surrounding community for existing SRS activities is very low. One could conclude that the impacts of existing SRS activities do not pose a high adverse impact; and therefore, there have been no environmental justice impacts from existing activities.

J.3.19.8 Comment: 72-010

Comment: The evaluation in environmental justice does not consider the long-term impacts of the waste from the proposed MOX facility. Although the NRC does not regulate waste management activities at the Savannah River Site (SRS), the impact from these activities will impact of these very same environmental justice communities.

Response: At the end of operations at the MOX facility, all wastes produced by the proposed facility would become the responsibility of the Department of Energy and would be managed in accordance with guidelines and procedures for all other waste materials at the SRS. EISs already completed by the DOE indicate that there are no significant human health impacts of waste management operations. Therefore, no environmental justice impacts would be associated with the management of the proposed MOX facility wastes produced during the operating period or decommissioning period. Text has been added to Section 4.3.7.3 of the FEIS to clarify this issue.

J.3.19.9 Comments: 10-015
82-002
84-002

Comment: There seem to be numerous contradictions within the report of what will and what will not be studied in terms of environmental justice. For instance, environmental justice impacts apparently will not be studied along MOX transportation routes but elsewhere in the document it states that transportation will be studied in terms of environmental justice. Impacts to less fortunate communities were viewed to occur from transportation activities. It was stated that the EIS should consider the environmental justice impacts of the transportation.

Response: The DEIS stated in Section 5.2.12 that mitigation measures would include relevant risks associated with MOX-related transportation programs. However, as noted in

the scoping summary report (Appendix I), environmental justice impacts along transportation routes were not included in the DEIS due to uncertainties surrounding the transportation routes that would be used, and the timing and quantity of MOX shipments. The statements in Section 5.2.1.2 of the DEIS have been deleted to address this contradiction, and text has been added to Section 4.3.7.1 of the FEIS to clarify the basis for not considering environmental justice impacts along transportation routes.

J.3.19.10 Comments: 77-005
96-030

Comment: The mitigation measures suggested are insufficient to achieve environmental justice for the low-income populations in the area surrounding the Savannah River Site (SRS). The mitigation measures should be revised to include: (1) warning sirens in the area of the facility, (2) free health care for those with health risks elevated due to the operation of the facility; and (3) an economic benefit for those who reside near the proposed MOX facility to offset the economic and health disadvantages of living in the area. It was suggested that the Nuclear Regulatory Commission (NRC) recommend that DCS work with potentially impacted communities.

Response: The NRC does not believe that normal operations of the proposed MOX facility increases health risks to the offsite public that warrants mitigation. In the case of an accident, warning sirens at the proposed MOX facility and the SRS boundary would be sounded as one means of alerting nearby residents. DCS and the SRS would follow established emergency procedures to inform local and state officials of the nature and extent of an accident and assist with appropriate actions to protect human health and safety.

J.3.19.11 Comment: 96-005

Comment: The mitigation measures section addressing the disproportionate impact to minority communities is totally unacceptable. The proposed mitigation measures place an unfair burden on communities and local government. Education will not address impacts described in the DEIS. Local governments and citizens should not bear the responsibility of emergency preparedness and associated costs.

Response: A reanalysis of impacts from accidents involving the MOX facility, the Pit Disassembly and Conversion Facility and the Waste Solidification Building to low income and minority populations has been conducted. Mitigation measures were revised to address the results of the new accident analysis and are reported in Chapter 5 of the EIS. The Nuclear Regulatory Commission does not intend for local communities to bear the full cost associated with emergency preparedness in the event of a severe accident affecting the local population. The DOE Emergency Preparedness Plan for the Savannah River Site would be implemented in case of an accident resulting in offsite releases of radioactive or chemical materials.

J.3.20 Transportation

J.3.20.1 Comments: 29-001
85-001

Comment: The transport of spent fuel and unused nuclear weapons pits to and from the proposed MOX facility was of concern. This presents a desirable target for terrorists. Many local communities do have sufficient law enforcement and National Guard to meet these challenges while many do not. It was suggested that costs for the law enforcement and National Guard to protect the MOX materials was an unfunded federal mandate. The Nuclear Regulatory Commission should address this unfunded federal mandate.

Response: The unfunded federal mandate comment raises issues that are outside the scope of this EIS. The shipments would be treated as other shipments of special nuclear materials under the protection of the U.S. Department of Energy Office of Transportation Safeguards as discussed in Section C.2.3 of Appendix C in the EIS. The nuclear weapons pits and MOX fuel would be shipped via the SafeGuards Transporter (SGT). The SGT is a structurally reinforced vehicle operated by armed federal officers and travels with armed escort vehicles.

J.3.20.2 Comment: 29-002

Comment: Although transportation casks have been looked at in regulation and testing for many years, the form of the spent fuel and the nuclear weapons pits have taken a back seat. The spent fuel has often failed in use and presents a peculiar problem in transportation and decanting. The design of the transportation casks often does not address the failures and the type of failures of the spent fuel. Any assumption that the fuel will be in a form which does not complicate accidents and handling may be flawed and needs to be addressed.

Response: The U.S. Nuclear Regulatory Commission (NRC) has requirements in its regulations in 10 CFR Part 71 that address the form of the radioactive fuel. The cask, also referred to as packaging, must be able to protect the contents from being released to the public and also must keep the dose to the public under specified limits for both routine and accident conditions of transport. The NRC has conducted a number of risk studies concerning the responses of spent fuel casks subjected to accident and severe accident conditions. The expected response of casts to these conditions can be found in such reports as *Shipping Container Response to Severe Highway and Railway Accident Conditions* (NUREG/CR-4829) published in 1987 and *Reexamination of Spent Fuel Shipment Risk Estimates* (NUREG/CR-6672) published in 2000. The NRC is currently working on the Package Performance Study which is a new risk study in the planning stage. This research program proposes to test the full scale transport casks under conditions that would exceed regulatory requirements. This type of information, including that used for plutonium metal, was incorporated into the transportation risk analysis in this EIS.

J.3.20.3 Comment: 86-067

Comment: The impacts resulting from shipping 50 metric tons of surplus plutonium to the Savannah River Site were covered in the DOE's Surplus Plutonium Disposition (SPD) EIS. The Nuclear Regulatory Commission should have simply deferred to that analysis instead of reanalyzing impacts already evaluated by another federal agency.

Response: The transportation risks for shipping the 50 metric tons (55 tons) of surplus plutonium were not presented separately from other transportation actions in the DOE's SPD EIS, making it impossible to extract the impacts directly associated with the plutonium shipments. In addition, decisions regarding the source of the plutonium, such as the Rocky Flats Environmental Technology Site (RFETS) shipments, were made after publication of the SPD EIS. Thus, the re-analysis of impacts associated with the shipments of plutonium provided more detailed information specific to the proposed action.

J.3.20.4 Comment: 86-068

Comment: The value for transuranic (TRU) waste on page 4-63, line 22 of the DEIS appears to be a great deal higher than experience.

Response: The detailed design information on the internal configuration of the TRUPACT-II containers, as it pertains to the Waste Solidification Building TRU waste shipments, is not yet available. Therefore, a conservative assumption was made to use the highest estimated dose rate for shipments expected to go to the Waste Isolation Pilot Plant (WIPP) as provided in the WIPP transportation studies. As referenced on line 23 of page 4-63 and line 20 on page C-21 in Appendix C, the 0.040 mSv/h dose rate for TRU waste shipments was taken from DOE's *Waste Isolation Pilot Plant Disposal Final Supplemental Environmental Impact Statement* (DOE/EIS-026-S-2).

J.3.20.5 Comment: 86-100

Comment: On page C-6, lines 37-38 of the DEIS, perhaps it would be better to state "The model allows the user to evaluate transportation risk, considering differences in the mode of transport and package used. The user selects parameters to represent the probability of an accident occurring and consequences of a spectrum of accident severities."

Response: The text in Section C.1.3.1 was revised in the FEIS to clarify that the model takes into account the mode of transportation and the type of packaging through selection of the appropriate accident probabilities and release fractions, respectively.

J.3.20.6 Comment: 86-102

Comment: A clarification should be made on page C-12, line 36 of the DEIS. The MOX ER specifies a 55-gallon Industrial Type 1 drum for the shipment of uranium dioxide ($UO_{2)}$. The DEIS specifies a 30-gallon Type A drum size.

Response: The text has been revised in the FEIS to indicate that the uranium dioxide does not require Type A packaging and is expected to be shipped in industrial packaging. Text has been revised to indicate the use of a 55-gallon drum for uranium dioxide shipments.

J.3.20.7 Comment: 86-103

Comment: Shipment routes were of concern in Section C.2.1.1 of the DEIS. It is important to clarify that none of the shipments would meet highway route controlled quantity (HRCQ) requirements. The uranium hexafluoride ($UF_{6)}$ and uranium dioxide (UO_2) won't meet HRCQ requirements because of the material hazards; the plutonium metal and MOX will be handled securely by DOE's Office of Secure Transportation (OST), and the transuranic (TRU) waste will follow Waste Isolation Pilot Plant (WIPP)-prescribed routes.

Response: The plutonium metal and MOX fuel meet HRCQ requirements whether or not they are handled by DOE's OST. Routing of a HRCQ of material is determined according to 49 CFR 397.101, "Requirements for motor carriers and drivers." Text has been added in the FEIS to clarify that the TRU waste shipments will follow the designated WIPP routes.

J.3.20.8 Comment: 86-105

Comment: It is suggested to provide a reference for how the number of shipments of plutonium metal to the Pit Disassembly and Conversion Facility (PDCF) was determined, since it differs from that used in the Surplus Plutonium Disposition EIS in Table C.2.

Response: The number of shipments was determined by the amount of plutonium metal shipped from Pantex and Hanford to the PDCF and the amount of plutonium metal in each shipment. As discussed in Section 4.4.1.1, 21.3 metric tons (23.4 tons) and 5.4 metric tons (5.9 tons) of plutonium metal was assumed to be shipped from Pantex and Hanford, respectively. The amount of plutonium metal in each shipment was determined from Table 4 in Didlake (1998) that listed 33 MT of plutonium pits and metal destined for the PDCF in 530 loads. Using the amounts to be shipped (21.3 and 5.4 metric tons) and the amount per shipment (33 metric tons divided by 530 shipments) the number of shipments were estimated to be 343 and 87 from Pantex and Hanford, respectively.

J.3.20.9 Comment: 86-110

Comment: The assumption that stops of Safeguards Transporter (SGT) shipments of both the fresh, unirradiated MOX fuel and the plutonium metal along the route would have the same duration and public exposure as spent fuel truck shipments is overly conservative.

Response: As discussed in Section 4.4.1.1 of the EIS a surrogate commercial nuclear power plant at a Midwestern location was chosen for assessing the transportation risks of the fresh, unirradiated MOX fuel. This conservative assumption was made to bound the impacts for use of the MOX fuel by any power plant in the eastern to Midwestern portion of the United States. In this case, rest stops would be needed over the 1,300-mile journey.

There is no reason to assume that the stop times used are specific to spent fuel shipments because truck maintenance and crew rest conditions would be similar.

The MOX ER assumed no stops for the MOX fresh, unirradiated fuel shipments because these shipments were assumed to be between the Savannah River Site and the McGuire and Catawba nuclear plants. These shipment distances are both on the order of 200 miles which is easily traversed without the need for refueling or rest for the crew.

J.3.20.10 Comment: 86-111

Comment: On page C-23, line 20 of the DEIS, units on this risk factor, based on the subsequent text, should be "latent fatalities-km/person."

Response: For a population density of 1 person/km^2, as mentioned in the text, the factor is as written. When used to determine risks at other population densities the full set of units must be used: 8.36E-10 latent fatalities/km per person/km^2 which reduces to the form suggested in the comment.

J.3.20.11 Comment: 89-051

Comment: The values in the accompanying paragraph do not agree with the values presented in Table 4.20 of the DEIS. This inconsistency should be reconciled.

Response: The text was revised to present the proper values as listed in Table 4.21 of the FEIS (DEIS Table 4.20).

J.3.20.12 Comments: 24-001
71-002

Comment: The U.S. portion of the proposal involves shipment of plutonium from dismantled nuclear weapons sites in western states, some likely via lnterstates 40 and 26 en route to South Carolina. The greatest transportation risk would be an accident in which plutonium metal, which rapidly oxidizes when it comes into contact with air, would vaporize or burn and disperse its deadly particles contaminating the air our citizens inhale, the water upon which we depend and the soil upon which we grow crops and upon which animals feed.

Response: The staff notes that the commenter assumes that an accident would cause a release of a cask's contents to the environment. The Nuclear Regulatory Commission (NRC) regulations require that the transport release of a cask be designed to withstand a sequence of four hypothetical accident conditions including drop, puncture, fire and submersion and still be able to perform its safety functions of containment and shielding. Such design requirements make it very unlikely that an accident would result in the release of the shipped material to the environment. The commenter should note, however, that the plutonium that will be shipped will not be in powder form, and thus if in the unlikely event

that it were released to the environment, it would neither be easily inhaled nor would it be easily vaporized or burned.

J.3.20.13 Comment: 86-101

Comment: In Section C.1.3.1, page C-7, lines 1-10 of the DEIS, the use of the ingestion pathway resulting from the consumption of contaminated food is highly speculative. Public policy and emergency response experiences from Three Mile Island in 1979 and Chernobyl in 1986 indicate that, essentially all food (whether contaminated or not) was destroyed, making the ingestion scenario not "reasonably foreseeable."

Response: The ingestion of contaminated food is a potential exposure pathway for transportation accidents as recognized by its incorporation into the RADTRAN transportation risk code originally developed for the NRC when it produced NUREG-0170 in 1977, *Final Environmental Impact Statement on the Transportation of Radioactive Materials by Air and Other Modes*. Since that time, radiological transportation risk assessments have routinely included the ingestion pathway as a potential source of exposure (e.g., see *A Resource Handbook on DOE Transportation Risk Assessment*, DOE/EM/NTP/HB-01). One reason for this trend in conducting radiological transportation risk assessments is concern by the public that appropriate actions to protect the public would not be carried out and the desire to know what would happen in the absence of these actions (e.g., intervention or interdiction of contaminated crops).

The ingestion of contaminated food is not highly speculative. The Nuclear Regulatory Commission recognizes that some interdiction would likely occur following a significant accident, even if contamination levels were below the protective action guides. Such a response occurred after Three Mile Island where no crop contamination was found. On the other hand, some members of the public were found to return illegally to contaminated areas near Chernobyl to live for various reasons (e.g., attachment to ancestral home/high sense of displacement) that could easily result in the consumption of contaminated, locally grown food. Thus, the inclusion of the ingestion pathway provides upper bound estimates of the impacts of potential significant accidents.

J.3.20.14 Comment: 86-108

Comment: Plutonium isotopic distribution is the same for plutonium metal, MOX fuel, and transuranic (TRU) waste. The Curie content should be linear with mass of plutonium in each stream. This should be reflected in Table C.3.

Response: The numerical values for the activity of plutonium in the MOX fuel and TRU waste shipments were taken directly from the DCS references noted in Table C.3 without any type of conversion. These values were preliminary estimates and are still subject to small changes. No further action will be taken at this time.

J.3.20.15 Comment: 116-009

Comment: It was questioned whether the Nuclear Regulatory Commission considered both fatal and non-fatal truck accidents. Also, it was questioned why the "neutral weather" conditions and not the "worst case" weather conditions were considered in an transport accident. Excluding the transportation risks on-site at the Savannah River Site was also questioned.

Response: As discussed in Appendix C, Section C.1.1 of the EIS, both fatal and non-fatal truck accidents were considered when assessing impacts from potential radioactive releases. The vehicle-related fatalities reported were the direct result of physical trauma related to potential accidents. As discussed in Appendix C, Section C.2.4.3, neutral weather conditions were used for the transportation risk assessment because the exact time and location of an accident cannot be known ahead of time and neutral weather conditions prevail for more than 50% of the time in the United States where shipments may occur. Because the shipment distances on-site are much shorter than the off-site routes, low on-site speed limits, and the sparse population density, the transportation risks on-site at the Savannah River Site for the material considered in the EIS are not significant compared to the transportation risks presented in the EIS.

J.3.20.16 Comment: 114-012

Comment: Emergency response to rail or highway accidents must be well-prepared and rapid. Delays in response to accidents which involve the release of radioactive material would expose unknown numbers of people to negative health effects. In 1996, a Department of Energy (DOE) Transport and Safeguards Division Safe Secure Transport (SST) trailer carrying nuclear weapons slid off the road and rolled over in rural Nebraska. Four hours elapsed before DOE headquarters was notified, and it was 20 hours before a Radiological Assistance Program team determined there was no release. A similar delay in response to a plutonium-MOX fuel accident could make effective emergency response dangerous and clean-up impossible.

Response: Any accident scene involving vehicles containing plutonium or MOX fuel is expected to be promptly closed to vehicle traffic. As discussed in Appendix C, Section C.2.3 of the EIS, such shipments would be made using the SafeGuards Transporter (SGT) with armed federal officers on-board as well as in escort vehicles. The SGT and escort vehicles would contain advanced communications equipment and be monitored 24-hours-a-day. Any accident would be identified in real-time and the federal officers at the scene would be able to take appropriate measures to ensure the safety of the public as well as the security of the shipment.

J.3.21 MOX Fuel Use

J.3.21.1 Comments:

2-002	30-003	71-009	92-003
12-004	47-005	72-006	105-007
13-004	65-003	77-002	114-004
24-004	67-002	90-002	114-010

Comment: In general, using MOX fuel in reactors was considered to be experimental and unsafe. Scientists are not in agreement as to the safety of this process. It was stated that the use of MOX fuel in a reactor would result in a smaller safety margin and was difficult to control which could result in serious accidents at a higher likelihood. Reactors were not designed to handle MOX fuel. Specific technical concerns were raised which included the lower delayed neutron fraction with plutonium, the reduced control rod effectiveness with using MOX fuel, a positive moderator temperature coefficient, increased fission gas production, twice the tritium production, lower melting temperature of MOX fuel, and formation of hot spots within a mixed core of MOX fuel and low enriched uranium fuel. It was noted that the first three issues were significant causes of the Chernobyl accident. It was questioned how emergency crews could respond to a reactor accident involving MOX fuel, given that plutonium is hotter than uranium. It was stated that the moderator temperature coefficient of reactivity is an example where European MOX fuel experience does not apply. Concern was expressed that modifications to reactors and increased monitoring would be required if MOX fuel was used in reactors. The reactor use, MOX fuel transportation, and spent fuel disposal impacts should assume the maximum throughput. It was further suggested that the proposed MOX fuel fabrication facility should not be authorized until problems with reactor use are resolved.

Response: All U.S. light water power reactors are designed to produce power from fuel that includes plutonium. By the end of a fuel cycle, light water reactors burning low enriched uranium (LEU) fuel produce a significant percentage of the energy in the reactor core from the fissioning of plutonium that was produced during normal operation from the irradiation of uranium-238. This is reflected in the design basis for the power plants.

Moderator temperature coefficient (MTC) is more strongly influenced by the choice of moderator (which is the same for MOX or LEU fuel) than the differences in the MOX and LEU fuel types considered here. In any event, the delayed neutron fraction, control rod worth, reactor vessel embrittlement, shielding analysis, MTC effects, fuel performance and source terms issues are typical of the issues that will be addressed in the NRC staff's safety review of any future amendment request by a reactor licensee to use MOX fuel. The results of the future site specific safety reviews will be considered, together with any future site specific National Environmental Policy Act (NEPA) evaluations in determining whether to authorize specific reactors to use 40% MOX fuel cores.

In planning for these reviews, the NRC has initiated a research program which includes developing tools to evaluate the neutronic and material behavior of MOX fuel, and to estimate source terms from potential accidents involving MOX fuel. Technical concerns, such as those mentioned in the comments, would be evaluated during the site-specific

safety review. Any modifications to the reactor, that would be required to ensure safety, would be determined within the scope of the NRC staff's future reviews of a specific request to use MOX fuel. The NRC believes that analyses performed to date are sufficient to reasonably estimate and bound the impacts of using MOX fuel. Reactor specific issues are beyond the scope of this EIS. However, the NRC staff believes that analyses performed to date are sufficient to reasonably estimate and bound the impacts of using MOX fuel for purposes of making a decision whether to authorize construction of the proposed MOX facility.

As discussed in Section 4.4.3 of the EIS, the impacts of using MOX fuel were tiered from an assessment presented in the DOE's Surplus Plutonium Disposition EIS (Section 4.28 and Appendix K.7 of that document). While weapons grade plutonium MOX fuel has not been used in reactors in the United States on a commercial scale, the impacts of doing so have been estimated assuming MOX fuel replaces about 40 percent of the low-enriched uranium (LEU) fuel. The DOE's analysis of using MOX fuel in reactors concluded that the operational safety would be essentially the same as using LEU fuel. The DOE determined that, depending on the accident, the risk of a latent cancer fatality among the general public associated with a potential accident, could decrease by up to 7% or increase by up to 14%.

J.3.21.2 Comments: 91-002
91-003
98-006

Comment: Water use issues relative to using MOX fuel were raised. Water would be used in the MOX processing to make MOX fuel, but water would also be used at nuclear power plants. Nuclear power plants were considered to be a water-intensive and toxic technology that imposes major long-term social, environmental, and economic costs. For example, the Hatch Plant withdraws 57 million gallons a day from the Altamaha River and returns only 24 million gallons a day. With ever-rising demands for water supply in this rapidly growing state, particularly during extended drought, such water intensive practices are increasingly unjustifiable, imposing avoidable burdens on many other sectors. Water resources are limited and discussions on how this precious resource should be protected are currently being debated in the Southeast. The link between energy and water resources is profound. At the national level, the electric industry follows closely on the heels of irrigation as the largest water user in the U.S. Yet, there is no discussion in the DEIS on the impacts of nuclear power production, which the MOX program will support the possible advancement of, on the region's water supply.

Response: Nuclear reactors use water, regardless of whether they use conventional low-enriched uranium (LEU) fuel or a combination of LEU fuel and MOX fuel. As discussed in Section 4.4.3 of the EIS, the Department of Energy's analysis of using MOX fuel in reactors concluded that, during normal operations, the impacts would be the same as using LEU fuel. Specific water use impacts at any particular reactor are beyond the scope of this EIS.

J.3.22 Cumulative Impacts

J.3.22.1 Comments: 72-008
39-001

Comment: There was concern about the decision to add new radioactive missions to the Savannah River Site (SRS) which has already been weakened by previous and ongoing exposures. It was stated that the SRS has the most radioactivity of any Department of Energy site nationally and that millions of gallons of high level radioactive waste are stored there. It was also stated that the proposed mitigation steps do not address the ongoing routine and repeated exposure. It was felt that the Nuclear Regulatory Commission analysis did not fully express the cumulative and synergistic nature of the situation.

Response: Cumulative radiological dose to the public and SRS workers from normal operations of the proposed facilities, existing SRS operations, past operations, and reasonably foreseeable future actions is presented in Section 4.5.1.1 of the EIS. This analysis indicates that MOX operations would contribute a relatively small incremental dose to the public and to workers and that the number of latent cancer fatalities that would result from cumulative radiological dose is less than one for the public (including the maximally exposed individual) and about 1 for workers.

J.3.22.2 Comment: 89-054

Comment: The DEIS references the Yucca Mountain environmental impact statement for high latent cancer fatalities from “general transportation” when the historical results are low. However, this reference cannot be found. Please verify the numbers used.

Response: The numbers presented in the EIS are correct. Please see page 8-90 of the Yucca Mountain environmental impact statement.

J.3.22.3 Comment: 89-055

Comment: Presuming the MOX shipments in line 16 of Table 4.27 of the DEIS are supposed to be the same as the totals presented in Table 4.20, the numbers for the population dose do not agree. If the information is supposed to be the same, it is suggested that the category be relabeled to more accurately reflect the nature of the information (e.g., All shipments for the MOX program).

Response: The numbers in Table 4.27 in the DEIS (Table 4.28 in the FEIS) were correct. The numbers have been revised in the FEIS to reflect changes made in the TRU waste shipments in ER Revision 5. A footnote has been added for clarity as suggested by the commenter.

J.3.22.4 Comment: 93-013

Comment: It is not correct to assume that the proposed MOX facility and Waste Solidification Building construction are "bounding," since the movement of contaminated particulate off-site and movement of contamination from soil into ground water are both cumulative, and construction of all three facilities will result in one or both of these events. It should be necessary to assess the impacts of all three and look at them cumulatively, even though the Pit Disassembly and Conversion Facility (PDCF) construction may lag behind the other two.

Response: As discussed in Section 5.2.8 of the FEIS, the Nuclear Regulatory Commission is concerned that the spoils pile currently located on the proposed MOX site may be contaminated. Although DCS has conducted initial screening that does not indicate contamination, removal of the spoils pile constitutes a significant earthmoving activity and a potential source of exposure to construction workers. In contrast, significant earthmoving operations are not anticipated for the PDCF and Waste Solidification Building sites. The spoils pile is not considered a significant source of potential contamination to the environment. Construction of the MOX and associated facilities would not be expected to mobilize any contaminated particulates off-site. Dust control measures during construction (Section 5.2.4 of the FEIS) would limit migration of any contaminated particulates. The groundwater beneath the proposed MOX facility site is already contaminated. Past activities at the Savannah River Site do not indicate that the area where the spoils pile soils were excavated is a significant source of existing contamination; and therefore, would not be expected to be a significant source of groundwater contamination.

J.3.22.5 Comment: 86-072

Comment: The "SRS baseline" concentrations summarized in Table 4-23 do not represent regional air quality. They are only representative air monitoring data. The "SRS baseline" data are a hypothetical set of values that are based on modeling maximum potential emissions of Savannah River Site (SRS) sources and are applicable only as a screening level for evaluating and managing Savannah River Site air permits. This section of text must be revised accordingly. In addition, footnotes to the columns "SRS Maximum" in Tables 4-6, 4-8 or the column "SRS Baseline" in Table 4-23 should be modified to state that the listed values are hypothetical levels based on maximum potential (i.e., permitted) emissions from SRS sources and do not necessarily quantify actual air quality conditions.

Response: The text in Section 4.5 of the FEIS has been modified as suggested by the commenter. In addition, the footnotes to Tables 4.6, 4.8, and 4.24 (DEIS Table 4.23) have been modified.

J.3.22.6 Comment: 96-037

Comment: The cumulative impacts should be evaluated with respect to increasing or decreasing existing inequities.

Response: The cumulative impacts associated with the construction and operation of the proposed facilities are presented in Section 4.5 of the EIS. The impact evaluation considered the effects of past, present, and reasonably foreseeable future actions in the Savannah River Site region. High adverse impacts were not identified for any impact category in this cumulative impact analysis. Accident impacts are not considered in the cumulative impact assessment. Additional information regarding risks to low-income and minority communities from accidents can be found in Comment J.3.19.5.

J.3.22.7 Comment: 89-053

Comment: It would be helpful to the reader in Table 4.25 of the DEIS to include capacities of treatment facilities and storage capacities. The table provides no way to judge the significance of these numbers.

Response: Waste treatment and storage capacities have been added to Section 4.5 of the FEIS as suggested.

J.3.23 Cost-Benefit

J.3.23.1 Comments:

5-007	12-003	38-002	76-003
8-005	30-004	44-004	79-004
10-004	32-005	45-007	108-002
10-019	35-001	76-002	

Comment: The project will waste valuable tax dollars. It was questioned whether spending money on upgrading nuclear reactors that would use MOX fuel was money well spent. It was alleged that Duke was receiving a government subsidy (favoring nuclear energy) to produce electricity. Duke would also be allowed to turn around and sell the electricity generated in part from the subsidy, to the citizens of Georgia, South Carolina, and North Carolina. It was argued that the citizens should receive the electricity for free.

There was disagreement about exactly who was bearing the costs of the proposed action and who was receiving the benefits. It was stated that the citizens of Georgia and South Carolina bear the environmental impacts, but others received the benefit of the electricity. Another point of view was expressed that the nation was bearing the financial costs of the proposed action, while the local communities were receiving the economic benefit. Likewise, others indicated the nation was bearing the financial costs of the proposed action, so that a small number of shareholders in the nuclear industry could receive a large benefit.

Response: There are both costs and benefits resulting from the proposed action to design, construct, and operate a MOX Fuel Fabrication Facility. The benefits are experienced at both the national and regional level. At the national level, the benefits include improving security by reducing the risk of plutonium falling into the hands of terrorists. In addition, processing plutonium into MOX fuel benefits the environment by reducing the risk of contamination and it reduces the risk to human health and safety at the current storage

sites. When presented with the cost of maintaining storage of plutonium, processing the plutonium into MOX fuel results in a cost savings to the federal government. At the regional level, the benefits include a boost to the local economy and employment opportunities associated with the construction and operation of the MOX facility.

As noted in the comments, benefits are also experienced in the private sector. After determining that, to comply with the United States-Russia Agreement, excess plutonium should be disposed of by making MOX fuel, the Department of Energy concluded that the most cost effective means of implementing the program was to hire a contractor. The contractor selected, DCS, was chosen from a series of competitive bids from qualified companies and is being compensated according to the costs it will incur in constructing and operating the proposed facility. Reactors irradiating MOX fuel will not receive the fuel for free, as alleged in the comments. Rather, the reactors will purchase fuel from the Department of Energy (DOE) at a set rate.

There are also costs at the national and regional level. The national costs are primarily the cost of constructing and operating the proposed MOX facility. The overall cost of the program is approximately $4.1 billion (2003 dollars). However, the DOE will receive a monetary credit for the fuel sent to commercial reactors that would be used to generate electricity. The fuel credits (or money paid by the reactors for fuel use) amount to $1.0 billion over the life of the project. Thus, the overall cost of the project is reduced from approximately $4.1 billion to $3.1 billion. The regional costs include potential impacts that an accident at the proposed facilities would produce. Additionally, routine operations of the proposed facilities would produce an annual latent cancer risk of about 1 in 250 million for the maximally exposed individual of the public. The environmental impacts, under normal conditions, are considered to be small; therefore, they do not constitute a significant regional cost.

For a full discussion of costs and benefits, see Section 4.6 of the EIS.

J.3.23.2 Comment: 48-004

Comment: The cost information presented in the DEIS is very confusing and vague. The cost of the MOX program is estimated to be $3.8 billion. However, the cost was not broken down into research and development, construction cost, operation cost. It was suggested that the cost should be clearly stated. The DEIS did elude to a discussion on the decommissioning cost which gives a range. The fact the Department of Energy is trying to get $415 million in fiscal year 2004 is going to draw some attention and requesting $650 million for the overall program is going to get some scrutiny.

Response: Additional breakdown on the components of the costs can be found in *Report to Congress: Disposition of Surplus Defense Plutonium at Savannah River Site*, produced by the National Nuclear Security Administration (NNSA 2002), which provides more detail on project cost. Decommissioning costs were estimated using data from a number of studies of other large-scale nuclear fuel-cycle facilities. Details on how these estimates were made can be found in Section 4.3.6.3 of the EIS.

J.3.23.3 Comment: 89-056

Comment: The DEIS states that the benefits to national security are substantial but not quantifiable. The costs associated with continued storage of this material are quantifiable; avoiding these costs should be mentioned as a benefit in Section 4.6.1.

Response: Section 4.6.1 of the FEIS has been changed to reflect this comment.

J.3.23.4 Comment: 89-057

Comment: Section 4.6.3.2 of the DEIS discusses regional benefits in terms of money entering the local economy for labor associated with the construction and operation of the proposed facilities, and the multiplier effect this money has on the regional economy. The same is true for the national economy but no mention is made of these effects in this section.

Response: Because of the preliminary nature of the data needed to calculate national impacts, no quantitative estimate of the impacts of construction and operation of the proposed MOX facility on the national economy was included in the EIS. The text in Section 4.6.1 of the FEIS has been changed to provide a qualitative discussion of the national economic benefits of the proposed action to clarify the issue.

J.3.23.5 Comment: 89-059

Comment: The DEIS references the costs of continued storage (i.e., no-action alternative) from the Department of Energy's Surplus Plutonium Disposition EIS. However, according to the MOX ER, the National Nuclear Security Administration (NNSA 2002) estimated the costs associated with continued storage to be approximately $246 million per year. One of the national benefits associated with this program should be the avoided safeguard and storage costs. If the no-action alternative were to store the plutonium for 50 years, the estimated storage costs would exceed $12 billion while the cost of disposition is estimated to be $3.85 billion as discussed in Section 4.6.2.

Response: Estimates of the avoided cost of continued storage have been added to Section 4.6.2 in the FEIS to reflect this comment.

J.3.23.6 Comment: 89-060

Comment: In the DEIS, it was mentioned that the Surplus Plutonium Disposition (SPD) EIS was used as a reference for data pertaining to the proposed MOX facility. However, it is not clear where the data is taken from in the SPD EIS. For the proposed MOX facility, employment estimates would most likely have come from the MOX ER since this included more recent information.

Response: The SPD EIS was used to establish the relationship between direct (on-site) and indirect (off-site) employment for the construction and operation of a MOX facility. This

was because the MOX ER only calculated direct employment impacts, with a qualitative description provided for the indirect socioeconomic impacts of the facility. As data on both direct and indirect impacts of a MOX facility at the Savannah River Site were provided in the SPD EIS, these data were used in this EIS to calculate indirect impacts. Text has been added to Section 4.6.3.2 of the FEIS to clarify the issue.

J.3.23.7 Comment: 105-011

Comment: On page 4-83, line 30 & 31, the DEIS states that, "Therefore, continued storage would result in higher annual impacts." This statement appears incorrect considering the activities of storing the plutonium in hardened bunkers without touching or processing it when compared to all the plutonium transportation, processing, reactor use and removal to Yucca Mountain associated with the proposed action.

Response: The impacts for the no-action alternative (i.e., continued storage of surplus plutonium at existing DOE sites) were previously evaluated by the Department of Energy (DOE) in the Surplus Plutonium Disposition (SPD) EIS. As discussed in Section 4.2.1 of the EIS, the impacts in this EIS for the no-action alternative are essentially the same as those evaluated by DOE. Some of the impacts for the no-action alternative presented in this EIS represent impacts for the entire DOE site at which the surplus plutonium is currently stored. Text has been added to Sections 4.2.1 and 4.6.2 of the FEIS to clarify this point.

J.3.23.8 Comments: 87-006
89-058

Comment: The 2002 cost estimates do not reflect the costs of additional process time needed for the 34 metric tons (37.5 tons) of plutonium compared to the 25.6 metric tons (28.2 tons) the cost of handling additional purification of untreated plutonium from the immobilization facility, and the cost of the additional waste streams from the proposed facility. The discount rate used to normalize the costs in 2001 dollars was not specified in the cost estimate report.

Response: The NRC used cost estimates provided in the 2002 National Nuclear Security Administration report which does reflect the costs associated with processing 34 metric tons of plutonium, including the removal of impurities and treatment and disposition of associated wastes. No information is presented in the report on the discount rate used to normalize the costs in 2001 dollars.

J.3.23.9 Comment: 66-004

Comment: The DEIS states that any impacts associated with the transportation of fresh, unirradiated MOX fuel, including impacts on property values, will be minimal. The cost associated with changes in property values does not appear to be well addressed in the DEIS.

Response: The cost impacts of the transportation of MOX fuel, such as impacts on property values, were not considered in the DEIS due to uncertainty surrounding the transportation routes that would be used, and the timing and quantity of MOX shipments. Text has been added to Section 4.6.3 of the FEIS to clarify the basis for not considering impacts along transportation routes.

J.3.23.10 Comment: 43-004

Comment: The treatment of time line effects of costs and benefits in the DEIS was questioned. Typical cost benefit analysis reduces the impact of future costs in proportion to their distance away from the present time. It was suggested that environmental resources will be worth more in the future, not less. If one considers the worth of environmental resources in the present by applying a discount method, the worth of the environmental resources would be very much reduced in value compared to what they are likely to actually be worth in that future time. The DEIS needs to consider alternative methods for evaluating costs and benefits.

Response: Cost benefit analysis typically uses a positive discount rate in order to include the effects of time in the valuation of the overall costs and benefits of a project. This means that the valuation of future costs and benefits would be larger the further away from the present time these impacts occur. An estimation of the present value of all costs and benefits is then made to establish the value of all future costs and benefits back in time by expressing them in terms of their monetary value in the current year. As the measurable impacts on the environment and human health during construction and normal operation of the proposed MOX facility would be small, an estimation of the present value of these impacts was not undertaken for the EIS. Annual monetary costs of facility construction and operation are expressed in constant 2003 dollars, which takes into account the projected impacts of inflation on total life-cycle project cost.

J.3.23.11 Comments: 53-001
58-004
66-002

Comment: The EIS does not include an analysis of the economic impacts of accidents. This would include costs associated with victim health recovery, costs to farmers from interdiction of crops, and the costs of cleaning up contaminated lands.

Response: Human health risks associated with accidents are discussed in Section 4.3.5 of the EIS. The socioeconomic impacts of accidents associated with the proposed MOX facility were not estimated in the EIS, because accidents are not expected to have a significant economic impact on the communities surrounding SRS. Emergency response activities associated with a release from the facility would be handled by local emergency response and health authorities already prepared for accidents at SRS, with no resulting additional burden on local community financial resources. In the case of the most serious accidents postulated for the proposed facilities, the amount of radioactive material deposited per unit area would be relatively small and would be limited to the area under the

plume. Any interdiction of crops as a result of the deposition of radioactive material would be a limited, one-time event, and if it were to occur at all, would only affect a small number of farm communities. Text has been added to Sections 4.6 and Appendix D in the FEIS to clarify the issue.

J.3.24 Mitigation

J.3.24.1 Comments: 86-005 89-064 89-013 89-066 89-063

Comment: The DEIS lists 43 highly specific mitigative actions. Many of these mitigation measures simply duplicate state or federal agency regulations with which DCS is already required to comply. Doing what is required by law or common practice is not mitigation. Mitigation occurs when, if there are significant impacts, an action is taken to lower those impacts to a more acceptable level. The DEIS should be modified to state that DCS will comply with the regulations of the appropriate regulatory agency. The mitigation measures discussed in Chapter 5 and presented in Table 5.1 with the Nuclear Regulatory Commission (NRC) as the proponent are in general excessive relative to the postulated impacts and may not be necessary. Therefore, it was recommended that these proposed mitigation measures be reconsidered. In addition, each mitigation measure should specify who is responsible for taking action or assuring that action is taken. Clarifying language should precede the table, or additional columns should be added to the table, to indicate which entity is responsible for 1) implementation and 2) verification of completion, of the mitigation.

Response: Under 40 CFR 1500.2(f), federal agencies shall to the fullest extent possible use all practicable means consistent with the requirements of the National Environmental Policy Act (NEPA) and other considerations of national policy to avoid or minimize any possible adverse effects of their actions on the quality of the human environment. The Council on Environmental Quality (CEQ) definition of mitigation is provided in EIS Chapter 5. Mitigation includes measures that minimize impacts by limiting the magnitude of the action, measures that rectify the impact of an action, measures that reduce or eliminate the impact over time, and measures that compensate for the impact. In addition, CEQ's 40 most asked questions states that all relevant, reasonable mitigation measures that could improve the project are to be identified, even if they are outside the jurisdiction of the lead agency, and thus would not be committed as part of the Record of Decision. Identifying the full range of mitigation measures serves to alert agencies or officials who can implement these extra measures, and will encourage them to do so. Therefore, the NRC believes it is appropriate to include mitigation measures that are required by the regulations of the other federal agencies.

Text has been added to clarify mitigation measures that are required by laws and regulations, those that are suggested by DCS as good practices, and those that are suggested by the NRC. Generally, it is the position of the NRC that the applicant is

responsible for assuring that all necessary mitigation measures are fully implemented and completed.

The NRC staff has reviewed the mitigation measures and has concluded that no additional mitigation measures are required beyond the regulatory requirements and those measures identified by DCS.

J.3.24.2 Comment: 86-074

Comment: In Table 5-1 of the DEIS, grading the site to a uniform elevation is an inherent aspect of the MOX facility design (the grading would be the same regardless of the MOX facility location). Consequently, the grading is incorrectly identified as a "mitigation."

Response: The Nuclear Regulatory Commission disagrees with the comment. If the site was not graded, extensive erosion is possible because of the relatively steep topography. Grading minimizes the potential for erosion and is thus a mitigation activity.

J.3.24.3 Comments: 86-075
86-076
86-077

Comment: DCS's MOX ER (page 7-13, Table 7-I) specifically notes that a Stormwater Pollution Prevention Plan will be developed for the proposed MOX facility, which is more comprehensive and responsive to South Caroline Department of Health and Environmental Control (SCDHEC) enabling regulations. The DEIS states that a Sediment Control Plan and Spill Prevention Control and Countermeasures Plan would be developed prior to construction. A Spill Prevention Control and Countermeasures Plan would be developed prior to operating the proposed MOX facility. The correct title for the plan that would limit sediment in the surface waters and control spills during construction is the Stormwater Pollution Prevention Plan. The mitigative action identified by the DEIS should be limited to implementation of a Stormwater Pollution Prevention Plan in compliance with SCDHEC regulations.

Response: The Nuclear Regulatory Commission staff reviewed the elements of the Stormwater Pollution Prevention Plan and concluded that it would be sufficient to mitigate potential spills during construction. A Stormwater Pollution Prevention Plan is required by the South Carolina Department of Health and Environmental Control prior to construction. The Plan would minimize and avoid soil and surface water contamination from spills or other accidental released during construction. The text in Chapter 5 of the FEIS has been revised to delete reference to the Sediment Control Plan. Text has also been added to state that appropriate mitigation measures during construction would be chosen at the time of the spill event or release in conjunction with the Stormwater Pollution Prevention Plan.

J.3.24.4 Comment: 86-090

Comment: Section 5.2.2, page 5-7, lines 18-27 of the DEIS speculates what resources might be impacted if any MOX structures extended into groundwater. The fact is that the structures do not extend to groundwater. Speculation about what might happen if the structures should extend to groundwater should be removed from the DEIS.

Response: The text in Section 5.2.1 (DEIS Section 5.2.2) was revised to include sand filters as an example of structures that could impact groundwater.

J.3.24.5 Comment: 86-078

Comment: The South Carolina Department of Health and Environmental Control (SCDHEC) does not specify requirements for reduction of fugitive construction dust. As noted in the MOX ER, DCS will have a Construction Emissions Control Plan which will implement a number of different good engineering practices to reduce fugitive dust emissions. The MOX ER does not identify specific actions or emissions reductions. The mitigative action specified in the DEIS Table 5-1 and ES-1 should be limited to compliance with appropriate SCDHEC air quality regulations.

Response: The text in Section 5.2.4 and Table 5.1 has been revised to state that DCS will have a Construction Emissions Control Plan which will implement a number of good engineering practices to reduce fugitive dust emissions.

J.3.24.6 Comment: 86-079

Comment: The statement in Table 5-1, page 5-2, lines 46-49 of the DEIS was questioned. The MOX ER identifies that the concrete batch plant will be subject to the provisions of a South Carolina Department of Health and Environmental Control (SCDHEC) air quality permit. The concrete batch plant will meet the conditions of that permit. The mitigative action specified in the DEIS should be limited to compliance with appropriate SCDHEC air quality regulations.

Response: The cementation process would be part of the operation of the Waste Solidification Building (WSB), not the construction of the WSB as indicated in the comment. The text in Section 5.2.4 and Table 5.1 has been corrected to note that the reduction would occur during operation of the WSB.

J.3.24.7 Comments: 86-085
86-097

Comment: The mitigation actions associated with National Historic Preservation Act (NHPA) activities were questioned. Information provided by DCS to the Nuclear Regulatory Commission (NRC) on December 12, 2002, demonstrated that the State Historic Preservation Office (SHPO) has agreed that all mitigation action is complete. No monitoring is required. Inadvertent discoveries will be handled in accordance with Federal Law and the

Savannah River Site Programmatic Memorandum of Agreement (PMOA). Because the NRC and the Department of Energy (DOE) have designated the DOE as the lead agency for mitigation under the NHPA, NRC specified mitigation actions are not appropriate. The mitigative action specified in the DEIS should be limited to compliance with DOE PMOA policies for archaeological management of construction activities.

Response: The NRC agrees with the comment that the DOE is responsible for compliance with the PMOA for archaeological management during construction. However, past experience at construction sites suggests that the mitigation actions identified by the NRC in the EIS (e.g., periodic monitoring, awareness training) are potential means to ensure nearby archaeological sites would not be adversely affected either indirectly from erosion or directly from disturbance by the workforce. The comment correctly states that the letter from the SHPO indicates mitigative action is complete for the two eligible archaeological sites; however, the letter from the DOE to which the SHPO is responding, indicated that some monitoring would occur during construction. The text has been revised in EIS Section 5.2.9 to reference both letters (Long 2002 and Gould 2002) and to specify that the monitoring would focus on the removal of fill on the site areas. A similar text change on monitoring the removal of fill has been made to Table 5.1, in addition to deleting the NRC as a proponent for the monitoring of the two eligible sites.

J.3.24.8 Comment: 10-014

Comment: The DEIS states that "issues related to general emergency preparedness of communities are outside the scope of this EIS." The DEIS also mentions that "consequences on human health would be mitigated by following SRS emergency procedures." It was requested that a copy of the Savannah River Site (SRS) emergency procedures be provided to citizens in Savannah and other communities throughout the Savannah River corridor. Concerns was expressed that the SRS emergency procedures would not be protective of the public.

Response: The DOE is responsible for the SRS emergency response plan, and it is not a publically available document. SRS coordinates its emergency preparedness with local and State agencies, including conducting drill and community education.

J.3.24.9 Comment: 89-065

Comment: The DEIS Section 5.2.2, page 5-8, lines 7-9 should be reworded as follows for clarity: "Direct impacts to groundwater could occur if there were a failure in the underground pipeline carrying the liquid high-alpha activity waste stream from the proposed MOX facility's ... ."

Response: The text in Section 5.2.1 of the FEIS (DEIS Section 5.2.2) has been modified as suggested by the commenter.

J.3.24.10 Comment: 89-067

Comment: In Section 5.2, the DEIS states that DCS shall add appropriate revisions of the Savannah River Site (SRS) Emergency Response Plan for chemicals identified as presenting moderate or high risks to workers. It is not clear that this measure is within the jurisdiction of the Nuclear Regulatory Commission.

Response: Upgrading of the SRS Emergency Response Plan to include chemicals posing moderate or high risks to workers is a mitigation action that is appropriate for protection of DCS and SRS employees from an accidental release. DCS has committed to establishing a protocol with the Department of Energy — to be submitted by DCS as part of any request for a license to possess and use special nuclear material — to integrate DCS's emergency plans with the existing SRS emergency preparedness program. Because this is a commitment made by DCS, relating to the proposed MOX facility, the Nuclear Regulatory Commission does have regulatory authority to enforce this commitment.

J.3.24.11 Comments: 86-080
86-093

Comment: Section 5.2.3 of the DEIS discusses mitigation measures for ecological resources. The MOX ER 4.6 describes the ecological habitat and the habitat surveys conducted prior to construction activities. MOX ER Appendix A, pages A-25 and A-26 provides letters of negative declaration from the U.S. Fish and Wildlife Service that the MOX facility construction and operation will not affect resources under the jurisdiction of the U.S. Fish and Wildlife Service. All necessary ecological surveys are complete. No sensitive species or nests of migratory species are present. These precautionary and mitigative actions presented in the DEIS are misleading and unnecessary.

Response: The U.S. Fish and Wildlife Service has raised no objections and has stated that the proposed action will have no effect on resources under its jurisdiction (letter dated June 20, 2001, from L. Duncan [U.S. Fish and Wildlife Service] to A.B. Gould [DOE]). The mitigation commitment described in the DEIS for surveys of plants and nests of migratory birds, sensitive species, and habitats has been deleted.

J.3.24.12 Comments: 86-081
86-083

Comment: Statements in Section 5.2.1 and Table 5-1 of the DEIS that measures shall be taken to protect trees not selected for removal, that any trees or other landscape features accidentally scarred or damaged should be replaced and that environmental supervisors shall be present during vegetation clearing to ensure that impacts are held to a minimum are misleading.

As noted in DEIS 3.6.1 (pg.3-34) the Savannah River Site (SRS) forests are managed by the U.S. Forest Service. The removal of trees and protection of trees not designated for removal will be under the direction of the U.S. Forest Service. The mitigative action

specified in the DEIS should be limited to compliance with appropriate U.S. Forest Service regulations.

Response: Section 3.6.1 of the EIS states that the forests on the SRS are managed for timber production and that the U.S. Forest Service harvests the trees. However, DCS should still take action at the construction site to prevent the workforce from removing vegetation in excess of that needed for construction clearing.

J.3.24.13 Comment: 86-082

Comment: The statement in Section 5.2.1 and Table 5-1 of the DEIS that "The loss of the existing storm-water basin near the southern boundary of the proposed site would be compensated for by construction of a new basin that would provide more viable aquatic habitat" is misleading. As noted in Attachment 14a of the letter from P. Hastings to the Nuclear Regulatory Commission Document Control Desk, the U.S. Army Corps of Engineers concluded that the existing storm-water basin is not part of the waters of the United States. Consequently, it is not appropriate to specify any mitigative action.

Response: The staff agrees with the commenter that compensation for loss of the existing stormwater basin is not an appropriate mitigative action. This action was addressed in Section H.3.1.2 of the EIS simply to point out the small impacts that would occur to aquatic ecological resources from construction. The mitigation measure to compensate for loss of the stormwater basin has been deleted from the FEIS.

J.3.24.14 Comment: 86-084

Comment: The statement in Section 5.2.1 and Table 5-1 of the DEIS that "Reclamation plans shall be developed for laydown areas and other construction areas that will not be occupied by structures, parking lots, or roads. Reclamation will include removal of all temporary construction features, stabilization of soils, and reseeding with appropriate plant species" is misleading. Property beyond the 41-acre proposed MOX facility site is managed under the DOE jurisdiction for the Savannah River Site. Land reclamation will be in accordance with DOE directives. The mitigative action specified in the DEIS should be limited to compliance with appropriate DOE policies for reclamation of construction areas.

Response: The mitigation measure described in Table 5-1 and in Section 5.2.3 of the FEIS (DEIS Section 5.2.1) has been revised to state that site restoration (e.g., stabilization of soils and revegetation) shall be done in compliance with appropriate DOE policies for reclamation of construction areas.

J.3.24.15 Comment: 86-092

Comment: The statement in Section 5.2.3, page 5-8 of the DEIS that "For example, a portion of the construction activities for the proposed MOX facility would take place on a former spoils pile used for previous F-Ares construction" is incorrect. The proposed MOX

facility will not be constructed on a former spoils pile; the spoils pile will be removed prior to construction.

Response: The text in Section 5.2.3 of the FEIS has been modified to indicate that a portion of the proposed MOX facility site had been previously used for storage of spoils, rather than implying that construction would occur on the spoils pile.

J.3.24.16 Comment: 86-086

Comment: The October 29, 2002, correspondence from DCS to the Nuclear Regulatory Commission responding to requests for additional information included the results of the Plutonium Project Pre-construction Environmental Report, including the results of soil analyses at the proposed MOX facility site. The DEIS should have included the results of this report which confirm the previous DCS conclusion in the MOX ER that there are no significant concentrations of radioisotopes or chemicals in the soil that would be hazardous to construction workers health. Consequently, the mitigative action is misleading and unnecessary.

Response: Text has been added to section 4.3.1 of the FEIS to summarize the results of the Preconstruction report. Although no significant contamination was detected, further sampling may be necessary because the study did not include samples to the depth that will be required for building foundations in the area of the spoils pile, and also did not include testing for some chemical contaminants of potential concern. Therefore, the potential mitigation action has been retained.

J.3.24.17 Comment: 86-096

Comment: The word “on-site” should be removed from page 5-11, line 23-24 of the DEIS. Treatment can occur “off-site” as well.

Response: The text in Section 5.2.7 of the FEIS was revised and the referenced word was removed.

J.3.24.18 Comment: 86-098

Comment: The proposed MOX facility stack height is incorrect on page 5-14, line 7 of the DEIS. The revised MOX ER increased the height of the structure to 120 feet.

Response: The text in Section 5.2.10 of the FEIS has been revised to state that the height of the tallest structure would be 120 ft (37 m) above the existing grade.

J.3.24.19 Comment**:** 27-001

Comment: In Section 2.2.4.2.3, the DEIS does not provide information regarding monitoring buried and exposed pipes for leaks that could result in discharge of liquid waste

to ground water. Monitoring/detection, response, and enforcement protocols related to pipe integrity and leaks should be included in the DEIS.

Response: Staff evaluated the impacts of an accidental release from liquid waste pipes in Section 4.3.5.4 of the EIS. As described in this section, pipes carrying stripped uranium and high alpha activity wastes would be double-walled stainless steel pipes designed to withstand natural phenomena hazards, and for which the Savannah River Site Spill Prevention Control and Countermeasures Plan applies. The text has been revised in the FEIS to include the ability of the transfer lines to withstand external man-made hazards. The text has also been revised to include the applicant's commitment to monitoring of the annular space inside the pipes for leaks, as described in the Construction Authorization Request.

J.3.24.20 Comment: 97-002

Comment: The DEIS indicates the proposed action (to build and operate the proposed MOX facility) has some impacts but concludes that the impacts are acceptable regardless of the severity of the impact. This comes across as a non-sequitur. The DEIS should be extremely firm in its conclusions on the requirement of adequate safety and protection, as this is the primary mission of the Nuclear Regulatory Commission (NRC). For example, the DEIS should explicitly acknowledge which mitigation measures are required by the NRC, with clear and objective criteria. In addition, the proposed MOX facility has not been fully designed. However, the DEIS is not clear if reasonable conservatism has been incorporated into the analyses due to the lack of design information or if ALARA (As Low As Reasonably Achievable) considerations are included.

Response: The impacts presented in the EIS are intended not to underestimate the potential impacts of the proposed action. As discussed in responses to comments in the human health risk sections (J.3.12 and J.3.13), conservatism is used in selecting models and parameters used to estimate the impacts. In this way, the EIS should bound the actual impacts and account for future design changes that may occur. Text has been added to Chapter 5 (Mitigation) of the FEIS to clarify which mitigation measures are proposed by the NRC and which mitigation measures would be required as part of any construction authorization approval or operating license issuance.

J.3.24.21 Comment: 10-024

Comment: Many of the mitigation procedures that are identified in the draft EIS seem lacking in their ability to protect workers and surrounding communities.

Response: The discussion of mitigation measures in Chapter 5 of the FEIS has been revised. Text has been added to clarify which mitigation measures are required by laws and regulations, which are suggested by DCS as good practices, and which are recommendations by the Nuclear Regulatory Commission. As suggested by the commenter, a discussion of mitigation measures for the proposed action, including the

connected actions, has been added to more completely describe how workers and the public would be protected if the proposed action is taken.

J.3.24.22 Comment: 86-087

Comment: Hydrazine emissions from the proposed MOX facility will be subject to South Carolina Department of Health and Environmental Control (SCDHEC) regulations. The mitigative action specified in Table 5.1 in the DEIS should be limited to compliance with SCDHEC air quality regulations.

Regarding potential accidents, the offgas treatment system (or any ventilation system at the proposed MOX facility) is not required to be credited to reduce the hydrazine concentration in air after a spill because calculations indicate that releases that originate indoors (inside the reagent building or the MOX Building) do not result in concentrations that exceed any temporary emergency exposure limits (TEELs) for the site worker or public. There appear to be errors in the DEIS hydrazine airborne concentration calculation that leads to this conclusion (see comments on Appendix E.1) and furthermore, crediting the release as an indoor release, which reduces the air speed across the surface of the spilled solution, provides sufficient reduction in the airborne concentration to result in acceptable consequences without mitigation by any offgas treatment system.

Response: The text in Table 5.1 and Section 5.2.8 of the FEIS has been revised to state that DCS would limit operational hydrazine emissions to levels that do not cause exceedance of the SCDHEC standard. With respect to accidental releases, the NRC conservatively assumed that the accident would occur during chemical delivery, and that the container contents would be spilled on an outdoor concrete surface (See EIS Section 4.3.5.3). Therefore, modeled downwind air concentrations were not reduced by a factor assuming indoor release. Chemical accidents are also discussed in Comments J.3.12.9, J.3.12.21, J.3.12.22, and J.3.12.25.

J.3.24.23 Comment: 86-091

Comment: Section 5.2.2, page 5-7, lines 45-46 of the DEIS states, “Operation of a sand filter would not directly impact groundwater because the filter would be covered to prevent infiltration and it would have a concrete wall and bottom.” Because the proposed action does not include a sand filter this statement is irrelevant.

Response: The NRC disagrees with the comment. Sand filters are being considered as an option for controlling air emissions from the proposed MOX facility, as part of the NRC’s NEPA evaluation; the discussion presented in Section 5.2.1 of the EIS is therefore relevant.

J.3.25 Unavoidable Impacts

J.3.25.1 Comment: 89-061

Comment: DEIS Section 4.7.1 reads as a summary of potential unavoidable impacts, many of which are then dismissed if mitigation or good engineering practices are implemented. It is recommended that the discussion be limited to only those areas where unavoidable adverse impacts are certain to occur.

Response: Mitigation measures and good engineering practices identified in Section 4.7.1 of the DEIS were included to provide the reader with a sense of the magnitude of the unavoidable impacts. The NRC agrees that with appropriate mitigation some impacts can be reduced, but also believes that some impacts cannot be avoided entirely even with good engineering practices or other mitigation measures. This section of the FEIS has been revised to eliminate mitigation actions if unavoidable impacts no longer occur, based on revised impact conclusions presented in earlier sections of Chapter 4.

J.3.26 Geology and Soils

J.3.26.1 Comment: 89-031

Comment: In Section 3.2, page 3-1 of the DEIS, the statement that "prime farmland is protected by the U.S. Department of Agriculture" is an oversimplification and technically inaccurate. Although it is a moot point at the Savannah River Site, the Farmland Protection Policy Act offers no absolute protection to important farmlands (i.e., prime, unique, or other statewide or locally important farmlands). It was suggested that the text be changed to: "Certain soils are classified by the U.S. Department of Agriculture, Natural Resources Conservation Service as prime farmland or other important farmlands. The Farmland Protection Policy Act (7 U.S.C. 4201 et seq.) and its implementing regulations (7 CFR 658) requires Federal agencies as part of the NEPA process to consider the extent to which Federal projects and programs contribute to the unnecessary conversion of important farmlands to nonagricultural uses."

Response: The text in Section 3.2 of the FEIS has been revised as suggested in the comment.

J.3.26.2 Comment: 89-032

Comment: In Section 3.2.2, page 3-4 of the DEIS, a citation should be provided for the estimated peak ground acceleration produced at the Savannah River Site from the Charleston earthquake. If the citation for the information in the preceding paragraph is USGS 2001, then this citation should be included at the end of the paragraph.

Response: The citation is DCS Environmental Report (DCS 2002). This citation was added to the text in Section 3.2.2 of the FEIS.

J.3.26.3 Comment: 89-033

Comment: In Section 3.2.2, page 3-5 of the DEIS, the sentence referencing the Uniform Building Code (UBC) should be deleted, as this Code was rendered obsolete with regard to seismic design provisions with publication of the International Building Code (IBC) in 2000. The IBC replaces all national model building codes previously is use. Instead of seismic zone designations, the IBC's seismic design provisions are based on the USGS' National Earthquake Hazard Reduction Program maps that depict maximum considered earthquake ground motions for the United States based on spectral response acceleration.

Response: The text in Section 3.2.2 of the FEIS has been revised as suggested in the comment.

J.3.27 Cultural Resources

J.3.27.1 Comment: 89-038

Comment: It was requested that in Section 3.7.1, the general location of site 38AK546/547 (as done for sites 38AK757, 38AK330, and 38AK548) be provided.

Response: The text in Section 3.7.1 of the FEIS has been revised to state the location of 38AK546/547 relative to the proposed MOX facility.

J.3.27.2 Comment: 86-022

Comment: To confirm Table 2.1, text should be added on page 2-34, lines 5-7 stating that mitigation measures are being planned by DCS, in conjunction with the State Historic Preservation Office, and the Savannah River Site cultural resources staff to mitigate any potential impacts to archaeological sites before construction.

Response: Data recovery obligations for Sites 38AK546/547 and 38AK757 have been completed. The text in the FEIS has been revised accordingly.

J.3.28 Ecology

J.3.28.1 Comments: 85-005
91-004

Comment: An area of concern about the Georgia coastal ecosystem was expressed. It was stated that 90 percent of the fish originate in this ecosystem and that the marshes in the costal area are dying. In addition, these marshes are a vital habitat for a diverse variety of species that compose the food web for marine ecosystems. It was stated that the marshes alone should warrant further study before proceeding with this expansion. It was also felt that processing nuclear fuels seriously threatens these vital resources and could

contaminate groundwater, yet assessments such as this DEIS undervalues these risks and their potential irreversibility.

Response: Section 3.9 of the EIS discusses current waste management at the Savannah River Site; Sections 4.3.3.1.2 and 4.3.3.2.2 address potential impacts of the proposed action on surface water and ground water, respectively; and Section 4.3.4.2 discusses waste disposal impacts associated with the proposed action. No wastes would be discharged to groundwater. Only effluents from low-level waste and nonhazardous liquid waste treatment would be eventually discharged to surface waters. The effluents of treatment facilities are tested before release to ensure that discharges are consistent with waste discharge limitations (e.g., radionuclide contaminants are removed before discharge). Therefore, no nuclear wastes associated with the proposed action would contaminate the Savannah River or its associated marsh habitats. This issue is also discussed in Comment J.3.29.1.

J.3.28.2 Comment: 86-127

Comment: In Section H.3.14 of the DEIS, it is suggested that the text be changed to reflect that the transmission line area has been surveyed, that no smooth coneflowers were observed, and that the U.S. Fish and Wildlife Service (USFWS) concurs that the proposed action will not affect resources under their jurisdiction.

Response: The text of Section H.3.1.4 of the FEIS has been changed to reflect that the transmission line area has been surveyed, that no smooth coneflowers were observed, and that the USFWS concurs that the proposed action will not affect resources under their jurisdiction. The letter response from Duncan (USFWS) to Gould (DOE) has also been added to the reference list for Appendix H.

J.3.28.3 Comment: 89-035

Comment: The bat species Myotis lucifugus and Myotis austroriparius are discussed Section 5.5.4 of the DEIS but are not included in the companion list of protected species presented in Appendix A, Table A.1. Please reconcile this inconsistency. Also, to be consistent with the balance of the Ecology discussion, the common name of these two species of bats should be presented in the text, followed by the Latin name in parentheses.

Response: The sentences pertaining to the bat species have been deleted from Section 3.5.4 of the FEIS to avoid confusion or inconsistencies with Appendix A, Table A.1. Neither bat species has been reported for Aiken or Barnwell counties.

J.3.28.4 Comment: 89-036

Comment: In Section 3.5.4 of the DEIS, the common ground dove, loggerhead shrike, and American sandburrowing mayfly are presented in this discussion of protected species but are not included in the companion list of protected species presented in Appendix A, Table A.1. This inconsistency should be reconciled.

Response: The text of Section 3.5.4 of the FEIS has been modified to avoid confusion or inconsistencies with Appendix A, Table A.1. As the common ground dove is not currently listed by the State of South Carolina, mention of it in Section 3.5.4 has been deleted. Similarly, the loggerhead shrike is not reported for Aiken or Barnwell counties. Thus, mention of it has also been deleted. A text addition has been made that states that the American burrowing mayfly is not currently listed by either the U.S. Fish and Wildlife Service or the State of South Carolina.

J.3.28.5 Comment: 89-037

Comment: In Section 3.5.4 of the DEIS, the majority of plant species discussed here are either not listed in Appendix A, Table A.1 or are listed under a different common name. This inconsistency should be reconciled.

Response: The text of Section 3.5.4 of the FEIS pertaining to plant species has been modified to make it consistent with Appendix A, Table A.1. This entailed either editing the common and/or scientific names of the plants or deleting the names of those species that are not listed for the counties of concern.

J.3.28.6 Comment: 89-026

Comment: The statement on page 2-30 of the DEIS, "No wetlands or endangered/threatened species would be impacted" is too broad and not entirely consistent with what is presented in Appendix H, pages H-7 through H-9. Based on what is presented, it is difficult to state that no impacts would occur. Rather, it appears that it would be more appropriate for lines 23 and 24 of page 2-30 to state that negligible impacts to wetlands, aquatic habitat, and threatened/endangered species would be expected.

Response: The text in Table 2.1 of the FEIS on impacts to threatened species and wetlands has been revised to be consistent with the discussion of impacts presented in Appendix H.

J.3.28.7 Comment: 89-029

Comment: It is suggested that Table 2.1, lines 23-27 and the text in Section 2.4, lines 2-4 be revised to have similar wording.

Response: The text in Section 2.4 and Table 2.1 of the FEIS has been revised to state that impacts to endangered or threatened species, wetlands, aquatic and terrestrial habitats (including woodlands) would be small.

J.3.29 Socioeconomics

J.3.29.1 Comments: 43-002
91-005

Comment: The impacts resulting from the loss of fresh water, or contamination of fresh water, could have devastating adverse impacts on public health and the remaining ecosystem functions in the lower reaches of Georgia's five coastal rivers and the vast estuaries and nature-based economy they support. This includes some 40,000 jobs in coastal Georgia alone, about one out of five jobs in coastal Georgia, generating more than $1 billion a year in revenue annually. Risks such as those linked to nuclear fuel processing, storage, handling, transport, use, and conversion to electricity (each of which pose serious threats to these resources and the businesses they support should) be included in the DEIS. These impacts should be evaluated in the DEIS.

Response: The socioeconomic impacts of postulated accidents of the proposed facilities on water and fish resources, and subsequently the economies of communities surrounding the Savannah River Site (SRS), were not estimated in the EIS because it is expected that such impacts, if any, would be small. In evaluation of postulated accidents, with potential damage to crops under the plume in the event of an airborne release and subsequent damage to water resources from the associated runoff, it was found that the amount of radioactive material deposited per unit area would be relatively small. Dilution of runoff would occur fairly rapidly in the affected rivers and streams and would not cause any significant risk to the economies of the communities downstream of the location of the proposed facility.

Text has been added to Sections 4.6 and Appendix D in the FEIS to clarify the issue.

The water resource impacts of the proposed action are discussed in Section 4.3.3 of the EIS. Water would be used during construction and operation. However, this water would come from deeper groundwater aquifers and would not significantly affect water flow in the Savannah River. There would also be no direct discharges into surface water during construction and discharges from the WSB during operation would have small impacts on surface water quality. Indirect discharges to the Savannah River would occur from treating liquid waste from the proposed MOX facility. However, treating this waste is not anticipated to significantly change the quantity or quality of the discharges for existing SRS waste processing facilities. Because the impact to water resources is expected to be small, alternatives to the proposed use of surface water to receive treated effluent are not required. Mitigation measures to further minimize any possible impact on water resources are discussed in Section 5.2.1 of the EIS. This issue is also discussed in Comment J.3.28.1.

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This page is being withheld pursuant to 10 CFR 2.390(a).

J.3.30.10 Comment: 89-024

Comment: Revise page 2-25, line 36 of the DEIS to read ". . .was manufactured at the DOE's Los Alamos National Laboratory (LANL) and at the Bochvar Institute in Moscow, Russia."

Response: The text in Section 2.3.5 of the FEIS has been modified to include the Bochvar Institute.

J.3.30.11 Comment: 89-025

Comment: In the Waste Management, Construction Section of Table 2.1 (page 2-29, lines 12-14 of the DEIS) both the liquid and solid wastes need to be labeled as "nonhazardous waste" as done on lines 32 and 34.

Response: The text was revised to include nonhazardous liquid and nonhazardous solid in the Construction Waste portion of Table 2.1 of the FEIS.

J.3.30.12 Comment: 89-028

Comment: In the infrastructure, normal operations section of Table 2.1 (page 2-31, line 21 of the DEIS), the percent of electric power capacity for operation (38.5%) does not agree with the percentage presented in Section H.6.2 (p. H-13, line 6), 36.4%.

Response: The percentage of electric power capacity in Table 2.1 of the FEIS was revised to read "36.4%."

J.3.30.13 Comment: 89-027

Comment: In Section 2.4, page 2-30 of the DEIS, the woodland habitat loss description under the proposed action column is awkward. Suggest it be reworded for clarity as follows: "Up to 14.7 ha (36.4 ac) of woodlands would be cleared for the proposed facilities. This would represent <1% of the annual timber harvest at SRS."

Response: The suggested text revision has been made to Table 2.1 of the FEIS under the heading of "Habitat Loss."

J.3.30.14 Comment: 89-048

Comment: In Table 4.13, the sixth column should be "Number of LCFs," not "Chance of LCF."

Response: The heading for the sixth column in Table 4.13 of the FEIS has been corrected to read "Fatalities (LCFs)."

J.3.30.15 Comment: 89-069

Comment: In Appendix F, page F-11, line 10 of the DEIS, "1900" should be "1990."

Response: Text in the FEIS has been changed as suggested.

J.3.30.16 Comment: 86-008

Comment: On page 2-13, line 42 of the DEIS, it is suggested to change to whenever "practical" rather than whenever "possible."

Response: Section 2.2.3.3.3 of the FEIS has been revised to indicate that the Savannah River Site is compacting solid waste whenever practical.

J.3.30.17 Comments**:** 86-010
86-015

Comment: On page 2-14, line 46 of the DEIS change "permitted" to "suitable." Department of Energy low-level radioactive waste sites are neither permitted nor licensed nor do they need to be.

Response: The text in Section 2.2.4.1 of the FEIS has been revised to indicate that low-level radioactive waste would be sent to a suitable disposal site.

J.3.30.18 Comments: 86-011
86-012
86-014

Comment: DEIS should not specify design details such as tank sizes. Otherwise, design evolution might mandate DEIS revisions. Where necessary, bounding conditions can be specified for impact projections; but these should be restricted to the discussions where they are needed and not simply cast about in general descriptions of the facility.

Response: The text in Section 2.2.4 of the FEIS has been revised to eliminate numerical values on design capacity for tanks or containers, and waste volumes produced by processing materials from the proposed MOX facility. Values on volumes of chemicals that could be released during an accident are reported in Chapter 4 of the EIS in order to provide the reader with a bounding estimate on the magnitude of impacts.

J.3.30.19 Comment: 86-018

Comment: In the chemical accident section of Table 2.1 (page 2-27, lines 52-53 of the DEIS), the Nuclear Regulatory Commission should consider deleting reference to impact from chemical spills on the general public. The DEIS contains no scenario of a release from the MOX Facility, the Pit Disassembly and Conversion Facility, or the Waste Solidification Building that results in any effect beyond the Savannah River Site boundary.

Response: The commenter is correct. The reference to the general public has been deleted from that section of Table 2.1.

J.3.30.20 Comment: 86-020

Comment: In the land use, accident section of Table 2.1 (page 2-31, lines 49-50 of the DEIS), the use of the term "severe accident" is inappropriate. In 10 CFR Part 70 (see NUREG-1718), the appropriate terms are "likely, unlikely, high unlikely, and credible." Text should be changed to say "highly unlikely" (see DEIS page 2-37 which notes that a severe accident is highly unlikely).

Response: The phrase "severe accident" has been replaced with the phrase "highly unlikely" in this section of Table 2.1.

J.3.30.21 Comment: 86-013

Comment: Section 2.2.4.2.1, page 2-15 of the DEIS states that the acid bottoms collected in the evaporator would be neutralized with sodium hydroxide in a neutralization tank. After neutralization, the waste would be pumped to two 110-L (30-gal) cement head tanks. The acidic bottoms will be collected in a bottoms tank where the solution will be sampled to determine concentrations. Based on this sample, the solution would be metered to one of three cement head tanks where neutralization would occur prior to transfer to the mixer. It is suggested that the text be revised to state the following, "After collection, the waste would be pumped into small batch cement head tanks to be neutralized."

Response: The text in Section 2.2.4.2.1 of the FEIS has been revised to indicate that after the acid bottoms collected in the evaporator were neutralized the material would be mixed with cement and poured into approved containers.

J.3.30.22 Comment: 86-061

Comment: On page 4-47, line 16-17 of the DEIS, after "unrestricted use" add "or restricted use."

Response: The text in the FEIS has been changed to indicate that the property would be released for unrestricted use or restricted used, under certain conditions.

J.3.30.23 Comment: 86-121

Comment: Table E.6 in the DEIS needs a reference.

Response: A reference has been added to Table E.6 in Appendix E, Section E.2.1.2 of the FEIS.

J.3.30.24 Comment: 86-070

Comment: In Section 4.4.2, page 4-67, line 20-21 of the DEIS, the citation for the environmental assessment for the conversion facility in Wilmington, NC, is incorrect.

Response: The commenter is correct that NUREG -0170 (NRC 1977) is not the appropriate reference. The new reference for the environmental assessment GE fuel fabrication facility in Wilmington, NC, will be added to the text in Section 4.4.2 of the FEIS.

J.3.30.25 Comment: 86-071

Comment: Inclusion of impacts from converting uranium hexafluoride to uranium dioxide and impacts from transporting spent MOX fuel to the geologic repository was questioned. If the Nuclear Regulatory Commission (NRC) feels compelled to retain these impacts, the DEIS should note that these impacts replace similar avoided impacts from the conversion and disposal of low enriched uranium fuel and that the net impact is zero.

Response: Conversion of uranium hexafluoride to uranium dioxide at the Global Nuclear Fuel-Americas, LLC Facility in Wilmington, North Carolina, is considered a connected action that is required for the surplus plutonium conversion process at the Savannah River Site.

The transport of spent MOX fuel to a geologic repository described in Section 4.4 would not occur without production of MOX fuel. A brief discussion of impacts from transporting spent MOX fuel thus seems appropriate. The NRC cannot conclude that the transportation impacts presented in Section 4.4 of the EIS “replace similar avoided impacts from conversion and disposal of low enriched uranium fuel and the net impact is zero” as stated in the comment.

J.3.30.26 Comment: 86-032

Comment: Line 13 on page 3-41 of the DEIS should be corrected to note 24-hour shifts rather than 12-hour shifts.

Response: The text in Section 3.8.5 of the FEIS was changed as suggested in the comment.

J.3.30.27 Comment: 86-094

Comment: In line 3 on page 5-11 of the DEIS, the word “recycling” should be deleted.

Response: The word “recycling” was deleted from the FEIS text as suggested by the commenter.

J.3.30.28 Comment: 86-095

Comment: It is suggested that line 18, page 5-11 of the DEIS be reworded to "A new tank would be constructed within the WSB so that the high-alpha-activity waste can be neutralized before being solidified to a TRU waste form."

Response: The text in Section 5.2.7 of the FEIS has been revised and the text referenced in the comment has been deleted.

J.3.30.29 Comment: 89-040

Comment: The text on page 3-58, line 38 of the DEIS states that housing units are expected to reach 35,400 in 2001. However, this is not consistent with Table 3.16 on page 3-60, which states this estimate is for 2002.

Response: Data shown are for 2002. The text in the FEIS has been changed to reflect the comment.

J.3.30.30 Comment: 89-041

Comment: On page 3-59, lines 33 and 35 of the DEIS refer to housing units in the "county" when it should be housing units in the "ROI."

Response: The data shown are for the region of influence (ROI). The FEIS has been changed to reflect the comment.

J.3.30.31 Comment: 89-042

Comment: In Table 3.16, the 2002 column of the table does not have a source footnoted (as do the 1990 and 2000 columns).

Response: A source has been added to the column showing the 2002 data.

J.3.30.32 Comment: 89-043

Comment: State Route 781 is not shown in either Figure 3.1 or 3.8, as indicated in the text. Also, the text refers to State Routes (SRs), while the Figure 3.8 refers to "SC."

Response: State Route 781 has been added to Figure 3.8, and the text and figure in the FEIS have been made consistent with each other.

J.3.30.33 Comment**:** 89-068

Comment: A reference should be provided for U.S. Census Bureau data used in calculations in Appendix D, as well as for the sources provided in the appendix tables.

Response: The relevant references have been added to Appendix D in the FEIS.

J.3.30.34 Comment: 89-070

Comment: The text on page H-15, lines 7 and 8 of the DEIS states that four additional local public service employees would be required, while Table H.1 (p H-14) shows five additional employees. Please reconcile this inconsistency.

Response: The text in the FEIS has been changed to reflect the comment; the correct number is five.

J.3.30.35 Comment: 86-104

Comment: On page C-10, line 19 of the DEIS an editorial change should be “0 to 139.”

Response: The text in Appendix C, Section C.2.1.2 of the FEIS has been corrected to reflect this editorial change.

J.3.30.36 Comment: 86-106

Comment: In Table C.2, the per package quantities are not accurate. These may be more accurate for a “per shipment” amount.

Response: These are per shipment quantities as noted in Section C.2.3 of the EIS. A footnote will be added to the table in the FEIS for clarification.

J.3.30.37 Comment: 86-107

Comment: Page C-14 should be corrected to note that Transportation Safeguards Division (TSD) is now called the Office of Secure Transportation, and the DOE Albuquerque Office is now a National Nuclear Security Administration (NNSA) Service Center.

Response: The text in Section C.2.3 has been changed in the FEIS.

J.3.30.38 Comment: 86-109

Comment: There was concern about the footnote used in Table C.5. The footnote is misleading as this footnote currently is used for the Type A packages as well as Type B. Type A packages are not used for plutonium metal shipments. The intent is to differentiate between the Type B release fractions used for the plutonium metal shipments and those used for the fresh, unirradiated MOX fuel shipments (Footnote "c").

Response: The footnotes in Table C.5 have been changed in the FEIS.

J.3.30.39 Comment: 89-052

Comment: On page 4-66, line 12 of the DEIS, it may be more clear to use the phrase "from the PDCF" after "recovered HEU" so that it is not confused with waste uranium from the proposed MOX facility.

Response: The text in Section 4.4.1.3 has been changed in the FEIS.

J.3.30.40 Comment: 89-062

Comment: In Section 4.7.1, page 4-94 of the DEIS, the statement regarding proportionate increase in amount of transuranic (TRU) waste (9%) is inconsistent with Section 4.5.1.2 (24%).

Response: The text in Section 4.5.1.1 has been revised in the FEIS. The TRU waste generated would constitute 26% and 13% of the treatment and storage capacities respectively.

J.3.30.41 Comments: 86-049
89-047

Comment: It is recommend that line 2 on page 4-29 of the DEIS be reworded to say the process will produce a solid TRU waste "suitable" for disposal at WIPP. The use of the word "similar" implies some differences and issues.

Response: The word "similar" has been changed in the FEIS to "suitable" as suggested.

J.3.30.42 Comment: 86-044

Comment: On page 4-26, lines 37-40 of the DEIS the lists of hazardous "liquid" wastes contains examples that are not liquids (i.e. batteries).

Response: The text has been revised to delete the word "liquid."

J.3.30.43 Comment: 27-002

Comment: Fourmile Branch appears to flow southwesterly in Figures 3.2 and 3.3, not southeasterly as described in the text. This apparent discrepancy should be checked and corrected, if warranted.

Response: Section 3.3.1 was revised to state that Fourmile Branch flows southwesterly.

J.3.30.44 Comment: 27-004

Comment: The first sentence in Section 3.2.2 of the DEIS reads, "Several underground aquifers occur... ." The word "underground" is redundant and should be deleted; all aquifers are below ground.

Response: The word "underground" has been deleted.

J.3.30.45 Comment: 86-023

Comment: The typographical error on page 3-7, lines 23-24 of the DEIS should be corrected to "Beaufort-Jasper."

Response: The typographical error for the Water Authority name in Section 3.3.1 was changed to read "Beaufort-Jasper Water Authority."

J.3.30.46 Comment: 86-024

Comment: In Section 3.3.1, the DEIS refers to the S-Area sewage treatment plant. With the opening of the Central Sanitary Waste Treatment Facility, the S-Area plant, and all other area treatment plants at the Savannah River Site were closed.

Response: The text in Section 3.3.1 was changed to indicate that discharge is received from the Central Sanitary Waste Treatment Facility rather than the S-Area sewage treatment plant.

J.3.30.47 Comment: 86-025

Comment: In Section 3.3.2, page 3-11, line 3 of the DEIS delete the word "Creek." The aquifer is the Upper Three Runs Aquifer.

Response: The name of the aquifer has been corrected.

J.3.30.48 Comment: 86-026

Comment: It is suggested that “waste management facilities” be added to the lists for facilities that could possibly contaminate groundwater on Section 3.3.2, page 3-12, lines 27-29 of the DEIS.

Response: The text in Section 3.3.2 has been revised as suggested in the comment.

J.3.30.49 Comment: 86-034

Comment: On page 3-7, line 24 of the DEIS the correct spelling is Hardeevile (South Carolina), not Hardeville.

Response: The typographical error has been corrected.

APPENDIX K:

COMMENTER AND COMMENT DOCUMENT INDEX

APPENDIX K:

COMMENTER AND COMMENT DOCUMENT INDEX

K.1. Index by Comment Document Number

Comment Document Number	Accession Number[a]	Commenter
0001	ml030660494	Mark Hogue
0002		Leah R. Karpen
0003	ml030940262	Pamela J. O'Brien
0004	ml031210403	Jody Lanier
0005	same	Jody Lanier
0006	ml031210406	William D. Hooker, Sr.
0007	ml031210491	Whitney Erin Lamb
0008	ml031210487	Andre Entermann
0009		Vernell Cutter, Center for Environmental Justice
0010	ml031210428	Sara Barczak, Southern Alliance for Clean Energy
0011	ml031210434	Edwin S. Presnell, Augusta Metro Chamber of Commerce
0012		Scott Justice
0013	ml031210485	Glenn Carroll
0014	ml031210479	Ernest S. Chaput, Economic Development Partnership of Aiken and Edgefield Counties
0015	ml031210451	Adele Kushner, Action for a Clean Environment
0016	ml031210483	Gresham Barrett, Congressman, 3rd District of South Carolina
0017	ml031210450	C. David Cowfer, Savannah River Site Retiree Association
0018	ml031210439	Donald A. Orth
0019	ml031210436	Mary T. Kelly, League of Women Voters of South Carolina
0020	ml031130034	Susan Cain Giusto
0021	ml030920471	Roy G. Hurni
0022	ml031130031	Linda Odom
0023	ml031210453	James E. Smith, Jr., State Representative, House of Representatives, State of SC
0024	ml031080139	Lewis Patrie, Western N.C. Physicians for Social Responsibility
0025	ml031040250	William J. Mottel
0026	ml031130021	Camille Price, Augusta Tomorrow, Inc.
0027	ml031600204	Gregory Hogue, Department of the Interior
0028		Tom Clements
0029		Marvin I. Lewis
0030		Scott Justice

Comment Document Number	Accession Number[a]	Commenter
0031	ml031200073	Ernest S. Chaput
0032		Kellie Gasink, Green Party
0033		Whitney Erin Lamb
0034		Kirk Cobb
0035		Vernell Cutter, Center for Environmental Justice
0036		Kelli Pearson
0037		Cheryl Jay
0038		Carol Cain
0039		Ellen O'Leary
0040		Bobbie Paul
0041		Victor Mereski
0042		Chester Dunham
0043		David Kyler, Center for a Sustainable Coast
0044		Sara Barczak, Southern Alliance for Clean Energy
0045		Jody Lanier
0046		Andre Entermann
0047		Peggy Roche, Carolina Peace Resource Center
0048		Tom Clements, Green Peace International
0049		Bill Robinson, Allendale County Council
0050		Mal McKibben, Citizens for Nuclear Technology Awareness
0051		Thomas Williams, Barnwell County Council
0052		William Hooker, Savannah River Group of the Sierra Club
0053		Don Moniak, Blue Ridge Environmental Defense League
0054		Ed Presnell, Augusta Metro Chamber of Commerce
0055		David Walker, Aiken Branch of the NAACP
0056		Mary Kelly, League of Women Voters of South Carolina
0057		Charles Weiss, Greater Aiken Chamber of Commerce
0058		Carolyn Betsy Rivard
0059		Brendolyn Jenkins, Imani Group
0060		David Cowfer, Savannah River Site Retiree Association
0061		Glenn Carroll, Georgians Against Nuclear Energy
0062		Ed Arnold, Physicians for Social Responsibility
0063		Ernest Chaput
0064		Robert Guild, South Carolina Chapter of the Sierra Club
0065		Darrell Watson
0066		Jen Kato, Georgia Chapter of the Sierra Club
0067		Tom Howell

Comment Document Number	Accession Number[a]	Commenter
0068		Adele Kushner, Action for a Clean Environment
0069		Joanne Steele
0070		Charles Utley
0071		Lew Patrie, Western N.C. Physicians for Social Responsibility
0072		Mary Olson, Nuclear Information and Resource Service
0073		Lou Zeller, Blue Ridge Environmental Defense League
0074		Peter Sipp
0075		James E. Smith, State House of Representatives, South Carolina
0076		Gregg Jocoy, York County South Carolina Greens
0077		Judy Aulette, Charlotte Area Green Party
0078	ml031140007	Amanda Voss
0079	ml031130043	Linda Ewald
0080	ml031140009	Betsy Rivard, Women's Action for New Directions
0081	ml031140008	Berta R. Laney, Women's Action for New Directions
0082	ml031320272	Chris Miller
0083	ml031340393	Joan O. King
0084	ml031350217	Lauren Sorkin
0085	ml031400071	Adrienne Valentino
0086	ml031400084	Peter S. Hastings, Duke Cogema Stone & Webster
0087	ml031400069	Allison Macfarlane
0088	ml031420049	Soumya Ganapathy
0089	ml031400037	Edward J. Siskin, U.S. Department of Energy, National Nuclear Security Administration
0090	ml031400090	Rachel Western
0091	ml031400092	David Kyler, Center for a Sustainable Coast
0092	ml031400086	Glenn Carroll, Georgians Against Nuclear Energy
0093	ml031420683	Mary Olson, Nuclear Information and Resource Service
0094		Ralph L. Andersen, Nuclear Energy Institute
0095	ml031400083	Thomas R. Mott
0096	ml031400327	Mildred McClain, Citizens for Environmental Justice
0097	ml031420029	Alexander P. Murray
0098	ml031420055	Sara Barczak, Southern Alliance for Clean Energy
0099	ml031430074	Bev Baker
0100	ml031420021	Meira Warshauer
0101	ml031420042	Judy Ponder
0102	ml031420036	Bart Patton
0103		Terri Jagger Bline
0103		Emily B. Calhoun

Comment Document Number	Accession Number[a]	Commenter
0103		Faye McKay-Clegg
0103		Eleanor L. Richardson
0103		Marguerite Sweet
0104		Petition (Don''t brand the Southeast "Plutonium Alley"! We Don't waste plutonium fuel)
0105	ml031400076	Robert B. Mills
0106	ml031400079	Diane F. Matesic
0107	ml031420017	Heinz J. Mueller, U.S. Environmental Protection Agency, Region 4
0108	ml031420019	Carolyn Cain
0109	ml031420011	Jennifer Zanck
0110	ml031420014	Mai Dang
0111	ml031480058	Ruth Thomas, Environmentalists, Inc.
0112	ml031600242	Ruth Sanford
0113	ml031620072	Dell Isham, South Carolina Chapter of the Sierra Club
0114		Louis Zeller, Blue Ridge Environmental Defense League
0115		Mary Olson, Nuclear Information and Resource Service
0116	ml031780008	Peter James Atherton

[a] A blank indicates no accession number available.

K.2. Index by Commenter/Organization

Commenter Name/Organization	Accession Number[a]	Comment Document Number
Action for a Clean Environment (Adele Kushner)	ml031210451	0015
Action for a Clean Environment (Adele Kushner)		0068
Allendale County Council (Bill Robinson)		0049
Andersen, Ralph L. (Nuclear Energy Institute)		0094
Arnold, Ed (Physicians for Social Responsibility)		0062
Atherton, Peter James	ml031780008	0116
Augusta Metro Chamber of Commerce (Edwin S. Presnell)	ml031210434	0011
Augusta Metro Chamber of Commerce (Ed Presnell)		0054
Augusta Tomorrow, Inc. (Camille Price)	ml031130021	0026
Aulette, Judy (Charlotte Area Green Party)		0077
Baker, Bev	ml031430074	0099
Barczak Sara (Southern Alliance for Clean Energy)	ml031210428	0010
Barczak Sara (Southern Alliance for Clean Energy)		0044
Barczak Sara (Southern Alliance for Clean Energy)	ml031420055	0098
Barnwell County Council (Thomas Williams)		0051
Barrett, Gresham (Congressman, 3rd District of South Carolina)	ml031210483	0016
Bline, Terri Jagger		0103
Blue Ridge Environmental Defense League (Don Moniak)		0053
Blue Ridge Environmental Defense League (Louis Zeller)		0073
Blue Ridge Environmental Defense League (Louis Zeller)		0114
Cain, Carol		0038
Cain, Carolyn	ml031420019	0108
Calhoun, Emily B.		0103
Carroll, Glenn (Georgians Against Nuclear Energy)	ml031210485	0013
Carroll, Glenn (Georgians Against Nuclear Energy)		0061
Carroll, Glenn (Georgians Against Nuclear Energy)	ml031400086	0092
Carolina Peace Resource Center (Peggy Roche)		0047
Center for a Sustainable Coast (David Kyler)		0043
Center for a Sustainable Coast (David Kyler)	ml031400092	0091
Center for Environmental Justice (Vernell Cutter)		0009
Center for Environmental Justice (Vernell Cutter)		0035
Chaput, Ernest S.(Economic Development Partnership of Aiken and Edgefield Counties)	ml031210479	0014
Chaput, Ernest S.(Economic Development Partnership of Aiken and Edgefield Counties)	ml031200073	0031
Chaput, Ernest S.(Economic Development Partnership of Aiken and Edgefield Counties)		0063

Commenter Name/Organization	Accession Number[a]	Comment Document Number
Charlotte Area Green Party (Judy Aulette)		0077
Citizens for Environmental Justice (Mildred McCain)	ml031400083	0096
Citizens for Nuclear Technology Awareness (Mal McKibben)		0050
Clements, Tom (Greenpeace International)		0028
Clements, Tom (Greenpeace International)		0048
Cobb, Kirk		0034
Cowfer, C. David (Savannah River Site Retiree Association)	ml031210450	0017
Cowfer, C. David (Savannah River Site Retiree Association)		0060
Cutter, Vernell (Center for Environmental Justice)	ml031210486	0009
Cutter, Vernell (Center for Environmental Justice)		0035
Dang, Mai	ml031420014	0110
Department of Energy, National Nuclear Security Administration (Edward J. Siskin)	ml031400037	0089
Department of the Interior (Gregory Hogue)	ml031600204	0027
Duke Cogema Stone & Webster (Peter S. Hastings)	ml031400084	0086
Dunham, Chester		0042
Economic Development Partnership of Aiken and Edgefield Counties (Ernest S. Chaput)	ml03120479	0014
Economic Development Partnership of Aiken and Edgefield Counties (Ernest S. Chaput)	ml031200073	0031
Economic Development Partnership of Aiken and Edgefield Counties (Ernest S. Chaput)		0063
Entermann, Andre	ml031210487	0008
Entermann, Andre		0046
Environmentalists, Inc. (Ruth Thomas)	ml031480058	0111
Ewald, Linda	ml031130043	0079
Ganapathy, Soumya	ml031420049	0088
Gasink, Kellie (Green Party)		0032
Georgians Against Nuclear Energy (Glenn Carroll)	ml031210485	0013
Georgians Against Nuclear Energy (Glenn Carroll)		0061
Georgians Against Nuclear Energy (Glenn Carroll)	ml031400086	0092
Giusto, Susan Cain	ml031130034	0020
Greater Aiken Chamber of Commerce (Charles Weiss)		0057
Green Party (Kellie Gasink)		0032
Greenpeace International (Thomas Clements)		0028
Greenpeace International (Thomas Clements)		0048
Guild, Robert (South Carolina Chapter for the Sierra Club)		0064
Hastings, Peter S. (Duke Cogema Stone & Webster)	ml031400084	0086

Commenter Name/Organization	Accession Number[a]	Comment Document Number
Hogue, Mark	ml030660494	0001
Hogue, Gregory (Department of the Interior)	ml031600204	0027
Hooker, William D. (Savannah River Group of the Sierra Club)		0052
Hooker, William D. (Savannah River Group of the Sierra Club)	ml031210406	0006
Howell, Tom		0067
Hurni, Roy G.	ml030920471	0021
Imani Group (Brendolyn Jenkins)		0059
Isham, Dell (Sierra Club South Carolina Chapter)	ml031620072	0113
Jay, Cheryl		0037
Jenkins, Brendolyn (Imani Group)		0059
Jocoy, Gregg		0076
Justice, Scott	ml031210496	0012
Justice, Scott	ml031130020	0030
Karpen, Leah R.	ml03210482	0002
Kato, Jen (Georgia Chapter of the Sierra Club)		0066
Kelly, Mary T. (League of Women Voters of South Carolina)	ml031210436	0019
Kelly, Mary T. (League of Women Voters of South Carolina)		0056
King, Joan O.	ml031340393	0083
Kushner (Action for a Clean Environment)	ml031210451	0015
Kushner (Action for a Clean Environment)		0068
Kyler, David (Center for a Sustainable Coast)		0043
Kyler, David (Center for a Sustainable Coast)	ml031400092	0091
Lamb, Whitney Erin	ml031210491	0007
Lamb, Whitney Erin		0033
Laney, Berta R. (Women's Action for New Directions)	ml031140008	0081
Lanier, Jody	ml031210403	0004
Lanier, Jody	ml031210403	0005
Lanier, Jody		0045
League of Women Voters of South Carolina (Vernell Cutter)		0009
League of Women Voters of South Carolina (Mary Kelly)		0056
Lewis, Marvin L.	ml031210455	0029
Macfarlane, Allison	ml031400069	0087
Matesic, Diane F.	ml031400079	0106
McClain, Mildred	ml031400327	0096
McKay-Clegg, Faye		0103
McKibben, Mal (Citizens for Nuclear Technology Awareness)		0050
Mereski, Victor		0041

Commenter Name/Organization	Accession Number[a]	Comment Document Number
Miller, Chris	ml031320272	0082
Mills, Robert B.	ml031400076	0105
Moniak, Don (Blue Ridge Environmental Defense League)		0053
Mott, Thomas R.	ml031400083	0095
Mottel, William J.	ml031040250	0025
Mueller, Heinz J.	ml031420017	0107
Murray, Alexander P.	ml031420029	0097
NAACP, Aiken Branch (David Walker)		0055
Nuclear Energy Institute (Ralph L. Andersen)		0094
Nuclear Information Resource Service (Mary Olson)		0072
Nuclear Information Resource Service (Mary Olson)	ml031420683	0093
Nuclear Information Resource Service (Mary Olson)		0115
O'Brien, Pamela J.	ml030940262	0003
Odom, Linda	ml031130031	0022
O'Leary, Ellen		0039
Olson, Mary (Nuclear Information Resource Service)		0072
Olson, Mary (Nuclear Information Resource Service)	ml031420683	0093
Olson, Mary (Nuclear Information Resource Service)		0115
Orth, Donald A.	ml031210439	0018
Patrie, Lewis (Western North Carolina Physicians for Social Responsibility)	ml031080139	0024
Patrie, Lewis (Western North Carolina Physicians for Social Responsibility)		0071
Patton, Bart	ml031420036	0102
Paul, Bobbie		0040
Pearson, Kelli		0036
Petition (Don''t brand the Southeast "Plutonium Alley"!)		0104
Physicians for Social Responsibility (Ed Arnold)		0062
Ponder, Judy	ml031420042	0101
Presnell, Edwin S. (Augusta Metro Chamber of Commerce)	ml031210434	0011
Presnell, Edwin S. (Augusta Metro Chamber of Commerce)		0054
Price, Camille (Augusta Tomorrow, Inc.)	ml031130021	0026
Richardson, Eleanor L.		0103
Rivard, Carolyn Betsy		0058
Rivard, Betsy (Women's Action for New Direction)	ml031140009	0080
Robinson, Bill (Allendale County Council)		0049
Roche, Peggy (Carolina Peace Resource Center)		0047

Commenter Name/Organization	Accession Number[a]	Comment Document Number
Sanford, Ruth	ml031600242	0112
Savannah River Site Retiree Association (C. David Cowfer)	ml031210450	0017
Savannah River Site Retiree Association (Dave Cowfer)		0060
Sierra Club, Georgia Chapter (Jen Kato)		0066
Sierra Club, South Carolina Chapter (Robert Gould)		0064
Sierra Club, South Carolina Chapter (Dell Isham)	ml031620072	0113
Sierra Club, Savannah River Group (William Hooker)		0052
Sierra Club, Savannah River Group (William Hooker)	ml031210406	0006
Sipp, Peter		0074
Siskin, Edward J.	ml031400037	0089
Smith, James E., Jr. (House of Representatives, State of South Carolina)		0075
Smith, James E., Jr. (House of Representatives, State of South Carolina)	ml031210453	0023
Sorkin, Lauren	ml031350217	0084
Southern Alliance for Clean Energy (Sara Barczak)	ml031210428	0010
Southern Alliance for Clean Energy (Sara Barczak)		0044
Southern Alliance for Clean Energy (Sara Barczak)	ml031420055	0098
Steele, Joanne		0069
Sweet, Marguerite		0103
Thomas, Ruth (Environmentalists, Inc.)	ml031480058	0111
U.S. Environmental Protection Agency, Region 4 (Heinz Mueller)	ml031420017	0107
Utley, Charles		0070
Valentino, Adrienne	ml031400071	0085
Voss, Amanda	ml031140007	0078
Walker, David (Aiken Branch of the NAACP)		0055
Warshauer, Meira	ml031420021	0100
Watson, Darrell		0065
Weiss, Charles (Greater Aiken Chamber of Commerce)		0057
Western North Carolina Physicians for Social Responsibility (Lewis Patrie)	ml031080139	0024
Western North Carolina Physicians for Social Responsibility (Lewis Patrie)		0071
Women's Action for New Directions (Betsy Rivard)	ml031140009	0080
Women's Action for New Directions (Berta R. Laney)	ml031140008	0081
Western, Rachel	ml031400090	0090
Williams, Thomas (Barnwell County Council)		0051
Zanck, Jennifer	ml031420011	0109

Commenter Name/Organization	Accession Number[a]	Comment Document Number
Zeller, Louis (Blue Ridge Environmental Defense League)		0073
Zeller, Louis (Blue Ridge Environmental Defense League)		0114

[a] A blank indicates no accession number available.

K.3. Index by Comment Number

Comment[a] Number	Section Number	Section Name	Commenter
1-001	J.3.13.14	Human Health - Radiological Risk	Mark Hogue
2-001	J.3.9.2	Scope - Terrorism	Leah R. Karpen
2-002	J.3.7.8	Scope - DOE Policy	
2-002	J.3.21.1	MOX Fuel Use	
2-003	J.3.10.2	Alternatives	
2-004	J.3.1.3	General Opposition	
3-001	J.3.7.4	Scope - DOE Policy	Pamela J. O'Brien
3-002	J.3.14.7	Accidents	
3-003	J.3.1.3	General Opposition	
4-001	J.3.11.2	Alternatives - Immobilization	Jody Lanier
4-002	J.3.8.3	Scope - Safety Evaluation Report	
4-003	J.3.9.2	Scope - Terrorism	
4-004	J.3.8.2	Scope - Safety Evaluation Report	
4-005	J.3.1.4	General Opposition	
5-001	J.3.11.3	Alternatives - Immobilization	Jody Lanier
5-002	J.3.4.1	NEPA Process	
5-003	J.3.4.1	NEPA Process	
5-003	J.3.4.5	NEPA Process	
5-004	J.3.6.1	Scope - General	
5-005	J.3.9.1	Scope - Terrorism	
5-006	J.3.7.4	Scope - DOE Policy	
5-007	J.3.21.1	Cost Benefit	
5-008	J.3.7.6	Scope - DOE Policy	
5-009	J.3.10.1	Alternatives	
6-001	J.3.12.2	Human Health Risk	William D. Hooker, Sr.
7-001	J.3.4.5	NEPA Process	Whitney Lamb
7-002	J.3.18.2	Decommissioning	
7-003	J.3.4.1	NEPA Process	
7-004	J.3.16.1	Hydrology	
8-001	J.3.1.5	General Opposition	Andre Entermann
8-002	J.3.4.6	NEPA Process	
8-003	J.3.15.1	Air Quality	
8-004	J.3.7.10	Scope - DOE Policy	
8-005	J.3.23.1	Cost Benefit	
9-001	J.3.19.4	Environmental Justice	Vernell Cutter
9-002	J.3.19.4	Environmental Justice	
9-003	J.3.19.4	Environmental Justice	

Comment[a] Number	Section Number	Section Name	Commenter
9-004	J.3.4.3	NEPA Process	
9-005	J.3.19.4	Environmental Justice	
10-001	J.3.9.1	Scope - Terrorism	Sara Barczak
10-001	J.3.9.2	Scope - Terrorism	
10-002	J.3.1.1	General Opposition	
10-003	J.3.17.4	Waste Management	
10-004	J.3.23.1	Cost Benefit	
10-005	J.3.7.9	Scope - DOE Policy	
10-006	J.3.1.6	General Opposition	
10-007	J.3.4.4	NEPA Process	
10-007	J.3.4.7	NEPA Process	
10-008	J.3.7.6	Scope - DOE Policy	
10-009	J.3.7.6	Scope - DOE Policy	
10-010	J.3.7.3	Scope - DOE Policy	
10-011	J.3.7.7	Scope - DOE Policy	
10-012	J.3.14.1	Accidents	
10-013	J.3.12.1	Human Health Risk	
10-014	J.3.24.8	Mitigation	
10-015	J.3.19.9	Environmental Justice	
10-016	J.3.10.8	Alternatives	
10-017	J.3.17.4	Waste Management	
10-017	J.3.17.5	Waste Management	
10-018	J.3.16.1	Hydrology	
10-019	J.3.23.1	Cost Benefit	
10-020	J.3.8.1	Scope - Safety Evaluation Report	
10-020	J.3.8.3	Scope - Safety Evaluation Report	
10-021	J.3.7.6	Scope - DOE Policy	
10-022	J.3.1.6	General Opposition	
10-023	J.3.11.2	Alternatives - Immobilization	
10-024	J.3.24.21	Mitigation	
11-001	J.3.2	General Support	Edwin S. Presnell
12-001	J.3.1.5	General Opposition	Scott Justice
12-002	J.3.7.6	Scope - DOE Policy	
12-003	J.3.23.1	Cost Benefit	
12-004	J.3.6.9	Scope - General	
12-004	J.3.21.1	MOX Fuel Use	
13-001	J.3.5.1	Licensing Process	Glenn Carroll
13-002	J.3.4.5	NEPA Process	

Comment[a] Number	Section Number	Section Name	Commenter
13-002	J.3.4.7	NEPA Process	
13-003	J.3.11.2	Alternatives - Immobilization	
13-004	J.3.6.9	Scope - General	
13-004	J.3.21.1	MOX Fuel Use	
13-005	J.3.7.7	Scope - DOE Policy	
13-006	J.3.17.6	Waste Management	
13-007	J.3.9.1	Scope - Terrorism	
14-001	J.3.2	General Support	Ernest S. Chaput
14-002	J.3.19.7	Alternatives	
14-003	J.3.14.8	Accidents	
14-004	J.3.6.3	Scope - General	
15-001	J.3.11.2	Alternatives - Immobilization	Adele Kushner
15-002	J.3.9.2	Scope - Terrorism	
16-001	J.3.2	General Support	Gresham Barrett
17-001	J.3.2	General Support	C. David Cowfer
17-002	J.3.14.9	Accidents	
18-001	J.3.8.1	Scope - Safety Evaluation Report	Donald A. Orth
18-001	J.3.8.5	Scope - Safety Evaluation Report	
19-001	J.3.4.5	NEPA Process	Mary T. Kelly
19-002	J.3.9.1	Scope - Terrorism	
19-003	J.3.10.4	Alternatives	
19-004	J.3.9.2	Scope - Terrorism	
19-005	J.3.9.2	Scope - Terrorism	
19-006	J.3.14.2	Accidents	
19-007	J.3.15.4	Air Quality	
19-008	J.3.6.1	Scope - General	
19-009	J.3.8.3	Scope - Safety Evaluation Report	
19-010	J.3.7.1	Scope - DOE Policy	
20-001	J.3.1.4	General Opposition	Susan Cain Guisto
21-001	J.3.2	General Support	Roy G. Hurni
22-001	J.3.14.10	Accidents	Linda Odom
22-002	J.3.19.2	Environmental justice	
22-003	J.3.1.6	General Opposition	
23-001	J.3.4.5	NEPA Process	James E. Smith, Jr.
24-001	J.3.20.12	Transportation	Lewis Patrie
24-002	J.3.9.1	Scope - Terrorism	
24-003	J.3.13.1	Human Health - Radiological Risk	
24-004	J.3.6.9	Scope - General	

Comment[a] Number	Section Number	Section Name	Commenter
24-004	J.3.21.1	MOX Fuel Use	
24-005	J.3.7.8	Scope - DOE Policy	
24-006	J.3.17.4	Waste Management	
24-007	J.3.11.2	Alternatives - Immobilization	
24-008	J.3.7.6	Scope - DOE Policy	
24-009	J.3.1.3	General Opposition	
24-010	J.3.9.1	Scope - Terrorism	
24-010	J.3.9.2	Scope - Terrorism	
25-001	J.3.2	General Support	William J. Mottel
25-002	J.3.14.11	Accidents	
26-001	J.3.2	General Support	Camille Price
27-001	J.3.24.19	Mitigation	Gregory Hogue
27-002	J.3.30.43	Editorial	
27-003	J.3.16.2	Hydrology	
27-004	J.3.30.44	Editorial	
27-005	J.3.16.3	Hydrology	
27-006	J.3.16.4	Hydrology	
27-007	J.3.16.5	Hydrology	
27-008	J.3.16.6	Hydrology	
27-009	J.3.13.15	Human Health - Radiological Risk	
27-010	J.3.16.7	Hydrology	
28-001	J.3.19.3	Environmental Justice	Tom Clements
28-002	J.3.19.3	Environmental Justice	
29-001	J.3.20.1	Transportation	Marvin I. Lewis
29-002	J.3.20.2	Transportation	
29-003	J.3.5.2	Licensing Process	
30-001	J.3.1.5	General Opposition	Scott Justice
30-002	J.3.9.1	Scope - Terrorism	
30-003	J.3.6.9	Scope - General	
30-003	J.3.21.1	MOX Fuel Use	
30-004	J.3.23.1	Cost Benefit	
31-001	J.3.19.6	Environmental Justice	Ernest S. Chaput
32-001	J.3.4.1	NEPA Process	Kellie Gasink
32-002	J.3.6.1	Scope - General	
32-003	J.3.7.10	Scope - DOE Policy	
32-004	J.3.1.5	General Opposition	
32-005	J.3.23.1	Cost Benefit	
33-001	J.3.6.2	Scope - General	Whitney Erin Lamb

Comment[a] Number	Section Number	Section Name	Commenter
34-001	J.3.7.10	Scope - DOE Policy	Kirk Cobb
35-001	J.3.23.1	Cost Benefit	Vernell Cutter
35-002	J.3.19.4	Environmental Justice	
35-003	J.3.19.4	Environmental Justice	
35-004	J.3.19.4	Environmental Justice	
35-005	J.3.19.4	Environmental Justice	
35-006	J.3.4.3	NEPA Process	
35-006	J.3.19.4	Environmental Justice	
35-006	J.3.19.6	Environmental Justice	
36-001	J.3.7.10	Scope - DOE Policy	Kelli Pearson
37-001	J.3.13.2	Human Health - Radiological Risk	Cheryl Jay
37-002	J.3.11.2	Alternatives - Immobilization	
37-003	J.3.3.1	Purpose and Need	
37-004	J.3.11.2	Alternatives - Immobilization	
38-001	J.3.7.4	Scope - DOE Policy	Carol Cain
38-002	J.3.23.1	Cost Benefit	
39-001	J.3.22.1	Cumulative	Ellen O'Leary
39-002	J.3.9.2	Scope - Terrorism	
39-003	J.3.7.4	Scope - DOE Policy	
39-004	J.3.19.3	Environmental Justice	
40-001	J.3.11.2	Alternatives - Immobilization	Bobbie Paul
41-001	J.3.9.2	Scope - Terrorism	Victor Mereski
42-001	J.3.12.2	Human Health Risk	Chester Dunham
42-002	J.3.12.2	Human Health Risk	
43-001	J.3.16.14	Hydrology	David Kyler
43-002	J.3.29.1	Socioeconomics	
43-003	J.3.8.2	Scope - Safety Evaluation Report	
43-004	J.3.23.10	Cost Benefit	
43-005	J.3.16.8	Hydrology	
43-006	J.3.4.3	NEPA Process	
44-001	J.3.9.1	Scope - Terrorism	Sara Barczak
44-002	J.3.1.1	General Opposition	
44-003	J.3.17.4	Waste Management	
44-004	J.3.23.1	Cost Benefit	
44-005	J.3.7.9	Scope - DOE Policy	
44-006	J.3.1.6	General Opposition	
44-007	J.3.4.4	NEPA Process	
44-007	J.3.4.7	NEPA Process	

Comment[a] Number	Section Number	Section Name	Commenter
44-008	J.3.7.6	Scope - DOE Policy	
44-009	J.3.7.6	Scope - DOE Policy	
44-010	J.3.7.3	Scope - DOE Policy	
44-011	J.3.7.7	Scope - DOE Policy	
44-012	J.3.8.3	Scope - Safety Evaluation Report	
45-001	J.3.11.3	Alternatives - Immobilization	Jody Lanier
45-002	J.3.4.1	NEPA Process	
45-003	J.3.4.1	NEPA Process	
45-003	J.3.4.5	NEPA Process	
45-004	J.3.6.1	Scope - General	
45-005	J.3.9.1	Scope - Terrorism	
45-006	J.3.7.4	Scope - DOE Policy	
45-007	J.3.23.1	Cost Benefit	
45-008	J.3.7.6	Scope - DOE Policy	
45-009	J.3.10.1	Alternatives	
46-001	J.3.1.5	General Opposition	Andre Entermann
46-002	J.3.4.1	NEPA Process	
46-003	J.3.4.6	NEPA Process	
47-001	J.3.7.1	Scope - DOE Policy	Peggy Roche
47-002	J.3.9.2	Scope - Terrorism	
47-003	J.3.4.5	NEPA Process	
47-004	J.3.15.2	Air Quality	
47-005	J.3.21.1	MOX Fuel Use	
48-001	J.3.7.2	Scope - DOE Policy	Tom Clements
48-002	J.3.7.3	Scope - DOE Policy	
48-003	J.3.7.5	Scope - DOE Policy	
48-004	J.3.23.2	Cost Benefit	
48-005	J.3.7.4	Scope - DOE Policy	
49-001	J.3.2	General Support	Bill Robinson
50-001	J.3.2	General Support	Mal McKibben
50-002	J.3.14.8	Accidents	
50-002	J.3.14.9	Accidents	
51-001	J.3.2	General Support	Thomas Williams
52-001	J.3.9.1	Scope - Terrorism	William Hooker
52-002	J.3.8.2	Scope - Safety Evaluation Report	
52-003	J.3.12.4	Human Health Risk	
52-004	J.3.13.13	Human Health - Radiological Risk	
53-001	J.3.23.11	Cost Benefit	Don Moniak

Comment[a] Number	Section Number	Section Name	Commenter
53-002	J.3.13.7	Human Health - Radiological Risk	
53-002	J.3.14.10	Accidents	
53-003	J.3.13.16	Human Health - Radiological Risk	
53-004	J.3.13.3	Human Health - Radiological Risk	
53-005	J.3.12.5	Human Health Risk	
53-006	J.3.13.4	Human Health - Radiological Risk	
53-007	J.3.17.5	Waste Management	
53-008	J.3.14.3	Accidents	
53-009	J.3.15.5	Air Quality	
53-010	J.3.3.1	Purpose and Need	
53-011	J.3.8.9	Scope - Safety Evaluation Report	
53-012	J.3.15.5	Air Quality	
54-001	J.3.2	General Support	Ed Presnell
55-001	J.3.2	General Support	David Walker
55-002	J.3.4.5	NEPA Process	
56-001	J.3.9.1	Scope - Terrorism	Mary Kelly
56-001	J.3.9.2	Scope - Terrorism	
56-002	J.3.9.2	Scope - Terrorism	
56-003	J.3.8.3	Scope - Safety Evaluation Report	
56-004	J.3.15.4	Air Quality	
56-005	J.3.6.1	Scope - General	
56-006	J.3.7.1	Scope - DOE Policy	
57-001	J.3.2	General Support	Charles Weiss
58-001	J.3.9.1	Scope - Terrorism	Carolyn Betsy Rivard
58-002	J.3.9.2	Scope - Terrorism	
58-003	J.3.11.2	Alternatives - Immobilization	
58-003	J.3.11.3	Alternatives - Immobilization	
58-004	J.3.23.11	Cost Benefit	
59-001	J.3.2	General Support	Brendolyn Jenkins
59-002	J.3.4.7	NEPA Process	
60-001	J.3.2	General Support	David Cowfer
60-002	J.3.14.9	Accidents	
61-001	J.3.1.3	General Opposition	Glenn Carroll
61-002	J.3.4.5	NEPA Process	
61-003	J.3.5.1	Licensing Process	
61-004	J.3.7.5	Scope - DOE Policy	
61-005	J.3.17.5	Waste Management	
61-006	J.3.4.2	NEPA Process	

Comment[a] Number	Section Number	Section Name	Commenter
61-007	J.3.11.2	Alternatives - Immobilization	
61-008	J.3.7.2	Scope - DOE Policy	
62-001	J.3.4.5	NEPA Process	Ed Arnold
62-002	J.3.14.12	Accidents	
62-003	J.3.4.5	NEPA Process	
62-003	J.3.8.1	Scope - Safety Evaluation Report	
63-001	J.3.2	General Support	Ernest S. Chaput
63-002	J.3.10.7	Alternatives	
63-003	J.3.14.8	Accidents	
63-004	J.3.6.3	Scope - General	
64-001	J.3.1.3	General Opposition	Robert Guild
64-002	J.3.11.2	Alternatives - Immobilization	
64-003	J.3.4.2	NEPA Process	
64-004	J.3.6.9	Scoep - General	
64-005	J.3.19.6	Environmental Justice	
64-006	J.3.14.1	Accidents	
64-006	J.3.14.16	Accidents	
64-007	J.3.19.3	Environmental Justice	
64-007	J.3.19.4	Environmental Justice	
65-001	J.3.9.2	Scope - Terrorism	Darrell Watson
65-002	J.3.9.1	Scope - Terrorism	
65-003	J.3.21.1	MOX Fuel Use	
65-004	J.3.8.3	Scope - Safety Evaluation Report	
66-001	J.3.1.2	General Opposition	Jen Kato
66-002	J.3.23.11	Cost Benefit	
66-003	J.3.12.6	Human Health Risk	
66-004	J.3.23.9	Cost Benefit	
66-005	J.3.12.3	Human Health Risk	
66-006	J.3.4.4	NEPA Process	
66-006	J.3.4.5	NEPA Process	
66-007	J.3.17.4	Waste Management	
66-007	J.3.17.5	Waste Management	
66-008	J.3.9.1	Scope - Terrorism	
67-001	J.3.17.3	Waste Management	Tom Howell
67-002	J.3.21.1	MOX Fuel Use	
67-003	J.3.8.4	Scope - Safety Evaluation Report	
68-001	J.3.11.2	Alternatives - Immobilization	Adele Kushner
68-002	J.3.9.1	Scope - Terrorism	

Comment[a] Number	Section Number	Section Name	Commenter
68-002	J.3.9.2	Scope - Terrorism	
69-001	J.3.1.6	General Opposition	Joanne Steele
69-002	J.3.11.1	Alternatives - Immobilization	
70-001	J.3.19.3	Environmental Justice	Charles Utley
71-001	J.3.13.6	Human Health - Radiological Risk	Lewis Patrie
71-002	J.3.20.12	Transportation	
71-003	J.3.9.2	Scope - Terrorism	
71-004	J.3.1.6	General Opposition	
71-005	J.3.13.5	Human Health - Radiological Risk	
71-006	J.3.17.4	Waste Management	
71-007	J.3.13.5	Human Health - Radiological Risk	
71-008	J.3.13.1	Human Health - Radiological Risk	
71-009	J.3.6.9	Scope - General	
71-009	J.3.21.1	MOX Fuel Use	
71-010	J.3.9.1	Scope - Terrorism	
71-011	J.3.7.8	Scope - DOE Policy	
71-012	J.3.9.1	Scope - Terrorism	
71-012	J.3.9.2	Scope - Terrorism	
71-013	J.3.11.2	Alternatives - Immobilization	
71-014	J.3.17.4	Waste Management	
71-015	J.3.7.6	Scope - DOE Policy	
72-001	J.3.10.3	Alternatives	Mary Olson
72-002	J.3.10.1	Alternatives	
72-003	J.3.3.1	Purpose and Need	
72-004	J.3.7.8	Scope - DOE Policy	
72-005	J.3.10.3	Alternatives	
72-006	J.3.21.1	MOX Fuel Use	
72-007	J.3.19.7	Environmental Justice	
72-008	J.3.22.1	Cumulative Impacts	
72-009	J.3.13.6	Human Health - Radiological Risk	
72-010	J.3.19.8	Environmental justice	
72-011	J.3.7.6	Scope - DOE Policy	
72-012	J.3.7.6	Scope - DOE Policy	
72-013	J.3.11.3	Alternatives - Immobilization	
72-014	J.3.6.2	Scope - General	
72-015	J.3.10.1	Alternatives	
73-001	J.3.13.7	Human Health - Radiological Risk	Lou Zeller
73-002	J.3.10.1	Alternatives	

Comment[a] Number	Section Number	Section Name	Commenter
73-003	J.3.08.3	Scope - Safety Evaluation Report	
73-004	J.3.13.8	Human Health - Radiological Risk	
73-005	J.3.10.8	Alternatives	
74-001	J.3.8.2	Scope - Safety Evaluation Report	Peter Sipp
74-002	J.3.10.3	Alternatives	
75-001	J.3.4.5	NEPA Process	James E. Smith
76-001	J.3.5.3	Licensing Process	Gregg Jocoy
76-002	J.3.23.1	Cost Benefit	
76-003	J.3.23.1	Cost Benefit	
77-001	J.3.6.2	Scope - General	Judy Aulette
77-002	J.3.21.1	MOX Fuel Use	
77-003	J.3.6.10	Scope - General	
77-004	J.3.7.6	DOE Policy	
77-005	J.3.19.10	Environmental Justice	
77-006	J.3.9.1	Scope - Terrorism	
77-007	J.3.6.4	Scope - General	
77-008	J.3.4.1	NEPA Process	
77-009	J.3.1.6	General Opposition	
78-001	J.3.11.2	Alternatives - Immobilization	Amanda Voss
78-002	J.3.5.1	Licensing Process	
78-003	J.3.19.3	Environmental Justice	
79-001	J.3.1.1	General Opposition	Linda Ewald
79-002	J.3.17.4	Waste Management	
79-003	J.3.19.3	Environmental Justice	
79-004	J.3.23.1	Cost Benefit	
80-001	J.3.5.1	Licensing Process	Betsy Rivard
80-002	J.3.19.4	Environmental Justice	
80-003	J.3.11.2	Alternatives - Immobilization	
81-001	J.3.19.3	Environmental Justice	Berta R. Laney
81-002	J.3.11.2	Alternatives - Immobilization	
81-003	J.3.5.1	Licensing Process	
82-001	J.3.9.1	Scope - Terrorism	Chris Miller
82-002	J.3.19.9	Environmental Justice	
82-003	J.3.8.2	Scope - Safety Evaluation Report	
82-004	J.3.19.3	Environmental Justice	
82-005	J.3.10.5	Alternatives	
82-006	J.3.7.1	Scope - DOE Policy	
83-001	J.3.1.1	General Opposition	Joan O. King

Comment[a] Number	Section Number	Section Name	Commenter
84-001	J.3.1.6	General Opposition	Lauren Sorkin
84-002	J.3.19.4	Environmental Justice	
84-002	J.3.19.9	Environmental Justice	
84-003	J.3.10.5	Alternatives	
85-001	J.3.20.1	Transportation	Adrienne Valentino
85-002	J.3.1.4	General Opposition	
85-003	J.3.12.17	Human Health Risk	
85-004	J.3.9.1	Scope -Terrorism	
85-005	J.3.28.1	Ecology	
86-001	J.3.2	General Support	Peter S. Hastings
86-002	J.3.11.4	Alternatives - Immobilization	
86-003	J.3.14.8	Accidents	
86-003	J.3.14.16	Accidents	
86-004	J.3.19.5	Environmental Justice	
86-005	J.3.24.1	Mitigation	
86-006	J.3.30.4	Editorial	
86-007	J.3.6.7	Scope - General	
86-008	J.3.30.16	Editorial	
86-009	J.3.17.10	Waste Management	
86-010	J.3.30.17	Editorial	
86-011	J.3.30.18	Editorial	
86-012	J.3.30.18	Editorial	
86-013	J.3.30.21	Editorial	
86-014	J.3.30.18	Editorial	
86-015	J.3.30.17	Editorial	
86-016	J.3.10.9	Alternatives	
86-017	J.3.10.10	Alternatives	
86-018	J.3.30.19	Editorial	
86-019	J.3.17.8	Waste Management	
86-020	J.3.30.20	Editorial	
86-021	J.3.15.1	Air Quality	
86-022	J.3.27.2	Cultural Resources	
86-023	J.3.30.45	Editorial	
86-024	J.3.30.46	Editorial	
86-025	J.3.30.47	Editorial	
86-026	J.3.30.48	Hydrology	
86-027	J.3.16.9	Hydrology	
86-028	J.3.16.10	Hydrology	

Comment[a] Number	Section Number	Section Name	Commenter
86-029	J.3.16.11	Hydrology	
86-030	J.3.16.12	Hydrology	
86-031	J.3.15.1	Air Quality	
86-032	J.3.30.26	Editorial	
86-033	J.3.12.7	Human Health Risk	
86-034	J.3.12.8	Human Health Risk	
86-035	J.3.13.17	Human Health - Radiological Risk	
86-036	J.3.13.18	Human Health - Radiological Risk	
86-037	J.3.12.9	Human Health Risk	
86-038	J.3.12.10	Human Health Risk	
86-039	J.3.12.18	Human Health Risk	
86-040	J.3.12.9	Human Health Risk	
86-041	J.3.12.9	Human Health Risk	
86-042	J.3.15.3	Air Quality	
86-043	J.3.17.13	Waste Management	
86-044	J.3.30.42	Editorial	
86-045	J.3.17.1	Waste Management	
86-046	J.3.17.1	Waste Management	
86-047	J.3.17.8	Waste Management	
86-048	J.3.17.2	Waste Management	
86-049	J.3.30.41	Editorial	
86-050	J.3.17.8	Waste Management	
86-051	J.3.14.15	Accidents	
86-052	J.3.14.8	Accidents	
86-053	J.3.14.17	Accidents	
86-054	J.3.14.20	Accidents	
86-055	J.3.14.20	Accidents	
86-056	J.3.13.6	Human Health - Radiological Risk	
86-057	J.3.14.18	Accidents	
86-058	J.3.12.24	Human Health Risk	
86-059	J.3.12.25	Human Health Risk	
86-060	J.3.12.19	Human Health Risk	
86-061	J.3.30.22	Editorial	
86-062	J.3.18.1	Decommissioning	
86-063	J.3.18.4	Decommissioning	
86-064	J.3.18.3	Decommissioning	
86-065	J.3.19.5	Environmental Justice	
86-066	J.3.14.9	Accidents	

Comment[a] Number	Section Number	Section Name	Commenter
86-066	J.3.14.16	Accidents	
86-067	J.3.20.3	Transportation	
86-068	J.3.20.4	Transportation	
86-069	J.3.13.6	Human Health - Radiological Risk	
86-070	J.3.30.24	Editorial	
86-071	J.3.30.25	Editorial	
86-072	J.3.22.5	Cumulative Impacts	
86-073	J.3.17.8	Waste Management	
86-074	J.3.24.2	Mitigation	
86-075	J.3.24.3	Mitigation	
86-076	J.3.24.3	Mitigation	
86-077	J.3.24.3	Mitigation	
86-078	J.3.24.5	Mitigation	
86-079	J.3.24.6	Mitigation	
86-080	J.3.24.11	Mitigation	
86-081	J.3.24.12	Mitigation	
86-082	J.3.24.13	Mitigation	
86-083	J.3.24.12	Mitigation	
86-084	J.3.24.14	Mitigation	
86-085	J.3.24.7	Mitigation	
86-086	J.3.24.16	Mitigation	
86-087	J.3.24.22	Mitigation	
86-088	J.3.19.5	Environmental Justice	
86-089	J.3.19.5	Environmental Justice	
86-090	J.3.24.4	Mitigation	
86-091	J.3.24.23	Mitigation	
86-092	J.3.24.15	Mitigation	
86-093	J.3.24.11	Mitigation	
86-094	J.3.30.27	Editorial	
86-095	J.3.30.28	Editorial	
86-096	J.3.24.17	Mitigation	
86-097	J.3.24.7	Mitigation	
86-098	J.3.24.18	Mitigation	
86-099	J.3.16.15	Hydrology	
86-100	J.3.20.5	Transportation	
86-101	J.3.20.13	Transportation	
86-102	J.3.20.6	Transportation	
86-103	J.3.20.7	Transportation	

Comment[a] Number	Section Number	Section Name	Commenter
86-104	J.3.30.35	Editorial	
86-105	J.3.20.8	Transportation	
86-106	J.3.30.36	Editorial	
86-107	J.3.30.37	Editorial	
86-108	J.3.20.14	Transportation	
86-109	J.3.30.38	Editorial	
86-110	J.3.20.9	Transportation	
86-111	J.3.20.10	Transportation	
86-112	J.3.13.6	Human Health - Radiological Risk	
86-113	J.3.12.25	Human Health Risk	
86-114	J.3.12.21	Human Health Risk	
86-115	J.3.12.21	Human Health Risk	
86-116	J.3.12.22	Human Health Risk	
86-117	J.3.13.9	Human Health - Radiological Risk	
86-118	J.3.13.10	Human Health - Radiological Risk	
86-119	J.3.13.11	Human Health - Radiological Risk	
86-120	J.3.13.11	Human Health - Radiological Risk	
86-121	J.3.30.23	Editorial	
86-122	J.3.14.23	Accidents	
86-123	J.3.13.19	Human Health - Radiological Risk	
86-124	J.3.14.24	Accidents	
86-125	J.3.13.20	Human Health - Radiological Risk	
86-126	J.3.15.6	Air Quality	
86-127	J.3.28.2	Ecology	
87-001	J.3.7.11	Scope - DOE Policy	Allison Macfarlane
87-002	J.3.17.9	Waste Management	
87-003	J.3.11.2	Alternatives - Immobilization	
87-004	J.3.10.2	Alternatives	
87-005	J.3.11.2	Alternatives - Immobilization	
87-006	J.3.23.8	Cost Benefit	
88-001	J.3.9.1	Terrorism	Soumya Ganapathy
88-002	J.3.8.2	Scope - Safety Evaluation Report	
88-003	J.3.19.3	Environmental justice	
88-004	J.3.10.5	Alternatives	
89-001	J.3.14.9	Accidents	Edward J. Siskin
89-002	J.3.14.17	Accidents	
89-003	J.3.14.18	Accidents	
89-004	J.3.14.20	Accidents	

Comment[a] Number	Section Number	Section Name	Commenter
89-005	J.3.14.9	Accidents	
89-006	J.3.14.9	Accidents	
89-007	J.3.14.16	Accidents	
89-007	J.3.14.18	Accidents	
89-008	J.3.6.3	Scope - General	
89-009	J.3.19.5	Environmental Justice	
89-010	J.3.15.1	Air Quality	
89-011	J.3.15.1	Air Quality	
89-012	J.3.18.2	Decommissioning	
89-013	J.3.24.1	Mitigation	
89-014	J.3.6.3	Scope - General	
89-015	J.3.30.1	Editorial	
89-016	J.3.30.2	Editorial	
89-017	J.3.30.3	Editorial	
89-018	J.3.30.4	Editorial	
89-019	J.3.30.6	Editorial	
89-020	J.3.30.5	Editorial	
89-021	J.3.30.7	Editorial	
89-022	J.3.30.8	Editorial	
89-023	J.3.30.9	Editorial	
89-024	J.3.30.10	Editorial	
89-025	J.3.30.11	Editorial	
89-026	J.3.28.6	Ecology	
89-027	J.3.30.13	Editorial	
89-028	J.3.30.12	Editorial	
89-029	J.3.28.7	Ecology	
89-030	J.3.30.3	Editorial	
89-031	J.3.26.1	Geology and Soils	
89-032	J.3.26.2	Geology and Soils	
89-033	J.3.26.3	Geology and Soils	
89-034	J.3.30.49	Editorial	
89-035	J.3.28.3	Ecology	
89-036	J.3.28.4	Ecology	
89-037	J.3.2805	Ecology	
89-038	J.3.27.1	Cultural Resources	
89-039	J.3.12.11	Human Health Risk	
89-040	J.3.30.29	Editorial	
89-041	J.3.30.30	Editorial	

Comment[a] Number	Section Number	Section Name	Commenter
89-042	J.3.30.31	Editorial	
89-043	J.3.30.32	Editorial	
89-044	J.3.13.12	Human Health - Radiological Risk	
89-045	J.3.12.12	Human Health Risk	
89-046	J.3.30.1	Editorial	
89-047	J.3.30.41	Editorial	
89-048	J.3.30.14	Editorial	
89-049	J.3.12.24	Human Health Risk	
89-050	J.3.12.13	Human Health Risk	
89-051	J.3.20.11	Transportation	
89-052	J.3.30.39	Editorial	
89-053	J.3.22.7	Cumulative Impacts	
89-054	J.3.22.2	Cumulative Impacts	
89-055	J.3.22.3	Cumulative Impacts	
89-056	J.3.23.3	Cost Benefit	
89-057	J.3.23.4	Cost Benefit	
89-058	J.3.23.8	Cost Benefit	
89-059	J.3.23.6	Cost Benefit	
89-060	J.3.23.7	Cost Benefit	
89-061	J.3.25.1	Unavoidable Impacts	
89-062	J.3.30.40	Editorial	
89-063	J.3.24.1	Mitigation	
89-064	J.3.24.1	Mitigation	
89-065	J.3.24.9	Mitigation	
89-066	J.3.24.1	Mitigation	
89-067	J.3.24.10	Mitigation	
89-068	J.3.30.33	Editorial	
89-069	J.3.30.15	Editorial	
89-070	J.3.30.34	Editorial	
90-001	J.3.1.6	General Opposition	Rachel Western
90-002	J.3.21.1	MOX Fuel Use	
90-003	J.3.17.4	Waste Management	
91-001	J.3.11.2	Alternatives - Immobilization	David Kyler
91-002	J.3.21.2	MOX Fuel Use	
91-003	J.3.21.2	MOX Fuel Use	
91-004	J.3.28.1	Ecology	
91-005	J.3.29.1	Socioeconomics	
91-006	J.3.9.1	Scope - Terrorism	

Comment[a] Number	Section Number	Section Name	Commenter
91-006	J.3.9.2	Scope - Terrorism	
91-007	J.3.1.2	General Opposition	
92-001	J.3.5.1	Licensing Process	Glenn Carroll
92-002	J.3.11.2	Alternatives - Immobilization	
92-003	J.3.6.9	Scope - General	
92-003	J.3.21.1	MOX Fuel Use	
92-004	J.3.7.7	Scope - DOE Policy	
92-005	J.3.17.3	Waste Management	
92-006	J.3.13.13	Human Health - Radiological Risk	
93-001	J.3.5.1	Licensing Process	Mary Olson
93-002	J.3.8.4	Scope - Safety Evaluation Report	
93-003	J.3.6.5	Scope - General	
93-004	J.3.11.3	Alternatives - Immobilization	
93-005	J.3.9.1	Scope - Terrorism	
93-006	J.3.7.4	Scope - DOE Policy	
93-007	J.3.10.3	Alternatives	
93-008	J.3.7.2	Scope - DOE Policy	
93-008	J.3.7.6	Scope - DOE Policy	
93-009	J.3.7.5	Scope - DOE Policy	
93-009	J.3.7.6	Scope - DOE Policy	
93-010	J.3.6.9	Scope - General	
93-011	J.3.13.21	Human Health - Radiological Risk	
93-012	J.3.16.3	Hydrology	
93-013	J.3.22.4	Cumulative Impacts	
93-014	J.3.13.6	Human Health - Radiological Risk	
93-015	J.3.8.4	Scope - Safety Evaluation Report	
93-016	J.3.17.3	Waste Management	
93-017	J.3.19.3	Environmental Justice	
93-017	J.3.19.4	Environmental Justice	
93-018	J.3.13.13	Human Health - Radiological Risk	
93-019	J.3.9.2	Scope - Terrorism	
94-001	J.3.13.6	Human Health - Radiological Risk	Ralph L. Anderson
94-001	J.3.14.16	Accidents	
94-001	J.3.14.9	Accidents	
94-002	J.3.19.1	Environmental Justice	
95-001	J.3.4.6	NEPA Process	Thomas R. Mott
95-002	J.3.7.10	Scope - DOE Policy	
95-003	J.3.5.4	Licensing Process	

Comment[a] Number	Section Number	Section Name	Commenter
96-001	J.3.1.4	General Opposition	Mildred McClain
96-002	J.3.19.6	Environmental Justice	
96-003	J.3.4.7	NEPA Process	
96-004	J.3.4.1	NEPA Process	
96-005	J.3.19.11	Environmental Justice	
96-006	J.3.11.2	Alternatives - Immobilization	
96-007	J.3.17.4	Waste Management	
96-008	J.3.4.4	NEPA Process	
96-008	J.3.4.6	NEPA Process	
96-009	J.3.4.1	NEPA Process	
96-010	J.3.4.2	NEPA Process	
96-011	J.3.19.3	Environmental Justice	
96-012	J.3.8.2	Scope - Safety Evaluation Report	
96-013	J.3.19.4	Environmental justice	
96-014	J.3.19.4	Environmental justice	
96-015	J.3.4.1	NEPA Process	
96-015	J.3.19.4	Environmental Justice	
96-016	J.3.17.4	Waste Management	
96-017	J.3.14.15	Accidents	
96-018	J.3.4.7	NEPA Process	
96-019	J.3.7.7	Scope - DOE Policy	
96-020	J.3.9.1	Scope - Terrorism	
96-021	J.3.8.4	Scope - Safety Evaluation Report	
96-022	J.3.3.2	Editorial	
96-023	J.3.4.2	NEPA Process	
96-023	J.3.4.5	NEPA Process	
96-024	J.3.4.2	NEPA Process	
96-024	J.3.4.5	NEPA Process	
96-025	J.3.8.2	Scope - Safety Evaluation Report	
96-026	J.3.19.4	Environmental Justice	
96-027	J.3.11.2	Alternatives - Immobilization	
96-028	J.3.4.5	NEPA Process	
96-029	J.3.4.7	NEPA Process	
96-030	J.3.19.10	Environmental Justice	
96-031	J.3.4.6	NEPA Process	
96-032	J.3.7.3	Scope - DOE Policy	
96-033	J.3.6.2	Scope - General	
96-034	J.3.19.4	Environmental Justice	

Comment[a] Number	Section Number	Section Name	Commenter
96-035	J.3.8.1	Scope - Safety Evaluation Report	
96-036	J.3.8.2	Scope - Safety Evaluation Report	
96-037	J.3.22.6	Cumulative Impacts	
96-038	J.3.19.4	Environmental justice	
96-039	J.3.1.3	General Opposition	
97-001	J.3.4.2	NEPA Process	Alexander P. Murray
97-001	J.3.4.4	NEPA Process	
97-002	J.3.24.20	Mitigation	
97-003	J.3.8.1	Scope - Safety Evaluation Report	
97-004	J.3.14.14	Accidents	
97-005	J.3.8.1	Scope - Safety Evaluation Report	
97-006	J.3.4.4	NEPA Process	
97-007	J.3.14.15	Accidents	
97-008	J.3.12.20	Human Health Risk	
97-009	J.3.12.14	Human Health Risk	
97-010	J.3.12.23	Human Health Risk	
97-011	J.3.14.25	Accidents	
97-012	J.3.12.15	Human Health Risk	
97-013	J.3.6.6	Scope - General	
97-014	J.3.17.12	Waste Management	
97-015	J.3.14.15	Accidents	
97-016	J.3.17.6	Waste Management	
97-017	J.3.10.8	Alternatives	
97-018	J.3.10.8	Alternatives	
98-001	J.3.1.6	General Opposition	Sara Barczak
98-002	J.3.11.3	Alternatives - Immobilization	
98-003	J.3.7.3	Scope - DOE Policy	
98-003	J.3.7.5	Scope - DOE Policy	
98-004	J.3.7.6	Scope - DOE Policy	
98-005	J.3.7.7	Scope - DOE Policy	
98-006	J.3.21.2	MOX Fuel Use	
98-007	J.3.16.1	Hydrology	
98-008	J.3.14.19	Accidents	
98-009	J.3.6.7	Scope - General	
98-010	J.3.1.6	General Opposition	
99-001	J.3.1.5	General Opposition	Bev Baker
99-002	J.3.8.9	Scope - Safety Evaluation Report	
99-003	J.3.16.1	Hydrology	

Comment[a] Number	Section Number	Section Name	Commenter
100-001	J.3.8.6	Scope - Safety Evaluation Report	Meira Warshauer
101-001	J.3.14.15	Accidents	Judy Ponder
101-002	J.3.13.22	Human Health - Radiological Risk	
101-003	J.3.16.1	Hydrology	
102-001	J.3.14.15	Accidents	Bart Patton
102-002	J.3.13.22	Human Health - Radiological Risk	
103-001	J.3.5.1	Licensing Process	Terri Jagger Bline Emily B. Calhoun Faye McKay-Clegg Eleanor L. Richardson Maruguerite Sweet
103-002	J.3.11.2	Alternatives - Immobilization	Terri Jagger Bline Emily B. Calhoun Faye McKay-Clegg Eleanor L. Richardson Maruguerite Sweet
103-003	J.3.17.6	Waste Management	Terri Jagger Bline Emily B. Calhoun Faye McKay-Clegg Eleanor L. Richardson Maruguerite Sweet
103-004	J.3.9.1	Scope - Terrorism	Terri Jagger Bline Emily B. Calhoun Faye McKay-Clegg Eleanor L. Richardson Maruguerite Sweet
104-001	J.3.1.6	General Opposition	Petition
105-001	J.3.1.3	General Opposition	Robert B. Mills
105-002	J.3.11.5	Alternatives - Immobilization	
105-003	J.3.8.3	Scope - Safety Evaluation Report	
105-003	J.3.8.6	Scope - Safety Evaluation Report	
105-004	J.3.13.7	Human Health - Radiological Risk	
105-005	J.3.8.1	Scope - Safety Evaluation Report	
105-006	J.3.7.10	Scope - DOE Policy	
105-007	J.3.21.1	MOX Fuel Use	
105-008	J.3.11.2	Alternatives - Immobilization	
105-009	J.3.10.1	Alternatives	
105-010	J.3.11.2	Alternatives - Immobilization	

Comment[a] Number	Section Number	Section Name	Commenter
105-011	J.3.23.7	Cost Benefit	
105-012	J.3.11.3	Alternatives - Immobilization	
105-013	J.3.13.23	Human Health - Radiological Risk	
105-014	J.3.1.7	General Opposition	
105-015	J.3.14.21	Accidents	
106-001	J.3.1.7	General Opposition	Diane F. Matesic
107-001	J.3.15.7	Air Quality	Heinz J. Mueller
107-002	J.3.12.16	Human Health - Gen	
108-001	J.3.17.3	Waste Management	Carolyn Cain
108-002	J.3.23.1	Cost Benefit	
108-003	J.3.11.1	Alternatives - Immobilization	
109-001	J.3.1.6	General Opposition	Jennifer Zanck
110-001	J.3.1.6	General Opposition	Mai Dang
111-001	J.3.8.6	Scope - Safety Evaluation Report	Ruth Thomas
112-001	J.3.1.6	General Opposition	Ruth Sanford
112-002	J.3.11.2	Alternatives - Immobilization	
112-003	J.3.17.6	Waste Management	
112-004	J.3.9.1	Scope - Terrorism	
113-001	J.3.8.6	Scope - Safety Evaluation Report	Dell Isham
114-001	J.3.7.5	Scope - DOE Policy	Louis Zeller
114-002	J.3.7.5	Scope - DOE Policy	
114-002	J.3.13.13	Human Health - Radiological Risk	
114-003	J.3.7.7	Scope - DOE Policy	
114-004	J.3.21.1	MOX Fuel Use	
114-005	J.3.17.11	Waste Management	
114-006	J.3.7.4	Scope - DOE Policy	
114-007	J.3.11.3	Alternatives - Immobilization	
114-008	J.3.11.3	Alternatives - Immobilization	
114-009	J.3.9.1	Terrorism	
114-009	J.3.9.2	Terrorism	
114-010	J.3.21.1	MOX Fuel Use	
114-011	J.3.9.2	Scope - Terrorism	
114-012	J.3.20.16	Transportation	
114-013	J.3.9.1	Scope - Terrorism	
115-001	J.3.13.8	Human Health - Radiological Risk	Mary Olson
115-002	J.3.10.8	Alternatives	
115-003	J.3.19.7	Environmental justice	
115-004	J.3.17.3	Waste Management	

Comment[a] Number	Section Number	Section Name	Commenter
116-001	J.3.4.8	NEPA Process	Peter James Atherton
116-002	J.3.9.1	Scope - Terrorism	
116-003	J.3.14.12	Accidents	
116-004	J.3.1.1	General Opposition	
116-005	J.3.5.5	Licensing Process	
116-006	J.3.10.6	Alternatives	
116-007	J.3.14.4	Accidents	
116-008	J.3.14.5	Accidents	
116-009	J.3.20.15	Transportation	
116-010	J.3.8.4	Scope - Safety Evaluation Report	
116-011	J.3.8.2	Scope - Safety Evaluation Report	
116-012	J.3.8.5	Scope - Safety Evaluation Report	
116-013	J.3.10.8	Alternatives	
116-014	J.3.8.7	Scope - Safety Evaluation Report	
116-015	J.3.14.22	Accidents	
116-016	J.3.17.7	Waste Management	
116-017	J.3.13.14	Human Health - Radiological Risk	
116-018	J.3.4.9	NEPA Process	
116-019	J.3.14.6	Accidents	
116-020	J.3.8.8	Scope - Safety Evaluation Report	

[a] Some comments are associated with more than one section.