Table G–28. Emissions (kg/yr) From Operation of Pit Conversion and Immobilization Facilities in FMEF and MOX in New Construction at Hanford

	Pit Conversion			Immobilization			MOX		
Pollutant	**EG**	**Process**	**Veh**	**EG**	**Process[a]**	**Veh**	**EG**	**Process**	**Veh**
Carbon monoxide	520	0	41,800	1,460	0	52,700	374	0	34,200
Nitrogen dioxide	2,000	0	11,200	6,790	0	14,100	1,738	0	9,170
PM_{10}	50	0	38,100	480	0	48,100	122	0	31,200
Sulfur dioxide	34	0	0	450	0	0	114	0	0
Volatile organic compounds	58	0	5,150	550	0	6,490	142	0	4,210
Total suspended particulates	50	0	38,100	480	0	48,100	122	0	31,200
[Text deleted.]									

[a] Ceramic or glass.
Key: EG, emergency generator; FMEF, Fuels and Materials Examination Facility; Veh, vehicle.
Source: UC 1998a, 1998b, 1999a, 1999b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–29. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–29. Concentrations ($\mu g/m^3$) From Operation of Pit Conversion and Immobilization Facilities in FMEF and MOX in New Construction at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	Immobilization (Ceramic or Glass)	MOX	Total
Carbon monoxide	8 hours	10,000	34.1	0.144	0.404	0.103	34.7
	1 hour	40,000	48.3	0.978	2.75	0.704	52.7
Nitrogen dioxide	Annual	100	0.25	0.0166	0.0563	0.0144	0.337
PM_{10}	Annual	50	0.0179	0.000415	0.00398	0.00101	0.023
	24 hours	150	0.77	0.00461	0.0442	0.0113	0.83
Sulfur dioxide	Annual	50	1.63	0.000282	0.00373	0.000946	1.64
	24 hours	260	8.91	0.00313	0.0415	0.0105	8.97
	3 hours	1,300	29.6	0.0213	0.282	0.0715	30
	[Text deleted.]						
	1 hour	660[b]	32.9	0.064	0.847	0.214	34
Total suspended particulates	Annual	60	0.0179	0.000415	0.00398	0.00101	0.023
	24 hours	150	0.77	0.00461	0.0443	0.0113	0.83
[Text deleted.]							

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
[Text deleted.]
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.2 INEEL

G.2.1 Assessment Data

Emission rates for criteria, hazardous, and toxic pollutants at INEEL are presented in Table F.1.2.4–1 of the *Storage and Disposition PEIS* (DOE 1996a:F-10). These emission rates were used as input into the modeled No Action pollutant concentrations presented in that document and reflect INEEL facility emissions for 1990, which were assumed to be representative of No Action for 2005. The storage alternative selected for INEEL results in no change in these concentrations (DOE 1996a:4-138). Other onsite activities related to programs analyzed in EISs for spent nuclear fuel and waste management are also included in the estimates of the No Action concentration for surplus plutonium disposition shown in Table G–30. For the cumulative impacts analysis, additional emissions from the proposed Advanced Mixed Waste Treatment Project are also considered. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–30. Estimated Concentrations ($\mu g/m^3$) From No Action at INEEL

Pollutant	Averaging Period	PEIS Estimated Base Year (2005)	Other Onsite From PEIS	No Action	AMWTP[a]
Carbon monoxide	8 hours	284	18	302	0.85
	1 hour	614	605	1,219	115
Nitrogen dioxide	Annual	4	7	11	0.34
PM_{10}	Annual	3	0	3	0.006
	24 hours	33	6	39	4.6
Sulfur dioxide	Annual	6	0	6	0.012
	24 hours	135	2	137	4.5
	3 hours	579	12	591	25
Benzene	Annual	0.029	0	0.029	0.0001
[Text deleted.]					

[a] Contribution from the Advanced Mixed Waste Treatment Project proposed action with microencapsulation or vitrification (included in cumulative impacts analysis).

Key: AMWTP, *INEEL Advanced Mixed Waste Treatment Project Final EIS*; PEIS, *Storage and Disposition PEIS*.

Source: DOE 1996a:4-138, 4-928, 4-929; DOE 1999.

G.2.2 Facilities

G.2.2.1 Pit Conversion Facility

G.2.2.1.1 Construction of Pit Conversion Facility

Potential air quality impacts from modification of the Fuel Processing Facility (FPF) and construction of new support facilities at INEEL for pit disassembly and conversion were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G–31.

Maximum air pollutant concentrations from construction activities are summarized in Table G–32 but are not expected to result in the exceedance of the ambient air quality standards.

Table G–31. Emissions (kg/yr) From Construction of Pit Conversion Facility in FPF at INEEL

Pollutant	Diesel Equipment and Construction Fugitive Emissions	Vehicles
Carbon monoxide	1,300	44,100
Nitrogen dioxide	5,600	11,100
PM_{10}	3,900	33,300
Sulfur dioxide	370	0
Volatile organic compounds	460	5,390

Key: FPF, Fuel Processing Facility.
Source: UC 1998c.

Table G–32. Concentrations ($\mu g/m^3$) From Construction of Pit Conversion Facility in FPF at INEEL

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	302	0.524	303
	1 hour	40,000	1,219	1.42	1,220
Nitrogen dioxide	Annual	100	11	0.0658	11.1
PM_{10}	Annual	50	3	0.0458	3.05
	24 hours	150	39	0.585	39.6
Sulfur dioxide	Annual	80	6	0.00434	6
	24 hours	365	137	0.0555	137
	3 hours	1,300	591	0.223	591

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
Key: FPF, Fuel Processing Facility.
Source: EPA 1997; ID DHW 1995.

G.2.2.1.2 Operation of Pit Conversion Facility

Potential air quality impacts from operation of the pit conversion and support facilities at INEEL were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–33. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 35 m (115 ft) height, 1.82 m (6.0 ft) diameter, stack exit temperature of 11 C (52 F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 45.7 m (150 ft) height, 1.85 m (6.1 ft) diameter, stack exit temperature of 174 C (345 F), and an exit velocity of 3.25 m/s (10.7 ft/s) (UC 1998c).

Table G–33. Emissions (kg/yr) From Operation of Pit Conversion Facility in FPF at INEEL

Pollutant	Boilers	Emergency Generator	Process	Vehicles
Carbon monoxide	580	520	0	74,100
Nitrogen dioxide	18,000	2,000	0	18,600
PM_{10}	1,250	50	0	56,000
Sulfur dioxide	30,000	34	0	0
Volatile organic compounds	62	58	0	9,050

Key: FPF, Fuel Processing Facility.
Source: UC 1998c.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–34.

Table G–34. Concentrations ($\mu g/m^3$) From Operation of Pit Conversion Facility in FPF at INEEL

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	302	0.253	302
	1 hour	40,000	1,219	0.80	1,220
Nitrogen dioxide	Annual	100	11	0.0838	11.1
PM_{10}	Annual	50	3	0.00477	3.00
	24 hours	150	39	0.0494	39.1
Sulfur dioxide	Annual	80	6	0.101	6.10
	24 hours	365	137	1.01	138
	3 hours	1,300	591	5.42	596

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
Key: FPF, Fuel Processing Facility.
Source: EPA 1997; ID DHW 1995.

At the nearest prevention of significant deterioration (PSD) Class I area, Craters of the Moon National Monument, the contribution to air pollutant concentrations is less than 0.01 $\mu g/m^3$ for nitrogen dioxide, particulate matter with an aerodynamic diameter less than or equal to 10 μm (PM_{10}), and sulfur dioxide, except for the 24-hr sulfur dioxide value, which is 0.05 $\mu g/m^3$, and the 3-hr sulfur dioxide value, which is 0.23 $\mu g/m^3$. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

G.2.2.2 MOX Facility

G.2.2.2.1 Construction of MOX Facility

Potential air quality impacts from construction of new MOX and support facilities at INEEL were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G–35.

Table G–35. Emissions (kg/yr) From Construction of New MOX Facility at INEEL

Pollutant	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Vehicles
Carbon monoxide	3,840	0	0	114,000
Nitrogen dioxide	10,080	0	0	28,600
PM_{10}	768	6,860	1,460	85,900
Sulfur dioxide	1,020	0	0	0
Volatile organic compounds	792	0	0	13,900
Toxics[b]	0	<1	0	0

[a] Does not include fugitive emissions from the concrete batch plant.
[b] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Source: UC 1998d.

Maximum air pollutant concentrations from construction activities are summarized in Table G–36.

Table G–36. Concentrations ($\mu g/m^3$) From Construction of New MOX Facility at INEEL

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	302	1.54	304
	1 hour	40,000	1,219	4.18	1,220
Nitrogen dioxide	Annual	100	11	0.118	11.1
PM_{10}	Annual	50	3	0.105	3.11
	24 hours	150	39	5.32	44.3
Sulfur dioxide	Annual	80	6	0.012	6.01
	24 hours	365	137	0.153	137
	3 hours	1,300	591	0.614	592
Toxics[b]	Annual	0.12	0.029	0.00001	0.029

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.
Source: EPA 1997; ID DHW 1995.

G.2.2.2.2 Operation of MOX Facility

Potential air quality impacts from operation of the new MOX and support facilities at INEEL were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–37. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 8 m (26 ft) height, 0.3048 m (1.0 ft) diameter, stack exit temperature of 11 C (52 F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 45.7 m (150 ft) height, 1.85 m (6.1 ft) diameter, stack exit temperature of 174 C (345 F), and exit velocity of 3.25 m/s (10.7 ft/s) (UC 1998d).

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–38.

Table G–37. Emissions (kg/yr) From Operation of New MOX Facility at INEEL

Pollutant	Boilers	Emergency Generator	Process	Vehicles
Carbon monoxide	4,800	374	0	77,600
Nitrogen dioxide	12,000	1,738	0	19,500
PM_{10}	636	122	0	58,600
Sulfur dioxide	72,600	114	0	0
Volatile organic compounds	0	142	0	9,470
[Text deleted.]				

[Text deleted.]
Source: UC 1998d.

Table G–38. Concentrations ($\mu g/m^3$) From Operation of New MOX Facility at INEEL

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	302	0.509	303
	1 hour	40,000	1,219	2.34	1,220
Nitrogen dioxide	Annual	100	11	0.0606	11.1
PM_{10}	Annual	50	3	0.00356	3.
	24 hours	150	39	0.0396	39.
Sulfur dioxide	Annual	80	6	0.244	6.24
	24 hours	365	137	2.45	139
	3 hours	1,300	591	13.2	604
[Text deleted.]					

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[Text deleted.]
Source: EPA 1997; ID DHW 1995.

At the nearest PSD Class I area, Craters of the Moon National Monument, the contribution to air pollutant concentrations is less than 0.01 $\mu g/m^3$ for nitrogen dioxide and PM_{10}. For sulfur dioxide the annual value is 0.01 $\mu g/m^3$, the 24-hr value is 0.11 $\mu g/m^3$, and the 3-hr value is 0.46 $\mu g/m^3$. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

G.2.2.3 Pit Conversion and MOX Facilities

G.2.2.3.1 Construction of Pit Conversion and MOX Facilities

Potential air quality impacts from modification of FPF for pit disassembly and conversion and construction of new MOX and support facilities at INEEL were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G–39.

Table G–39. Emissions (kg/yr) From Construction of Pit Conversion Facility in FPF and New MOX Facility at INEEL

	Pit Conversion		MOX			
Pollutant	Diesel Equipment and Construction Fugitive Emissions	Vehicles	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Vehicles
Carbon monoxide	1,300	44,100	3,840	0	0	114,000
Nitrogen dioxide	5,600	11,100	10,080	0	0	28,600
PM_{10}	3,900	33,300	768	6,860	1,460	85,900
Sulfur dioxide	370	0	1,020	0	0	0
Volatile organic compounds	460	5,390	792	0	0	13,900
Toxics[b]	0	0	0	<1	0	0

[a] Does not include fugitive emissions from the concrete batch plant.
[b] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Key: FPF, Fuel Processing Facility.
Source: UC 1998c, 1998d.

Maximum air pollutant concentrations from construction activities are summarized in Table G–40.

Table G–40. Concentrations ($\mu g/m^3$) From Construction of Pit Conversion Facility in FPF and New MOX Facility at INEEL

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	MOX	Total
Carbon monoxide	8 hours	10,000	302	0.524	1.55	304
	1 hour	40,000	1,219	1.42	4.18	1,220
Nitrogen dioxide	Annual	100	11	0.0658	0.118	11.2
PM_{10}	Annual	50	3	0.0458	0.105	3.15
	24 hours	150	39	0.585	5.32	44.9
Sulfur dioxide	Annual	80	6	0.00434	0.012	6.02
	24 hours	365	137	0.0555	0.153	137
	3 hours	1,300	591	0.223	0.614	592
Toxics[b]	Annual	0.12	0.029	0	0.00001	0.029

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.
Key: FPF, Fuel Processing Facility.
Source: EPA 1997; ID DHW 1995.

G.2.2.3.2 Operation of Pit Conversion and MOX Facilities

Potential air quality impacts from operation of the new pit conversion, MOX, and support facilities at INEEL were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from boilers, emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–41. Stack parameters used for modeling were as stated previously.

Table G–41. Emissions (kg/yr) From Operation of Pit Conversion Facility in FPF and New MOX Facility at INEEL

	Pit Conversion				MOX			
Pollutant	**Boilers**	**Emergency Generator**	**Process**	**Vehicles**	**Boilers**	**Emergency Generator**	**Process**	**Vehicles**
Carbon monoxide	580	520	0	74,100	4,800	374	0	77,600
Nitrogen dioxide	18,000	2,000	0	18,600	12,000	1,738	0	19,500
PM_{10}	1,250	50	0	56,000	636	122	0	58,600
Sulfur dioxide	30,000	34	0	0	72,600	114	0	0
Volatile organic compounds	62	58	0	9,050	0	142	0	9,470
[Text deleted.]								

[Text deleted.]
Key: FPF, Fuel Processing Facility.
Source: UC 1998c, 1998d.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–42.

Table G–42. Concentrations ($\mu g/m^3$) From Operation of Pit Conversion Facility in FPF and New MOX Facility at INEEL

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	MOX	Total
Carbon monoxide	8 hours	10,000	302	0.253	0.509	303
	1 hour	40,000	1,219	0.80	2.34	1,220
Nitrogen dioxide	Annual	100	11	0.0838	0.0606	11.1
PM_{10}	Annual	50	3	0.00477	0.00356	3.01
	24 hours	150	39	0.0494	0.0396	39.1
Sulfur dioxide	Annual	80	6	0.101	0.244	6.35
	24 hours	365	137	1.01	2.45	140
	3 hours	1,300	591	5.42	13.2	610
[Text deleted.]						

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[Text deleted.]
Key: FPF, Fuel Processing Facility.
Source: EPA 1997; ID DHW 1995.

At the nearest PSD Class I area, Craters of the Moon National Monument, the contribution to air pollutant concentrations are 0.01 $\mu g/m^3$ or less for nitrogen dioxide and PM_{10}. For sulfur dioxide the annual value is 0.01 $\mu g/m^3$, the 24-hr value is 0.16 $\mu g/m^3$, and the 3-hr value is 0.69 $\mu g/m^3$. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

G.3 PANTEX

G.3.1 Assessment Data

Emission rates for criteria, hazardous, and toxic air pollutants at Pantex are presented in Table 4.7.2.1–3 of the *Final Environmental Impact Statement for the Continued Operation of Pantex* (DOE 1996c:4-147). These emission rates were used as input into the modeled pollutant concentrations presented in that document and reflect Pantex facility emissions for over a 10-year period to about 2006. These concentrations are assumed to be representative of No Action for 2005 and include the upgrade storage alternative selected for Pantex and discussed in the *Storage and Disposition PEIS* (DOE 1996a:4-190). Other onsite activities related to programs analyzed in EISs for stockpile stewardship management and waste management are added to these concentrations as shown in Table G–43. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–43. Estimated Concentrations ($\mu g/m^3$) From No Action at Pantex

Pollutant	Averaging Period	PEIS No Action[a]	Other Onsite From PEIS	No Action
Carbon monoxide	8 hours	602	17.5	620
	1 hour	2,900	92.8	2,990
Nitrogen dioxide	Annual	0.542	1.4	1.94
PM_{10}	Annual	8.73	0.06	8.79
	24 hours	88.5	0.93	89.4
Sulfur dioxide	Annual	0	0	0
	24 hours	0.00002	0	0.00002
	3 hours	0.00008	0	0.00008
	30 minutes	0.00016	0	0.00016
Total suspended particulates	3 hours	(a)	(a)	(a)
	1 hour	(a)	(a)	(a)
Benzene	Annual	0.0547	0	0.0547
	1 hour	19.4	0	19.4
[Text deleted.]				

[a] Three- and 1-hr concentrations for total suspended particulates were not reported in the source document.
[Text deleted.]
Key: PEIS, *Storage and Disposition PEIS.*
Source: DOE 1996a:4-936, 4-937; 1996c:4-139.

G.3.2 Facilities

G.3.2.1 Pit Conversion Facility

G.3.2.1.1 Construction of Pit Conversion Facility

Potential air quality impacts from construction of new pit conversion and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–44.

Maximum air pollutant concentrations from construction activities are summarized in Table G–45.

Table G–44. Emissions (kg/yr) From Construction of New Pit Conversion Facility at Pantex

Pollutant	Diesel Equipment and Construction Fugitive Emissions	Vehicles
Carbon monoxide	6,400	40,500
Nitrogen dioxide	29,200	11,200
PM_{10}	20,300	38,900
Sulfur dioxide	1,900	0
Volatile organic compounds	2,400	5,140
Total suspended particulates	47,500	38,900

Source: UC 1998e.

Table G–45. Concentrations ($\mu g/m^3$) From Construction of New Pit Conversion Facility at Pantex

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	620	3.77	623
	1 hour	40,000	2,990	23.5	3,020
Nitrogen dioxide	Annual	100	1.94	0.501	2.44
PM_{10}	Annual	50	8.79	0.349	9.14
	24 hours	150	89.4	4.18	93.6
Sulfur dioxide	Annual	80	0	0.0326	0.0326
	24 hours	365	0.00002	0.392	0.392
	3 hours	1,300	0.00008	1.71	1.71
	30 minutes	1,048	0.00016	6.98	6.98
Total suspended particulates	3 hours	200	(b)	42.7	42.7
	1 hour	400	(b)	174	174

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.
Source: EPA 1997; TNRCC 1997a, 1997b.

G.3.2.1.2 Operation of Pit Conversion Facility

Potential air quality impacts from operation of the new pit conversion and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–46. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 35 m (115 ft) height, 1.82 m (6.0 ft) diameter, stack exit temperature of 20 C (68 F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 19.8 m (65 ft) height, 1.7 m (5.6 ft) diameter, stack exit temperature of 124 C (255 F), and an exit velocity of 6.2 m/s (20 ft/s) (UC 1998e).

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–47. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–46. Emissions (kg/yr) From Operation of New Pit Conversion Facility at Pantex

Pollutant	Boilers	Emergency Generator	Process	Vehicles
Carbon monoxide	780	520	0	38,800
Nitrogen dioxide	700	2,000	0	10,800
PM_{10}	300	50	0	37,300
Sulfur dioxide	13	34	0	0
Volatile organic compounds	132	58	0	4,920
Total suspended particulates	300	50	0	37,300

Source: UC 1998e.

Table G–47. Concentrations ($\mu g/m^3$) From Operation of New Pit Conversion Facility at Pantex

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	620	0.381	620
	1 hour	40,000	2,990	2.14	2,990
Nitrogen dioxide	Annual	100	1.94	0.0374	1.98
PM_{10}	Annual	50	8.79	0.00215	8.79
	24 hours	150	89.4	0.0225	89.5
Sulfur dioxide	Annual	80	0	0.00064	0.00064
	24 hours	365	0.00002	0.00753	0.00755
	3 hours	1,300	0.00008	0.0327	0.0328
	30 minutes	1,048	0.00016	0.129	0.129
Total suspended particulates	3 hours	200	(b)	0.0937	0.0937
	1 hour	400	(b)	0.273	0.273

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.
Source: EPA 1997; TNRCC 1997a, 1997b.

G.3.2.2 MOX Facility

G.3.2.2.1 Construction of MOX Facility

Potential air quality impacts from construction of new MOX and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–48.

Maximum air pollutant concentrations from construction activities are summarized in Table G–49.

Table G–48. Emissions (kg/yr) From Construction of New MOX Facility at Pantex

Pollutant	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Vehicles
Carbon monoxide	3,840	0	0	35,800
Nitrogen dioxide	10,080	0	0	9,930
PM_{10}	768[b]	6,890	1,460[b]	34,400
Sulfur dioxide	1,020	0	0	0
Volatile organic compounds	792	0	0	4,540
Total suspended particulates	768	13,700	1,460	34,400
Toxics[c]	0	<1	0	0

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis resulting in some overestimate of PM_{10} concentrations.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Source: UC 1998f.

Table G–49. Concentrations ($\mu g/m^3$) From Construction of New MOX Facility at Pantex

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	620	2.26	622
	1 hour	40,000	2,990	14.1	3,010
Nitrogen dioxide	Annual	100	1.94	0.173	2.12
PM_{10}	Annual	50	8.79	0.154	8.94
	24 hours	150	89.4	7.31	96.7
Sulfur dioxide	Annual	80	0	0.0175	0.018
	24 hours	365	0.00002	0.21	0.21
	3 hours	1,300	0.00008	0.917	0.918
	30 minutes	1,048	0.00016	3.75	3.75
Total suspended particulates	3 hours	200	(b)	57.4	57.4
	1 hour	400	(b)	234	234
Toxics[c]	Annual	3[d]	0.0547	0.00002	0.0547
	1 hour	75[d]	19.4	0.0162	19.4

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.
[d] Effects-screening level of the Texas Natural Resource Conservation Commission. Such levels are not ambient air standards, but merely "tools" used by the Toxicology and Risk Assessment staff to evaluate impacts of air pollutant emissions. Thus, exceedance of the screening levels by ambient air contaminants does not necessarily indicate a problem. That circumstance, however, would prompt a more thorough evaluation.
[Text deleted.]
Source: EPA 1997; TNRCC 1997a, 1997b.

G.3.2.2.2 Operation of MOX Facility

Potential air quality impacts from operation of the new MOX and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–50. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 8 m (26 ft) height, 0.3048 m

Table G–50. Emissions (kg/yr) From Operation of New MOX Facility at Pantex

Pollutant	Boilers	Emergency Generator	Process	Vehicles
Carbon monoxide	1,080	374	0	34,800
Nitrogen dioxide	1,470	1,738	0	9,660
PM_{10}	247	122	0	33,400
Sulfur dioxide	11	114	0	0
Volatile organic compounds	102	142	0	4,410
Total suspended particulates	247	122	0	33,400
[Text deleted.]				

Source: UC 1998f.

(1.0 ft) diameter, stack exit temperature of 20 C (68 F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 19.8 m (65 ft) height, 1.7 m (5.6 ft) diameter, stack exit temperature of 124 C (255 F), and an exit velocity of 6.2 m/s (20 ft/s) (UC 1998f).

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–51. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–51. Concentrations ($\mu g/m^3$) From Operation of New MOX Facility at Pantex

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	620	0.324	620
	1 hour	40,000	2,990	1.70	2,990
Nitrogen dioxide	Annual	100	1.94	0.0362	1.98
PM_{10}	Annual	50	8.79	0.00316	8.79
	24 hours	150	89.4	0.0352	89.5
Sulfur dioxide	Annual	80	0	0.00201	0.002
	24 hours	365	0.00002	0.0239	0.0239
	3 hours	1,300	0.00008	0.104	0.104
	30 minutes	1,048	0.00016	0.422	0.422
Total suspended particulates	3 hours	200	(b)	0.15	0.15
	1 hour	400	(b)	0.522	0.522
[Text deleted.]					

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.
[Text deleted.]
Source: EPA 1997; TNRCC 1997a, 1997b.

G.3.2.3 Pit Conversion and MOX Facilities

G.3.2.3.1 Construction of Pit Conversion and MOX Facilities

Potential air quality impacts from construction of new pit conversion, MOX, and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–52.

Table G–52. Emissions (kg/yr) From Construction of New Pit Conversion and MOX Facilities at Pantex

Pollutant	Pit Conversion: Diesel Equipment and Construction Fugitive Emissions	Pit Conversion: Vehicles	MOX: Diesel Equipment	MOX: Construction Fugitive Emissions[a]	MOX: Concrete Batch Plant	MOX: Vehicles
Carbon monoxide	6,400	40,500	3,840	0	0	35,800
Nitrogen dioxide	29,200	11,200	10,080	0	0	9,930
PM_{10}	20,300	38,900	768[b]	6,890	1,460[b]	34,400
Sulfur dioxide	1,900	0	1,020	0	0	0
Volatile organic compounds	2,400	5,140	792	0	0	4,540
Total suspended particulates	47,500	38,900	768	13,700	1,460	34,400
Toxics[c]	0	0	0	<1	0	0

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for MOX for the purpose of this analysis resulting in some overestimate of PM_{10} concentrations.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Source: UC 1998e, 1998f.

Maximum air pollutant concentrations from construction activities are summarized in Table G–53.

Table G–53. Concentrations (μ/m^3) From Construction of New Pit Conversion and MOX Facilities at Pantex

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	MOX	Total
Carbon monoxide	8 hours	10,000	620	3.77	2.26	626
	1 hour	40,000	2,990	23.5	14.1	3,030
Nitrogen dioxide	Annual	100	1.94	0.501	0.173	2.62
PM_{10}	Annual	50	8.79	0.349	0.154	9.29
	24 hours	150	89.4	4.18	7.31	100
Sulfur dioxide	Annual	80	0	0.0326	0.0175	0.0501
	24 hours	365	0.00002	0.392	0.21	0.602
	3 hours	1,300	0.00008	1.71	0.917	2.63
	30 minutes	1,048	0.00016	6.98	3.75	10.7
Total suspended particulates	3 hours	200	(b)	42.7	57.4	100
	1 hour	400	(b)	174	234	409
Toxics[c]	Annual	3	0.0547	0.00	0.00002	0.0547
	1 hour	75	19.4	0.00	0.0162	19.4

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.
[Text deleted.]
Source: EPA 1997; TNRCC 1997a, 1997b.

G.3.2.3.2 Operation of Pit Conversion and MOX Facilities

Potential air quality impacts from operation of the new pit conversion, MOX, and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–54. Stack parameters used for modeling were as stated previously.

Table G–54. Emissions (kg/yr) From Operation of New Pit Conversion and MOX Facilities at Pantex

	Pit Conversion				MOX			
Pollutant	Boilers	Emergency Generator	Process	Vehicles	Boilers	Emergency Generator	Process	Vehicles
Carbon monoxide	780	520	0	38,800	1,080	374	0	34,800
Nitrogen dioxide	700	2,000	0	10,800	1,470	1,738	0	9,660
PM_{10}	300	50	0	37,300	247	122	0	33,400
Sulfur dioxide	13	34	0	0	11	114	0	0
Volatile organic compounds	132	58	0	4,920	102	142	0	4,410
Total suspended particulates	300	50	0	37,300	247	122	0	33,400
[Text deleted.]								

[Text deleted.]
Source: UC 1998e, 1998f.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–55. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–55. Concentrations ($\mu g/m^3$) From Operation of New Pit Conversion and MOX Facilities at Pantex

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	MOX	Total
Carbon monoxide	8 hours	10,000	620	0.381	0.324	620
	1 hour	40,000	2,990	2.14	1.7	3,000
Nitrogen dioxide	Annual	100	1.94	0.0374	0.0362	2.02
PM_{10}	Annual	50	8.79	0.00215	0.00316	8.80
	24 hours	150	89.4	0.0225	0.0352	89.5
Sulfur dioxide	Annual	80	0	0.00064	0.00201	0.00265
	24 hours	365	0.00002	0.00753	0.0239	0.0315
	3 hours	1,300	0.00008	0.0327	0.104	0.137
	30 minutes	1,048	0.00016	0.129	0.422	0.551
Total suspended particulates	3 hours	200	(b)	0.0937	0.15	0.244
	1 hour	400	(b)	0.273	0.522	0.796
[Text deleted.]						

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.
[Text deleted.]
Source: EPA 1997; TNRCC 1997a, 1997b.

G.4 SRS

G.4.1 Assessment Data

Emission rates for 1994 for criteria, hazardous, and toxic air pollutants at SRS were used as input into the modeling of pollutant concentrations presented in the *Savannah River Site Spent Nuclear Fuel Management Draft Environmental Impact Statement* (DOE 1998a:3-26). Presented in Table G–56 are concentration estimates assumed to be representative of the No Action Alternative at SRS for 2005. These estimates take into account the storage upgrade to accommodate nonpit material from the Rocky Flats Environmental Technology Site (DOE 1996a:4-299), as well as other onsite activities responsive to EIS Records of Decision in various program areas, specifically, foreign research reactor spent nuclear fuel, highly enriched uranium disposition, interim management of nuclear materials, stockpile stewardship and management, tritium supply and recycling, and waste management (DOE 1996a:4-953, 4-954). Other activities at SRS, which may occur during the time period 2005–2015, including operation of the Tritium Extraction Facility and spent nuclear fuel processing, are discussed in the cumulative impacts section. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–56. Estimated Concentrations ($\mu g/m^3$) From No Action at SRS

Pollutant	Averaging Period	1994 Baseline Concentration[a]	Other Onsite Sources	No Action	TEF	SNF
Carbon monoxide	8 hours	632	39.1	671	0.45	1.3
	1 hour	5,010	82.2	5,100	3.6	9.8
Nitrogen dioxide	Annual	8.8	2.57	11.4	0.0055	3.4
PM_{10}	Annual	4.8	0.14	4.94	0.00009	0.02
	24 hours	80.6	5.13	85.7	0.01	0.13
Sulfur dioxide	Annual	16.3	0.39	16.7	0.00009	0.02
	24 hours	215	6.96	222	0.001	0.13
	3 hours	690	34.9	725	0.088	0.98
Total suspended particulates	Annual	43.3	2.08	45.4	0.00016	0.02
Benzene	24 hours	20.7	0	20.7	0	0
[Text deleted.]						

[a] DOE 1998a:3-26.

Key: SNF, SRS *Spent Nuclear Fuel Management Draft EIS*; TEF, *Construction and Operation of a Tritium Extraction Facility at SRS Draft EIS*.

Source: DOE 1995a:E-10–E-13; 1995b:5-3; 1995c: vol. 1, app. C, 5-9; 1995d:4-408; 1996a:4-299; 1996d:4-26; 1998a:5-4; 1998b:4-6.

G.4.2 Facilities

G.4.2.1 Pit Conversion Facility

G.4.2.1.1 Construction of Pit Conversion Facility

Potential air quality impacts from construction of new pit conversion and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G–57.

Table G–57. Emissions (kg/yr) From Construction of New Pit Conversion Facility at SRS

Pollutant	Diesel Equipment and Construction Fugitive Emissions	Vehicles
Carbon monoxide	6,400	38,600
Nitrogen dioxide	29,200	11,200
PM_{10}	20,300	39,500
Sulfur dioxide	1,900	0
Volatile organic compounds	2,400	5,160
Total suspended particulates	47,500	39,500

Source: UC 1998g.

Maximum air pollutant concentrations from construction activities are summarized in Table G–58.

Table G–58. Concentrations ($\mu g/m^3$) From Construction of New Pit Conversion Facility at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	671	0.911	672
	1 hour	40,000	5,100	4.14	5,100
Nitrogen dioxide	Annual	100	11.4	0.0601	11.4
PM_{10}	Annual	50	4.94	0.0418	4.98
	24 hours	150	85.7	1.03	86.8
Sulfur dioxide	Annual	80	16.7	0.00391	16.7
	24 hours	365	222	0.0964	222
	3 hours	1,300	725	0.578	726
Total suspended particulates	Annual	75	45.4	0.0977	45.5

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
Source: EPA 1997; SCDHEC 1996.

G.4.2.1.2 Operation of Pit Conversion Facility

Potential air quality impacts from operation of the new pit conversion and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–59. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 35 m (115 ft) height, 1.82 m (6 ft) diameter, stack exit temperature of 20 C (68 F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 38.1 m (125 ft) height, 3.01 m (9.9 ft) diameter, stack exit temperature of 160 C (320 F), and an exit velocity of 10.67 m/s (35 ft/s) (UC 1998g).

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–60. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–59. Emissions (kg/yr) From Operation of New Pit Conversion Facility at SRS

Pollutant	Boilers	Emergency Generator	Process	Vehicles
Carbon monoxide	587	520	0	39,600
Nitrogen dioxide	20,000	2,000	0	11,500
PM_{10}	1,400	50	0	40,500
Sulfur dioxide	33,300	34	0	0
Volatile organic compounds	69	58	0	5,300
Total suspended particulates	1,400	50	0	40,500

Source: UC 1998g.

Table G–60. Concentrations ($\mu g/m^3$) From Operation of New Pit Conversion Facility at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	671	0.0942	672
	1 hour	40,000	5,100	0.373	5,100
Nitrogen dioxide	Annual	100	11.4	0.0287	11.4
PM_{10}	Annual	50	4.94	0.00182	4.94
	24 hours	150	85.7	0.026	85.8
Sulfur dioxide	Annual	80	16.7	0.041	16.7
	24 hours	365	222	0.56	223
	3 hours	1,300	725	1.46	726
Total suspended particulates	Annual	75	45.4	0.00182	45.4

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
Source: EPA 1997; SCDHEC 1996.

G.4.2.2 [Text deleted.]

G.4.2.3 Immobilization Facility

G.4.2.3.1 Construction of Immobilization Facility

Potential air quality impacts from construction of new immobilization (ceramic or glass) and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G–61.

Maximum air pollutant concentrations from construction activities are summarized in Table G–62.

Table G–61. Emissions (kg/yr) From Construction of New Immobilization Facility at SRS

Pollutant	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Vehicles
Carbon monoxide	20,300	0	0	48,700
Nitrogen dioxide	52,700	0	0	14,100
PM_{10}	3,930[b]	11,300	2,610[b]	49,900
Sulfur dioxide	24,400	0	0	0
Volatile organic compounds	3,900	0	0	6,520
Total suspended particulates	3,930	21,600	2,610	49,900

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for this analysis, resulting in some overestimate of PM_{10} concentrations.
Source: UC 1999c, 1999d.

Table G–62. Concentrations ($\mu g/m^3$) From Construction of New Immobilization Facility at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Ceramic or Glass	Total
Carbon monoxide	8 hours	10,000	671	2.89	674
	1 hour	40,000	5,100	13.1	5,110
Nitrogen dioxide	Annual	100	11.4	0.108	11.5
PM_{10}	Annual	50	4.94	0.0366	4.98
	24 hours	150	85.7	3.56	89.3
Sulfur dioxide	Annual	80	16.7	0.0502	16.7
	24 hours	365	222	1.24	223
	3 hours	1,300	725	7.42	732
Total suspended particulates	Annual	75	45.4	0.0581	45.4

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
Source: EPA 1997; SCDHEC 1996.

G.4.2.3.2 Operation of Immobilization Facility

Potential air quality impacts from operation of new immobilization (ceramic or glass) and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–63. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 41 m (135 ft) height, 5.1 m (17 ft) diameter, stack exit temperature of 20 C (68 F), and an exit velocity of 7 m/s (23 ft/s). The boiler stack was modeled with a 38.1 m (125 ft) height, 3.01 m (9.9 ft) diameter, stack exit temperature of 160 C (320 F), and an exit velocity of 10.67 m/s (35 ft/s) (UC 1999c, 1999d).

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–64. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–63. Emissions (kg/yr) From Operation of New Immobilization Facility at SRS

Pollutant	Boilers	Emergency Generator	Ceramic or Glass Process	Vehicles[a]
Carbon monoxide	370	980	0	46,500
Nitrogen dioxide	12,100	4,530	0	13,500
PM_{10}	940	320	0	47,600
Sulfur dioxide	35,500	300	0	0
Volatile organic compounds	80	370	0	6,220
Total suspended particulates	940	320	0	47,600

[a] For 50-t (55-ton) case.
Source: UC 1999c, 1999d.

Table G–64. Concentrations ($\mu g/m^3$) From Operation of New Immobilization Facility at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Ceramic or Glass	Total
Carbon monoxide	8 hours	10,000	671	0.152	671
	1 hour	40,000	5,100	0.657	5,100
Nitrogen dioxide	Annual	100	11.4	0.0242	11.4
PM_{10}	Annual	50	4.94	0.00181	4.94
	24 hours	150	85.7	0.032	85.8
Sulfur dioxide	Annual	80	16.7	0.0442	16.7
	24 hours	365	222	0.61	223
	3 hours	1,300	725	1.63	727
Total suspended particulates	Annual	75	45.4	0.00181	45.4

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
Source: EPA 1997; SCDHEC 1996.

G.4.2.4 MOX Facility

G.4.2.4.1 Construction of MOX Facility

Potential air quality impacts from construction of new MOX and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G–65.

Maximum air pollutant concentrations from construction activities are summarized in Table G–66.

Table G–65. Emissions (kg/yr) From Construction of New MOX Facility at SRS

Pollutant	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Vehicles
Carbon monoxide	3,840	0	0	33,600
Nitrogen dioxide	10,100	0	0	9,740
PM_{10}	768[b]	6,870	1,310[b]	34,400
Sulfur dioxide	1,020	0	0	0
Volatile organic compounds	792	0	0	4,490
Total suspended particulates	768	13,600	1,310	34,400
Toxics[c]	0	<1	0	0

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for this analysis resulting in some overestimate of PM_{10} concentrations.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Source: UC 1998h.

Table G–66. Concentrations ($\mu g/m^3$) From Construction of New MOX Facility at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	671	0.547	672
	1 hour	40,000	5,100	2.48	5,100
Nitrogen dioxide	Annual	100	11.4	0.0207	11.4
PM_{10}	Annual	50	4.94	0.0185	4.96
	24 hours	150	85.7	1.8	87.5
Sulfur dioxide	Annual	80	16.7	0.0021	16.7
	24 hours	365	222	0.0517	222
	3 hours	1,300	725	0.31	725
Total suspended particulates	Annual	75	45.4	0.0321	45.4
Toxics[b]	24 hours	150	20.7	0.000224	20.7

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.
Source: EPA 1997; SCDHEC 1996.

G.4.2.4.2 Operation of MOX Facility

Potential air quality impacts from operation of the new MOX and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–67. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 8 m (26 ft) height, 0.3048 m (1.0 ft) diameter, stack exit temperature of 20 C (68 F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 38.1 m (125 ft) height, 3.01 m (9.9 ft) diameter, stack exit temperature of 160 C (320 F), and an exit velocity of 10.67 m/s (35 ft/s) (UC 1998h).

Table G–67. Emissions (kg/yr) From Operation of New MOX Facility at SRS

Pollutant	Boilers	Emergency Generator	Process	Vehicles
Carbon monoxide	2,040	374	0	32,700
Nitrogen dioxide	5,640	1,740	0	9,470
PM_{10}	276	122	0	33,400
Sulfur dioxide	31,300	114	0	0
Volatile organic compounds	0	142	0	4,370
Total suspended particulates	276	122	0	33,400
[Text deleted.]				

[Text deleted.]
Source: UC 1998h.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–68. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–68. Concentrations ($\mu g/m^3$) From Operation of New MOX Facility at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	671	0.123	671
	1 hour	40,000	5,100	0.371	5,100
Nitrogen dioxide	Annual	100	11.4	0.0105	11.4
PM_{10}	Annual	50	4.94	0.00059	4.94
	24 hours	150	85.7	0.0108	85.7
Sulfur dioxide	Annual	80	16.7	0.0387	16.7
	24 hours	365	222	0.531	222
	3 hours	1,300	725	1.39	726
Total suspended particulates	Annual	75	45.4	0.00059	45.4
[Text deleted.]					

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[Text deleted.]
Source: EPA 1997; SCDHEC 1996.

G.4.2.5 Pit Conversion and Immobilization Facilities

G.4.2.5.1 Construction of Pit Conversion and Immobilization Facilities

Potential air quality impacts from construction of new pit conversion, immobilization (ceramic or glass), and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. [Text deleted.] Construction impacts result from emissions from fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–69.

Table G–69. Emissions (kg/yr) From Construction of New Pit Conversion and Immobilization Facilities at SRS

	Pit Conversion		Immobilization (Ceramic or Glass)			
Pollutant	Diesel Equipment and Construction Fugitive Emissions	Veh	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Veh
Carbon monoxide	6,400	38,600	20,300	0	0	48,700
Nitrogen dioxide	29,200	11,200	52,700	0	0	14,100
PM_{10}	20,300	39,500	3,930[b]	11,300	2,610[b]	49,900
Sulfur dioxide	1,900	0	24,400	0	0	0
Volatile organic compounds	2,400	5,160	3,900	0	0	6,520
Total suspended particulates	47,500	39,500	3,930	21,600	2,610	49,900

[a] Does not include fugitive emissions from concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for this analysis, resulting in some overestimate of PM_{10} concentrations.
Key: Veh, vehicles.
Source: UC 1998g, 1999c, 1999d.

Maximum air pollutant concentrations from construction activities are summarized in Table G–70.

Table G–70. Concentrations ($\mu g/m^3$) From Construction of New Pit Conversion and Immobilization Facilities at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	Immobilization (Ceramic or Glass)	Total
Carbon monoxide	8 hours	10,000	671	0.911	2.89	675
	1 hour	40,000	5,100	4.14	13.1	5,110
Nitrogen dioxide	Annual	100	11.4	0.0601	0.108	11.5
PM_{10}	Annual	50	4.94	0.0418	0.0366	5.02
	24 hours	150	85.7	1.03	3.56	90.3
Sulfur dioxide	Annual	80	16.7	0.00391	0.0502	16.7
	24 hours	365	222	0.0964	1.24	223
	3 hours	1,300	725	0.578	7.42	733
Total suspended particulates	Annual	75	45.4	0.0977	0.0581	45.5

[a] The more stringent of the Federal and state standards is presented if both exist for the averaging period.
Source: EPA 1997; SCDHEC 1996.

G.4.2.5.2 Operation of Pit Conversion and Immobilization Facilities

Potential air quality impacts from operation of new pit conversion, immobilization (ceramic or glass), and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–71. Stack parameters used for modeling were as stated previously.

Table G–71. Emissions (kg/yr) From Operation of New Pit Conversion and Immobilization Facilities at SRS

	Pit Conversion				Immobilization			
Pollutant	Boilers	EG	Process	Veh	Boilers	EG	Process	Veh[a]
Carbon monoxide	587	520	0	39,600	370	980	0	46,500
Nitrogen dioxide	20,000	2,000	0	11,500	12,100	4,530	0	13,500
PM_{10}	1,400	50	0	40,500	940	320	0	47,600
Sulfur dioxide	33,300	34	0	0	35,500	300	0	0
Volatile organic compounds	69	58	0	5,300	80	370	0	6,220
Total suspended particulates	1,400	50	0	40,500	940	320	0	47,600

[a] For 50-t (55-ton) case.
[Text deleted.]
Key: EG, emergency generator; Veh, vehicles.
Source: UC 1998g, 1999c, 1999d.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–72. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–72. Concentrations ($\mu g/m^3$) From Operation of New Pit Conversion and Immobilization Facilities at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	Immobilization (Ceramic or Glass)	Total
Carbon monoxide	8 hours	10,000	671	0.0942	0.152	671
	1 hour	40,000	5,100	0.373	0.657	5,100
Nitrogen dioxide	Annual	100	11.4	0.0287	0.0242	11.4
PM_{10}	Annual	50	4.94	0.00182	0.00181	4.94
	24 hours	150	85.7	0.026	0.032	85.8
Sulfur dioxide	Annual	80	16.7	0.041	0.0442	16.8
	24 hours	365	222	0.56	0.61	223
	3 hours	1,300	725	1.46	1.63	728
Total suspended particulates	Annual	75	45.4	0.00182	0.00181	45.4

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[Text deleted.]
Source: EPA 1997; SCDHEC 1996.

G.4.2.6 Pit Conversion and MOX Facilities

G.4.2.6.1 Construction of Pit Conversion and MOX Facilities

Potential air quality impacts from construction of new pit conversion, MOX, and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–73.

Table G–73. Emissions (kg/yr) From Construction of New Pit Conversion and MOX Facilities at SRS

	Pit Conversion		MOX			
Pollutant	Diesel Equipment and Construction Fugitive Emissions	Vehicles	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Vehicles
Carbon monoxide	6,400	38,600	3,840	0	0	33,600
Nitrogen dioxide	29,200	11,200	10,100	0	0	9,740
PM_{10}	20,300	39,500	768[b]	6,870	1,310[b]	34,400
Sulfur dioxide	1,900	0	1,020	0	0	0
Volatile organic compounds	2,400	5,160	792	0	0	4,490
Total suspended particulates	47,500	39,500	768	13,600	1,310	34,400
Toxics[c]	0	0	0	<1	0	0

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for this analysis, resulting in some overestimate of PM_{10} concentrations.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Source: UC 1998g, 1998h.

Maximum air pollutant concentrations from construction activities are summarized in Table G–74.

Table G–74. Concentrations ($\mu g/m^3$) From Construction of New Pit Conversion and MOX Facilities at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	MOX	Total
Carbon monoxide	8 hours	10,000	671	0.911	0.547	672
	1 hour	40,000	5,100	4.14	2.48	5,110
Nitrogen dioxide	Annual	100	11.4	0.0601	0.0207	11.5
PM_{10}	Annual	50	4.94	0.0418	0.0185	5.
	24 hours	150	85.7	1.03	1.8	88.5
Sulfur dioxide	Annual	80	16.7	0.00391	0.0021	16.7
	24 hours	365	222	0.0964	0.0517	222
	3 hours	1,300	725	0.578	0.31	726
Total suspended particulates	Annual	75	45.4	0.0977	0.0321	45.5
Toxics[b]	24 hours	150	20.7	0	0.000224	20.7

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Various toxic air pollutants (e.g., lead, benzene, and hexane) could be emitted during construction and were analyzed as benzene.
Source: EPA 1997; SCDHEC 1996.

G.4.2.6.2 Operation of Pit Conversion and MOX Facilities

Potential air quality impacts from operation of the new pit conversion and MOX facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–75. Stack parameters used for modeling were as stated previously.

Table G–75. Emissions (kg/yr) From Operation of New Pit Conversion and MOX Facilities at SRS

	Pit Conversion				MOX			
Pollutant	**Boilers**	**EG**	**Process**	**Vehicles**	**Boilers**	**EG**	**Process**	**Vehicles**
Carbon monoxide	587	520	0	39,600	2,040	374	0	32,700
Nitrogen dioxide	20,000	2,000	0	11,500	5,640	1,740	0	9,470
PM_{10}	1,400	50	0	40,500	276	122	0	33,400
Sulfur dioxide	33,300	34	0	0	31,300	114	0	0
Volatile organic compounds	69	58	0	5,300	0	142	0	4,370
Total suspended particulates	1,400	50	0	40,500	276	122	0	33,400
[Text deleted.]								

[Text deleted.]
Key: EG, emergency generator.
Source: UC 1998g, 1998h.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–76. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–76. Concentrations ($\mu g/m^3$) From Operation of New Pit Conversion and MOX Facilities at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	MOX	Total
Carbon monoxide	8 hours	10,000	671	0.0942	0.123	671
	1 hour	40,000	5,100	0.373	0.371	5,100
Nitrogen dioxide	Annual	100	11.4	0.0287	0.0105	11.4
PM_{10}	Annual	50	4.94	0.00182	0.00059	4.94
	24 hours	150	85.7	0.026	0.0108	85.7
Sulfur dioxide	Annual	80	16.7	0.041	0.0387	16.8
	24 hours	365	222	0.56	0.531	223
	3 hours	1,300	725	1.46	1.39	728
Total suspended particulates	Annual	75	45.4	0.00182	0.00059	45.4
[Text deleted.]						

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[Text deleted.]
Source: EPA 1997; SCDHEC 1996.

G.4.2.7 Immobilization and MOX Facilities

G.4.2.7.1 Construction of Immobilization and MOX Facilities

Potential air quality impacts from construction of new immobilization (ceramic or glass), MOX, and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. [Text deleted.] Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–77.

Table G–77. Emissions (kg/yr) From Construction of New Immobilization and MOX Facilities at SRS

Pollutant	Immobilization (Ceramic or Glass)				MOX			
	DE	CFE[a]	CBP	Veh	DE	CFE[a]	CBP	Veh
Carbon monoxide	20,300	0	0	48,700	3,840	0	0	33,600
Nitrogen dioxide	52,700	0	0	14,100	10,100	0	0	9,740
PM_{10}	3,930[b]	11,300	2,610[b]	49,900	768[b]	6,810	1,310[b]	34,400
Sulfur dioxide	24,400	0	0	0	1,020	0	0	0
Volatile organic compounds	3,900	0	0	6,520	792	0	0	4,490
Total suspended particulates	3,930	21,600	2,610	49,900	768	13,600	1,310	34,400
Toxics[c]	0	0	0	0	0	<1	0	0

[a] Does not include fugitive emissions from concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for this analysis, resulting in some overestimate of PM_{10} concentrations.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Key: CBP, concrete batch plant; CFE, construction fugitive emissions; DE, diesel equipment; Veh, vehicles.
Source: UC 1998h, 1999c, 1999d.

Maximum air pollutant concentrations from construction activities are summarized in Table G–78.

Table G–78. Concentrations ($\mu g/m^3$) From Construction of New Immobilization and MOX Facilities at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Immobilization (Ceramic or Glass)	MOX	Total
Carbon monoxide	8 hours	10,000	671	2.89	0.547	675
	1 hour	40,000	5,100	13.1	2.48	5,110
Nitrogen dioxide	Annual	100	11.4	0.108	0.0207	11.5
PM_{10}	Annual	50	4.94	0.0366	0.0185	5
	24 hours	150	85.7	3.56	1.8	91.1
Sulfur dioxide	Annual	80	16.7	0.0502	0.0021	16.7
	24 hours	365	222	1.24	0.0517	223
	3 hours	1,300	725	7.42	0.31	733
Total suspended particulates	Annual	75	45.4	0.0581	0.0321	45.5
Toxics[b]	24 hours	150	20.7	0	0.000224	20.7

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.
Source: EPA 1997; SCDHEC 1996.

G.4.2.7.2 Operation of Immobilization and MOX Facilities

Potential air quality impacts from operation of new immobilization (ceramic or glass), MOX, and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–79. Stack parameters used for modeling were as stated previously.

Table G–79. Emissions (kg/yr) From Operation of New Immobilization and MOX Facilities at SRS

	Immobilization				MOX			
Pollutant	Boilers	Emergency Generator	Process[a]	Vehicles	Boilers	Emergency Generator	Process	Vehicles
Carbon monoxide	370	980	0	44,400	2,040	374	0	32,700
Nitrogen dioxide	12,100	4,530	0	12,900	5,640	1,740	0	9,470
PM_{10}	940	320	0	45,400	276	122	0	33,400
Sulfur dioxide	35,500	300	0	0	31,300	114	0	0
Volatile organic compounds	80	370	0	5,940	0	142	0	4,370
Total suspended particulates	940	320	0	45,400	276	122	0	33,400
[Text deleted.]								

[a] Ceramic or glass.
[Text deleted.]
Source: UC 1998h, 1999c, 1999d.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–80. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–80. Concentrations ($\mu g/m^3$) From Operation of New Immobilization and MOX Facilities at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Immobilization	MOX	Total
Carbon monoxide	8 hours	10,000	671	0.152	0.123	671
	1 hour	40,000	5,100	0.657	0.371	5,100
Nitrogen dioxide	Annual	100	11.4	0.0242	0.0105	11.4
PM_{10}	Annual	50	4.94	0.00181	0.00059	4.94
	24 hours	150	85.7	0.032	0.0108	85.8
Sulfur dioxide	Annual	80	16.7	0.0442	0.0388	16.8
	24 hours	365	222	0.61	0.531	223
	3 hours	1,300	725	1.63	1.39	728
Total suspended particulates	Annual	75	45.4	0.00181	0.00059	45.4
[Text deleted.]						

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[Text deleted.]
Source: EPA 1997; SCDHEC 1996.

G.4.2.8 Pit Conversion, Immobilization, and MOX Facilities

G.4.2.8.1 Construction of Pit Conversion, Immobilization, and MOX Facilities

Potential air quality impacts from construction of new pit conversion, immobilization (ceramic or glass), MOX, and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. [Text deleted.] Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–81.

Table G–81. Emissions (kg/yr) From Construction of New Pit Conversion, Immobilization, and MOX Facilities at SRS

	Pit Conversion		Immobilization (Ceramic or Glass)				MOX			
Pollutant	DE & CFE	Veh	DE	CFE[a]	CBP	Veh	DE	CFE[a]	CBP	Veh
Carbon monoxide	6,400	38,600	20,300	0	0	48,700	3,840	0	0	33,600
Nitrogen dioxide	29,200	11,200	52,700	0	0	14,100	10,080	0	0	9,740
PM_{10}	20,300	39,500	3,930[b]	11,300	2,610[b]	49,900	768[b]	6,870	1,310[b]	34,400
Sulfur dioxide	1,900	0	24,400	0	0	0	1,020	0	0	0
Volatile organic compounds	2,400	5,160	3,900	0	0	6,520	792	0	0	4,490
Total suspended particulates	47,500	39,500	3,930	21,600	2,610	49,900	768	13,600	1,310	34,400
Toxics[c]	0	0	0	0	0	0	0	<1	0	0

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for this analysis, resulting in some overestimate of PM_{10} concentrations.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Key: CBP, concrete batch plant; CFE, construction fugitive emissions; DE, diesel equipment; Veh, vehicles.
Source: UC 1998g, 1998h, 1999c, 1999d.

Maximum air pollutant concentrations from construction activities are summarized in Table G–82.

Table G–82. Concentrations ($\mu g/m^3$) From Construction of New Pit Conversion, Immobilization, and MOX Facilities at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	Immobilization (Ceramic or Glass)	MOX	Total
Carbon monoxide	8 hours	10,000	671	0.911	2.89	0.547	675
	1 hour	40,000	5,100	4.14	13.1	2.48	5,120
Nitrogen dioxide	Annual	100	11.4	0.0601	0.108	0.0207	11.6
PM_{10}	Annual	50	4.94	0.0418	0.0366	0.0185	5.04
	24 hours	150	85.7	1.03	3.56	1.8	92.1
Sulfur dioxide	Annual	80	16.7	0.00391	0.0502	0.0021	16.7
	24 hours	365	222	0.0964	1.24	0.0517	223
	3 hours	1,300	725	0.578	7.42	0.31	733
Total suspended particulates	Annual	75	45.4	0.0977	0.0581	0.0321	45.6
Toxics[b]	24 hours	150	20.7	0	0	0.000224	20.7

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.
Source: EPA 1997; SCDHEC 1996.

G.4.2.8.2 Operation of Pit Conversion, Immobilization, and MOX Facilities

Potential air quality impacts from operation of the three surplus plutonium disposition and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, steam boilers, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–83. Stack parameters used for modeling were as stated previously.

Table G–83. Emissions (kg/yr) From Operation of New Pit Conversion, Immobilization, and MOX Facilities at SRS

	Pit Conversion				Immobilization				MOX			
Pollutant	Boilers	EG	Process	Veh	Boilers	EG	Process[a]	Veh	Boilers	EG	Process	Veh
CO	587	520	0	39,600	370	980	0	44,400	2,040	374	0	32,700
NO_2	20,000	2,000	0	11,500	12,100	4,530	0	12,900	5,640	1,740	0	9,470
PM_{10}	1,400	50	0	40,500	940	320	0	45,400	276	122	0	33,400
SO_2	33,300	34	0	0	35,500	300	0	0	31,300	114	0	0
VOC	69	58	0	5,300	80	370	0	5,940	0	142	0	4,370
TSP	1,400	50	0	40,500	940	320	0	45,400	276	122	0	33,400
[Text deleted.]												

[a] Ceramic or glass.
[Text deleted.]
Key: CO, carbon monoxide; EG, emergency generator; NO_2, nitrogen dioxide; SO_2, sulfur dioxide; TSP, total suspended particulates; Veh, vehicles; VOC, volatile organic compounds.
Source: UC 1998g, 1998h, 1999c, 1999d.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–84. Radiological impacts, including those emissions to the air, are discussed in Appendix J.

Table G–84. Concentrations ($\mu g/m^3$) From Operation of New Pit Conversion, Immobilization, and MOX Facilities at SRS

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	Immobilization (Ceramic or Glass)	MOX	Total
Carbon monoxide	8 hours	10,000	671	0.0942	0.152	0.123	671
	1 hour	40,000	5,100	0.373	0.657	0.371	5,100
Nitrogen dioxide	Annual	100	11.4	0.0287	0.0242	0.0105	11.4
PM_{10}	Annual	50	4.94	0.00182	0.00181	0.00059	4.94
	24 hours	150	85.7	0.0261	0.032	0.0108	85.8
Sulfur dioxide	Annual	80	16.7	0.041	0.0442	0.0387	16.8
	24 hours	365	222	0.56	0.61	0.531	224
	3 hours	1,300	725	1.46	1.63	1.39	729
Total suspended particulates	Annual	75	45.4	0.00182	0.00181	0.00059	45.4
[Text deleted.]							

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[Text deleted.]
Source: EPA 1997; SCDHEC 1996.

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Appendix H
Waste Management

This appendix describes the impacts on the waste management infrastructure that would occur if the proposed surplus plutonium disposition facilities were located at the Hanford Site (Hanford), Idaho National Engineering and Environmental Laboratory (INEEL), the Pantex Plant (Pantex), or the Savannah River Site (SRS), or if lead assembly fabrication activities were conducted at INEEL (Argonne National Laboratory–West [ANL–W]), Hanford, Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL), or SRS. The waste types evaluated in this section are transuranic (TRU) waste (including mixed TRU waste), low-level waste (LLW), mixed LLW, hazardous waste, nonhazardous solid waste, and nonhazardous liquid waste. The quantities of mixed TRU waste that would be generated are small. Mixed TRU waste would be generated by analytical laboratory operations (handling of solvents and scintillation vials containing plutonium), glovebox maintenance (replacement of lead-lined rubber gloves), and pit bisection (management of hazardous constituents of the incoming pits). According to engineering estimates, solid mixed TRU waste would be generated at the following rates: 1 m^3/yr (1.3 yd^3/yr) for the pit conversion facility, zero for the immobilization facility, less than 5.7 m^3/yr (7.5 yd^3/yr) for the mixed oxide (MOX) facility, less than 1 m^3/yr (1.3 yd^3/yr) for lead assembly fabrication, and 0.03 m^3/yr (0.039 yd^3/yr) for postirradiation examination. Liquid mixed TRU waste would be generated in the MOX facility at a rate of 0.05 m^3/yr (0.065 yd^3/yr), and by postirradiation examination at a rate of less than 0.01 m^3/yr (0.013 yd^3/yr) (DOE 1999a; O'Connor et al. 1998a; ORNL 1998; UC 1998a–h, 1999a–d). These small quantities of waste are included in the total amounts of TRU waste generated.

Generation rates for contaminated liquid waste would generally be small. Operation of the pit conversion facility is estimated to generate no liquid TRU waste, 0.36 m^3/yr (0.47 yd^3/yr) of liquid LLW, no liquid mixed LLW, and 0.74 m^3/yr (0.97 yd^3/yr) of liquid hazardous waste. Operation of the immobilization facility is estimated to generate 0.28 to 0.76 m^3/yr (0.37 to 0.99 yd^3/yr) of liquid TRU waste, no liquid LLW, no liquid mixed LLW, and 4.5 m^3/yr (5.9 yd^3/yr) of liquid hazardous waste. Operation of the MOX facility is estimated to generate 0.5 m^3/yr (0.65 yd^3/yr) of liquid TRU waste, 0.3 m^3/yr (0.39 yd^3/yr) of liquid LLW, no liquid mixed LLW, and 1.9 m^3/yr (2.5 yd^3/yr) of liquid hazardous waste (DOE 1999a; ORNL 1998; UC 1998a–h, 1999a–d). Lead assembly fabrication is estimated to generate 0.2 m^3/yr (0.26 yd^3/yr) of liquid TRU waste, 160 m^3/yr (209 yd^3/yr) of liquid LLW, less than 0.01 m^3/yr (0.013 yd^3/yr) of liquid mixed LLW, and less than 0.01 m^3/yr (0.013 yd^3/yr) of liquid hazardous waste. Postirradiation examination is estimated to generate 0.1 m^3/yr (0.13 yd^3/yr) of liquid TRU waste, 0.1 m^3/yr (0.13 yd^3/yr) of liquid LLW, less than 0.01 m^3/yr (0.013 yd^3/yr) of liquid mixed LLW, and less than 0.01 m^3/yr (0.013 yd^3/yr) of liquid hazardous waste (O'Connor et al. 1998a:36, 66). For all but nonhazardous wastes, DOE combined the liquid- and solid-waste generation estimates into one waste generation rate for ease of comparison with site waste generation rates.

Section 2.4.1 describes impurities that may be present in the plutonium pits. Those impurities are present only at very low levels and, with the exception of tritium, should largely remain entrained in the plutonium. As they generally would not adversely affect the immobilization or MOX fuel fabrication process, it would not be necessary to remove them from the plutonium destined for use in those processes. Tritium, a radioisotope of hydrogen, would be removed by heating the pit material in a vacuum furnace to drive off the tritium gas. Another component of the pit plutonium, gallium, is present as an alloying agent. Because high levels of gallium could adversely affect MOX fuel performance, it would be largely removed during the pit conversion and MOX fuel fabrication processes.

Because impurities are present in the plutonium, they would also be present in the radioactive waste contaminated by plutonium. Although some of these impurities are hazardous materials, they generally would not be present in concentrations and forms sufficient to justify classification of the radioactive waste as mixed

TRU waste or mixed LLW. In any event, wastes would be classified and managed in accordance with all applicable regulations.

Major adverse impacts are not expected at any of the U.S. Department of Energy (DOE) sites. The *Surplus Plutonium Disposition Environmental Impact Statement* (SPD EIS) conservatively assumes that all TRU waste generated by proposed facilities would have to be stored on the site until the Waste Isolation Pilot Plant (WIPP) is ready to accept this waste in 2016 (DOE 1997a:17). Although TRU waste would be routinely generated for the first time at Pantex, impacts from additional TRU waste storage at the DOE sites should not be major. A description of the methods used to estimate impacts on waste management facilities is presented in Appendix F.8.

Decisions in the Records of Decision (RODs) for the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (WM PEIS) (DOE 1997b) could affect where DOE would send wastes in the future and could result in the closing of some existing waste management facilities and construction of new facilities at DOE sites. The ROD for TRU waste issued on January 20, 1998, states that each of the DOE sites that currently has or will generate TRU waste will prepare and store its TRU waste on the site for eventual shipment to WIPP. The ROD for hazardous waste issued on August 5, 1998, states that most DOE sites will continue to use offsite facilities for the treatment and disposal of major portions of the nonwastewater hazardous waste, with the Oak Ridge Reservation and SRS continuing to treat some of their own hazardous waste on the site in existing facilities where this is economically favorable. RODs for LLW and mixed LLW are pending.

H.1 HANFORD

H.1.1 Assessment Data

Impacts on Hanford waste management facilities were estimated using information on existing environmental conditions from Chapter 3 and information on the characteristics of the proposed surplus plutonium disposition facilities from Chapter 2 and the facility data reports. A description of the methods used to evaluate impacts on waste management facilities is presented in Appendix F.8.

H.1.2 Facilities

H.1.2.1 Pit Conversion Facility

H.1.2.1.1 Construction of Pit Conversion Facility

Table H–1 compares the expected construction waste generation rates for the facility that may be constructed at Hanford with the existing generation rates for Hanford waste. No radioactive waste would be generated during the 3-year construction period because this action involves modification of uncontaminated buildings only (UC 1998a). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations.

Table H–1. Potential Waste Management Impacts of Construction of Pit Conversion Facility in FMEF at Hanford

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Hazardous	13	560	2
Nonhazardous			
Liquid	1,300	200,000	1
Solid	28	43,000	<1

[a] See definitions in Appendix F.8.
[b] UC 1998a. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
Key: FMEF, Fuels and Materials Examination Facility.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in U.S. Department of Transportation (DOT) approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998a). Hazardous waste generation for this facility is estimated to be 2 percent of existing annual hazardous waste generation. The additional waste load generated during construction should not have a major impact on the Hanford hazardous waste management system.

Nonhazardous solid waste includes office garbage, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite facilities for recycling or disposal (UC 1998a). Nonrecyclable solid sanitary waste would be sent off the site and would likely be disposed of in the Richland Sanitary Landfill. Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore were not included in the waste volumes. Nonrecyclable, nonhazardous solid waste generated by this facility is estimated to be less than 1 percent of existing annual waste generation. The additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets (UC 1998a). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at onsite facilities, even though it is likely that much of this waste would be collected in portable toilets and would be managed at offsite facilities. Nonhazardous liquid waste generated for this facility is estimated to be 1 percent of existing annual site waste generation, 1 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, 1 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest (formerly Washington Public Power Supply System [WPPSS]) Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system during construction.

H.1.2.1.2 Operation of Pit Conversion Facility

The waste management facilities within the pit conversion facility would process, temporarily store, and ship all wastes generated. Table H–2 compares the expected waste generation rates from operating the new facility at Hanford with the existing generation rates for Hanford waste. No high-level waste (HLW) would be generated by the facility (UC 1998a). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current

Table H–2. Potential Waste Management Impacts of Operation of Pit Conversion Facility in FMEF at Hanford

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	18	450	4
LLW	60	3,902	2
Mixed LLW	1	847	<1
Hazardous	2	560	<1
Nonhazardous			
Liquid	40,000	200,000	20
Solid	1,800	43,000	4

[a] See definitions in Appendix F.8.
[b] UC 1998a. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.

Key: FMEF, Fuels and Materials Examination Facility; LLW, low-level waste; TRU, transuranic.

WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at Hanford will be evaluated in the *Hanford Site Solid (Radioactive and Hazardous) Waste Program EIS* being prepared by the DOE Richland Operations Office (DOE 1997c).

TRU wastes generated during operations include spent filters, contaminated beryllium pieces and cuttings, used containers and equipment, paper and cloth wipes, analytical and quality control samples, and solidified inorganic solutions. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facility (UC 1998a). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the Waste Receiving and Processing Facility at Hanford. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generated for this facility is estimated to be 4 percent of existing annual waste generated and 1 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. A total of 180 m^3 (235 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 2 percent of the 11,450 m^3 (14,977 yd^3) of contact-handled TRU waste currently in storage, and 1 percent of the 17,000-m^3 (22,200-yd^3) storage capacity available at Hanford. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 860 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of approximately 260 m^2 (310 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on less than 0.1 ha (0.25 acre) of land at Hanford should not be major.

The 180 m^3 (235 yd^3) of TRU waste generated by this facility would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3

(220,400-yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for accumulation. Tritium recovered from pit disassembly would be disposed of as LLW (UC 1998a). A total of 600 m^3 (785 yd^3) of LLW would be generated over the operation period. LLW generation for this facility is estimated to be 2 percent of existing annual waste generation, less than 1 percent of the 1.74 million-m^3 (2.28 million-yd^3) disposal capacity of the LLW Burial Grounds, and less than 1 percent of the 230,000-m^3 (301,000-yd^3) capacity of the Grout Vaults. Using the 3,480-m^3/ha (1,842-yd^3/acre) disposal land usage factor for Hanford published in the *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement* (*Storage and Disposition PEIS*) (DOE 1996a:E-9), 600 m^3 (780 yd^3) of waste would require 0.17 ha (0.42 acre) of disposal space at Hanford. Therefore, impacts of the management of this additional LLW at Hanford should not be major.

Mixed LLW includes lead shielding, solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits (UC 1998a). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for Hanford. Hanford currently treats and disposes of mixed LLW on the site. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for this facility is estimated to be 1 m^3/yr (1.3 yd^3/yr) or less than 1 percent of existing annual waste generation, and less than 1 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. Over the operating life of the facility, the 10 m^3 (13 yd^3) of mixed LLW generated would be less than 1 percent of the 16,800-m^3 (22,000-yd^3) storage capacity of the Central Waste Complex, and less than 1 percent of the 14,200-m^3 (18,600-yd^3) disposal capacity in the Radioactive Mixed Waste Disposal Facility. Therefore, the management of this additional waste at Hanford should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (UC 1998a). Hazardous waste generation for this facility is estimated to be less than 1 percent of existing annual waste generation. These wastes should not have a major impact on the hazardous waste management system at Hanford.

Nonhazardous solid waste includes office garbage, machine shop waste, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998a). The remaining solid sanitary waste would be sent off the site for disposal in the Richland Sanitary Landfill. Nonrecyclable, nonhazardous solid waste generated by this facility is estimated to be 4 percent of existing annual waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and process wastewater from lab sinks and drains, mop water, and cooling tower blowdown. Wastewater would be treated, if necessary, before being discharged to the 400 Area sanitary sewer that connects to the Energy Northwest (formerly WPPSS) wastewater treatment system (UC 1998a). Nonhazardous liquid waste generated for this facility is estimated to be 20 percent of the existing annual site waste generated, 17 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, 17 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system.

H.1.2.2 Immobilization Facility

H.1.2.2.1 Construction of Immobilization Facility

Table H–3 compares the expected construction waste generation rates for the immobilization facility that may be constructed at Hanford with the existing generation rates for Hanford waste. No radioactive waste would be generated during the 3-year construction period because this action involves modification of uncontaminated buildings only (UC 1999a, 1999b). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations. Construction waste generation would be the same for both the ceramic and glass immobilization technologies and would be the same for the 17-t (19-ton) and 50-t (55-ton) immobilization scenarios, because the same size facility would be built under any scenario (UC 1999a, 1999b).

Table H–3. Potential Waste Management Impacts of Construction of Immobilization Facility in FMEF at Hanford

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Hazardous	8	560	1
Nonhazardous			
Liquid	5,200	200,000	3
Solid	430	43,000	1

[a] See definitions in Appendix F.8.
[b] UC 1999a, 1999b. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
Key: FMEF, Fuels and Materials Examination Facility.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints, chemicals, as well as rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1999a, 1999b). Hazardous waste generation for this facility is estimated to be 1 percent of existing annual hazardous waste generation. The additional waste load generated during construction should not have a major impact on the Hanford hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite facilities for recycling or disposal (UC 1999a, 1999b). Nonrecyclable solid sanitary waste would be sent off the site and would likely be disposed of in the Richland Sanitary Landfill. Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore were not included in the waste volumes. Nonhazardous solid waste generated for this facility is estimated to be

1 percent of existing annual waste generated. The additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets (UC 1999a, 1999b). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at onsite facilities, even though it is likely that much of this waste would be collected in portable toilets and would be managed at offsite facilities. Nonhazardous liquid waste generated for this facility is estimated to be 3 percent of existing annual site waste generated, 2 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, 2 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest (formerly WPPSS) Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system during construction.

H.1.2.2.2 Operation of Immobilization Facility

The waste management facilities within the immobilization facility would process, temporarily store, and ship all wastes generated. Table H–4 compares the expected waste generation rates from operating the new facility at Hanford with the existing generation rates for Hanford waste. Although HLW would be used in the immobilization process, no HLW would be generated by the facility (UC 1999a, 1999b). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Waste generation would be the same for both ceramic and glass immobilization technologies, but varies between the 17-t (19-ton) and the 50-t (55-ton) immobilization cases (UC 1999a, 1999b). Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at Hanford will be evaluated in the *Hanford Site Solid (Radioactive and Hazardous) Waste Program EIS* being prepared by the DOE Richland Operations Office (DOE 1997c).

Table H–4. Potential Waste Management Impacts of Operation of Immobilization Facility in FMEF at Hanford

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b] 17 t	Estimated Waste Generation (m^3/yr)[b] 50 t	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation 17 t	Percent of Site Waste Generation 50 t
TRU[d]	95	130	450	21	29
LLW	80	110	3,902	2	3
Mixed LLW	1	1	847	<1	<1
Hazardous	75	75	560	13	13
Nonhazardous					
Liquid	40,000	44,000	200,000	20	22
Solid	340	340	43,000	1	1

[a] See definitions in Appendix F.8.
[b] UC 1999a, 1999b. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
Key: FMEF, Fuels and Materials Examination Facility; LLW, low-level waste; TRU, transuranic.

TRU wastes generated during operations include metal cladding from fuel elements, spent filters, used containers and equipment, paper and cloth wipes, analytical and quality control samples, and solidified inorganic solutions. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facilities (UC 1999a, 1999b). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the Waste Receiving and Processing Facility at Hanford. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this facility is estimated to be 21 to 29 percent of existing annual waste generation and 5 to 7 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. A total of 950 to 1,300 m^3 (1,240 to 1,700 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 8 to 11 percent of the 11,450 m^3 (14,977 yd^3) of contact-handled TRU waste currently in storage and 6 to 8 percent of the 17,000-m^3 (22,200-yd^3) storage capacity available at Hanford. Assuming the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 4,500 to 6,000 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of approximately 1,400 to 1,800 m^2 (1,670 to 2,150 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.14 to 0.18 ha (0.35 to 0.44 acre) of land at Hanford should not be major.

The 950 to 1,300 m^3 (1,240 to 1,700 yd^3) of TRU waste generated by this facility would be 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, and solidified inorganic solutions. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facility before being transferred for additional treatment and/or disposal in existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for accumulation (UC 1999a, 1999b). A total of 800 to 1,100 m^3 (1,050 to 1,440 yd^3) of LLW would be generated over the operation period. LLW generation for this facility is estimated to be 2 to 3 percent of existing annual waste generation, less than 1 percent of the 1.74 million-m^3 (2.28 million-yd^3) disposal capacity of the LLW Burial Grounds and less than 1 percent of the 230,000-m^3 (301,000-yd^3) capacity of the Grout Vaults. Using the 3,480-m^3/ha (1,842-yd^3/acre) disposal land usage factor for Hanford published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 800 to 1,100 m^3 (1,050 to 1,440 yd^3) of waste would require 0.23 to 0.31 ha (0.57 to 0.77 acre) of disposal space at Hanford. Therefore, impacts of the management of this additional LLW at Hanford should not be major.

Mixed LLW includes lead shielding, solvents contaminated with plutonium, and scintillation vials from the analytical laboratory (UC 1999a, 1999b). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for Hanford. Hanford currently treats and disposes of mixed LLW on the site. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for this facility is estimated to be 1 m^3/yr (1.3 yd^3/yr), or less than 1 percent of existing annual waste generation. The 1 m^3/yr (1.3 yd^3/yr) of mixed LLW would be less than 1 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. Over the operating life of this facility, the 10 m^3 (13 yd^3) of mixed LLW generated would be less than 1 percent of the 16,800-m^3 (22,000-yd^3) storage capacity of the Central Waste Complex, and less than

1 percent of the 14,200-m^3 (18,600-yd^3) disposal capacity in the Radioactive Mixed Waste Disposal Facility. Therefore, the management of this additional mixed LLW at Hanford should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, lubrication oils, film processing fluids, hydraulic fluids, coolants, paints, chemicals, batteries, fluorescent light tubes, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (UC 1999a, 1999b). Hazardous waste generation for this facility is estimated to be 13 percent of existing annual waste generation. Because these wastes would be treated and disposed of at offsite commercial facilities, they should not have a major impact on the hazardous waste management system at Hanford.

Nonhazardous solid waste includes office garbage, machine shop wastes, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1999a, 1999b). The remaining solid sanitary waste would be sent off the site for disposal in the Richland Sanitary Landfill. Nonrecyclable, nonhazardous solid waste generated by this facility is estimated to be 1 percent of existing annual waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and wastewater from cooling tower blowdown. Wastewater would be treated, if necessary, before being discharged to the 400 Area sanitary sewer that connects to the Energy Northwest (formerly WPPSS) wastewater treatment system (UC 1999a, 1999b). Nonhazardous liquid waste generated for this facility is estimated to be 20 to 22 percent of the existing annual site waste generation, 17 to 19 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, and 17 to 19 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system.

H.1.2.3 MOX Facility

H.1.2.3.1 Construction of MOX Facility

Table H–5 compares the expected construction waste generation rates for the facility that may be constructed at Hanford with the existing generation rates for Hanford waste. No radioactive waste would be generated during the 3-year construction period because this action involves new construction or modification of uncontaminated buildings only (UC 1998b). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations. The amount of waste generated during construction would vary if the Fuels and Materials Examination Facility (FMEF) needs to be modified to accept the mixed oxide (MOX) facility versus constructing a new building (UC 1998b:attachment).

Table H–5. Potential Waste Management Impacts of Construction of MOX Facility in FMEF or New Construction at Hanford

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]		Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation	
	FMEF	New		FMEF	New
Hazardous	9	19	560	2	3
Nonhazardous					
Liquid	19,000	20,000	200,000	9	10
Solid	6,800	8,600	43,000	16	20

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998b. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
Key: FMEF, Fuels and Materials Examination Facility.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints, chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998b). Hazardous waste generation for this facility is estimated to be 2 to 3 percent of existing annual hazardous waste generation. The additional waste load generated during construction should not have a major impact on the Hanford hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite facilities for recycling or disposal (UC 1998b). Nonrecyclable solid sanitary waste would be sent off the site and would likely be disposed of in the Richland Sanitary Landfill. Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore were not included in the waste volumes. Nonhazardous solid waste generated for this facility is estimated to be 16 to 20 percent of existing annual waste generation. Because these wastes would be managed at offsite facilities, the additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and wastewater from dewatering (UC 1998b). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at onsite facilities, even though it is likely that much of this waste would be collected in portable toilets and would be managed at offsite facilities. Nonhazardous liquid-waste generated for this facility is estimated to be 9 to 10 percent of existing annual site waste generation, 8 to 9 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, 8 to 9 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest (formerly WPPSS) Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system during construction.

H.1.2.3.2 Operation of MOX Facility

The waste management facilities within the MOX facility would process, temporarily store, and ship all wastes generated. Table H–6 compares the expected waste generation rates from operating the new facility at Hanford with the existing generation rates for Hanford waste. No HLW would be generated by the facility (UC 1998b). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998,

Table H–6. Potential Waste Management Impacts of Operation of MOX Facility in FMEF or New Construction at Hanford

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	68	450	15
LLW	94	3,902	2
Mixed LLW	3	847	<1
Hazardous	3	560	1
Nonhazardous			
Liquid	26,000	200,000	13
Solid	440	43,000	1

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998b. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.

Key: FMEF, Fuels and Materials Examination Facility; LLW, low-level waste; TRU, transuranic.

TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Waste generation during operations would be the same whether the MOX facility is located in FMEF or in a new building (UC 1998b:attachment). Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at Hanford will be evaluated in the *Hanford Site Solid (Radioactive and Hazardous) Waste Program EIS* being prepared by the DOE Richland Operations Office (DOE 1997c).

TRU wastes generated during operations include spent filters, used containers and equipment, paper and cloth wipes, analytical and quality control samples, solidified inorganic solutions, and dirty plutonium oxide scrap. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facilities (UC 1998b). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the Waste Receiving and Processing Facility at Hanford. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this facility is estimated to be 15 percent of existing annual waste generation and 4 percent of the 1,820-m^3/yr (2,380-yd^3/yr) planned capacity of the Waste Receiving and Processing Facility. A total of 680 m^3 (890 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 6 percent of the 11,450 m^3 (14,977 yd^3) of contact-handled TRU waste currently in storage and 4 percent of the 17,000-m^3 (22,200-yd^3) storage capacity available at Hanford. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 3,200 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of approximately 960 m^2 (1,150 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.1 ha (0.25 acre) of land at Hanford should not be major.

The 680 m^3 (890 yd^3) of TRU waste generated by this facility would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, and solidified inorganic solutions. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facility before being transferred for additional treatment and/or disposal in existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for accumulation (UC 1998b). A total of 940 m^3 (1,230 yd^3) of LLW would be generated over the operation period. LLW generation for this facility is estimated to be 2 percent of existing annual waste generation, less than 1 percent of the 1.74 million-m^3 (2.28 million-yd^3) disposal capacity of the LLW Burial Grounds, and less than 1 percent of the 230,000-m^3 (301,000-yd^3) capacity of the Grout Vaults. Using the 3,480-m^3/ha (1,842-yd^3/acre) disposal land usage factor for Hanford published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 940 m^3 (1,230 yd^3) of waste would require 0.1 ha (0.25 acre) of disposal space at Hanford. Therefore, impacts of the management of this additional LLW at Hanford should not be major.

Mixed LLW includes solvents contaminated with plutonium and scintillation vials from the analytical laboratory (UC 1998b). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for Hanford. Hanford currently treats and disposes of mixed LLW on the site. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for this facility is estimated to be 3 m^3/yr (3.9 yd^3/yr) or less than 1 percent of existing annual waste generation. The 3 m^3/yr (3.9 yd^3/yr) of mixed LLW would be less than 1 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. Over the operating life of this facility, the 30 m^3 (39 yd^3) of mixed LLW generated would be less than 1 percent of the 16,800-m^3 (22,000-yd^3) storage capacity of the Central Waste Complex, and less than 1 percent of the 14,200-m^3 (18,600-yd^3) disposal capacity in the Radioactive Mixed Waste Disposal Facility. Therefore, the management of this additional waste at Hanford should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, lubricants, oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, fluorescent light tubes, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (UC 1998b). Hazardous waste generation for this facility is estimated to be 1 percent of existing annual waste generation. These wastes should not have a major impact on the hazardous waste management system at Hanford.

Nonhazardous solid waste includes office garbage, machine shop waste, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998b). The remaining solid sanitary waste would be sent off the site for disposal in the Richland Sanitary Landfill. Nonrecyclable, nonhazardous solid waste generated for this facility is estimated to be 1 percent of existing annual waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets; process wastewater from lab sinks and drains, mop water, and cooling tower blowdown; and treated wastewater from the liquid effluent treatment system. Wastewater would be treated, if necessary, before being discharged to the 400 Area sanitary sewer that connects to the Energy Northwest (formerly WPPSS) wastewater treatment system (UC 1998b). Nonhazardous liquid waste generated for this facility is estimated to be 13 percent of the existing annual site waste generation, 11 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, 11 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system.

H.1.2.4 Pit Conversion and Immobilization Facilities

H.1.2.4.1 Construction of Pit Conversion and Immobilization Facilities

Table H–7 compares the expected construction waste generation rates for the facilities that may be constructed at Hanford with the existing generation rates for Hanford waste. No radioactive waste would be generated during the 3-year construction period because this action involves modification of uncontaminated buildings only (UC 1998a, 1999a, 1999b). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations. Construction waste generation would be the same for both the ceramic and glass immobilization technologies and would be the same for the 17-t (19-ton) and 50-t (55-ton) immobilization scenarios because the same size facility would be built under any scenario (UC 1999a, 1999b).

Table H–7. Potential Waste Management Impacts of Construction of Pit Conversion and Immobilization Facilities in FMEF at Hanford

	Estimated Waste Generation (m^3/yr)[b]			Percent of Site Waste Generation		
Waste Type[a]	Pit Conversion	Immobilization (Ceramic or Glass)	Site Waste Generation (m^3/yr)[c]	Pit Conversion	Immobilization (Ceramic or Glass)	Both Facilities
Hazardous	13	18	560	2	3	6
Nonhazardous						
Liquid	1,300	8,800	200,000	1	4	5
Solid	28	1,100	43,000	<1	2	3

[a] See definitions in Appendix F.8.
[b] UC 1998a, 1999a, 1999b. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
Key: FMEF, Fuels and Materials Examination Facility.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998a, 1999a, 1999b). Hazardous waste generation for this combination of facilities is estimated to be 6 percent of existing annual hazardous waste generation. The additional waste load generated during construction should not have a major impact on the Hanford hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite facilities for recycling or disposal (UC 1998a, 1999a, 1999b). Nonrecyclable solid sanitary waste would be sent off the site and would likely be disposed of in the Richland Sanitary

Landfill. Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore were not included in the waste volumes. Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be less than 3 percent of existing annual waste generation. The additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets (UC 1998a, 1999a, 1999b). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at onsite facilities, even though it is likely that much of this waste would be collected in portable toilets and would be managed at offsite facilities. Nonhazardous liquid waste generated for this combination of facilities is estimated to be 5 percent of existing annual site waste generation, 4 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, 4 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest (formerly WPPSS) Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system during construction.

H.1.2.4.2 Operation of Pit Conversion and Immobilization Facilities

The waste management facilities within the pit conversion and immobilization facilities would process, temporarily store, and ship all wastes generated. Table H–8 compares the expected waste generation rates from operating the new facilities at Hanford with the existing generation rates for Hanford waste. Although HLW would be used in the immobilization process, no HLW would be generated by the facilities (UC 1998a, 1999a, 1999b). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Waste generation would be the same for both the ceramic and glass immobilization technologies, but varies between the 17-t (19-ton) and the 50-t (55-ton) immobilization cases (UC 1999a, 1999b). Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at Hanford will be evaluated in the *Hanford Site Solid (Radioactive and Hazardous) Waste Program EIS* being prepared by the DOE Richland Operations Office (DOE 1997c).

TRU wastes generated during operations include metal cladding from fuel elements, spent filters, contaminated beryllium pieces and cuttings, used containers and equipment, paper and cloth wipes, analytical and quality control samples, and solidified inorganic solutions. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facilities (UC 1998a, 1999a, 1999b). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the Waste Receiving and Processing Facility at Hanford. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this combination of facilities is estimated to be 25 to 32 percent of existing annual waste generation and 6 to 8 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. A total of 1,130 to 1,480 m^3 (1,478 to 1,936 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 10 to 13 percent of the 11,450 m^3 (14,977 yd^3) of contact-handled

Table H–8. Potential Waste Management Impacts of Operation of Pit Conversion and Immobilization Facilities in FMEF at Hanford

	Estimated Waste Generation (m^3/yr)[b]				Percent of Site Waste Generation			
		Immobilization (Ceramic or Glass)		Site Waste Generation		Immobilization (Ceramic or Glass)		
Waste Type[a]	Pit Conversion	17 t	50 t	(m^3/yr)[c]	Pit Conversion	17 t	50 t	Both Facilities
TRU[d]	18	95	130	450	4	21	28	25 to 32
LLW	60	80	110	3,902	2	2	3	4
Mixed LLW	1	1	1	847	<1	<1	<1	<1
Hazardous	2	75	75	560	<1	13	13	14
Nonhazardous								
Liquid	40,000	45,000	49,000	200,000	20	23	25	43 to 44
Solid	1,800	340	340	43,000	4	1	1	5

[a] See definitions in Appendix F.8.
[b] UC 1998a, 1999a, 1999b. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
Key: FMEF, Fuels and Materials Examination Facility; LLW, low-level waste; TRU, transuranic.

TRU waste currently in storage and 7 to 8 percent of the 17,000-m^3 (22,200-yd^3) storage capacity available at Hanford. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 5,400 to 6,900 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 1,600 to 2,100 m^2 (1,910 to 2,510 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.16 to 0.21 ha (0.40 to 0.51 acre) of land at Hanford should not be major.

The 1,130 to 1,480 m^3 (1,478 to 1,936 yd^3) of TRU waste generated by these facilities would be approximately 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP, and within the 168,500-m^3 (220,400-yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for accumulation (UC 1998a, 1999a, 1999b). Tritium recovered from pit disassembly would be disposed of as LLW (UC 1998a). A total of 1,400 to 1,700 m^3 (1,830 to 2,220 yd^3) of LLW would be generated over the operation period. LLW generation for this combination of facilities is estimated to be 4 percent of existing annual waste generation, less than 1 percent of the 1.74 million-m^3 (2.28 million-yd^3) disposal capacity of the LLW Burial Grounds, and 1 percent of the 230,000-m^3 (301,000-yd^3) capacity of the Grout Vaults. Using the 3,480-m^3/ha (1,842-yd^3/acre) disposal land usage factor for Hanford published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 1,400 to 1,700 m^3 of waste would require 0.40 to 0.48 ha (0.99 to 1.2 acre) of disposal space at Hanford. Therefore, impacts of the management of this additional LLW at Hanford should not be major.

Mixed LLW includes lead shielding, solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits (UC 1998a, 1999a, 1999b). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for Hanford. Hanford currently treats and disposes of mixed LLW on the site. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for this combination of facilities is estimated to be 2 m^3/yr (2.6 m^3/yr) or less than 1 percent of existing annual waste generation, and less than 1 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. Over the operating lives of these facilities, the 20 m^3 (26 ft^3) of mixed LLW generated would be less than 1 percent of the 16,800-m^3 (22,000-yd^3) storage capacity of the Central Waste Complex, and less than 1 percent of the 14,200-m^3 (18,600-yd^3) disposal capacity in the Radioactive Mixed Waste Disposal Facility. Therefore, the management of this additional waste at Hanford should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, fluorescent light tubes, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (UC 1998a, 1999a, 1999b). Hazardous waste generation for this combination of facilities is estimated to be 14 percent of existing annual waste generation. Because these wastes would be treated and disposed of at offsite commercial facilities, they should not have a major impact on the hazardous waste management system at Hanford.

Nonhazardous solid waste includes office garbage, machine shop waste, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998a, 1999a, 1999b). The remaining solid sanitary waste would be sent off the site for disposal in the Richland Sanitary Landfill. Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be 5 percent of existing annual waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and, process wastewater from lab sinks and drains, mop water, and cooling tower blowdown. Wastewater would be treated, if necessary, before being discharged to the 400 Area sanitary sewer that connects to the Energy Northwest (formerly WPPSS) wastewater treatment system (UC 1998a, 1999a, 1999b). Nonhazardous liquid waste generated for this combination of facilities is estimated to be 43 to 44 percent of the existing annual site waste generation, 36 to 38 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, 36 to 38 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system.

H.1.2.5 Pit Conversion and MOX Facilities

H.1.2.5.1 Construction of Pit Conversion and MOX Facilities

Table H–9 compares the expected construction waste generation rates for the facilities that may be constructed at Hanford with the existing generation rates for Hanford waste. No radioactive waste would be generated during the 3-year construction period because this action involves new construction or modification of uncontaminated buildings only (UC 1998a, 1998b). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations. The amount of waste generated during construction would vary if FMEF needs to be modified to accept the MOX facility versus constructing a new building (UC 1998b:attachment).

Table H–9. Potential Waste Management Impacts of Construction of Pit Conversion and MOX Facilities in FMEF or New MOX Facility at Hanford

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b] Pit Conversion	MOX FMEF	MOX New	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation Pit Conversion	MOX	Both Facilities
Hazardous	13	9	19	560	2	2 to 3	4 to 6
Nonhazardous							
Liquid	1,300	19,000	20,000	200,000	1	9 to 10	10 to 11
Solid	28	6,800	8,600	43,000	<1	16 to 20	16 to 20

a See definitions in Appendix F.8.
b DOE 1999a; UC 1998a, 1998b. Values rounded to two significant figures.
c From the waste management section in Chapter 3.
Key: FMEF, Fuels and Materials Examination Facility.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998a, 1998b). Hazardous waste generation for this combination of facilities is estimated to be 4 to 6 percent of existing annual hazardous waste generation. The additional waste load generated during construction should not have a major impact on the Hanford hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite facilities for recycling or disposal (UC 1998a, 1998b). Nonrecyclable solid sanitary waste would be sent off the site and would likely be disposed of in the Richland Sanitary Landfill. Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore were not included in the waste volumes. Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be 16 to 20 percent of existing annual waste generation. The additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and wastewater from dewatering (UC 1998a, 1998b). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at onsite facilities, even though it is likely that much of this waste would be collected in portable toilets and would be managed at offsite facilities. Nonhazardous liquid waste generated for this combination of facilities is estimated to be 10 to 11 percent of existing annual site waste generation, 9 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, 9 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest (formerly WPPSS) Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system during construction.

H.1.2.5.2 Operation of Pit Conversion and MOX Facilities

The waste management facilities within the pit conversion and MOX facilities would process, temporarily store, and ship all wastes generated. Table H–10 compares the expected waste generation rates from operating the new facilities at Hanford with the existing generation rates for Hanford waste. No HLW would be generated by the facilities (UC 1998a, 1998b). Depending in part on decisions in the RODs for the WM PEIS,

Table H–10. Potential Waste Management Impacts of Operation of Pit Conversion and MOX Facilities in FMEF or New MOX Facility at Hanford

	Estimated Waste Generation (m^3/yr)[b]		Site Waste	Percent of Site Waste Generation		
Waste Type[a]	Pit Conversion	MOX	Generation (m^3/yr)[c]	Pit Conversion	MOX	Both Facilities
TRU[d]	18	68	450	4	15	19
LLW	60	94	3,902	2	2	4
Mixed LLW	1	3	847	<1	<1	<1
Hazardous	2	3	560	<1	1	1
Nonhazardous						
Liquid	40,000	26,000	200,000	20	13	33
Solid	1,800	440	43,000	4	1	5

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998a, 1998b. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
Key: FMEF, Fuels and Materials Examination Facility; LLW, low-level waste; TRU, transuranic.

wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Waste generation during operations would be the same whether the MOX facility is located in FMEF or in a new building (UC 1998b:attachment). Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at Hanford will be evaluated in the *Hanford Site Solid (Radioactive and Hazardous) Waste Program EIS* being prepared by the DOE Richland Operations Office (DOE 1997c).

TRU wastes generated during operations include spent filters, contaminated beryllium pieces and cuttings, used containers and equipment, paper and cloth wipes, analytical and quality control samples, solidified inorganic solutions, and dirty plutonium oxide scrap. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facilities (UC 1998a, 1998b). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the Waste Receiving and Processing Facility at Hanford. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this combination of facilities is estimated to be 19 percent of existing annual waste generation and 5 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. A total of 860 m^3 (1,120 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 8 percent of the 11,450 m^3 (14,977 yd^3) of contact-handled TRU waste currently in storage and 5 percent of the 17,000-m^3 (22,200-yd^3) storage capacity available at Hanford. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 4,000 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of approximately 1,200 m^2 (1,440 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.12 ha (0.30 acre) of land at Hanford should not be major.

The 860 m^3 (1,120 yd^3) of TRU waste generated by these facilities would be 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for accumulation. Tritium recovered from pit disassembly would be disposed of as LLW (UC 1998a). A total of 1,540 m^3 (2,010 yd^3) of LLW would be generated over the operation period. LLW generation for this combination of facilities is estimated to be 4 percent of existing annual waste generation, less than 1 percent of the 1.74 million-m^3 (2.28 million-yd^3) disposal capacity of the LLW Burial Grounds, and 1 percent of the 230,000-m^3 (301,000-yd^3) capacity of the Grout Vaults. Using the 3,480-m^3/ha (1,842-yd^3/acre) disposal land usage factor for Hanford published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 1,540 m^3 (2,010 yd^3) of waste would require 0.44 ha (1.09 acre) of disposal space at Hanford. Therefore, impacts of the management of this additional LLW at Hanford should not be major.

Mixed LLW includes lead shielding, solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits (UC 1998a, 1998b). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for Hanford. Hanford currently treats and disposes of mixed LLW on the site. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for this combination of facilities is estimated to be 4 m^3/yr (5.2 yd^3/yr) or less than 1 percent of existing annual waste generation, and less than 1 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. Over the operating lives of these facilities, the 40 m^3 (52 yd^3) of mixed LLW generated would be less than 1 percent of the 16,800-m^3 (22,000-yd^3) storage capacity of the Central Waste Complex, and less than 1 percent of the 14,200-m^3 (18,600-yd^3) disposal capacity in the Radioactive Mixed Waste Disposal Facility. Therefore, the management of this additional waste at Hanford should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, fluorescent light tubes, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (UC 1998a, 1998b). Hazardous waste generation for this combination of facilities is estimated to be 1 percent of existing annual waste generation. These wastes should not have a major impact on the hazardous waste management system at Hanford.

Nonhazardous solid waste includes office garbage, machine shop cuttings, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998a, 1998b). The remaining solid sanitary waste would be sent off the site for disposal in the Richland Sanitary Landfill. Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be 5 percent of existing annual waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets; process wastewater from lab sinks and drains, mop water, and cooling tower blowdown; and treated wastewater from the liquid effluent treatment system. Wastewater would be treated, if necessary, before being discharged to the 400 Area sanitary sewer that connects to the Energy Northwest (formerly WPPSS) wastewater treatment system (UC 1998a, 1998b). Nonhazardous liquid waste generated for this combination of facilities is estimated to be 33 percent of the existing annual site waste generation, 28 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, 28 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system.

H.1.2.6 Immobilization and MOX Facilities

H.1.2.6.1 Construction of Immobilization and MOX Facilities

Table H–11 compares the expected construction waste generation rates for the facilities that may be constructed at Hanford with the existing generation rates for Hanford waste. No radioactive waste would be generated during the 3-year construction period because this action involves new construction or modification of uncontaminated buildings only (UC 1998b, 1999a, 1999b). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations. Construction waste generation would be the same for ceramic and glass immobilization technologies (UC 1999a, 1999b), although the amount of waste generated during construction would vary if FMEF needs to be modified to accept the immobilization and MOX facilities versus constructing a new building for MOX (UC 1998b).

Table H–11. Potential Waste Management Impacts of Construction of Collocating Immobilization and MOX Facilities in FMEF or New MOX Facility at Hanford

	Estimated Waste Generation (m^3/yr)[b]					Percent of Site Waste Generation			
	IF in FMEF (Ceramic or Glass)		MOX					Both Facilities	
Waste Type[a]	w/ MOX	w/o MOX	FMEF	New	Site Waste Generation (m^3/yr)[c]	IF Ceramic or Glass	MOX	Both in FMEF	New MOX
Hazardous	21	8	9	19	560	1-4	2-3	5	5
Nonhazardous									
Liquid	11,000	5,200	19,000	20,000	200,000	3-5	9-10	15	13
Solid	1,200	430	6,800	8,600	43,000	1-3	16-20	19	21

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998b, 1999a, 1999b. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
Key: FMEF, Fuels and Materials Examination Facility; IF, Immobilization Facility.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998b, 1999a, 1999b). Hazardous waste generation for this combination of facilities is estimated to be 5 percent of existing annual hazardous waste generation. The additional waste load generated during construction should not have a major impact on the Hanford hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite facilities for recycling or disposal (UC 1998b, 1999a, 1999b). Nonrecyclable solid sanitary waste would be sent off the site and would likely be disposed of in the Richland Sanitary Landfill. Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore were not included in the waste volumes. Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be 19 to 21 percent of existing annual waste generation. The additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and wastewater from dewatering (UC 1998b, 1999a, 1999b). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at onsite facilities, even though it is likely that much of this waste would be collected in portable toilets and would be managed at offsite facilities. Nonhazardous liquid waste generated for this combination of facilities is estimated to be 13 to 15 percent of existing annual site waste generation, 11 to 13 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, and 11 to 13 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest (formerly WPPSS) Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system during construction.

H.1.2.6.2 Operation of Immobilization and MOX Facilities

The waste management facilities within the immobilization and MOX facilities would process, temporarily store, and ship all wastes generated. Table H–12 compares the expected waste generation rates from operating the new facilities at Hanford with the existing generation rates for Hanford waste. Although HLW would be used in the immobilization process, no HLW would be generated by the facilities (UC 1998b, 1999a, 1999b). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Waste generation would be the same for ceramic and glass immobilization technologies (UC 1999a, 1999b) and would be the same whether the MOX facility is located in FMEF or in a new building (UC 1998b:attachment). Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at Hanford will be evaluated in the *Hanford Site Solid (Radioactive and Hazardous) Waste Program EIS* being prepared by the DOE Richland Operations Office (DOE 1997c).

TRU wastes generated during operations include metal cladding from fuel elements, spent filters, used containers and equipment, paper and cloth wipes, analytical and quality control samples, solidified inorganic solutions, and dirty plutonium oxide scrap. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facilities (UC 1998b, 1999a, 1999b). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the Waste Receiving and Processing Facility at Hanford. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

Table H–12. Potential Waste Management Impacts of Operation of Collocating Immobilization and MOX Facilities in FMEF or New MOX Facility at Hanford

	Estimated Waste Generation (m^3/yr)[b]			Percent of Site Waste Generation		
Waste Type[a]	Immobilization (Ceramic or Glass)	MOX	Site Waste Generation (m^3/yr)[c]	Immobilization (Ceramic or Glass)	MOX	Both Facilities
TRU[d]	95	68	450	21	15	36
LLW	80	94	3,902	2	2	4
Mixed LLW	1	3	847	<1	<1	<1
Hazardous	75	3	560	13	1	14
Nonhazardous						
Liquid	40,000-46,000	26,000	200,000	20	13	33-36
Solid	340	440	43,000	1	1	2

a See definitions in Appendix F.8.
b DOE 1999a; UC 1998b, 1999a, 1999b. Values rounded to two significant figures.
c From the waste management section in Chapter 3.
d Includes mixed TRU waste.
Key: FMEF, Fuels and Materials Examination Facility; LLW, low-level waste; TRU, transuranic.

TRU waste generation for this combination of facilities is estimated to be 36 percent of existing annual waste generation and 9 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. A total of 1,630 m^3 (2,132 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 14 percent of the 11,450 m^3 (14,977 yd^3) of contact-handled TRU waste currently in storage, and 10 percent of the 17,000-m^3 (22,200-yd^3) storage capacity available at Hanford. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 7,700 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 2,300 m^2 (2,750 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.23 ha (0.57 acre) of land at Hanford should not be major.

The 1,630 m^3 (2,132 yd^3) of TRU waste generated by these facilities would be 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, and solidified inorganic solutions. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste (UC 1999a, 1999b). LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for accumulation (UC 1998b, 1999a, 1999b). A total of 1,740 m^3 (2,276 yd^3) of LLW would be generated over the operation period. LLW generation for this combination of facilities is estimated to be 4 percent of existing annual waste generation, less than 1 percent of the 1.74 million-m^3 (2.28 million-yd^3) disposal capacity of the LLW Burial Grounds, and 1 percent of the 230,000-m^3 (301,000-yd^3) capacity of the Grout Vaults. Using the 3,480-m^3/ha (1,842-yd^3/acre) disposal land usage factor for Hanford published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 1,740 m^3 (2,276 yd^3) of waste would require 0.5 ha (1.2 acre) of disposal space at Hanford. Therefore, impacts of the management of this additional LLW at Hanford should not be major.

Mixed LLW includes lead shielding, solvents contaminated with plutonium, and scintillation vials from the analytical laboratory (UC 1998b, 1999a, 1999b). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for Hanford. Hanford currently treats and disposes of mixed LLW on the site. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for this combination of facilities is estimated to be 4 m^3/yr (5.2 yd^3/yr) or less than 1 percent of existing annual waste generation, and less than 1 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. Over the operating life of these facilities, the 40 m^3 (52 yd^3) of mixed LLW generated would be less than 1 percent of the 16,800-m^3 (22,000-yd^3) storage capacity of the Central Waste Complex, and less than 1 percent of the 14,200-m^3 (18,600-yd^3) disposal capacity in the Radioactive Mixed Waste Disposal Facility. Therefore, the management of this additional waste at Hanford should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, lubricants, oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, fluorescent light tubes, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (UC 1998b, 1999a, 1999b). Hazardous waste generation for this combination of facilities is estimated to be 14 percent of existing annual waste generation. Because these wastes would be treated and disposed of at offsite commercial facilities, these wastes should not have a major impact on the hazardous waste management system at Hanford.

Nonhazardous solid waste includes office garbage, machine shop cuttings, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998b, 1999a, 1999b). The remaining solid sanitary waste would be sent off the site for disposal in the Richland Sanitary Landfill. Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be 2 percent of existing annual waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets; process wastewater from lab sinks and drains, mop water, cooling tower blowdown; and treated wastewater from the liquid effluent treatment system. Wastewater would be treated, if necessary, before being discharged to the 400 Area sanitary sewer that connects to the Energy Northwest (formerly WPPSS) wastewater treatment system (UC 1998b, 1999a, 1999b). Nonhazardous liquid waste generated for this combination of facilities is estimated to be 33 to 36 percent of the existing annual site waste generation, 28 to 31 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, 28 to 31 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system.

H.1.2.7 Pit Conversion, Immobilization, and MOX Facilities

H.1.2.7.1 Construction of Pit Conversion, Immobilization, and MOX Facilities

Table H–13 compares the expected construction waste generation rates for the facilities that may be constructed at Hanford with the existing generation rates for Hanford waste. No radioactive waste would be generated during the 3-year construction period because this action involves new construction and modification of uncontaminated buildings only (UC 1998a, 1998b, 1999a, 1999b). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were

Table H–13. Potential Waste Management Impacts of Construction of Pit Conversion and Immobilization Facilities in FMEF and New MOX Facility at Hanford

	Estimated Waste Generation (m^3/yr)[b]				Percent of Site Waste Generation			
Waste Type[a]	Pit Conversion	Immobilization (Ceramic or Glass)	MOX	Site Waste Generation (m^3/yr)[c]	Pit Conversion	Immobilization (Ceramic or Glass)	MOX	All Facilities
Hazardous	13	18	19	560	2	3	3	9
Nonhazardous								
Liquid	1,300	8,800	20,000	200,000	1	4	10	15
Solid	28	1,100	8,600	43,000	<1	2	20	22

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998a, 1998b, 1999a, 1999b. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
Key: FMEF, Fuels and Materials Examination Facility.

generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations. Construction waste generation would be the same for ceramic and glass immobilization technologies (UC 1999a, 1999b).

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, motor oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during the 3-year construction period would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998a, 1998b, 1999a, 1999b). Hazardous waste generation for this combination of facilities is estimated to be 9 percent of existing annual hazardous waste generation. The additional waste load generated during construction should not have a major impact on the Hanford hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite facilities for recycling or disposal (UC 1998a, 1998b, 1999a, 1999b). Nonrecyclable solid sanitary waste would be sent off the site and would likely be disposed of in the Richland Sanitary Landfill. Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore were not included in the waste volumes. Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be 22 percent of existing annual waste generation. The additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and wastewater from dewatering (UC 1998a, 1998b, 1999a, 1999b). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at onsite facilities, even though it is likely that much of this waste would be collected in portable toilets and would be managed at offsite facilities. Nonhazardous liquid waste generated for this combination of facilities is estimated to be 15 percent of existing annual site waste generation, 13 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, and 13 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest (formerly WPPSS) Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system during construction.

H.1.2.7.2 Operation of Pit Conversion, Immobilization, and MOX Facilities

The waste management facilities within the pit conversion, immobilization, and MOX facilities would process, temporarily store, and ship all wastes generated. Table H–14 compares the expected waste generation rates from operating the new facilities at Hanford with the existing generation rates for Hanford waste. Although HLW would be used in the immobilization process, no HLW would be generated by the facilities (UC 1998a, 1998b, 1999a, 1999b). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Waste generation would be the same for ceramic and glass immobilization technologies (UC 1999a, 1999b). Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at Hanford will be evaluated in the *Hanford Site Solid (Radioactive and Hazardous) Waste Program EIS* being prepared by the DOE Richland Operations Office (DOE 1997c).

Table H–14. Potential Waste Management Impacts of Operation of Pit Conversion and Immobilization Facilities in FMEF and New MOX Facilities at Hanford

	Estimated Waste Generation (m^3/yr)[b]				Percent of Site Waste Generation			
Waste Type[a]	Pit Conversion	Immobilization (Ceramic or Glass)	MOX	Site Waste Generation (m^3/yr)[c]	Pit Conversion	Immobilization (Ceramic or Glass)	MOX	All Facilities
TRU[d]	18	95	68	450	4	21	15	40
LLW	60	80	94	3,902	2	2	2	6
Mixed LLW	1	1	3	847	<1	<1	<1	1
Hazardous	2	75	3	560	<1	13	1	14
Nonhazardous								
Liquid	40,000	45,000	26,000	200,000	20	23	13	56
Solid	1,800	340	440	43,000	4	1	1	6

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998a, 1998b, 1999a, 1999b. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
Key: FMEF, Fuels and Materials Examination Facility; LLW, low-level waste; TRU, transuranic.

TRU wastes generated during operations include metal cladding from fuel elements, spent filters, contaminated beryllium pieces and cuttings, sweepings, used containers and equipment, paper and cloth wipes, analytical and quality control samples, solidified inorganic solutions, and dirty plutonium oxide scrap. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facility (UC 1998a, 1998b, 1999a, 1999b). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the Waste Receiving and Processing Facility at Hanford. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this combination of facilities is estimated to be 40 percent of existing annual waste generation and 10 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing

Facility. A total of 1,810 m^3 (2,367 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 16 percent of the 11,450 m^3 (14,977 yd^3) of contact-handled TRU waste currently in storage, and 10 percent of the 17,000-m^3 (22,200-yd^3) storage capacity available at Hanford. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 8,600 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of approximately 2,600 m^2 (3,110 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.26 ha (0.64 acre) of land at Hanford should not be major.

The 1,810 m^3 (2,367 yd^3) of TRU waste generated by these facilities would be 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste (UC 1998a, 1999a, 1999b). LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for accumulation (UC 1998a, 1998b, 1999a, 1999b). Tritium recovered from pit disassembly would be disposed of as LLW (UC 1998a). A total of 2,340 m^3 (3,061 yd^3) of LLW would be generated over the operation period. LLW generation for this combination of facilities is estimated to be 6 percent of existing annual waste generation, less than 1 percent of the 1.74 million-m^3 (2.28 million-yd^3) disposal capacity of the LLW Burial Grounds, and 1 percent of the 230,000-m^3 (301,000-yd^3) capacity of the Grout Vaults. Using the 3,480-m^3/ha (1,842-yd^3/acre) disposal land usage factor for Hanford published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 2,340 m^3 (3,061 yd^3) of waste would require 0.67 ha (1.66 acre) of disposal space at Hanford. Therefore, impacts of the management of this additional LLW at Hanford should not be major.

Mixed LLW includes lead shielding, solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits (UC 1998a, 1998b, 1999a, 1999b). Mixed LLW would be stabilized, packaged, and stored onsite for treatment and disposal in a manner consistent with the site treatment plan for Hanford. Hanford currently treats and disposes of mixed LLW on the site. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for this combination of facilities is estimated to be 5 m^3/yr (6.5 yd^3/yr) or 1 percent of existing annual waste generation, and less than 1 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. Over the operating lives of these facilities, the 50 m^3 (65 yd^3) of mixed LLW generated would be less than 1 percent of the 16,800-m^3 (22,000-yd^3) storage capacity of the Central Waste Complex, and less than 1 percent of the 14,200-m^3 (18,600-yd^3) disposal capacity in the Radioactive Mixed Waste Disposal Facility. Therefore, the management of this additional waste at Hanford should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, fluorescent light tubes, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (UC 1998a, 1998b, 1999a, 1999b). Hazardous waste generation for this combination of facilities is estimated to be 14 percent of existing annual waste generation. Because these wastes would be treated and disposed of at offsite commercial facilities, these wastes should not have a major impact on the hazardous waste management system at Hanford.

Nonhazardous solid waste includes office garbage, machine shop cuttings, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998a, 1998b, 1999a, 1999b). The remaining solid sanitary waste would be sent off the site for disposal in the Richland Sanitary Landfill. Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be 6 percent of existing annual waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets; process wastewater from lab sinks and drains, mop water, cooling tower blowdown, boiler blowdown; and treated wastewater from the liquid effluent treatment system. Nonhazardous process wastewater would be treated, if necessary, before being discharged to the 400 Area sanitary sewer which connects to the Energy Northwest (formerly WPPSS) wastewater treatment system (UC 1998a, 1998b, 1999a, 1999b). Nonhazardous liquid waste generated for this combination of facilities is estimated to be 56 percent of the existing annual site waste generation, 48 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, 48 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest Sewage Treatment Facility and within the 138,000-m^3/yr (181,000-yd^3/yr) excess capacity of the Energy Northwest Sewage Treatment Facility (Mecca 1997). Therefore, the management of this additional waste should not have a major impact on the system.

H.2 INEEL

H.2.1 Assessment Data

Impacts on INEEL waste management facilities were estimated using information on existing environmental conditions from Chapter 3 and information on the characteristics of the proposed surplus plutonium disposition facilities from Chapter 2 and the facility data reports. A description of the methods used to evaluate impacts on waste management facilities is presented in Appendix F.8.

H.2.2 Facilities

H.2.2.1 Pit Conversion Facility

H.2.2.1.1 Construction of Pit Conversion Facility

Table H–15 compares the expected construction waste generation rates for the pit conversion facility that may be constructed at INEEL with the existing site waste generation rates. No radioactive waste would be generated during the 3-year construction period because this facility involves the modification of an uncontaminated building (UC 1998c). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and applicable Federal and State regulations.

Table H–15. Potential Waste Management Impacts of Construction of Pit Conversion Facility in FPF at INEEL

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Hazardous	16	835	2
Nonhazardous			
Liquid	2,300	2,000,000	<1
Solid	40	62,000	<1

[a] See definitions in Appendix F.8.
[b] UC 1998c. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
Key: FPF, Fuel Processing Facility.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998c). Hazardous waste generation for this facility is estimated to be 2 percent of existing annual hazardous waste generation. The additional waste load generated during construction should not have a major impact on the INEEL hazardous waste management system.

Nonhazardous solid waste includes office garbage, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite recycling or onsite disposal facilities (UC 1998c). Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore would not be included in the waste volumes. Construction debris would be disposed of in the INEEL onsite landfill complex in the Central Facilities Area (CFA). Nonrecyclable solid sanitary waste would be sent off the site for disposal in the Bonneville County landfill. Nonhazardous solid waste generated for this facility is estimated to be less than 1 percent of existing annual waste generation. Assuming all nonhazardous solid waste were disposed of on the site, this additional waste would require less than 1 percent of the 48,000-m^3/yr (62,800-yd^3/yr) capacity in the CFA landfill complex. The additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at INEEL.

Nonhazardous liquid waste includes sanitary waste from any sinks, showers, and water closets (UC 1998c). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at onsite facilities, even though it is likely that most of this waste would be collected in portable toilets and managed at offsite facilities. Nonhazardous liquid waste generated for this facility is estimated to be less than 1 percent of existing annual waste generation, 1 percent of the 166,000-m^3/yr (217,000-yd^3/yr) capacity of the Fuel Processing Facility (FPF) sanitary sewer system, less than 1 percent of the 3.2 million-m^3/yr (4.2 million-yd^3/yr) capacity of the Idaho Nuclear Technology and Engineering Center (INTEC) Sewage Treatment Plant and within the 3,117,000-m^3/yr (4,077,000-yd^3/yr) excess capacity of the INTEC Sewage Treatment Plant (Abbott et al. 1997:20). Therefore, the generation of nonhazardous liquid waste should not have a major impact on the system during construction.

H.2.2.1.2 Operation of Pit Conversion Facility

The waste management facilities within the pit conversion facility would process, temporarily store, and ship all wastes generated. Table H–16 compares the expected waste generation rates from operating the new facility at INEEL with the existing site waste generation rates. No HLW would be generated by the pit conversion facility (UC 1998c). Depending in part on decisions in the ROD for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment, storage and disposal of radioactive, hazardous, and mixed wastes at INEEL are described in the *DOE Programmatic Spent Nuclear Fuel Management and INEL Environmental Restoration and Waste Management Programs Final EIS* (DOE 1995a).

TRU wastes generated during operations include spent filters, contaminated beryllium pieces and cuttings, used containers and equipment, paper and cloth wipes, analytical and quality control samples, and solidified inorganic solutions. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the pit conversion facility. Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Longer-term storage, drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned Waste Characterization Facility at INEEL (UC 1998c). TRU waste is not routinely generated at INEEL, although 39,300 m^3 (51,400 yd^3) of contact-handled TRU waste is currently in storage. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this facility is estimated to be 18 m^3/yr (24 yd^3/yr) or a total of 180 m^3 (235 yd^3) over the 10-year operation period. This would be less than 1 percent of the 6,500-m^3/yr (8,500-yd^3/yr) capacity of the planned Advanced Mixed Waste Treatment Project and less than 1 percent of the 177,300-m^3 (231,900-yd^3) storage capacity available at the Radioactive Waste Management Complex (RWMC).

Table H–16. Potential Waste Management Impacts of Operation of Pit Conversion Facility in FPF at INEEL

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	18	(e)	NA
LLW	60	2,624	2
Mixed LLW	1	180	1
Hazardous	2	835	<1
Nonhazardous			
Liquid	41,000	2,000,000	2
Solid	1,800	62,000	3

[a] See definitions in Appendix F.8.
[b] UC 1998c. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
[e] TRU waste is not routinely generated at INEEL, although 39,300 m^3 (51,400 yd^3) of contact-handled TRU waste is currently in storage.
Key: FPF, Fuel Processing Facility; LLW, low-level waste; NA, not applicable; TRU, transuranic.

Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 860 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 260 m^2 (310 yd^2) would be required. The impacts of storing additional quantities of TRU waste on less than 0.1 ha (0.25 acre) of land at INEEL should not be major.

The 180 m^3 (235 yd^3) of TRU waste generated by this facility would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and is within the 168,500-m^3 (220,400-yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operation would originate from activities in the processing areas that contain the glove-box lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facility before being transferred for additional treatment and/or disposal in existing facilities on the site. Liquid LLW would be evaporated or solidified before being packaged for accumulation. Tritium recovered from pit disassembly would be disposed of as LLW (UC 1998c). LLW generation for this facility is estimated to be 2 percent of existing annual waste generation, less than 1 percent of the 177,300-m^3 (231,900-yd^3) storage capacity at the RWMC, and less than 1 percent of the 37,700-m^3/yr (49,300-yd^3/yr) disposal capacity of the RWMC. If the LLW were treated at Waste Experimental Reduction Facility, the 60 m^3 (78 yd^3) of annual waste generation would be less than 1 percent of the 49,610 m^3 (64,890 yd^3) annual facility capacity. A total of 600-m^3 (780-yd^3) LLW would be generated over the operation period. Using the 6,264-m^3/ha (3,315-yd^3/acre) disposal land usage factor for INEEL published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 600 m^3 (780 yd^3) of waste would require 0.1 ha (0.25 acre) of disposal space. Therefore, impacts of the management of this additional LLW at INEEL should not be major.

Mixed LLW includes solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits (UC 1998c). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for INEEL. INEEL currently treats some mixed LLW on the site and ships some to Envirocare of Utah. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for this facility is estimated to be 1 m^3/yr (1.3 yd^3/yr) or 1 percent of the existing annual waste generation, and less than 1 percent of the 6,500-m^3/yr (8,500-yd^3/yr) planned capacity of the Advanced Mixed Waste Treatment Project. Over the operating life of this facility, the 10 m^3 (13 yd^3) of mixed LLW generated would be less than 1 percent of the 177,300-m^3 (231,900-yd^3) storage capacity at the RWMC. Therefore, the management of this additional waste at INEEL should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at onsite and offsite permitted facilities (UC 1998c). Hazardous waste generation for this facility is estimated to be less than 1 percent of the existing annual waste generation and less than 1 percent of the 9,848-m^3 (12,881-yd^3) onsite storage capacity. Therefore, impacts on the hazardous waste management system at INEEL should not be major.

Nonhazardous solid waste includes office garbage, machine shop cuttings, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998c). The remaining solid sanitary waste would be sent off the site for disposal in the Bonneville County landfill. Nonrecyclable, nonhazardous solid waste generated by this facility is estimated to be 3 percent of existing annual waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at INEEL.

Nonhazardous liquid waste includes sanitary waste from sinks, showers and water closets, and process wastewater from lab sinks and drains, mop water, cooling tower blowdown, and boiler blowdown. Nonhazardous wastewater would be treated, if necessary, before being discharged to the FPF sanitary sewer that connects to the INTEC wastewater treatment system (UC 1998c). Nonhazardous liquid waste generated for this facility is estimated to be 2 percent of the existing annual site waste generation, 25 percent of the 166,000-m^3/yr (217,000-yd^3/yr) capacity of the FPF sanitary sewer system, 1 percent of the 3.2 million-m^3/yr (4.2 million-yd^3/yr) capacity of the INTEC Sewage Treatment Plant and within the 3,117,000-m^3/yr (4,077,000-yd^3/yr) excess capacity of the INTEC Sewage Treatment Plant (Abbott et al. 1997:20). Therefore, the management of this additional waste should not have a major impact on the system.

H.2.2.2 MOX Facility

H.2.2.2.1 Construction of MOX Facility

Table H–17 compares the expected construction waste generation rates for the new MOX facility that may be constructed at INEEL with the existing site waste generation rates. No radioactive waste would be generated during the 3-year construction period because this facility involves new construction only (UC 1998d). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous

Table H–17. Potential Waste Management Impacts of Construction of New MOX Facility at INEEL

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Hazardous	19	835	2
Nonhazardous			
Liquid	20,000	2,000,000	1
Solid	8,600	62,000	14

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998d. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.

waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998d). Hazardous waste generation for this facility is estimated to be 2 percent of the existing annual hazardous waste generation. The additional waste load generated during construction should not have a major impact on the INEEL hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite recycling or onsite disposal facilities (UC 1998d). Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore were not included in the waste volumes. Construction debris would be disposed of in the onsite INEEL landfill complex in the CFA. Nonrecyclable solid sanitary waste would be sent off the site for disposal in the Bonneville County landfill. Nonhazardous solid waste generated for this facility is estimated to be 14 percent of existing annual waste generation. Assuming all nonhazardous solid waste was to be disposed of on the site, this additional waste would require 18 percent of the 48,000-m^3/yr (62,800-yd^3/yr) capacity in the CFA landfill complex. The additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at INEEL.

Nonhazardous liquid waste includes sanitary waste from any sinks, showers and water closets, and wastewater from dewatering (UC 1998d). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at facilities on the site, even though it is likely that most of this waste would be collected in portable toilets and would be managed at offsite facilities. Nonhazardous liquid waste generated for this facility is estimated to be 1 percent of existing annual waste generation, 12 percent of the 166,000-m^3/yr (217,000-yd^3/yr) capacity of the FPF sanitary sewer system, less than 1 percent of the 3.2 million-m^3/yr (4.2 million-yd^3/yr) capacity of the INTEC Sewage Treatment Plant and within the 3,117,000-m^3/yr (4,077,000-yd^3/yr) excess capacity of the INTEC Sewage Treatment Plant (Abbott et al. 1997:20). Therefore, the management of this additional waste should not have a major impact on the system during construction.

H.2.2.2.2 Operation of MOX Facility

The waste management facilities within the MOX facility would process, temporarily store, and ship all wastes generated. Table H–18 compares the expected waste generation rates from operating the new facility at INEEL with the existing site waste generation rates. No HLW would be generated by the MOX facility (UC 1998d). Depending in part on decisions in the ROD for the WM PEIS, wastes could be treated and disposed of on the

Table H–18. Potential Waste Management Impacts of Operation of New MOX Facility at INEEL

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	68	(e)	NA
LLW	94	2,624	4
Mixed LLW	3	180	2
Hazardous	3	835	<1
Nonhazardous			
Liquid	26,000	2,000,000	1
Solid	440	62,000	1

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998d. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
[e] TRU waste is not routinely generated at INEEL, although 39,300 m^3 (51,400 yd^3) of contact-handled TRU waste is currently in storage.
Key: LLW, low-level waste, NA, not applicable; TRU, transuranic.

site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment, storage and disposal of radioactive, hazardous, and mixed wastes at INEEL are described in the *DOE Programmatic Spent Nuclear Fuel Management and INEL Environmental Restoration and Waste Management Programs EIS* (DOE 1995a).

TRU wastes generated during operations include spent filters, sweepings, used containers and equipment, paper and cloth wipes, analytical and quality control samples, solidified inorganic solutions, and dirty plutonium oxide scrap. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the MOX facility (UC 1998d). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned Waste Characterization Facility at INEEL. TRU waste is not routinely generated at INEEL, although 39,300 m^3 (51,400 yd^3) of contact-handled TRU waste is currently in storage. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generated by this facility is estimated to be 68 m^3/yr (89 yd^3/yr) or a total of 680 m^3 (890 yd^3) over the 10-year operation period. This would be 1 percent of the 6,500-m^3/yr (8,500-yd^3/yr) capacity of the planned Advanced Mixed Waste Treatment Project and less than 1 percent of the 177,300-m^3 (231,900-yd^3) storage capacity available at the RWMC. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 3,200 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 960 m^2 (1,150 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.1 ha (0.25 acre) of land at INEEL should not be major.

The 680 m^3 (890 yd^3) of TRU waste generated by this facility would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500 m^3 (220,400 yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, and solidified inorganic solutions. It is likely that the LLW generated during operation would originate from activities in the processing areas containing the glove-box lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for accumulation (UC 1998d). LLW generation for this facility is estimated to be 4 percent of existing annual waste generation, 1 percent of the 177,300-m^3 (231,900-yd^3) storage capacity at the RWMC, and less than 1 percent of the 37,700-m^3/yr (49,300-yd^3/yr) disposal capacity of the RWMC. If the LLW were to be treated at the Waste Experimental Reduction Facility, the 94 m^3 (123 yd^3) of annual waste generation would be less than 1 percent of the 49,610 m^3 (64,890 yd^3) annual facility capacity. A total of 940-m^3 (1,230-yd^3) LLW would be generated over the period of operation. Using the 6,264-m^3/ha (3,315-yd^3/acre) disposal land usage factor for INEEL published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 940 m^3 (1,230 yd^3) of waste would require 0.15 ha (0.37 acre) of disposal space. Therefore, impacts of the management of this additional LLW at INEEL should not be major.

Mixed LLW includes solvents contaminated with plutonium and scintillation vials from the analytical laboratory (UC 1998d). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for INEEL. INEEL currently treats mixed LLW on the site and ships some mixed LLW to Envirocare of Utah. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for this facility is estimated to be 3 m^3/yr (3.9 yd^3/yr) or 2 percent of existing annual waste generation. The 3 m^3/yr (3.9 yd^3/yr) of mixed LLW would be less than 1 percent of the 6,500-m^3/yr (8,500-yd^3/yr) planned capacity of the Advanced Mixed Waste Treatment Project. Over the operating life of this facility, the 30 m^3 (39 yd^3) of mixed LLW generated would be less than 1 percent of the 177,300-m^3 (231,900-yd^3) storage capacity at the RWMC. Therefore, the management of this additional waste at INEEL should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at onsite and offsite permitted facilities (UC 1998d). Hazardous waste generation for this facility is estimated to be less than 1 percent of existing annual waste generation and less than 1 percent of the 9,848-m^3 (12,881-yd^3) onsite storage capacity. Therefore, impacts on the hazardous waste management system at INEEL should not be major.

Nonhazardous solid waste includes office garbage, machine shop cuttings, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998d). The remaining solid sanitary waste would be sent off the site for disposal in the Bonneville County landfill. Nonrecyclable, nonhazardous solid waste generated by this facility is estimated to be 1 percent of existing annual waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at INEEL.

Nonhazardous liquid waste includes sanitary waste from sinks, showers and water closets, process wastewater from lab sinks and drains, mop water, cooling tower blowdown, boiler blowdown, and treated wastewater from the liquid effluent treatment system. Nonhazardous wastewater would be treated, if necessary, before being discharged to the FPF sanitary sewer that connects to the INTEC wastewater treatment system (UC 1998d). Nonhazardous liquid waste generated for this facility is estimated to be 1 percent of existing annual site waste generation, 16 percent of the 166,000-m^3/yr (217,000-yd^3/yr) capacity of the FPF sanitary sewer system, 1 percent of the 3.2 million-m^3/yr (4.2 million-yd^3/yr) capacity of the INTEC Sewage Treatment Plant and within the 3,117,000-m^3/yr (4,077,000-yd^3/yr) excess capacity of the INTEC Sewage Treatment Plant (Abbott et al. 1997:20). Therefore, the management of this additional waste should not have a major impact on the system.

H.2.2.3 Pit Conversion and MOX Facilities

H.2.2.3.1 Construction of Pit Conversion and MOX Facilities

Table H–19 compares the expected construction waste generation rates for the facilities that may be constructed at INEEL with the existing site waste generation rates. No radioactive waste would be generated during the 3-year construction period because these facilities involve new construction and modification of uncontaminated buildings only (UC 1998c, 1998d). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations.

Table H–19. Potential Waste Management Impacts of Construction of Pit Conversion Facility in FPF and New MOX Facility at INEEL

	Estimated Waste Generation (m^3/yr)[b]		Site Waste	Percent of Site Waste Generation		
WasteType[a]	Pit Conversion	MOX	Generation (m^3/yr)[c]	Pit Conversion	MOX	Both Facilities
Hazardous	16	19	835	2	2	4
Nonhazardous						
Liquid	2,300	20,000	2,000,000	<1	1	1
Solid	40	8,600	62,000	<1	14	14

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998c, 1998d. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
Key: FPF, Fuel Processing Facility.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998c, 1998d). Hazardous waste generation for these facilities is estimated to be 4 percent of existing annual hazardous waste generation. The additional waste load generated during construction should not have a major impact on INEEL hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite recycling or disposal facilities on the site (UC 1998c, 1998d). Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore were not included in the waste volumes. Construction debris would be disposed of in the onsite INEEL landfill complex in the

CFA. Nonrecyclable solid sanitary waste would be sent off the site for disposal in the Bonneville County landfill. Nonhazardous solid waste generation for these facilities is estimated to be 14 percent of existing annual waste generation. Assuming all nonhazardous solid waste was to be disposed on the site, this additional waste would require 18 percent of the 48,000-m^3/yr (62,800-yd^3/yr) capacity in the CFA landfill complex. The additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at INEEL.

Nonhazardous liquid waste includes sanitary waste from any sinks, showers and water closets, and wastewater from dewatering (UC 1998c, 1998d). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at facilities on the site, even though it is likely that most of this waste would be collected in portable toilets and would be managed at offsite facilities. Nonhazardous liquid waste generated for these facilities is estimated to be 1 percent of existing annual waste generation, 13 percent of the 166,000-m^3/yr (217,000-yd^3/yr) capacity of the FPF sanitary sewer system, 1 percent of the 3.2 million-m^3/yr (4.2 million-yd^3/yr) capacity of the INTEC Sewage Treatment Plant and within the 3,117,000-m^3/yr (4,077,000-yd^3/yr) excess capacity of the INTEC Sewage Treatment Plant (Abbott et al. 1997:20). Therefore, the management of this additional waste should not have a major impact on the system during construction.

H.2.2.3.2 Operation of Pit Conversion and MOX Facilities

The waste management facilities within the pit conversion and MOX facilities would process, temporarily store, and ship all wastes generated. Table H–20 compares the expected waste generation rates from operating the new facilities at INEEL with the existing site waste generation rates. No HLW would be generated by the pit conversion and MOX facilities (UC 1998c, 1998d). Depending in part on decisions in the ROD for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment, storage and disposal of radioactive, hazardous, and mixed wastes at INEEL are described in the *DOE Programmatic Spent Nuclear Fuel Management and INEL Environmental Restoration and Waste Management Programs EIS* (DOE 1995a).

TRU wastes generated during operations include spent filters, contaminated beryllium pieces and cuttings, sweepings, used containers and equipment, paper and cloth wipes, analytical and quality control samples, solidified inorganic solutions, and dirty plutonium oxide scrap (UC 1998c, 1998d). Lead gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste (UC 1998c). TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the pit conversion and MOX facilities (UC 1998c, 1998d). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned Waste Characterization Facility at INEEL (UC 1998c). TRU waste is not routinely generated at INEEL, although 39,300 m^3 (51,400 yd^3) of contact-handled TRU waste is currently in storage. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are

Table H–20. Potential Waste Management Impacts of Operation of Pit Conversion Facility in FPF and New MOX Facility at INEEL

	Estimated Waste Generation (m^3/yr)[b]		Site Waste	Percent of Site Waste Generation		
Waste Type[a]	Pit Conversion	MOX	Generation (m^3/yr)[c]	Pit Conversion	MOX	Both Facilities
TRU[d]	18	68	(e)	NA	NA	NA
LLW	60	94	2,624	2	4	6
Mixed LLW	1	3	180	1	2	2
Hazardous	2	3	835	<1	<1	1
Nonhazardous						
Liquid	41,000	26,000	2,000,000	2	1	3
Solid	1,800	440	62,000	3	1	4

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998c, 1998d. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
[e] TRU waste is not routinely generated at INEEL, although 39,300 m^3 (51,400 yd^3) of contact-handled TRU waste is currently in storage.
Key: FPF, Fuel Processing Facility; LLW, low-level waste; NA, not applicable; TRU, transuranic.

described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for these facilities is estimated to be 86 m^3/yr (112 yd^3/yr) or a total of 860 m^3 (1,120 yd^3) over the 10-year operation period. This would be 1 percent of the 6,500-m^3 (8,500-yd^3) capacity of the planned Advance Mixed Waste Treatment Project and less than 1 percent of the 177,300-m^3 (231,900-yd^3) storage capacity available at the RWMC. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 4,100 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 1,200 m^2 (1,440 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.12 ha (0.30 acre) of land at INEEL should not be major.

The 860 m^3 (1,120 yd^3) of TRU waste generated by these facilities would be 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operation would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste (UC 1998c). LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for accumulation (UC 1998c, 1998d). Tritium recovered from pit disassembly would be disposed of as LLW (UC 1998c). LLW generation for these facilities is estimated to be 6 percent of existing annual waste generation, 1 percent of the 177,300-m^3 (231,900-yd^3) storage capacity at the RWMC, and less than 1 percent of the 37,700-m^3/yr (49,300-yd^3/yr) disposal capacity of the RWMC. If the LLW were to be treated at the Waste Experimental Reduction Facility, the 154 m^3 (201 yd^3) of annual waste generation would be less than 1 percent of the 49,610 m^3 (64,880 yd^3) annual facility capacity. A total of 1,540-m^3 (2,014-yd^3) LLW would be generated over the operation period. Using the 6,264-m^3/ha (3,315-yd^3/acre) disposal land usage factor for INEEL published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 1,540 m^3 (2,014 yd^3) of waste would require 0.22 ha (0.54 acre) of disposal space. Therefore, impacts of the management of this additional LLW at INEEL should not be major.

Mixed LLW includes solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits (UC 1998c, 1998d). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for INEEL. INEEL currently treats mixed LLW on the site and ships some mixed LLW to Envirocare of Utah. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for these facilities is estimated to be 4 m^3/yr (5.2 yd^3/yr), or 2 percent of existing annual waste generation, and less than 1 percent of the 6,500-m^3/yr (8,500-yd^3/yr) planned capacity of the Advanced Mixed Waste Treatment Project. Over the operating life of these facilities, the 40 m^3 (52 yd^3) of mixed LLW generated would be less than 1 percent of the 177,300-m^3 (231,900-yd^3) storage capacity at the RWMC. Therefore, the management of this additional waste at INEEL should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operation includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at onsite and offsite permitted facilities (UC 1998c, 1998d). Hazardous waste generation for these facilities is estimated to be 1 percent of existing annual waste generation and 1 percent of the 9,848-m^3 (12,881-yd^3) onsite storage capacity. Therefore, impacts on the hazardous waste management system at INEEL should not be major.

Nonhazardous solid waste includes office garbage, machine shop cuttings, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998c, 1998d). The remaining solid sanitary waste would be sent off the site for disposal in the Bonneville County landfill. Nonrecyclable, nonhazardous solid waste generated by these facilities is estimated to be 4 percent of existing annual waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at INEEL.

Nonhazardous liquid waste includes sanitary waste from sinks, showers and water closets, process wastewater from lab sinks and drains, mop water, cooling tower blowdown, boiler blowdown, and treated wastewater from the liquid effluent treatment system. Nonhazardous wastewater would be treated, if necessary, before being discharged to the FPF sanitary sewer that connects to the INTEC wastewater treatment system (UC 1998c, 1998d). Nonhazardous liquid waste generated for these facilities is estimated to be 3 percent of existing annual waste generation, 40 percent of the 166,000-m^3/yr (217,000-yd^3/yr) capacity of the FPF sanitary sewer system, 2 percent of the 3.2 million-m^3/yr (4.2 million-yd^3/yr) capacity of the INTEC Sewage Treatment Plant and within the 3,117,000-m^3/yr (4,077,000-yd^3/yr) excess capacity of the INTEC Sewage Treatment Plant (Abbott et al. 1997:20). Therefore, management of this additional waste should not have a major impact on the system.

H.3 PANTEX

H.3.1 Assessment Data

Impacts on Pantex waste management facilities were estimated using information on existing environmental conditions from Chapter 3 and information on the characteristics of the proposed surplus plutonium disposition facilities from Chapter 2 and the facility data reports. A description of the methods used to evaluate impacts on waste management facilities is presented in Appendix F.8.

H.3.2 Facilities

H.3.2.1 Pit Conversion Facility

H.3.2.1.1 Construction of Pit Conversion Facility

Table H–21 compares the expected construction waste generation rates for the new pit conversion facility that may be constructed at Pantex with the existing generation rates for Pantex waste. No radioactive waste would be generated during the 3-year construction period because this facility involves new construction only (UC 1998e). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations.

Table H–21. Potential Waste Management Impacts of Construction of New Pit Conversion Facility at Pantex

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Hazardous	50	486	10
Nonhazardous			
Liquid	5,300	473,125	1
Solid	120	8,007	1

[a] See definitions in Appendix F.8.
[b] UC 1998e. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998e). Hazardous waste generation for this facility is estimated to be 10 percent of existing annual site hazardous waste generation. The additional waste load generated during construction should not have a major impact on the Pantex hazardous waste management system.

Nonhazardous solid waste includes office garbage, concrete and steel waste, and other trash from construction of the new facilities and concrete soil, and reinforcing steel from demolition of three existing storage bunkers. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to onsite and offsite disposal and recycling facilities. It was assumed that waste concrete would require disposal, although it is likely that this waste would be stockpiled on the site and crushed for reuse. Waste metals would be sent off the site for recycling and, therefore, were not included in the waste volumes (UC 1998e). Construction debris would be disposed of in the onsite Class 2 construction waste landfill.

Nonrecyclable solid sanitary waste would be sent off the site for disposal in a local landfill such as the Amarillo landfill. Nonhazardous-solid-waste generation for the pit conversion facility is estimated to be 1 percent of existing annual site waste generation. The additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at Pantex.

Nonhazardous liquid waste includes sanitary waste from any sinks, showers, and water closets (UC 1998e). To be conservative it was assumed that all nonhazardous liquid waste generated during construction would be managed at onsite facilities, even though it is likely that most of this waste would be collected in portable toilets and treated and disposed of off the site. Nonhazardous liquid waste generated for this facility is estimated to be 1 percent of existing annual site waste generation, 1 percent of the 946,250-m^3/yr (1,237,700-yd^3/yr) capacity of the sanitary wastewater treatment system and within the 473,125-m^3/yr (618,848-yd^3/yr) excess capacity of the Pantex Wastewater Treatment Facility (M&H 1997:29). Therefore, impacts during construction should not be major.

H.3.2.1.2 Operation of Pit Conversion Facility

The waste management facilities within the pit conversion facility would process, temporarily store, and ship all wastes generated. Table H–22 compares the expected waste generation rates from operating the new facility at Pantex with the existing generation rates for Pantex waste. No HLW would be generated by the pit conversion facility (UC 1998e). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment and storage of radioactive, hazardous, mixed, and nonhazardous wastes at Pantex are described in the *Final EIS for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components* (DOE 1996b).

Table H–22. Potential Waste Management Impacts of Operation of New Pit Conversion Facility at Pantex

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	18	(e)	NA
LLW	60	139	43
Mixed LLW	1	24	4
Hazardous	2	486	<1
Nonhazardous			
Liquid	25,000	473,125	5
Solid	1,800	8,007	22

[a] See definitions in Appendix F.8.
[b] UC 1998e. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
[e] TRU waste is not routinely generated at Pantex.
Key: LLW, low-level waste; NA, not applicable; TRU, transuranic.

TRU wastes generated during operations include spent filters, contaminated beryllium pieces and cuttings, used containers and equipment, paper and cloth wipes, analytical and quality control samples, and solidified inorganic solutions. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the pit conversion facility (UC 1998e). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. [Text deleted.]

TRU waste generation for this facility is estimated to be 18 m^3/yr (24 yd^3/yr). Because TRU waste is not currently generated or stored at Pantex, storage capacity would be provided within the pit conversion facility. A maximum of approximately 180 m^3 (235 yd^3) of TRU waste may need to be stored at Pantex. Assuming that the waste were stored in 208-l (55-gal) drums, each with a capacity of 0.21 m^3 (0.27 yd^3), approximately 860 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of approximately 260 m^2 (310 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste in the pit conversion facility at Pantex should not be major.

The 180 m^3 (235 yd^3) of TRU waste generated by this facility would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500 m^3 (220,400 yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glove-box lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be packaged, certified, and accumulated at the new facilities before being transferred for treatment and interim storage at existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for storage. Tritium recovered from pit disassembly would be disposed of as LLW. Wastes would be stored on the site on an interim basis before being shipped off the site for disposal (UC 1998e). LLW generation for this facility is estimated to be 43 percent of existing annual waste generation, but only 8 percent of the 750-m^3/yr (980-yd^3/yr) capacity of the planned Hazardous Waste Treatment and Processing Facility. Therefore, impacts of the management of this additional LLW at Pantex should not be major.

Most LLW generated at Pantex is currently sent to DOE's Nevada Test Site (NTS) for disposal, although LLWs could also be sent to commercial disposal facilities or other DOE sites. If the shipment of LLW to offsite disposal were delayed, a maximum of approximately 600-m^3 (780-yd^3) LLW may need to be stored at Pantex. This is about 25 percent of the approximately 2,400 m^3 (3,140 yd^3) of existing storage capacity at Pantex. Assuming that the waste were stored in 208-l (55-gal) drums, each with a capacity of 0.21 m^3 (0.27 yd^3), about 2,900 drums would be required to store the additional waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 860 m^2 (1,000 yd^2) is required. Impacts of the storage of additional quantities of LLW on 0.1 ha (0.25 acre) of land at Pantex should not be major.

As stated above, a total of 600 m^3 (780 yd^3) of LLW would be generated over the operation period. Using the 6,08-m^3/ha (3,221-yd^3/acre) disposal land usage factor for NTS published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 600 m^3 (780 yd^3) of waste would require 0.1 ha (0.25 acre) of disposal space at NTS or some other similar facility. Impacts at the disposal site from the use of this small area for disposal should not be major. Impacts of disposal of LLW at NTS are described in the *Final EIS for the NTS and Off-Site Locations in the State of Nevada* (DOE 1996c).

Mixed LLW includes solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits. Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for Pantex. Pantex currently ships mixed LLW to Envirocare of Utah and Diversified Scientific Services, Inc. of Tennessee. These facilities or other treatment or disposal facilities that meet DOE criteria would be used (UC 1998e). Mixed LLW generation for this facility is estimated to be 1 m^3/yr (1.3 yd^3/yr) or 4 percent of existing annual waste generation and, therefore, should not have a major impact on the mixed LLW management system at Pantex.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (UC 1998e). Hazardous waste generation for this facility is estimated to be less than 1 percent of existing annual site waste generation, and less than 1 percent of the 750-m^3/yr (980-yd^3/yr) capacity of the planned Hazardous Waste Treatment and Processing Facility, and, therefore, should not have a major impact on the hazardous waste management system.

Nonhazardous solid waste includes office garbage, machine shop cuttings, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to onsite and offsite disposal and recycling facilities. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998e). The remaining solid sanitary waste would be sent off the site for disposal in a local landfill such as the Amarillo landfill. Nonrecyclable, nonhazardous solid waste generated by this facility is estimated to be 22 percent of existing annual site waste generation. This additional waste load should have not a major impact on the nonhazardous solid waste management system at Pantex.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, and water closets and process wastewater from lab sinks and drains, mop water, cooling tower blowdown, and boiler blowdown. Nonhazardous wastewater would be treated, if necessary, before being discharged to the Pantex wastewater treatment system (UC 1998e). Nonhazardous liquid waste generated for this facility is estimated to be 5 percent of existing annual site waste generation, 3 percent of the 946,250-m^3/yr (1,237,700-yd^3/yr) capacity to Pantex wastewater treatment system and within the 473,125-m^3/yr (618,848-yd^3/yr) excess capacity of the Pantex Wastewater Treatment Facility (M&H 1997:29). Therefore impact on the system should not be major.

H.3.2.2 MOX Facility

H.3.2.2.1 Construction of MOX Facility

Table H–23 compares the expected construction waste generation rates for the new facilities that may be constructed at Pantex with the existing generation rates for Pantex waste. No radioactive waste would be generated during the 3-year construction period because this facility involves new construction only (UC 1998f). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998f). Hazardous waste generation for this

Table H–23. Potential Waste Management Impacts of Construction of New MOX Facility at Pantex

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Hazardous	19	486	4
Nonhazardous			
Liquid	20,000	473,125	4
Solid	8,600	8,007	107

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998f. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.

facility is estimated to be 4 percent of existing annual site hazardous waste generation. The additional waste load generated during construction should not have a major impact on the Pantex hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to onsite and offsite disposal and recycling facilities. It was assumed that waste concrete would require disposal, although it is likely that this waste would be stockpiled on the site and crushed for reuse. Waste metals would be sent off the site for recycling and, therefore, were not included in the waste volumes (UC 1998f). Construction debris would be disposed of in the onsite Class 2 construction waste landfill. Nonrecyclable solid sanitary waste would be sent off the site for disposal in a local landfill such as the Amarillo landfill. Nonhazardous-solid-waste generation for the MOX facility is estimated to be 107 percent of existing annual site waste generation. Because much of this waste would be managed at offsite commercial facilities, the additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at Pantex.

Nonhazardous liquid waste includes sanitary waste from any sinks, showers, and water closets and wastewater from dewatering (UC 1998f). To be conservative it was assumed that all nonhazardous liquid waste generated during construction would be managed at onsite facilities, even though it is likely that most of this waste would be collected in portable toilets and would be managed at offsite facilities. Nonhazardous liquid waste generated for this facility is estimated to be 4 percent of existing annual site waste generation, 2 percent of the 946,250-m^3/yr (1,237,700-yd^3/yr) capacity of the sanitary wastewater treatment system and within the 473,125-m^3/yr (618,848-yd^3/yr) excess capacity of the Pantex Wastewater Treatment Facility (M&H 1997:29). Therefore, impacts during construction should not be major.

H.3.2.2.2 Operation of MOX Facility

The waste management facilities within the MOX facility would process, temporarily store, and ship all wastes generated. Table H–24 compares the expected waste generation rates from operating the new facility at Pantex with the existing generation rates for Pantex waste. No HLW would be generated by the MOX facility (UC 1998f). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment and storage of radioactive, hazardous, mixed, and

Table H–24. Potential Waste Management Impacts of Operation of New MOX Facility at Pantex

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	68	(e)	NA
LLW	94	139	68
Mixed LLW	3	24	13
Hazardous	3	486	1
Nonhazardous			
Liquid	26,000	473,125	6
Solid	440	8,007	5

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998f. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
[e] TRU waste is not routinely generated at Pantex.
Key: LLW, low-level waste; NA, not applicable; TRU, transuranic.

nonhazardous wastes at Pantex are described in the *Final EIS for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components* (DOE 1996b).

TRU wastes generated during operations include spent filters, sweepings, used containers and equipment, paper and cloth wipes, analytical and quality control samples, solidified inorganic solutions, and dirty plutonium oxide scrap. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the MOX facility (UC 1998f). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Because TRU wastes are not routinely generated or stored at Pantex, facilities for longer-term storage, drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP need to be developed.

TRU waste generation for this facility is estimated to be 68 m^3/yr (89 yd^3/yr). Because TRU waste is not currently generated or stored at Pantex, storage capacity would be provided within the MOX facility. A maximum of about 680 m^3 (890 yd^3) of TRU waste may need to be stored at Pantex. Assuming that the waste were stored in 208-l (55-gal) drums, each with a capacity of 0.21 m^3 (0.27 yd^3), about 3,200 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 960 m^2 (1,150 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste in the MOX facility at Pantex should not be major.

The 680 m^3 (890 yd^3) of TRU waste generated by this facility would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500 m^3 (220,400 yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, and solidified inorganic solutions. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glove-box lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be packaged, certified, and accumulated at the new facilities before being transferred for treatment and interim storage at existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for storage. Wastes would be stored on the site on an interim basis before being shipped off the site for disposal (UC 1998f). LLW generation for this facility is estimated to be 68 percent of existing annual waste generation but only 13 percent of the 750-m^3/yr (980-yd^3/yr) capacity of the planned Hazardous Waste Treatment and Processing Facility. Therefore, impacts of the management of this additional LLW at Pantex should not be major.

Most LLW generated at Pantex is currently sent to NTS for disposal, although LLW could also be sent to commercial disposal facilities or other DOE sites. If the shipment of LLW to offsite disposal were delayed, a maximum of about 940-m^3 (1,230-yd^3) of LLW may need to be stored at Pantex. This is about 39 percent of the approximately 2,400 m^3 (3,140 yd^3) of existing storage capacity at Pantex. Assuming that the waste were stored in 208-l (55-gal) drums, each with a capacity of 0.21 m^3 (0.27 yd^3), about 4,500 drums would be required to store the additional waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 1,300 m^2 (1,550 yd^2) is required. Impacts of the storage of additional quantities of LLW on 0.13 ha (0.32 acre) of land at Pantex should not be major.

As stated above, a total of 940-m^3 (1,230-yd^3) LLW would be generated over the operation period. Using the 6,085-m^3/ha (3,221-yd^3/acre) disposal land usage factor for NTS published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 940 m^3 (1,230 yd^3) of waste would require 0.15 ha (0.37 acre) of disposal space at NTS or some other similar facility. Impacts on the disposal site from the use of this small area for disposal should not be major. Impacts of disposal of LLW at NTS are described in the *Final EIS for the NTS and Off-Site Locations in the State of Nevada* (DOE 1996c).

Mixed LLW includes solvents contaminated with plutonium and scintillation vials from the analytical laboratory (UC 1998f). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for Pantex. Pantex currently ships mixed LLW to Envirocare of Utah and Diversified Scientific Services, Inc., of Tennessee. These facilities or other treatment or disposal facilities that meet DOE criteria would be used (UC 1998e). Mixed LLW generation for this facility is estimated to be 3 m^3/yr (3.9 yd^3/yr) or 13 percent of existing annual waste generation, and, therefore, should not have a major impact on the mixed LLW management system at Pantex.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (UC 1998f). Hazardous waste generation for this facility is estimated to be 1 percent of existing annual site waste generation, and less than 1 percent of the 750-m^3/yr (980-yd^3/yr) capacity of the planned Hazardous Waste Treatment and Processing Facility, and, therefore, should not have a major impact on the hazardous waste management system.

Nonhazardous solid waste includes office garbage, machine shop cuttings, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice, and shipped to onsite and offsite disposal and recycling facilities. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998f). The remaining solid sanitary waste would be sent off the site for disposal in a local landfill such as the Amarillo landfill. Nonrecyclable, nonhazardous solid waste generated by this facility is estimated to be less than 5 percent of existing annual site waste generation. This additional waste load should have not a major impact on the nonhazardous solid waste management system at Pantex.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, and water closets; process wastewater from lab sinks and drains, mop water, cooling tower blowdown, and boiler blowdown; and treated wastewater from the liquid effluent treatment system. Nonhazardous wastewater would be treated, if necessary, before being discharged to the Pantex wastewater treatment system (UC 1998f). Nonhazardous liquid waste generated for this facility is estimated to be 6 percent of existing annual site waste generation, 3 percent of the 946,250-m^3/yr (1,237,700-yd^3) capacity of the Pantex wastewater treatment system and within the 473,125-m^3/yr (618,848-yd^3/yr) excess capacity of the Pantex Wastewater Treatment Facility (M&H 1997:29). Therefore, impacts on the system should not be major.

H.3.2.3 Pit Conversion and MOX Facilities

H.3.2.3.1 Construction of Pit Conversion and MOX Facilities

Table H–25 compares the expected construction waste generation rates for the new facilities that may be constructed at Pantex with the existing generation rates for Pantex waste. No radioactive waste would be generated during the 3-year construction period because these facilities involve new construction only (UC 1998e, 1998f). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations.

Table H–25. Potential Waste Management Impacts of Construction of New Pit Conversion and MOX Facilities at Pantex

	Estimated Waste Generation (m^3/yr)[b]		Site Waste	Percent of Site Waste Generation		
Waste Type[a]	Pit Conversion	MOX	Generation (m^3/yr)[c]	Pit Conversion	MOX	Both Facilities
Hazardous	50	19	486	10	4	14
Nonhazardous						
Liquid	5,300	20,000	473,125	1	4	5
Solid	120	8,600	8,007	1	107	108

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998e, 1998f. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998e, 1998f). Hazardous waste generation for these facilities is estimated to be 14 percent of existing annual site hazardous waste generation. The additional waste load generated during construction should not have a major impact on the Pantex hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other trash from construction of the new facilities and concrete, soil, and reinforcing steel from demolition of three existing storage bunkers. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to onsite and offsite disposal and recycling facilities. It was assumed that waste concrete would require disposal although it is likely that this waste would be stockpiled on the site and crushed for reuse. Waste metals would be sent off the site for recycling and, therefore, were not included in the waste volumes (UC 1998e, 1998f). Construction debris would be disposed of in the onsite Class 2 construction waste landfill. Nonrecyclable solid sanitary waste would be sent off the site for disposal in a local landfill such as the Amarillo landfill. Nonhazardous-solid-waste generation for these facilities is estimated to be 108 percent of existing annual site waste generation. Because much of this waste would be managed at offsite commercial facilities, the additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at Pantex.

Nonhazardous liquid waste includes sanitary waste from any sinks, showers and water closets and wastewater from dewatering (UC 1998e, 1998f). To be conservative it was assumed that all nonhazardous liquid waste generated during construction would be managed at onsite facilities, even though it is likely that most of this waste would be collected in portable toilets and would be managed at offsite facilities. Nonhazardous liquid waste generated for these facilities is estimated to be 5 percent of existing annual site waste generation, 3 percent of the 946,250-m^3/yr (1,237,700-yd^3/yr) capacity of the sanitary wastewater treatment system and within the 473,125-m^3/yr (618,848-yd^3/yr) excess capacity of the Pantex Wastewater Treatment Facility (M&H 1997:29). Therefore, impacts during the construction period should not be major.

H.3.2.3.2 Operation of Pit Conversion and MOX Facilities

The waste management facilities within the pit conversion and MOX facilities would process, temporarily store, and ship all wastes generated. Table H–26 compares the expected waste generation rates from operating the new facilities at Pantex with the existing generation rates for Pantex waste. No HLW would be generated by the pit conversion facility or MOX facility (UC 1998e, 1998f). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment and storage of radioactive, hazardous, mixed, and nonhazardous wastes at Pantex are described in the *Final EIS for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components* (DOE 1996b).

Table H–26. Potential Waste Management Impacts of Operation of New Pit Conversion and MOX Facilities at Pantex

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b] Pit Conversion	Estimated Waste Generation (m^3/yr)[b] MOX	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation Pit Conversion	Percent of Site Waste Generation MOX	Percent of Site Waste Generation Both Facilities
TRU[d]	18	68	(e)	NA	NA	NA
LLW	60	94	139	43	68	111
Mixed LLW	1	3	24	4	13	17
Hazardous	2	3	486	<1	1	1
Nonhazardous						
Liquid	25,000	26,000	473,125	5	6	11
Solid	1,800	440	8,007	22	5	28

a See definitions in Appendix F.8.
b DOE 1999a; UC 1998e, 1998f. Values rounded to two significant figures.
c From the waste management section in Chapter 3.
d Includes mixed TRU waste.
e TRU waste is not routinely generated at Pantex.
Key: LLW, low-level waste; NA, not applicable; TRU, transuranic.

TRU wastes generated during operations include spent filters, contaminated beryllium pieces and cuttings, sweepings, used containers and equipment, paper and cloth wipes, analytical and quality control samples, solidified inorganic solutions, and dirty plutonium oxide scrap (UC 1998e, 1998f). Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste (UC 1998f). TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the pit conversion facility and MOX facility (UC 1998e, 1998f). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Because TRU wastes are not routinely generated or stored at Pantex, facilities for longer-term storage, drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would need to be developed.

TRU waste generation for these facilities is estimated to be 86 m^3/yr (112 yd^3/yr). Because TRU waste is not currently generated or stored at Pantex, storage capacity would be provided within the pit conversion and MOX facilities. A maximum of about 860 m^3 (1,125 yd^3) of TRU waste may need to be stored at Pantex. Assuming that the waste were stored in 208-l (55-gal) drums, each with a capacity of 0.21 m^3 (0.27 yd^3), about 4,100 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 1,200 m^2 (1,440 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste in the pit conversion and MOX facilities at Pantex should not be major.

The 860 m^3 (1,125 yd^3) of TRU waste generated by these facilities would be 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500 m^3 (220,400 yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glove-box lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste (UC 1998e). LLW would be packaged, certified, and accumulated at the new facilities before being transferred for treatment and interim storage at existing onsite facilities. Liquid LLW would be evaporated or solidified before being packaged for storage (UC 1998e, 1998f). Tritium recovered from pit disassembly would be disposed of as LLW (UC 1998e). Wastes would be stored on the site on an interim basis before being shipped off the site for disposal (UC 1998e, 1998f). LLW generation for these facilities is estimated to be 111 percent of existing annual site waste generation, but only 20 percent of the 750-m^3/yr (980-m^3/yr) capacity of the planned Hazardous Waste Treatment and Processing Facility, and 63 percent of the 2,400-m^3 (3,140-yd^3) LLW storage capacity.

Most LLW generated at Pantex is currently sent to NTS for disposal, although LLW could also be sent to commercial disposal facilities or other DOE sites. If the shipment of LLW to offsite disposal were delayed, a maximum of approximately 1,540-m^3 (2,014-yd^3) LLW may need to be stored at Pantex. Assuming that the waste were stored in 208-l (55-gal) drums, each with a capacity of 0.21 m^3 (0.27 yd^3), approximately 7,300 drums would be required to store the additional waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of approximately 2,200 m^2 (2,630 yd^2) is required. Impacts of the storage of additional quantities of LLW on 0.22 ha (0.54 acre) of land at Pantex should not be major.

As stated above, a total of 1,540-m^3 (2,014-yd^3) LLW would be generated over the operation period. Using the 6,085-m^3/ha (3,221-yd^3/acre) disposal land usage factor for NTS published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 1,540 m^3 (2,014 yd^3) of waste would require 0.25 ha (0.62 acre) of disposal space at NTS or some other similar facility. Impacts on the disposal site from the use of this small area for disposal should not be major. Impacts of disposal of LLW at NTS are described in the *Final EIS for the NTS and Off-Site Locations in the State of Nevada* (DOE 1996c).

Mixed LLW includes solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits (UC 1998e, 1998f). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for Pantex. Pantex currently ships mixed LLW to Envirocare of Utah and Diversified Scientific Services, Inc of Tennessee. These facilities or other treatment or disposal facilities that meet DOE criteria would be used (UC 1998e). Mixed LLW generation for these facilities is estimated to be 4 m^3/yr (5.2 yd^3/yr) or 17 percent of existing annual site waste generation and, therefore, should not have a major impact on the mixed LLW management system at Pantex.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (UC 1998e, 1998f). Hazardous waste generation for these facilities is estimated to be 1 percent of existing annual site waste generation, and 1 percent of the 750-m^3/yr (980-yd^3/yr) capacity of the planned Hazardous Waste Treatment and Processing Facility, and, therefore, should not have a major impact on the hazardous waste management system.

Nonhazardous solid waste includes office garbage, machine shop cuttings, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to onsite and offsite disposal and recycling facilities. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998e, 1998f). The remaining solid sanitary waste would be sent off the site for disposal in a local landfill such as the Amarillo landfill. Nonrecyclable, nonhazardous solid waste generated by these facilities is estimated to be less than 28 percent of existing annual site waste generation. This additional waste load should have not a major impact on the nonhazardous solid waste management system at Pantex.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, and water closets; process wastewater from lab sinks and drains, mop water, cooling tower blowdown, and boiler blowdown; and treated wastewater from the liquid effluent treatment system. Nonhazardous wastewater would be treated, if necessary, before being discharged to the Pantex wastewater treatment system (UC 1998e, 1998f). Nonhazardous liquid waste generated for these facilities is estimated to be 11 percent of existing annual site waste generation, 5 percent of the 946,250-m^3/yr (1,237,700-m^3/yr) capacity of the Pantex sanitary wastewater treatment system and within the 473,125-m^3/yr (618,848-yd^3/yr) excess capacity of the Pantex Wastewater Treatment Facility (M&H 1997:29). Therefore, impacts on the system should not be major.

H.4 SRS

H.4.1 Assessment Data

Impacts on SRS waste management facilities were estimated using information on existing environmental conditions from Chapter 3 and information on the characteristics of the proposed surplus plutonium disposition facilities from Chapter 2 and the facility data reports. A description of the methods used to evaluate impacts on waste management is presented in Appendix F.8.

H.4.2 Facilities

H.4.2.1 Pit Conversion Facility

H.4.2.1.1 Construction of Pit Conversion Facility

Table H–27 compares the expected construction waste generation rates for the facilities that may be constructed at SRS with the existing site waste generation rates. No radioactive waste would be generated during the 3-year construction period because this action involves new construction only (UC 1998g). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations.

Table H–27. Potential Waste Management Impacts of Construction of New Pit Conversion Facility at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Hazardous	50	74	68
Nonhazardous			
Liquid	5,300	416,100	1
Solid	120	6,670	2

[a] See definitions in Appendix F.8.
[b] UC 1998g. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998g). Hazardous waste generation for construction of this facility is estimated to be 68 percent of existing annual site waste generation. Because these wastes would be treated and disposed of at offsite commercial facilities, the additional waste load generated during construction should not have a major impact on the SRS hazardous waste management system.

Nonhazardous solid waste includes office garbage, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice, and shipped to commercial or municipal facilities for recycling or disposal (UC 1998g). Waste metals would be sent off the site for recycling and, therefore, were not included in the waste volumes. Nonhazardous-solid-waste generation during construction of this facility is estimated to be 2 percent of existing annual site waste generation. The additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets (UC 1998g). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at the Central Sanitary Wastewater Treatment Facility, even though it is likely that much of this waste would be collected in portable toilets and managed at offsite facilities. Nonhazardous liquid waste generated for construction of this facility is estimated to be 1 percent of existing annual site waste generation, 2 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, less than 1 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, the management of this additional waste should not have a major impact on the system.

H.4.2.1.2 Operation of Pit Conversion Facility

The waste management facilities within the pit conversion facility would process, temporarily store, and ship all wastes generated. Table H–28 compares the expected waste generation rates from operating the new facility at SRS with the existing site waste generation rates. No HLW would be generated by the facility (UC 1998g). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated on the site in the Consolidated Incineration Facility and treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at SRS are described in the *SRS Waste Management Final EIS* (DOE 1995b).

Table H–28. Potential Waste Management Impacts of Operation of New Pit Conversion Facility at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	18	427	4
LLW	60	10,043	1
Mixed LLW	1	1,135	<1
Hazardous	2	74	3
Nonhazardous			
Liquid	25,000	416,100	6
Solid	1,800	6,670	27

[a] See definitions in Appendix F.8.
[b] UC 1998g. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
Key: LLW, low-level waste; TRU, transuranic.

TRU wastes generated during operations include spent filters, contaminated beryllium pieces and cuttings, used containers and equipment, paper and cloth wipes, analytical and quality-control samples, and solidified inorganic solutions. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to

WIPP waste acceptance criteria at the new facility. Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned TRU Waste Characterization and Certification Facility at SRS (UC 1998g). Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this facility is estimated to be 4 percent of existing annual site waste generation and 1 percent of the 1,720-m^3/yr (2,250-yd^3/yr) planned capacity of the TRU Waste Characterization and Certification Facility. A total of 180 m^3 (235 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 3 percent of the 6,977 m^3 (9,126 yd^3) of contact-handled TRU waste currently in storage, and 1 percent of the 34,400-m^3 (44,995-yd^3) storage capacity available at SRS. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 860 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 260 m^2 (310 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on less than 0.1 ha (0.25 acre) of land at SRS should not be major.

The 180 m^3 (235 yd^3) of TRU waste generated by this facility would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500 m^3 (220,400 yd^3) limit for WIPP (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities. Tritium recovered from pit disassembly would be disposed of as LLW (UC 1998g). A total of 600 m^3 (780 yd^3) of LLW would be generated over the operation period. LLW generation for this facility is estimated to be 1 percent of existing annual site waste generation, less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 2 percent of the 30,500-m^3 (39,900-yd^3) capacity of the Low-Activity Waste Vaults. Using the 8,687-m^3/ha (4,598-yd^3/acre) disposal land usage factor for SRS published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 600 m^3 (780 yd^3) of waste would require 0.1 ha (0.25 acre) of disposal space at SRS. Therefore, impacts of the management of this additional LLW at SRS should not be major.

Mixed LLW includes lead shielding, solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits (UC 1998g). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and offsite disposal in a manner consistent with the site treatment plan for SRS. Mixed LLW generation for this facility is estimated to be less than 1 percent of existing annual site waste generation, and less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility. Over the operating life of this facility, the 10 m^3 (13 yd^3) of mixed LLW generated would be 1 percent of the 1,900-m^3 (2,490-yd^3) capacity of the Mixed Waste Storage Buildings. Therefore, the management of this additional waste at SRS should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at a combination of onsite and offsite permitted facilities (UC 1998g). Assuming that all hazardous waste is managed on the site, hazardous waste generation for this facility is estimated to be 3 percent of existing annual site waste generation, less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and less than 1 percent of the 5,200-m^3 (6,800-yd^3) capacity of the hazardous waste storage buildings. The management of these additional hazardous wastes at SRS should not have a major impact on the hazardous waste management system.

Nonhazardous solid waste includes office garbage, coal ash, machine shop waste, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998g). The remaining solid sanitary waste would be sent to the Three Rivers Landfill (DOE 1998a:3-42). Nonrecyclable, nonhazardous solid waste generated by this facility is estimated to be 27 percent of existing annual site waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and process wastewater from lab sinks and drains, mop water, cooling tower blowdown, and steam condensate. Wastewater would be treated, if necessary, before being discharged to the F-Area sanitary sewer system that connects to the Central Sanitary Wastewater Treatment Facility (UC 1998g). Nonhazardous liquid waste generated for this facility is estimated to be 6 percent of the existing annual site waste generation, 9 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, 2 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore the management of this additional waste should not have a major impact on the system.

H.4.2.2 Immobilization Facility

H.4.2.2.1 Construction of Immobilization Facility

Table H–29 compares the expected construction waste generation rates for the facilities that may be constructed at SRS with the existing site waste generation rates. No radioactive waste would be generated during the 3-year construction period because this action involves new construction only (UC 1999c, 1999d). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations. Construction waste generation would be the same for the ceramic and glass immobilization technologies and is the same for the 17-t (19-ton) and 50-t (55-ton) immobilization scenarios (UC 1999c, 1999d).

Table H–29. Potential Waste Management Impacts of Construction of New Immobilization Facility at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Hazardous	35	74	47
Nonhazardous			
Liquid	21,000	416,100	5
Solid	2,200	6,670	33

[a] See definitions in Appendix F.8.
[b] UC 1999c, 1999d. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[Text deleted.]

[Text deleted.]

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, lubricants, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1999c, 1999d). Hazardous waste generation for construction of this facility is estimated to be 47 percent of existing annual site waste generation. Because these wastes would be treated and disposed of at offsite commercial facilities, the additional waste load generated during construction should not have a major impact on the SRS hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to commercial or municipal facilities for recycling or disposal (UC 1999c, 1999d). Waste metals would be sent off the site for recycling and, therefore, were not included in the waste volumes. Nonhazardous-solid-waste generation during construction of this facility is estimated to be 33 percent of existing annual site waste generation. Because these wastes would be managed at commercial or municipal facilities, the additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets (UC 1999c, 1999d). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at the Central Sanitary Wastewater Treatment Facility, even though it is likely that much of this waste would be collected in portable toilets and managed at offsite facilities. Nonhazardous liquid waste generated for construction of this facility is estimated to be 5 percent of existing annual site waste generation, 8 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, 1 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, the management of this additional waste should not have a major impact on the system.

H.4.2.2.2 Operation of Immobilization Facility

The waste management facilities within the immobilization facility would process, temporarily store, and ship all wastes generated. Table H–30 compares the expected waste generation rates from operating the new facility at SRS with the existing site waste generation rates. Although HLW would be used in the immobilization process, no HLW would be generated by the facility (UC 1999c, 1999d). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated on the site in the Consolidated Incineration Facility and treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Waste generation would be the same for the ceramic and glass immobilization technologies, although the amount of waste generated would vary between the 17-t and the 50-t immobilization cases (UC 1999c, 1999d). Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at SRS are described in the *SRS Waste Management Final EIS* (DOE 1995b).

Table H–30. Potential Waste Management Impacts of Operation of New Immobilization Facility at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b] 17 t	Estimated Waste Generation (m^3/yr)[b] 50 t	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation 17 t	Percent of Site Waste Generation 50 t
TRU[d]	95	130	427	22	30
LLW	81	110	10,043	1	1
Mixed LLW	1	1	1,135	<1	<1
Hazardous	89	89	74	120	120
Nonhazardous					
Liquid	55,000	57,000	416,100	13	14
Solid	850	850	6,670	13	13

[a] See definitions in Appendix F.8.
[b] UC 1999c, 1999d. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
Key: LLW, low-level waste; TRU, transuranic.

TRU wastes generated during operations include metal cladding from fuel elements, spent filters, contaminated beryllium pieces and cuttings, used containers and equipment, paper and cloth wipes, analytical and quality-control samples, and solidified inorganic solutions. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facility (UC 1999c, 1999d). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned TRU Waste Characterization and Certification Facility at SRS. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this facility is estimated to be 22 to 30 percent of existing annual site waste generation and 6 to 8 percent of the 1,720-m^3/yr (2,250-yd^3/yr) planned capacity of the TRU Waste Characterization and Certification Facility. A total of 950 to 1,300 m^3 (1,240 to 1,700 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 14 to 19 percent of the 6,977 m^3 (9,126 yd^3) of contact-handled TRU waste currently in storage, and 3 to 4 percent of the 34,400-m^3 (44,995-yd^3) storage capacity available at SRS. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 4,500 to 6,000 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 1,400 to 1,800 m^2 (1,670 to 2,150 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.14 to 0.18 ha (0.35 to 0.44 acre) of land at SRS should not be major.

The 950 to 1,300 m^3 (1,240 to 1,700 yd^3) of TRU waste generated by this facility would be 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500 m^3 (220,400 yd^3) limit for WIPP (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, and solidified inorganic solutions. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities

(UC 1999c, 1999d). A total of 810 to 1,100-m^3 (1,060- to 1,440-yd^3) LLW would be generated over the operation period. LLW generation for this facility is estimated to be 1 percent of existing annual site waste generation, 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 3 to 4 percent of the 30,500-m^3 (39,900-yd^3) capacity of the Low-Activity Waste Vaults. Using the 8,687-m^3/ha (4,598-yd^3/acre) disposal land usage factor for SRS published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 810 to 1,080 m^3 (1,060 to 1,413 yd^3) of waste would require approximately 0.1 to 0.12 ha (0.25 to 0.30 acre) of disposal space at SRS. Therefore, impacts of the management of this additional LLW at SRS should not be major.

Mixed LLW includes leaded shielding, solvents contaminated with plutonium, and scintillation vials from the analytical laboratory (UC 1999c, 1999d). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and offsite disposal in a manner consistent with the site treatment plan for SRS. Mixed LLW generation for this facility is estimated to be less than 1 percent of existing annual site waste generation, and less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility. Over the operating life of this facility, the 10 m^3 (13 yd^3) of mixed LLW generated would be 1 percent of the 1,900-m^3 (2,490-yd^3) capacity of the Mixed Waste Storage Buildings. Therefore, the management of this additional waste at SRS should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, lubricants, oils, film processing fluids, hydraulic fluids, coolants, paints, chemicals, batteries, fluorescent light tubes, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at a combination of onsite and offsite permitted facilities (UC 1999c, 1999d). Assuming that all hazardous waste is managed on the site, hazardous waste generation for this facility is estimated to be 120 percent of existing annual site waste generation, but less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 17 percent of the 5,200-m^3 (6,800-yd^3) capacity of the hazardous waste storage buildings. The management of these additional hazardous wastes at SRS should not have a major impact on the hazardous waste management system.

Nonhazardous solid waste includes office garbage, coal ash, machine shop waste, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling. Ash from the coal-fired steam generating plant would be disposed of in the onsite ash disposal landfills (UC 1999c, 1999d). The remaining solid sanitary waste would be sent to the Three Rivers Landfill (DOE 1998a:3-42). Nonrecyclable, nonhazardous solid waste generated by this facility is estimated to be 13 percent of existing annual site waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and wastewater from cooling tower blowdown and steam condensate. Nonhazardous wastewater would be treated, if necessary, before being discharged to the F-Area sanitary sewer system that connects to the Central Sanitary Wastewater Treatment Facility (UC 1999c, 1999d). Nonhazardous liquid waste generated for this facility is estimated to be 13 to 14 percent of the existing annual site waste generation, 20 to 21 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, and 4 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, the management of this additional waste should not have a major impact on the system.

H.4.2.3 MOX Facility

H.4.2.3.1 Construction of MOX Facility

Table H–31 compares the expected construction waste generation rates for the facility that may be constructed at SRS with the existing site waste generation rates. No radioactive waste would be generated during the 3-year construction period because this action involves new construction only (UC 1998h). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations.

Table H–31. Potential Waste Management Impacts From Construction of New MOX Facility at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Hazardous	19	74	26
Nonhazardous			
Liquid	20,000	416,100	5
Solid	8,600	6,670	128

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998h. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998h). Hazardous waste generation for construction of this facility is estimated to be 26 percent of existing annual site waste generation. Because these wastes would be treated and disposed at offsite commercial facilities, the additional waste load generated during construction should not have a major impact on the SRS hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to commercial or municipal facilities for recycling or disposal (UC 1998h). Waste metals would be sent off the site for recycling and, therefore, were not included in the waste volumes. Nonhazardous-solid-waste generation during construction of this facility is estimated to be 128 percent of existing annual site waste generation. Because these wastes would be managed at commercial or municipal facilities, the additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and wastewater from dewatering (UC 1998h). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at the Central Sanitary Wastewater Treatment Facility, even though it is likely that much of this waste would be collected in portable toilets and managed at offsite facilities. Nonhazardous liquid waste generated for construction of this facility is estimated to be 5 percent of existing annual site waste generation, 7 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, 1 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the

Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, impacts on the system during construction should not be major.

H.4.2.3.2 Operation of MOX Facility

The waste management facilities within the MOX facility would process, temporarily store, and ship all wastes generated. Table H–32 compares the expected waste generation rates from operating the new facility at SRS with the existing site waste generation rates. No HLW would be generated by the facility (UC 1998h). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated on the site in the Consolidated Incineration Facility and treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with the current site practices. Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at SRS are described in the *SRS Waste Management Final EIS* (DOE 1995b).

Table H–32. Potential Waste Management Impacts From Operation of New MOX Facility at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	68	427	16
LLW	94	10,043	1
Mixed LLW	3	1,135	<1
Hazardous	3	74	4
Nonhazardous			
Liquid	26,000	416,100	6
Solid	440	6,670	7

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998h. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
Key: LLW, low-level waste; TRU, transuranic.

TRU wastes generated during operations include spent filters, used containers and equipment, paper and cloth wipes, analytical and quality-control samples, solidified inorganic solutions, and dirty plutonium oxide scrap. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facility (UC 1998h). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned TRU Waste Characterization and Certification Facility at SRS. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this combination of facilities is estimated to be 16 percent of existing annual site waste generation and 4 percent of the 1,720-m^3/yr (2,250-yd^3/yr) planned capacity of the TRU Waste Characterization and Certification Facility. A total of 680 m^3 (890 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 10 percent of the 6,977 m^3 (9,126 yd^3) of contact-handled

TRU waste currently in storage, and 2 percent of the 34,400-m^3 (44,995-yd^3) storage capacity available at SRS. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 3,200 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 960 m^2 (1,150 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.1 ha (0.25 acre) of land at SRS should not be major.

The 960 m^3 (1,150 yd^3) of TRU waste generated by this facility would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500 m^3 (220,400 yd^3) limit for WIPP (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, and solidified inorganic solutions. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facility before being transferred for additional treatment and/or disposal in existing onsite facilities (UC 1998h). A total of 940 m^3 (1,230 yd^3) of LLW would be generated over the operation period. LLW generation for this facility is estimated to be 1 percent of existing annual site waste generation, 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 3 percent of the 30,500-m^3 (39,900-yd^3) capacity of the Low-Activity Waste Vaults. Using the 8,687-m^3/ha (4,598-yd^3/acre) disposal land usage factor for SRS published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 940 m^3 (1,230 yd^3) of waste would require less than 0.11 ha (0.27 acre) of disposal space at SRS. Therefore, management of this additional LLW at SRS should have no major impact.

Mixed LLW includes solvents contaminated with plutonium, and scintillation vials from the analytical laboratory (UC 1998h). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and offsite disposal in a manner consistent with the site treatment plan for SRS. Mixed LLW generation for this facility is estimated to be less than 1 percent of existing annual site waste generation, and less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility. Over the operating life of this facility, the 30-m^3 (39-yd^3) mixed LLW generated would be 2 percent of the 1,900-m^3 (2,490-yd^3) capacity of the Mixed Waste Storage Buildings. Therefore, the management of this additional waste at SRS should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, lubricants, oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, fluorescent light tubes, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at a combination of onsite and offsite permitted facilities (UC 1998h). Assuming that all hazardous waste is managed on the site, hazardous waste generation for this facility is estimated to be 4 percent of existing annual site waste generation, less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 1 percent of the 5,200-m^3 (6,800-yd^3) capacity of the hazardous waste storage building. The management of these additional hazardous wastes at SRS should not have a major impact on the hazardous waste management system.

Nonhazardous solid waste includes office garbage, machine shop waste, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998h). The remaining solid sanitary waste would be sent to the Three Rivers Landfill (DOE 1998a:3-42). Nonrecyclable, nonhazardous solid waste generated by this facility is estimated to be less than 7 percent of existing annual site waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets; process wastewater from lab sinks and drains, mop water, cooling tower blowdown and steam condensate; and treated wastewater from the liquid effluent treatment system. Nonhazardous wastewater would be treated, if necessary, before being discharged to the F-Area sanitary sewer system that connects to the Central Sanitary Wastewater Treatment Facility (UC 1998h). Nonhazardous liquid waste generated for this facility is estimated to be 6 percent of the existing annual site waste generation, 10 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, and 2 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, impacts on the system should not be major.

H.4.2.4 Pit Conversion and Immobilization Facilities

H.4.2.4.1 Construction of Pit Conversion and Immobilization Facilities

Table H–33 compares the expected construction waste generation rates for the facilities that may be constructed at SRS with the existing site waste generation rates. No radioactive waste would be generated during the 3-year construction period because this action involves new construction only (UC 1998g, 1999c, 1999d). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations. Construction waste generation would be the same for the ceramic and glass immobilization technologies and the 17-t (19-ton) and 50-t (55-ton) immobilization scenarios (UC 1999c, 1999d).

[Text deleted.]

Table H–33. Potential Waste Management Impacts of Construction of New Pit Conversion and Immobilization Facilities at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]: Pit Conversion	Estimated Waste Generation (m^3/yr)[b]: Immobilization (Ceramic or Glass)	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation: Pit Conversion	Percent of Site Waste Generation: Immobilization (Ceramic or Glass)	Percent of Site Waste Generation: Both Facilities
Hazardous	50	35	74	68	47	115
Nonhazardous						
Liquid	5,300	21,000	416,100	1	5	6
Solid	120	2,200	6,670	2	33	35

a See definitions in Appendix F.8.
b UC 1998g, 1999c, 1999d. Values rounded to two significant figures.
c From the waste management section in Chapter 3.
[Text deleted.]

[Text deleted.]

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998g, 1999c, 1999d). Hazardous waste generation for construction of this combination of facilities is estimated to be 115 percent of existing annual site waste generation. Because these wastes would be treated and disposed at offsite commercial facilities, the additional waste load generated during construction should not have a major impact on the SRS hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice, and shipped to commercial or municipal facilities for recycling or disposal (UC 1998g, 1999c, 1999d). Waste metals would be sent off the site for recycling, and therefore were not included in the waste volumes. Nonhazardous-solid-waste generation during construction of this combination of facilities is estimated to be 35 percent of existing annual site waste generation. Because these wastes would be managed at commercial or municipal facilities, the additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets (UC 1998g, 1999c, 1999d). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at the Central Sanitary Wastewater Treatment Facility, even though it is likely that much of this waste would be collected in portable toilets and managed at offsite facilities. Nonhazardous liquid waste generated for construction of this combination of facilities is estimated to be 6 percent of existing annual site waste generation, 9 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, 2 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, impacts on the system during construction should not be major.

H.4.2.4.2 Operation of Pit Conversion and Immobilization Facilities

The waste management facilities within the pit conversion and immobilization facilities would process, temporarily store, and ship all wastes generated. Table H–34 compares the expected waste generation rates from operating the new facilities at SRS with the existing site waste generation rates. Although HLW would be used in the immobilization process, no HLW would be generated by the facilities (UC 1998g, 1999c, 1999d). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated on the site in the Consolidated Incineration Facility and treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed in accordance with current site practices. Waste generation would be the same for the ceramic and glass immobilization technologies, although the amount of waste generated would vary between the 17-t (19-ton) and 50-t (55-ton) immobilization cases (UC 1999c, 1999d). Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at SRS are described in the *SRS Waste Management Final EIS* (DOE 1995b).

TRU wastes generated during operations include metal cladding from fuel elements, spent filters, contaminated beryllium pieces and cuttings, used containers and equipment, paper and cloth wipes, analytical and quality-control samples, and solidified inorganic solutions. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facilities (UC 1998g, 1999c, 1999d). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned TRU

Table H–34. Potential Waste Management Impacts of Operation of New Pit Conversion and Immobilization Facilities at SRS

	Estimated Waste Generation (m^3/yr)[b]			Site Waste	Percent of Site Waste Generation			
	Pit	Immobilization		Generation	Pit	Immobilization		Both
Waste Type[a]	Conversion	17 t	50 t	(m^3/yr)[c]	Conversion	17 t	50 t	Facilities
TRU[d]	18	95	130	427	4	22	30	26 to 34
LLW	60	81	110	10,043	1	1	1	1 to 2
Mixed LLW	1	1	1	1,135	<1	<1	<1	<1
Hazardous	2	89	89	74	3	120	120	123
Nonhazardous								
Liquid	25,000	55,000	57,000	416,100	6	13	14	19 to 20
Solid	1,800	850	850	6,670	27	13	13	40

[a] See definitions in Appendix F.8.
[b] UC 1998g, 1999c, 1999d. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
Key: LLW, low-level waste; TRU, transuranic.

Waste Characterization and Certification Facility at SRS. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this combination of facilities is estimated to be 26 to 34 percent of existing annual site waste generation and 7 to 8 percent of the 1,720-m^3/yr (2,250-yd^3/yr) planned capacity of the TRU Waste Characterization and Certification Facility. A total of 1,130 to 1,480 m^3 (1,478 to 1,936 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 16 to 21 percent of the 6,977 m^3 (9,126 yd^3) of contact-handled TRU waste currently in storage, and 3 to 4 percent of the 34,400-m^3 (44,995-yd^3) storage capacity available at SRS. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 5,400 to 6,900 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 1,600 to 2,100 m^2 (1,910 to 2,510 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.16 to 0.21 ha (0.40 to 0.52 acre) of land at SRS should not be major.

The 1,130 to 1,480 m^3 (1,478 to 1,936 yd^3) of TRU waste generated by these facilities would be approximately 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500 m^3 (220,400 yd^3) limit for WIPP (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities (UC 1998g, 1999c, 1999d). Tritium recovered from pit disassembly would be disposed of as LLW (UC 1999d). A total of 1,410 to 1,700-m^3 (1,844 to 2,220-yd^3) LLW would be generated over the operation period. LLW generation for this combination of facilities is estimated to be 1 to 2 percent of existing annual site waste generation, 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 5 to 6 percent of the 30,500-m^3 (39,900-yd^3) capacity of the Low-Activity Waste Vaults. Using the 8,687-m^3/ha (4,598-yd^3/acre) disposal land usage factor for SRS published in the *Storage* *and Disposition PEIS* (DOE 1996a:E-9), 1,410 to 1,700 m^3 (1,844 to 2,220 yd^3) of waste would require 0.16 to 0.19 ha (0.40 to 0.47 acre) of disposal space at SRS. Therefore, impacts of the management of this additional LLW at SRS should not be major.

Mixed LLW includes leaded shielding, solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits (UC 1998g, 1999c, 1999d). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and offsite disposal in a manner consistent with the site treatment plan for SRS. Mixed LLW generation for this combination of facilities is estimated to be less than 1 percent of existing annual site waste generation, and less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility. Over the operating life of these facilities, the 20 m^3 (26 yd^3) of mixed LLW generated would be 1 percent of the 1,900-m^3 (2,490-yd^3) capacity of the Mixed Waste Storage Buildings. Therefore, the management of this additional waste at SRS should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, fluorescent light tubes, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at a combination of onsite and offsite permitted facilities (UC 1998g, 1999c, 1999d). Assuming that all hazardous waste is managed on the site, hazardous waste generation for this combination of facilities is estimated to be 123 percent of existing annual site waste generation, but only 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 18 percent of the 5,200-m^3 (6,800-yd^3) capacity of the hazardous waste storage building. The management of these additional hazardous wastes at SRS should not have a major impact on the hazardous waste management system.

Nonhazardous solid waste includes office garbage, coal ash, machine shop waste, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998g, 1999c, 1999d). Ash from the coal-fired steam generating plant would be disposed of in the onsite ash disposal landfills (UC 1999c, 1999d). The remaining solid sanitary waste would be sent to the Three Rivers Landfill (DOE 1998a:3-42). Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be 40 percent of existing annual site waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and process wastewater from lab sinks and drains, mop water, cooling tower blowdown, and steam condensate. Nonhazardous wastewater would be treated, if necessary, before being discharged to the F-Area sanitary sewer system that connects to the Central Sanitary Wastewater Treatment Facility (UC 1998g, 1999c, 1999d). Nonhazardous liquid waste generated for this combination of facilities is estimated to be 19 to 20 percent of the existing annual site waste generation, 29 to 30 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, and 6 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, impacts on the system should not be major.

H.4.2.5 Pit Conversion and MOX Facilities

H.4.2.5.1 Construction of Pit Conversion and MOX Facilities

Table H–35 compares the expected construction waste generation rates for the facilities that may be constructed at SRS with the existing site waste generation rates. No radioactive waste would be generated because all construction would involve new buildings (UC 1998g, 1998h). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during the 3-year construction period. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations.

Table H–35. Potential Waste Management Impacts of Construction of New Pit Conversion and MOX Facilities at SRS

	Estimated Waste Generation (m^3/yr)[b]		Site Waste	Percent of Site Waste Generation		
Waste Type[a]	Pit Conversion	MOX	Generation (m^3/yr)[c]	Pit Conversion	MOX	Both Facilities
Hazardous	50	19	74	68	26	94
Nonhazardous						
Liquid	5,300	20,000	416,100	1	5	6
Solid	120	8,600	6,670	2	128	130

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998g, 1998h. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998g, 1998h). Hazardous waste generation for construction of this combination of facilities is estimated to be 94 percent of existing annual site waste generation. Because these wastes would be treated and disposed at offsite commercial facilities, the additional waste load generated during construction should not have a major impact on the SRS hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice, and shipped to commercial or municipal facilities for recycling or disposal (UC 1998g, 1998h). Waste metals would be sent off the site for recycling and, therefore, were not included in the waste volumes. Nonhazardous-solid-waste generation during construction of this combination of facilities is estimated to be 130 percent of existing annual site waste generation. Because these wastes would be managed at commercial or municipal facilities, the additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and wastewater from dewatering (UC 1998g, 1998h). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at the Central Sanitary Wastewater Treatment Facility, even though it is likely that much of this waste would be collected in portable toilets and managed at offsite facilities. Nonhazardous-liquid-waste generation for construction of this combination of facilities is estimated to be 6 percent of existing annual site waste generation, 9 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, 2 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, impacts on the system during construction should not be major.

H.4.2.5.2 Operation of Pit Conversion and MOX Facilities

The waste management facilities within the pit conversion and MOX facilities would process, temporarily store, and ship all wastes generated. Table H–36 compares the expected waste generation rates from operating the new facilities at SRS with the existing site waste generation rates. No HLW would be generated by the facilities (UC 1998g, 1998h). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated on the site in the Consolidated Incineration Facility and treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed in accordance with current site practices. Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at SRS are described in the *SRS Waste Management Final EIS* (DOE 1995b).

Table H–36. Potential Waste Management Impacts of Operation of New Pit Conversion and MOX Facilities at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b] Pit Conversion	Estimated Waste Generation (m^3/yr)[b] MOX	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation Pit Conversion	Percent of Site Waste Generation MOX	Percent of Site Waste Generation Both Facilities
TRU[d]	18	68	427	4	16	20
LLW	60	94	10,043	1	1	2
Mixed LLW	1	3	1,135	<1	<1	<1
Hazardous	2	3	74	3	4	7
Nonhazardous						
Liquid	25,000	26,000	416,100	6	6	12
Solid	1,800	440	6,670	27	7	34

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998g, 1998h. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
Key: LLW, low-level waste; TRU, transuranic.

TRU wastes generated during operations include spent filters, contaminated beryllium pieces and cuttings, used containers and equipment, paper and cloth wipes, analytical and quality-control samples, solidified inorganic solutions, and dirty plutonium oxide scrap. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facilities (UC 1998g, 1998h). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned TRU Waste Characterization and Certification Facility at SRS. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this combination of facilities is estimated to be 20 percent of existing annual site waste generation, and 5 percent of the 1,720-m^3/yr (2,250-yd^3/yr) planned capacity of the TRU Waste

Characterization and Certification Facility. A total of 860 m^3 (1,120 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 12 percent of the 6,977 m^3 (9,126 yd^3) of contact-handled TRU waste currently in storage, and 2 percent of the 34,400-m^3 (44,995-yd^3) storage capacity available at SRS. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 4,100 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 1,200 m^2 (1,440 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.12 ha (0.30 acre) of land at SRS should not be major.

The 860 m^3 (1,120 yd^3) of TRU waste generated by these facilities would be 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500 m^3 (220,400 yd^3) limit for WIPP (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities (UC 1998g, 1998h). Tritium recovered from pit disassembly would be disposed of as LLW (UC 1998g). A total of 1,540-m^3 (2,014-yd^3) LLW would be generated over the operation period. LLW generation for this combination of facilities is estimated to be 2 percent of existing annual site waste generation, 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 5 percent of the 30,500-m^3 (39,900-yd^3) capacity of the Low-Activity Waste Vaults. Using the 8,687-m^3/ha (4,598-yd^3/acre) disposal land usage factor for SRS published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 1,540 m^3 (2,014 yd^3) of waste would require 0.18 ha (0.44 acre) of disposal space at SRS. Therefore, the management of this additional LLW at SRS should have no major impact.

Mixed LLW includes leaded shielding, solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits (UC 1998g, 1998h). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and offsite disposal in a manner consistent with the site treatment plan for SRS. Mixed LLW generation for this combination of facilities is estimated to be less than 1 percent of existing annual site waste generation, and less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility. Over the operating life of these facilities, the 40 m^3 (52 yd^3) of mixed LLW generated would be 2 percent of the 1,900-m^3 (2,490-yd^3) capacity of the Mixed Waste Storage Buildings. Therefore, the management of this additional waste at SRS should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, fluorescent light tubes, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at a combination of onsite and offsite facilities (UC 1998g, 1998h). Assuming that all hazardous waste is managed on the site, hazardous waste generation for this combination of facilities is estimated to be 7 percent of existing annual site waste generation, less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 1 percent of the 5,200-m^3 (6,800-yd^3) capacity of the hazardous waste storage building. The management of these additional hazardous wastes at SRS should not have a major impact on the hazardous waste management system.

Nonhazardous solid waste includes office garbage, coal ash, machine shop waste, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998g, 1998h). The remaining solid sanitary waste would be sent to the Three Rivers Landfill (DOE 1998a:3-42). Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be less than 34 percent of existing annual site waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets; process wastewater from lab sinks and drains, mop water, cooling tower blowdown, and steam condensate; and treated wastewater from the liquid effluent treatment system. Nonhazardous wastewater would be treated, if necessary, before being discharged to the F-Area sanitary sewer system that connects to the Central Sanitary Wastewater Treatment Facility (UC 1998g, 1998h). Nonhazardous liquid waste generated for this combination of facilities is estimated to be 12 percent of the existing annual site waste generation, 19 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, 4 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, the management of this additional waste should not have a major impact on the system.

H.4.2.6 Immobilization and MOX Facilities

H.4.2.6.1 Construction of Immobilization and MOX Facilities

Table H–37 compares the expected construction waste generation rates for the facilities that may be constructed at SRS with the existing site waste generation rates. No radioactive waste would be generated during the 3-year construction period because this action involves new construction only (UC 1998h, 1999c, 1999d). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations. Construction waste generation would be the same for the ceramic and glass immobilization technologies (UC 1999c, 1999d).

Table H–37. Potential Waste Management Impacts of Construction of New Immobilization and MOX Facilities at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]: Immobilization (Ceramic or Glass)	Estimated Waste Generation (m^3/yr)[b]: MOX	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation: Immobilization (Ceramic or Glass)	Percent of Site Waste Generation: MOX	Percent of Site Waste Generation: Both Facilities
Hazardous	35	19	74	47	26	73
Nonhazardous						
Liquid	21,000	20,000	416,100	5	5	10
Solid	2,200	8,600	6,670	33	128	161

a. See definitions in Appendix F.8.
b. DOE 1999a; UC 1998h, 1999c, 1999d. Values rounded to two significant figures.
c. From the waste management section in Chapter 3.
[Text deleted.]

[Text deleted.]

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998h, 1999c, 1999d). Hazardous waste generation for construction of this combination of facilities is estimated to be 73 percent of existing annual site waste generation. Because these wastes would be treated and disposed at offsite commercial facilities, the additional waste load generated during construction should not have a major impact on the SRS hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice, and shipped to commercial or municipal facilities for recycling or disposal (UC 1998h, 1999c, 1999d). Waste metals would be sent off the site for recycling and, therefore, were not included in the waste volumes. Nonhazardous-solid-waste generation during construction of this combination of facilities is estimated to be 161 percent of existing annual site waste generation. Because these wastes would be managed at commercial or municipal facilities, the additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and wastewater from dewatering (UC 1998h, 1999c, 1999d). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at the Central Sanitary Wastewater Treatment Facility, even though it is likely that much of this waste would be collected in portable toilets and managed at offsite facilities. Nonhazardous liquid waste generated for construction of this combination of facilities is estimated to be 10 percent of existing annual site waste generation, 15 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, 3 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, impacts on the system during construction should not be major.

H.4.2.6.2 Operation of Immobilization and MOX Facilities

The waste management facilities within the immobilization and MOX facilities would process, temporarily store, and ship all wastes generated. Table H–38 compares the expected waste generation rates from operating the new facilities at SRS with the existing site waste generation. Although HLW would be used in the immobilization process, no HLW would be generated by the facilities (UC 1998h, 1999c, 1999d). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated on the site in the Consolidated Incineration Facility and treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed in accordance with current site practices. Waste generation would be the same for the ceramic and glass immobilization technologies (UC 1999c, 1999d). Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at SRS are described in the *SRS Waste Management Final EIS* (DOE 1995b).

TRU wastes generated during operations include metal cladding from fuel elements, spent filters, used containers and equipment, paper and cloth wipes, analytical and quality-control samples, solidified inorganic solutions, and dirty plutonium oxide scrap. Lead-lined gloves are likely to be managed as mixed TRU waste.

Table H–38. Potential Waste Management Impacts of Operation of New Immobilization and MOX Facilities at SRS

	Estimated Waste Generation (m^3/yr)[b]		Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation		
Waste Type[a]	Immobilization (Ceramic or Glass)	MOX		Immobilization (Ceramic or Glass)	MOX	Both Facilities
TRU[d]	95	68	427	22	16	38
LLW	81	94	10,043	1	1	2
Mixed LLW	1	3	1,135	<1	<1	<1
Hazardous	89	3	74	120	4	124
Nonhazardous						
Liquid	55,000	26,000	416,100	13	6	20
Solid	850	440	6,670	13	7	19

a See definitions in Appendix F.8.
b DOE 1999a; UC 1998h, 1999c, 1999d. Values rounded to two significant figures.
c From the waste management section in Chapter 3.
d Includes mixed TRU waste.
Key: LLW, low-level waste; TRU, transuranic.

It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facilities (UC 1998h, 1999c, 1999d). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned TRU Waste Characterization and Certification Facility at SRS. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this combination of facilities is estimated to be 38 percent of existing annual site waste generation and 9 percent of the 1,720-m^3/yr (2,250-yd^3/yr) planned capacity of the TRU Waste Characterization and Certification Facility. A total of 1,630 m^3 (2,132 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 23 percent of the 6,977 m^3 (9,126 yd^3) of contact-handled TRU waste currently in storage, and 5 percent of the 34,400-m^3 (44,995-yd^3) storage capacity available at SRS. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 7,700 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 2,300 m^2 (2,750 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.23 ha (0.57 acre) of land at SRS should not be major.

The 1,630 m^3 (2,132 yd^3) of TRU waste generated by these facilities would be 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500 m^3 (220,400 yd^3) limit for WIPP (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, and solidified inorganic solutions. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities (UC 1998h, 1999c, 1999d). A total of 1,750-m^3 (2,289-yd^3) LLW would be generated over the operation period. LLW generation for this combination of facilities is estimated to be 2 percent of existing annual site waste generation, 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration

Facility, and 6 percent of the 30,500-m^3 (39,900-yd^3) capacity of the Low-Activity Waste Vaults. Using the 8,687-m^3/ha (4,598-yd^3/acre) disposal land usage factor for SRS published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 1,750-m^3 (2,289-yd^3) waste would require 0.2 ha (0.49 acre) of disposal space at SRS. Therefore, impacts of the management of this additional LLW at SRS should not be major.

Mixed LLW includes lead shielding, solvents contaminated with plutonium, and scintillation vials from the analytical laboratory (UC 1998h, 1999c, 1999d). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and offsite disposal in a manner consistent with the site treatment plan for SRS. Mixed LLW generation for this combination of facilities is estimated to be less than 1 percent of existing annual site waste generation, and less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility. Over the operating life of these facilities, the 40-m^3 (52-yd^3) mixed LLW generated would be 2 percent of the 1,900-m^3 (2,490-yd^3) capacity of the Mixed Waste Storage Buildings. Therefore, the management of this additional waste at SRS should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, lubricants, oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, fluorescent light tubes, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at a combination of onsite and offsite permitted facilities (UC 1998h, 1999c, 1999d). Assuming that all hazardous waste is managed on the site, hazardous waste generation for this combination of facilities is estimated to be 124 percent of existing annual site waste generation, but only 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 18 percent of the 5,200-m^3 (6,800-yd^3) capacity of the hazardous waste storage buildings. The management of these additional hazardous wastes at SRS should not have a major impact on the hazardous waste management system.

Nonhazardous solid waste includes office garbage, coal ash, machine shop waste, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998h, 1999c, 1999d). Ash from the coal-fired steam generating plant would be disposed of in the onsite ash disposal landfills (UC 1999c, 1999d). The remaining solid sanitary waste would be sent to the Three Rivers Landfill (DOE 1998a:3-42). Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be less than 19 percent of existing annual site waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets; process wastewater from lab sinks and drains, mop water, cooling tower blowdown, and steam condensate; and treated wastewater from the liquid effluent treatment system. Nonhazardous wastewater would be treated, if necessary, before being discharged to the F-Area sanitary sewer system that connects to the Central Sanitary Wastewater Treatment Facility (UC 1998h, 1999c, 1999d). Nonhazardous liquid waste generated for this combination of facilities is estimated to be 20 percent of the existing annual site waste generation, 29 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, 6 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore the management of this additional waste should not have a major impact on the system.

H.4.2.7 Pit Conversion, Immobilization, and MOX Facilities

H.4.2.7.1 Construction of Pit Conversion, Immobilization, and MOX Facilities

Table H–39 compares the expected construction waste generation rates for the facilities that may be constructed at SRS with the existing site waste generation rates. No radioactive waste would be generated during the 3-year construction period because this action involves new construction only (UC 1998g, 1998h, 1999c, 1999d). In addition, no soil contaminated with hazardous or radioactive constituents would be generated during construction. However, if any were generated, the waste would be managed in accordance with site practice and all applicable Federal and State regulations. Construction waste generation would be the same for the ceramic and glass immobilization technologies (UC 1999c, 1999d).

Table H–39. Potential Waste Management Impacts of Construction of New Pit Conversion, Immobilization, and MOX Facilities at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b] PCF	IF (Ceramic or Glass)	MOX	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation PCF	IF (Ceramic or Glass)	MOX	All Facilities
Hazardous	50	35	19	74	68	47	26	141
Nonhazardous								
Liquid	5,300	21,000	20,000	416,100	1	5	5	11
Solid	120	2,200	8,600	6,670	2	33	128	163

[a] See definitions in Appendix F.8.
[b] DOE 1999a; UC 1998g, 1998h, 1999c, 1999d. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[Text deleted.]
Key: IF, immobilization facility; PCF, pit conversion facility.

[Text deleted.]

Hazardous waste generated during construction includes liquids such as spent cleaning solutions, lubricants, oils, hydraulic fluids, antifreeze solutions, paints and chemicals, and rags or wipes contaminated with these materials. These wastes are typically generated during construction of an industrial facility. Any hazardous waste generated during construction would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities (UC 1998g, 1999c, 1999d). Hazardous waste generation for construction of this combination of facilities is estimated to be 141 percent of existing annual site waste generation. Because these wastes would be treated and disposed at offsite commercial facilities, the additional waste load generated during construction should not have a major impact on the SRS hazardous waste management system.

Nonhazardous solid waste includes office garbage, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to commercial or municipal facilities for recycling or disposal (UC 1998g, 1999c, 1999d). Waste metals would be sent off the site for recycling, and therefore were not included in the waste volumes. Nonhazardous-solid-waste generation during construction of these facilities is estimated to be 163 percent of existing annual site waste generation. Because these wastes would be managed at commercial or municipal facilities, the additional waste load generated during construction should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets and wastewater from dewatering (UC 1998g, 1999c, 1999d). To be conservative, it was assumed that all nonhazardous liquid waste generated during construction would be managed at the Central Sanitary Wastewater Treatment Facility, even though it is likely that much of this waste would be collected in portable toilets and managed at offsite facilities. Nonhazardous liquid waste generated during construction of these facilities is estimated to be 11 percent of existing annual site waste generation, 17 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, 3 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore the management of this additional waste should not have a major impact on the system.

H.4.2.7.2 Operation of Pit Conversion, Immobilization, and MOX Facilities

The waste management facilities within the pit conversion, immobilization, and MOX facilities would process, temporarily store, and ship all wastes generated. Table H–40 compares the expected waste generation rates from operating the new facilities at SRS with the existing site waste generation rates. Although HLW would be used in the immobilization process, no HLW would be generated by the facilities (UC 1998g, 1998h, 1999c, 1999d). Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated on the site in the Consolidated Incineration Facility and treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that the LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Waste generation would be the same for the ceramic and glass immobilization technologies (UC 1999c, 1999d). Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at SRS are described in the *SRS Waste Management Final EIS* (DOE 1995b).

Table H–40. Potential Waste Management Impacts of Operation of New Pit Conversion, Immobilization, and MOX Facilities at SRS

	Estimated Waste Generation (m^3/yr)[b]			Site Waste	Percent of Site Waste Generation			
Waste Type[a]	PCF	Immobilization (Ceramic or Glass)	MOX	Generation (m^3/yr)[c]	PCF	Immobilization (Ceramic or Glass)	MOX	All Facilities
TRU[d]	18	95	68	427	4	22	16	42
LLW	60	81	94	10,043	1	1	1	2
Mixed LLW	1	1	3	1,135	<1	<1	<1	<1
Hazardous	2	89	3	74	3	120	4	127
Nonhazardous								
Liquid	25,000	55,000	26,000	416,100	6	13	6	26
Solid	1,800	850	440	6,670	27	13	7	46

a See definitions in Appendix F.8.
b DOE 1999a; UC 1998g, 1998h, 1999c, 1999d. Values rounded to two significant figures.
c From the waste management section in Chapter 3.
d Includes mixed TRU waste.
Key: LLW, low-level waste; PCF, pit conversion facility; TRU, transuranic.

TRU wastes generated during operations include metal cladding from fuel elements, spent filters, contaminated beryllium pieces and cuttings, used containers and equipment, paper and cloth wipes, analytical and quality-control samples, solidified inorganic solutions, and dirty plutonium oxide scrap. Lead-lined gloves are likely to be managed as mixed TRU waste. It is anticipated that all TRU waste would be contact-handled waste. TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the new facilities (UC 1998g, 1998h, 1999c, 1999d). Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned TRU Waste Characterization and Certification Facility at SRS. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for this combination of facilities is estimated to be 42 percent of existing annual site waste generation and 10 percent of the 1,720-m^3/yr (2,250-yd^3/yr) planned capacity of the TRU Waste Characterization and Certification Facility. A total of 1,810 m^3 (2,367 yd^3) of TRU waste would be generated over the 10-year operation period. This would be 26 percent of the 6,977 m^3 (9,126 yd^3) of contact-handled TRU waste currently in storage, and 5 percent of the 34,400-m^3 (44,995-yd^3) storage capacity available at SRS. Assuming that the waste were stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 8,600 drums would be required to store this waste. Assuming that these drums can be stacked two high, that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 2,600 m^2 (3,110 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on 0.26 ha (0.64 acre) of land at SRS should not be major.

The 2,600 m^3 (3,110 yd^3) of TRU waste generated by these facilities would be 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500 m^3 (220,400 yd^3) limit for WIPP (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW includes used equipment, wipes, protective clothing, solidified inorganic solutions, and tritium. It is likely that the LLW generated during operations would originate from activities in the processing areas containing the glovebox lines but not from operations within the gloveboxes. Operations within the gloveboxes are likely to generate mostly TRU waste. LLW would be treated, packaged, certified, and accumulated at the new facilities before being transferred for additional treatment and/or disposal in existing onsite facilities (UC 1998g, 1998h, 1999c, 1999d). Tritium recovered from pit disassembly would be disposed of as LLW (UC 1998g). A total of 2,350-m^3 (3,074-yd^3) LLW would be generated over the operation period. LLW generation for this combination of facilities is estimated to be 2 percent of existing annual site waste generation, 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 8 percent of the 30,500-m^3 (39,900-yd^3) capacity of the Low-Activity Waste Vaults. Using the 8,687-m^3/ha (4,598-yd^3/acre) disposal land usage factor for SRS published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 2,350 m^3 (3,074 yd^3) of waste would require 0.27 ha (0.67 acre) of disposal space at SRS. Therefore, the management of this additional LLW at SRS should have no major impact.

Mixed LLW includes leaded shielding, solvents contaminated with plutonium, scintillation vials from the analytical laboratory, and hazardous constituents that were introduced as part of the incoming pits (UC 1998g, 1998h, 1999c, 1999d). Mixed LLW would be stabilized, packaged, and stored on the site for treatment and offsite disposal in a manner consistent with the site treatment plan for SRS. Mixed LLW generation for this combination of facilities is estimated to be less than 1 percent of existing annual site waste generation, and less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility. Over the operating life of these facilities, the 50 m^3 (65 yd^3) of mixed LLW generated would be 3 percent of the 1,900-m^3 (2,490-yd^3) capacity of the Mixed Waste Storage Buildings. Therefore, the management of this additional waste at SRS should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations includes spent cleaning solutions, vacuum pump oils, film processing fluids, hydraulic fluids, antifreeze solutions, paints, chemicals, batteries, fluorescent light tubes, lead packaging, and contaminated rags or wipes. Hazardous waste would be packaged for treatment and disposal at a combination of onsite and offsite permitted facilities (UC 1998g, 1998h, 1999c, 1999d).

Assuming that all hazardous waste is managed on the site, hazardous waste generation for this combination of facilities is estimated to be 127 percent of existing annual site waste generation, but only 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 18 percent of the 5,200-m^3 (6,800-yd^3) capacity of the hazardous waste storage buildings. The management of these additional hazardous wastes at SRS should not have a major impact on the hazardous waste management system.

Nonhazardous solid waste includes office garbage, coal ash, machine shop waste, and other industrial wastes from utility and maintenance operations. Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling (UC 1998g, 1998h, 1999c, 1999d). Ash from the coal-fired steam generating plant would be disposed of in the onsite ash disposal landfills (UC 1999c, 1999d). The remaining solid sanitary waste would be sent to the Three Rivers Landfill (DOE 1998a:3-42). Nonrecyclable, nonhazardous solid waste generated by this combination of facilities is estimated to be 46 percent of existing annual site waste generation. Because most of this waste would be managed at commercial or municipal facilities, this additional waste load should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets; process wastewater from lab sinks and drains, mop water, cooling tower blowdown, and steam condensate; and treated wastewater from the liquid effluent treatment system. Nonhazardous wastewater would be treated, if necessary, before being discharged to the F-Area sanitary sewer system that connects to the Central Sanitary Wastewater Treatment Facility (UC 1998g, 1998h, 1999c, 1999d). Nonhazardous liquid waste generated for this combination of facilities is estimated to be 26 percent of the existing annual site waste generation, 40 percent of the 276,000-m^3/yr (361,000-yd^3/yr) capacity of the F-Area sanitary sewer, 8 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, impacts on the system should not be major.

H.5 LEAD ASSEMBLY FABRICATION

This section describes the impacts on the waste management infrastructure that may occur if lead assembly fabrication were to occur at ANL–W, Hanford, LLNL, LANL, or SRS. For each site, separate sections are presented for construction and operations.

H.5.1 ANL–W

H.5.1.1 Construction

Wastes would be generated during modification of the Fuel Manufacturing Facility (FMF) and the Zero Power Physics Reactor (ZPPR) for lead assembly fabrication. Table H–41 compares the expected waste generation rates for the modification of facilities at ANL–W with the existing generation rates for INEEL waste. LLW would be generated during modification of contaminated areas of FMF and ZPPR, although no TRU waste, mixed waste, or hazardous wastes should be generated (O'Connor et al. 1998a).

Table H–41. Potential Waste Management Impacts of Modification of Facilities for Lead Assembly Fabrication at ANL–W

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
LLW	18	2,624	1
Nonhazardous			
Liquid	37	2,000,000	<1
Solid	11	62,000	<1

[a] See definitions in Appendix F.8.
[b] O'Connor et al. 1998a. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3; waste generation rates for INEEL.
Key: ANL–W, Argonne National Laboratory–West; LLW, low-level waste.

LLW generated during modification of the FMF and ZPPR buildings would include used equipment, decontamination wastes, and protective clothing (O'Connor et al. 1998a). A total of 36 m^3 (47 yd^3) of LLW would be generated during the 2-year modification period. LLW generation for these activities is estimated to be 1 percent of existing annual waste generation, less than 1 percent of the 112,400-m^3 (147,000-yd^3) storage capacity at the RWMC, and less than 1 percent of the 37,700-m^3/yr (49,300-yd^3/yr) disposal capacity of the RWMC. Using the 6,264-m^3/ha (3,315-yd^3/acre) disposal land usage factor for the RWMC published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 36 m^3 (47 yd^3) of waste would require less than 0.1 ha (0.25 acre) of disposal space at INEEL. Therefore, impacts of the management of this additional LLW at ANL–W and INEEL should not be major.

Nonhazardous solid waste would include office garbage, construction debris, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice, and would be disposed of in the onsite CFA landfill complex or shipped to offsite facilities for recycling. Nonrecyclable nonhazardous solid waste generated during modification is estimated to be less than 1 percent of existing annual site waste generation and less than 1 percent of the 48,000-m^3/yr (62,800-yd^3/yr) capacity of the CFA landfill complex. The additional waste load generated during the modification period should not have a major impact on the nonhazardous solid waste management system at ANL–W or INEEL.

Nonhazardous liquid waste would include sanitary waste from sinks, showers, urinals, and water closets. To be conservative, it was assumed that all nonhazardous liquid waste generated during modification would be managed at the ANL–W sanitary wastewater treatment facility. Nonhazardous liquid waste generated for modification is estimated to be less than 1 percent of the existing annual waste generation for the INEEL, and 1 percent of the 6,057-m^3/yr (7,923-yd^3/yr) capacity of the ANL–W sanitary wastewater treatment facility. Therefore, this waste load should not have a major impact on the ANL–W sanitary wastewater treatment system.

H.5.1.2 Operations

Table H–42 compares the expected waste generation rates from lead assembly fabrication at ANL–W with the existing INEEL waste generation rates. No HLW would be generated by the proposed activities. Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. This SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at ANL–W and INEEL are described in the *DOE Programmatic Spent Nuclear Fuel Management and INEL Environmental Restoration and Waste Management Final EIS* (DOE 1995a).

Table H–42. Potential Waste Management Impacts of Operation of Facilities for Lead Assembly Fabrication at ANL–W

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	41	NA	NA
LLW	200	2,624	8
Mixed LLW	1	180	1
Hazardous	<1	835	<1
Nonhazardous			
Liquid	1,600	2,000,000	<1
Solid	1,300	62,000	2

[a] See definitions in Appendix F.8.
[b] O'Connor et al. 1998a. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3; waste generation rates for INEEL.
[d] Includes mixed TRU waste.
Key: ANL–W, Argonne National Laboratory–W; LLW, low-level waste; NA, not applicable; TRU, transuranic.

TRU wastes generated during lead assembly fabrication would include glovebox gloves, spent filters, used containers and equipment, paper and cloth wipes, analytical and quality control samples, metallography waste, and sludges (O'Connor et al. 1998a). It is anticipated that all TRU waste would be contact-handled waste. Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Long-term storage, drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned Waste Characterization Facility at INEEL. TRU waste is not routinely generated at INEEL. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for these activities at ANL–W is estimated to be 41 m^3/yr (54 yd^3/yr), or 1 percent of the 6,500-m^3/yr (8,500-yd^3/yr) capacity of the planned Advanced Mixed Waste Treatment Project. A total of 132 m^3 (173 yd^3) of waste would be generated over the 3-year operation period. This would be less than

1 percent of the 39,300 m^3 (51,404 yd^3) of contact-handled TRU waste currently in storage, and less than 1 percent of the 177,300-m^3 (231,908-yd^3) storage capacity available at INEEL.

The 132 m^3 (173 yd^3) of TRU waste generated by these activities would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for WIPP (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW may include room trash (e.g., blotter paper, wipes, mop heads); protective clothing; solidified sludges; ion exchange resins; metal cans and rods; and wastewater from the laundry, analytical laboratory, and decontamination process (O'Connor et al. 1998a). LLW would be packaged, certified, and accumulated before being transferred for treatment and disposal in existing onsite facilities. A total of 700 m^3 (916 yd^3) of LLW would be generated over the 3-year operation period. LLW generation for these activities is estimated to be 8 percent of existing annual site waste generation, less than 1 percent of the 49,610-m^3/yr (64,880-yd^3/yr) capacity of the WERF, 1 percent of the 112,400-m^3 (147,000-yd^3) storage capacity at the the RWMC, and 1 percent of the 37,700-m^3/yr (49,300-yd^3/yr) disposal capacity of the RWMC. Using the 6,264-m^3/ha (3,315-yd^3/acre) disposal land usage factor for the RWMC published in the *Storage and Disposition Final PEIS* (DOE 1996a:E-9), 700 m^3 (916 yd^3) of waste would require 0.11 ha (0.27 acre) of disposal space at INEEL. Therefore, impacts of the management of this additional LLW at ANL–W and INEEL should not be major.

Mixed LLW may include sludges, cleaning solvents, and analytical waste (O'Connor et al. 1998a). Mixed LLW will be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for ANL–W. INEEL currently treats mixed LLW onsite and ships some mixed LLW to Envirocare of Utah. Onsite disposal is planned in a new mixed LLW disposal facility. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for these activities is estimated to be 1 percent of existing annual waste generation and less than 1 percent of the 6,500-m^3/yr (8,500-yd^3/yr) planned capacity of the Advanced Mixed Waste Treatment Project. The 4 m^3 (5.2 yd^3) of mixed LLW expected to be generated would be less than 1 percent of the 112,400-m^3 (147,000-yd^3) storage capacity at the RWMC. Therefore, the management of this additional waste at ANL–W and INEEL should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations would include small quantities of process ends. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (O'Connor et al. 1998a). Hazardous waste generation for these activities is estimated to be less than 1 percent of existing annual waste generation and less than 1 percent of the 1,600-m^3 (2,090-yd^3) onsite storage capacity, and therefore should not have a major impact on the hazardous waste management system at ANL–W or INEEL.

Nonhazardous solid waste would include office and lunch room garbage, packaging materials, sewage sludges, and other industrial wastes from utility and maintenance operations (O'Connor et al. 1998a). Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling. The remaining solid sanitary waste would be sent off the site for disposal in the Bonneville County landfill. Nonrecyclable, nonhazardous solid waste generated by these activities is estimated to be 2 percent of existing annual site waste generation. It is unlikely that this additional waste load would have a major impact on the nonhazardous solid waste management system at ANL–W or INEEL.

Nonhazardous liquid waste would include sanitary waste from sinks, showers, urinals and water closets, and wastewater from cooling tower blowdown (O'Connor et al. 1998a). Nonhazardous liquid waste generated for these activities is estimated to be less than 1 percent of the existing annual waste generation for INEEL and 26 percent of the 6,057-m^3/yr (7,923-yd^3/yr) capacity of the ANL–W sanitary wastewater treatment facility. Therefore, this additional waste should not have a major impact on the ANL–W sanitary wastewater treatment system.

H.5.2 Hanford

H.5.2.1 Construction

Table H–43 compares the expected waste generation rates for the modification of Hanford facilities for lead assembly fabrication with the existing generation rates for Hanford waste. No radioactive waste would be generated during modification because this action involves modification of uncontaminated buildings only (O'Connor et al. 1998b).

Table H–43. Potential Waste Management Impacts of Modification of Facilities for Lead Assembly Fabrication at Hanford

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Nonhazardous			
Liquid	15	200,000	<1
Solid	50	43,000	<1

[a] See definitions in Appendix F.8.
[b] O'Connor et al. 1998b. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.

Nonhazardous solid waste includes office garbage, construction debris, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite facilities for recycling or disposal. Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore were not included in the waste volumes. Nonrecyclable solid sanitary waste would be sent off the site and would likely be disposed of in the Richland Sanitary Landfill. Nonrecyclable nonhazardous solid waste generated during modification is estimated to be less than 1 percent of existing annual waste generation. The additional waste load generated during the 2-year modification period should not have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets. To be conservative, it was assumed that all nonhazardous liquid waste generated during modification would be managed at onsite facilities. Nonhazardous liquid waste generated during modification is estimated to be less than 1 percent of existing annual site waste generation, less than 1 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, and less than 1 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest (formerly WPPSS) Sewage Treatment Facility. Therefore, this waste load is unlikely to have a major impact on the system during the modification period.

H.5.2.2 Operations

Table H–44 compares the expected waste generation rates from lead assembly fabrication at Hanford with the existing site waste generation rates. No HLW would be generated during lead assembly fabrication. Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998,

Table H–44. Potential Waste Management Impacts of Operation of Facilities for Lead Assembly Fabrication at Hanford

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	41	450	9
LLW	200	3,902	5
Mixed LLW	1	847	<1
Hazardous	<1	560	<1
Nonhazardous			
Liquid	1,600	200,000	1
Solid	1,300	43,000	3

a See definitions in Appendix F.8.
b O'Connor et al. 1998b. Values rounded to two significant figures.
c From the waste management section in Chapter 3.
d Includes mixed TRU waste
Key: LLW, low-level waste; TRU, transuranic.

TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at Hanford are being evaluated in the *Hanford Site Solid (Radioactive and Hazardous) Waste Program EIS* that is being prepared by the DOE Richland Operations Office (DOE 1997c).

TRU wastes generated during operations would include glovebox gloves, spent filters, used containers and equipment, paper and cloth wipes, analytical and quality control samples, metallography waste, and sludges (O'Connor et al. 1998b). It is anticipated that all TRU waste would be contact-handled waste. Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the Waste Receiving and Processing Facility at Hanford. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for these activities is estimated to be 9 percent of existing annual site waste generation and 2 percent of the 1,820-m^3/yr (2,380-yd^3/yr) planned capacity of the Waste Receiving and Processing Facility. A total of 132 m^3 (173 yd^3) of TRU waste would be generated over the 3-year operation period. This would be 1 percent of the 11,450 m^3 (14,977 yd^3) of contact-handled TRU waste currently in storage and 1 percent of the 17,000-m^3 (22,200-yd^3) storage capacity available at Hanford.

The 132 m^3 (173 yd^3) of TRU waste generated by these activities would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for WIPP (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW may include room trash (e.g., blotter paper, wipes, mop heads); protective clothing; solidified sludges; ion exchange resins; metal cans and rods; and wastewater from the laundry, analytical laboratory, and decontamination process (O'Connor et al. 1998b). LLW would be packaged, certified, and accumulated before being transferred for treatment and disposal in existing onsite facilities. A total of 700 m^3 (916 yd^3) of LLW would be generated over the 3-year operation period. LLW generation for these activities is estimated to be

5 percent of existing annual site waste generation, less than 1 percent of the 1,740,000-m^3 (2,280,000-yd^3) disposal capacity of the LLW Burial Grounds, and less than 1 percent of the 230,000-m^3 (301,000-yd^3) capacity of the Grout Vaults. Using the 3,480-m^3/ha (1,842-yd^3/acre) disposal land usage factor for Hanford published in the *Final Storage and Disposition PEIS* (DOE 1996a:E-9), 700 m^3 (916 yd^3) of waste would require 0.2 ha (0.49 acre) of disposal space at Hanford. Therefore, impacts of the management of this additional LLW at Hanford should not be major.

Mixed LLW may include sludges, cleaning solvents, and analytical waste (O'Connor et al. 1998b). Mixed LLW will be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for Hanford. Mixed LLW generation for these activities is estimated to be less than 1 percent of existing annual waste generation and less than 1 percent of the 1,820-m^3/yr (2,380-yd^3/yr) capacity of the Waste Receiving and Processing Facility. Over the operating life of this facility, the 4 m^3 (5.2 yd^3) of mixed LLW expected to be generated would be less than 1 percent of the 16,800-m^3 (21,970-yd^3) storage capacity of the Central Waste Complex and less than 1 percent of the 14,200 m^3 (18,600-yd^3) disposal capacity in the Radioactive Mixed Waste Disposal Facility. Therefore, the management of this additional waste at Hanford should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations would include small quantities of process ends. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (O'Connor et al. 1998b). Hazardous waste generation for these activities is estimated to be less than 1 percent of existing annual waste generation. These wastes should not have a major impact on the hazardous waste management system at Hanford.

Nonhazardous solid waste would include office and lunch room garbage, packaging materials, sewage sludges, and other industrial wastes from utility and maintenance operations (O'Connor et al. 1998b). Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling. The remaining solid sanitary waste would be sent off the site for disposal in the Richland Sanitary Landfill. Nonrecyclable, nonhazardous solid waste generated by these activities is estimated to be 3 percent of existing annual site waste generation. It is unlikely that this additional waste load would have a major impact on the nonhazardous solid waste management system at Hanford.

Nonhazardous liquid waste would include sanitary waste from sinks, showers, urinals and water closets, and wastewater from cooling tower blowdown (O'Connor et al. 1998b). Nonhazardous liquid waste generated for these activities is estimated to be 1 percent of the existing annual site waste generation, 1 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the 400 Area sanitary sewer, and 1 percent of the 235,000-m^3/yr (307,000-yd^3/yr) capacity of the Energy Northwest (formerly WPPSS) Sewage Treatment Facility. Therefore, this additional waste load should not have a major impact on the system.

H.5.3 LLNL

H.5.3.1 Construction

Table H–45 compares the expected waste generation rates for the modification of LLNL facilities for lead assembly fabrication with the existing generation rates for LLNL waste. No radioactive waste would be generated during modification because this action involves modification of uncontaminated buildings only (O'Connor et al. 1998c).

Table H–45. Potential Waste Management Impacts of Modification of Facilities for Lead Assembly Fabrication at LLNL

WasteType[a]	Estimated Waste Generation (m^3/yr) [b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Nonhazardous			
Liquid	17	456,000	<1
Solid	12	4,282	<1

[a] See definitions in Appendix F.8.
[b] O'Connor et al. 1998c. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.

Nonhazardous solid waste includes office garbage, construction debris, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to offsite facilities for recycling or disposal. Waste metals and other recyclable solid wastes would be sent off the site for recycling, and therefore were not included in the waste volumes. Nonrecyclable solid sanitary waste would be sent off the site and would likely be disposed of in the Vasco Road Landfill. Nonrecyclable nonhazardous solid waste generated during modification is estimated to be 1 percent of existing annual waste generation. The additional waste load generated during the 2-year modification period should not have major impact on the nonhazardous solid waste management system at LLNL.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals, and water closets. To be conservative, it was assumed that all nonhazardous liquid waste generated during modification would be discharged to the LLNL sewer system. Nonhazardous liquid waste generated during modification is estimated to be less than 1 percent of existing annual site waste generation and less than 1 percent of the 2,327,800-m^3/yr (3,044,762-yd^3/yr) capacity of the LLNL sanitary sewer, and therefore is unlikely to have a major impact on the LLNL sewer system or the city of Livermore Water Reclamation Plant during the modification period.

H.5.3.2 Operations

Table H–46 compares the expected waste generation rates from lead assembly fabrication at LLNL with the existing site waste generation rates. No HLW would be generated during lead assembly fabrication. Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment and storage of radioactive, hazardous, and mixed wastes at LLNL are described in the *Final EIS for Continued Operation of LLNL and SNL, Livermore* (DOE 1992).

TRU wastes generated during operations would include glovebox gloves, spent filters, used containers and equipment, paper and cloth wipes, analytical and quality control samples, metallography waste, and sludges (O'Connor et al. 1998c). It is anticipated that all TRU waste would be contact-handled waste. Liquid TRU wastes would be evaporated or solidified before being packaged for storage. It is likely that drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned Decontamination and Waste Treatment Facility. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

Table H–46. Potential Waste Management Impacts of Operation of Facilities for Lead Assembly Fabrication at LLNL

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	41	27	152
LLW	200	124	161
Mixed LLW	1	353	<1
Hazardous	<1	579	<1
Nonhazardous			
Liquid	1,600	456,000	<1
Solid	1,300	4,282	30

[a] See definitions in Appendix F.8.
[b] O'Connor et al. 1998c. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste

Key: LLW, low-level waste; TRU, transuranic.

TRU waste generation for these activities is estimated to be 152 percent of existing annual site waste generation. A total of 132 m^3 (173 yd^3) of TRU waste would be generated over the 3-year operation period. This would be 51 percent of the 257 m^3 (336 yd^3) of contact-handled TRU waste currently in storage, and 4 percent of the 3,335 m^3 (4,362 yd^3) of onsite storage capacity. Assuming that the waste is stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 630 drums would be needed to store this waste. Assuming that these drums can be stacked two high, each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space and shipping and receiving space, a storage area of about 190 m^2 (227 yd^2) would be required. Impacts of the storage of additional quantities of TRU waste on less than 0.1 ha (0.25 acre) of land at LLNL should not be major.

The 132 m^3 (173 yd^3) of TRU waste generated by these activities would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for WIPP (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW may include room trash (e.g., blotter paper, wipes, mop heads); protective clothing; solidified sludges; ion exchange resins; metal cans and rods; and wastewater from the laundry, analytical laboratory, and decontamination process (O'Connor et al. 1998c). LLW would be packaged, certified, and accumulated before being transferred for treatment and storage in existing facilities on the site. LLW generation for these activities is estimated to be 161 percent of existing annual site waste generation and 26 percent of the 771-m^3/yr (1,008-yd^3/yr) capacity of the size reduction facility. A total of 700 m^3 (916 yd^3) of LLW would be generated over the 3-year operation period. This would be 13 percent of the 5,255-m^3 (6,874-yd^3) onsite storage capacity, and would not be expected to require LLNL to build additional storage capacity because this waste would be shipped to a disposal facility on a routine basis. If additional storage space were required, and assuming that the waste is stored in 208-l (55-gal) drums each with a capacity of 0.21 m^3 (0.27 yd^3), about 3,300 drums would be needed to store this waste. Assuming that these drums can be stacked two high, each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space and shipping and receiving space, a storage area of about 1,000 m^2 (1,196 yd^2) would be required. Impacts of the storage of additional quantities of LLW on 0.1 ha (0.25 acre) of land at LLNL should not be major.

LLW from LLNL is currently shipped to NTS for disposal. The additional LLW from conduct of lead assembly fabrication at LLNL would be 4 percent of the 20,000 m^3 (26,000 yd^3) of LLW disposed at NTS in 1995 and less than 1 percent of the 500,000-m^3 (650,000-yd^3) disposal capacity at NTS. Using the

6,085-m^3/ha (3,221-yd^3/acre) disposal land usage factor for NTS published in the *Final Storage and Disposition PEIS* (DOE 1996a:E-9), 700 m^3 (916 yd^3) of waste would require 0.12 ha (0.30 acre) of disposal space at NTS or a similar facility. Therefore, impacts of the management of this additional LLW at the disposal site should not be major. Impacts of disposal of LLW at NTS are described in the *Final EIS for the NTS and Off-Site Locations in the State of Nevada* (DOE 1996c).

Mixed LLW may include sludges, cleaning solvents, and analytical waste (O'Connor et al. 1998c). Mixed LLW will be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for LLNL. Mixed LLW disposal would occur off the site. Mixed LLW generation for these activities is estimated to be less than 1 percent of existing annual waste generation and less than 1 percent of the 2,012-m^3/yr (2,632-yd^3/yr) capacity of the Building 513 and 514 Waste Treatment Facility. Over the operating life of this facility, the 4 m^3 (5.2 yd^3) of mixed LLW expected to be generated would be less than 1 percent of the 2,825-m^3 (3,695-yd^3) onsite storage capacity. Therefore, the management of this additional waste at LLNL should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations would include small quantities (< 1 m^3/yr [< 1.3 yd^3/yr]) of process ends. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (O'Connor et al. 1998c). Hazardous waste generated by these activities is estimated to be less than 1 percent of existing annual waste generation and less than 1 percent of the 2,825-m^3 (3,695-yd^3) hazardous waste storage capacity. Because the additional waste load is very small, management of this waste should not have a major impact on the hazardous waste management system at LLNL.

Nonhazardous solid waste would include office and lunch room garbage, packaging materials, sewage sludges, and other industrial wastes from utility and maintenance operations (O'Connor et al. 1998c). Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling. The remaining solid sanitary waste would be sent off the site for disposal in the Vasco Road Landfill. Nonrecyclable, nonhazardous solid waste generated by these activities is estimated to be 30 percent of existing annual site waste generation. It is unlikely that this additional waste load would have a major impact on the nonhazardous solid waste management system at LLNL.

Nonhazardous liquid waste would include sanitary waste from sinks, showers, urinals and water closets, and wastewater from cooling tower blowdown (O'Connor et al. 1998c). After monitoring to ensure that the wastewater meets discharge limits, sanitary wastewaters from lead assembly fabrication along with other sanitary wastewaters from LLNL and Sandia National Laboratory–Livermore, would be routed to the city of Livermore Water Reclamation Plant. Nonhazardous liquid waste generated for these activities is estimated to be less than 1 percent of the existing annual site waste generation, and less than 1 percent of the 2,327,800-m^3/yr (3,044,762-yd^3/yr) capacity of the LLNL sanitary sewer and therefore should not have a major impact on LLNL and the city of Livermore sanitary wastewater treatment systems.

H.5.4 LANL

H.5.4.1 Construction

Table H–47 compares the expected waste generation rates for the modification of LANL facilities for lead assembly fabrication with the existing generation rates for LANL waste. TRU waste and LLW would be generated during modification of the glovebox line in Building PF–4, although no mixed waste or hazardous wastes would be generated (O'Connor et al. 1998d).

Table H–47. Potential Waste Management Impacts of Modification of Facilities for Lead Assembly Fabrication at LANL

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	3	262	1
LLW	3	1,585	<1
Nonhazardous			
Liquid	10	692,857	<1

[a] See definitions in Appendix F.8.
[b] O'Connor et al. 1998d:33. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
Key: LLW, low-level waste; TRU, transuranic.

TRU wastes generated during modification of Building PF–4 would include contaminated equipment and gloveboxes. It is anticipated that all TRU waste would be contact-handled waste. No liquid TRU waste is anticipated (O'Connor et al. 1998d). Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the Radioactive Materials Research, Operations and Demonstration (RAMROD) Facility and the Radioactive Assay and Nondestructive Test (RANT) Facility (DOE 1999b:2-108, 2-112, 2-113). Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b).

TRU waste generation for modification of Building PF–4 is estimated to be 1 percent of existing annual site waste generation, and less than 1 percent of the 1,050-m^3/yr (1,373-yd^3/yr) TRU-waste-processing capacity of the RAMROD and RANT facilities. A total of 5 m^3 (6.5 yd^3) of TRU waste would be generated over the 2-year modification period. This would be less than 1 percent of the 11,262 m^3 (14,731 yd^3) of contact-handled TRU waste currently in storage, and less than 1 percent of the 24,355-m^3 (31,856-yd^3) storage capacity available at LANL.

In addition, the 5 m^3 (6.5 yd^3) of TRU waste generated by modification of this building would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for WIPP (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW generated during modification of Building PF–4 would include decontamination wastes and protective clothing. It is expected that no radioactive liquid LLW would be generated (O'Connor et al. 1998d). A total of 5 m^3 (6.5 yd^3) of LLW would be generated during the modification period. LLW generation for these activities is estimated to be less than 1 percent of existing annual waste generation, 1 percent of the 663-m^3 (867-yd^3) LLW storage capacity, and less than 1 percent of the 252,000-m^3 (329,616-yd^3) capacity of the TA–54 LLW disposal area. Using the 12,562-m^3/ha (6,649-yd^3/acre) disposal land usage factor for LANL published in the *Final Stockpile Stewardship and Management PEIS* (SSM PEIS) (DOE 1996d:H-9), 5 m^3 (6.5 yd^3) of waste would require less than 0.1 ha (0.25 acre) of disposal space at LANL. Therefore, impacts of the management of this additional LLW at LANL should not be major.

Nonhazardous liquid waste would include sanitary waste from sinks, showers, urinals, and water closets. To be conservative, it was assumed that all nonhazardous liquid waste generated during modification would be managed at the LANL sanitary wastewater treatment plant. Nonhazardous liquid waste generated for modification is estimated to be less than 1 percent of the existing annual waste generation, less than 1 percent of the 1,060,063-m^3/yr (1,386,562-yd^3/yr) capacity of the sanitary wastewater treatment plant, and less than

1 percent of the 567,750-m^3/yr (742,617-yd^3/yr) capacity of the sanitary tile fields. Therefore, this waste load would not have a major impact on the LANL sanitary wastewater treatment system.

H.5.4.2 Operations

Table H–48 compares the expected waste generation rates from lead assembly fabrication at LANL with the existing site waste generation rates. No HLW would be generated during lead assembly fabrication. Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998,TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of treatment, storage, and disposal of waste at LANL, including expansion of the LLW disposal facility, are evaluated in the *Site-Wide EIS for Continued Operation of LANL* (DOE 1999b).

Table H–48. Potential Waste Management Impacts of Operation of Facilities for Lead Assembly Fabrication at LANL

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	41	262	16
LLW	200	1,585	13
Mixed LLW	1	90	1
Hazardous	<1	942	<1
Nonhazardous			
Liquid	1,600	692,857	<1
Solid	1,300	5,453	24

[a] See definitions in Appendix F.8.
[b] O'Connor et al. 1998d:34. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.
[d] Includes mixed TRU waste.
Key: LLW, low-level waste; TRU, transuranic.

TRU wastes generated during operations would include glovebox gloves, spent filters, used containers and equipment, paper and cloth wipes, analytical and quality control samples, metallography waste, and sludges (O'Connor et al.1998d). It is anticipated that all TRU waste would be contact-handled waste. Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the RAMROD and RANT facilities (DOE 1999:2-108, 2-112, 2-113). Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for these activities is estimated to be 16 percent of existing annual site waste generation and 4 percent of the 1,050 m^3/yr (1,373-yd^3/yr) TRU-waste-processing capacity of the RAMROD and RANT facilities. A total of 132 m^3 (173 yd^3) of TRU waste would be generated over the 3-year operation period. This would be 1 percent of the 11,262 m^3 (14,731 yd^3) of contact-handled TRU waste currently in storage, and less than 1 percent of the 24,355-m^3 (31,856-yd^3) storage capacity available at LANL.

The 132 m^3 (173 yd^3) of TRU waste generated by these activities would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for WIPP (DOE 1997d:3-3). Impacts from disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW may include room trash (e.g., blotter paper, wipes, mop heads); protective clothing; solidified sludges; ion exchange resins; metal cans and rods; and wastewater from the laundry, analytical laboratory, and decontamination process (O'Connor et al. 1998d). LLW would be packaged, certified, and accumulated before being transferred for treatment and disposal in existing onsite facilities. A total of 700 m^3 (916 yd^3) of LLW would be generated over the 3-year operation period. LLW generation for these activities is estimated to be 13 percent of existing annual site waste generation, 106 percent of the 663-m^3 (867-yd^3) LLW storage capacity, and less than 1 percent of the 252,000-m^3 (329,616-yd^3) capacity of the TA–54 LLW disposal area. Because the waste would be sent for disposal on a regular basis, storage should not be a problem. Using the 12,562-m^3/ha (6,649-yd^3/acre) disposal land usage factor for LANL published in the SSM PEIS (DOE 1996d:H-9), 700 m^3 (916 yd^3) of waste would require 0.1 ha (0.25 acre) of disposal space at LANL. It is estimated that without any waste contribution from lead assembly fabrication, the existing disposal space in the TA–54 LLW disposal facility will be exhausted within the next 10 years. Expansion of the LLW disposal capacity at LANL is evaluated in the *Site-Wide EIS for Continued Operation of LANL* (DOE 1999b). Impacts from the management of the additional SPD LLW at LANL should not be major.

Mixed LLW may include sludges, cleaning solvents, and analytical waste (O'Connor et al. 1998d). Mixed LLW will be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for LANL. Mixed LLW disposal would occur off the site. Mixed LLW generation for these activities is estimated to be 1 percent of existing annual waste generation, and 1 percent of the 583-m^3 (762.6-yd^3) mixed LLW storage capacity. Therefore, the management of this additional waste at LANL should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations would include small quantities of process ends. Hazardous waste would be packaged for treatment and disposal at offsite permitted commercial facilities (O'Connor et al. 1998d). Hazardous waste generation for these activities is estimated to be less than 1 percent of existing annual waste generation and less than 1 percent of the 1,864-m^3 (2,438-yd^3) hazardous waste storage capacity. These wastes should not have a major impact on the hazardous waste management system at LANL.

Nonhazardous solid waste would include office and lunch room garbage, packaging materials, sewage sludges, and other industrial wastes from utility and maintenance operations (O'Connor et al. 1998d). Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling. The remaining solid sanitary waste would be disposed of in the Los Alamos County Landfill. Nonrecyclable, nonhazardous solid waste generated by these activities is estimated to be 24 percent of existing annual site waste generation. It is unlikely that this additional waste load would have a major impact on the nonhazardous solid waste management system at LANL.

Nonhazardous liquid waste would include sanitary waste from sinks, showers, urinals and water closets, and wastewater from cooling tower blowdown (O'Connor et al. 1998d). Nonhazardous liquid waste generated for these activities is estimated to be less than 1 percent of the existing annual site waste generation, less than 1 percent of the 1,060,063-m^3/yr (1,386,562-yd^3/yr) capacity of the sanitary wastewater treatment plant, and less than 1 percent of the 567,750-m^3/yr (742,617-yd^3/yr) capacity of the sanitary tile fields, and therefore should not have a major impact on the system.

H.5.5 SRS

H.5.5.1 Construction

Table H–49 compares the expected waste generation rates for the modification of facilities at SRS with the existing generation rates for SRS waste. No radioactive or mixed waste would be generated during modification because the areas of the buildings that will be modified are uncontaminated.

Table H–49. Potential Waste Management Impacts of Modification of Facilities for Lead Assembly Fabrication at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
Hazardous	1	74	1
Nonhazardous			
Liquid	2,400	416,100	1
Solid	19	6,670	<1

[a] See definitions in Appendix F.8.
[b] O'Connor et al. 1998e:35. Values rounded to two significant figures.
[c] From the waste management section in Chapter 3.

The small amount of hazardous waste generated during building modification would include batteries, fluorescent light tubes, and liquids such as cleaning solutions, lubricants, oils, and hydraulic fluids (O'Connor et al. 1998e). These wastes are typical of those generated during construction of an industrial facility. Any hazardous waste generated during modification would be packaged in DOT-approved containers and shipped off the site to permitted commercial treatment and disposal facilities. Hazardous waste generationfor modification of this facility is estimated to be 1 percent of existing annual site waste generation. The additional waste load generated during the 2-year modification period should not have a major impact on the SRS hazardous waste management system.

Nonhazardous solid waste would include office garbage, construction debris, scrap lumber, concrete and steel waste, and other construction trash. Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to commercial facilities for recycling or disposal. Waste metals would be sent off the site for recycling, and therefore, were not included in the waste volumes. Nonhazardous-solid-waste generation during modification of this facility is estimated to be less than 1 percent of existing annual site waste generation. The additional waste load generated during the modification period should not have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste would include sanitary waste from any sinks, showers, urinals, and water closets. To be conservative, it was assumed that all nonhazardous liquid waste generated during modification would be managed at the Central Sanitary Wastewater Treatment Facility. Nonhazardous liquid waste generated for modification of this facility is estimated to be 1 percent of existing annual site waste generation, 2 percent of the 136,274-m^3/yr (178,246-yd^3/yr) capacity of the H-Area sanitary sewer, less than 1 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, the management of this additional waste should not have a major impact on the system during the modification period.

H.5.5.2 Operations

Table H–50 compares the expected waste generation rates from lead assembly fabrication at SRS with the existing site waste generation rates. No HLW would be generated during lead assembly fabrication. Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated and disposed of on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated on the site in the Consolidated Incineration Facility and treated and disposed of at offsite commercial facilities. This EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts from treatment, storage, and disposal of radioactive, hazardous, and mixed wastes at SRS are described in the *SRS Waste Management Final EIS* (DOE 1995b).

Table H–50. Potential Waste Management Impacts of Operation of Facilities for Lead Assembly Fabrication at SRS

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	41	427	10
LLW	200	10,043	2
Mixed LLW	1	1,135	<1
Hazardous	<1	74	<1
Nonhazardous			
Liquid	1,600	416,100	<1
Solid	1,300	6,670	19

a See definitions in Appendix F.8.
b O'Connor et al. 1998e:38. Values rounded to two significant figures.
c From the waste management section in Chapter 3.
d Includes mixed TRU waste.
Key: LLW, low-level waste; TRU, transuranic.

TRU wastes generated during operations would include glovebox gloves, spent filters, used containers and equipment, paper and cloth wipes, analytical and quality control samples, metallography waste, and sludges (O'Connor et al. 1998e). It is anticipated that all TRU waste would be contact-handled waste. Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading the TRUPACT for shipment to WIPP would occur at the planned TRU Waste Characterization and Certification Facility at SRS. Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for these activities is estimated to be 10 percent of existing annual site waste generation, and 2 percent of the 1,720-m^3/yr (2,250-yd^3/yr) planned capacity of the TRU Waste Characterization and Certification Facility. A total of 132 m^3 (173 yd^3) of TRU waste would be generated over the 3-year operation period. This would be 2 percent of the 6,977 m^3 (9,125 yd^3) of contact-handled TRU waste currently in storage, and less than 1 percent of the 34,400-m^3 (44,995-yd^3) storage capacity available at SRS.

The 132 m^3 (173 yd^3) of TRU waste generated by these activities would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP, and within the 168,500-m^3 (220,400-yd^3) limit for WIPP (DOE 1997d:3-3). Impacts from disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW may include room trash (e.g., blotter paper, wipes, mop heads); protective clothing; solidified sludges; ion exchange resins; metal cans and rods; and wastewater from the laundry, analytical laboratory, and decontamination process (O'Connor et al. 1998e). LLW would be packaged, certified, and accumulated before being transferred for treatment and disposal in existing onsite facilities. A total of 700 m^3 (916 yd^3) of LLW would be generated over the 3-year operation period. LLW generation for these activities is estimated to be 2 percent of existing annual site waste generation, 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and 2 percent of the 30,500-m^3 (39,900-yd^3) capacity of the Low-Activity Waste Vaults. Using the 8,687-m^3/ha (4,598-yd^3/acre) disposal land usage factor for SRS published in the *Final Storage and Disposition PEIS* (DOE 1996a:E-9), 700 m^3 (916 yd^3) of waste would require 0.1 ha (0.25 acre) of disposal space at SRS. Therefore, impacts from the management of this additional LLW at SRS should not be major.

Mixed LLW may include sludges, cleaning solvents, and analytical waste (O'Connor et al. 1998e). Mixed LLW will be stabilized, packaged, and stored on the site for treatment and offsite disposal in a manner consistent with the site treatment plan for SRS. Mixed LLW generation for these activities is estimated to be less than 1 percent of existing annual site waste generation and less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility. Over the operating life of this facility, the 4 m^3 (5.2 yd^3) of mixed LLW expected to be generated would be less than 1 percent of the 1,900-m^3 (2,490-yd^3) capacity of the Mixed Waste Storage Buildings. Therefore, the management of this additional waste at SRS should not have a major impact on the mixed LLW management system.

Hazardous waste generated during operations would include small quantities of process ends (O'Connor et al. 1998e). Hazardous waste would be packaged for treatment and disposal at a combination of onsite and offsite permitted facilities. Assuming that all hazardous waste is managed on the site, hazardous waste generation for these activities is estimated to be less than 1 percent of existing annual site waste generation, less than 1 percent of the 17,830-m^3/yr (23,320-yd^3/yr) capacity of the Consolidated Incineration Facility, and less than 1 percent of the 5,200-m^3 (6,800-yd^3) capacity of the hazardous waste storage buildings. The management of these additional hazardous wastes at SRS should not have a major impact on the hazardous waste management system.

Nonhazardous solid waste would include office and lunch room garbage, packaging materials, sewage sludges, and other industrial wastes from utility and maintenance operations (O'Connor et al. 1998e). Nonhazardous solid waste would be packaged in conformance with standard industrial practice. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling. The remaining solid sanitary waste would be sent to the Three Rivers Landfill (DOE 1998a:3-42). Nonrecyclable, nonhazardous solid waste generated by these activities is estimated to be 19 percent of existing annual site waste generation. It is unlikely that this additional waste load would have a major impact on the nonhazardous solid waste management system at SRS.

Nonhazardous liquid waste includes sanitary waste from sinks, showers, urinals and water closets, and wastewater from cooling tower blowdown (O'Connor et al. 1998e). Nonhazardous liquid waste generated for these activities is estimated to be less than 1 percent of the existing annual site waste generation, 1 percent of the 136,274-m^3/yr (178,246-yd^3/yr) capacity of the H-Area sanitary sewer, less than 1 percent of the 1,449,050-m^3/yr (1,895,357-yd^3/yr) capacity of the Central Sanitary Wastewater Treatment Facility, and within the 1,032,950-m^3/yr (1,351,099-yd^3/yr) excess capacity of the Central Sanitary Wastewater Treatment Facility (Sessions 1997). Therefore, impacts on the system should not be major.

H.6 POSTIRRADIATION EXAMINATION

This section describes the impacts on the waste management infrastructure that may occur if postirradiation examination were to occur at ANL–W or ORNL. For each site, separate sections are presented for construction and operations.

H.6.1 ANL–W

H.6.1.1 Construction

It is expected that postirradiation examination could be performed at ANL–W without the need for facility modifications that would generate waste (O'Connor et al. 1998a). Therefore, there would be no construction waste to impact the waste management infrastructure.

H.6.1.2 Operations

The waste management facilities within the postirradiation examination facilities would process, temporarily store, and ship all wastes generated. Table H–51 compares the expected waste generation rates from postirradiation examination at ANL–W with the existing generation rates for INEEL. No HLW would be generated by the postirradiation examination facilities. Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices. Impacts of the treatment, storage and disposal of radioactive, hazardous, and mixed wastes at INEEL are described in the *DOE Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final EIS* (DOE 1995a).

Table H–51. Potential Waste Management Impacts at INEEL of Conducting Postirradiation Examination at ANL–W

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	3	0[e]	NA
LLW	35	2,624	1
Mixed LLW	<1	181	<1
Hazardous	<1	835	<1
Nonhazardous			
Liquid	380	2,000,000	<1
Solid	51	62,000	<1

[a] See definitions in Appendix F.8.
[b] O'Connor et al. 1998a. Values rounded to two significant figures.
[c] From the INEEL section of Chapter 3.
[d] Includes mixed TRU waste.
[e] In 1997, 2 m^3 (2.6 yd^3) of TRU wastes were generated at ANL–W (DOE 1998b:A-4).
Key: LLW, low-level waste; NA, not applicable; TRU, transuranic.

TRU wastes generated during operations would include used containers, paper and cloth wipes, fuel debris, clad pieces, and radiochemical solutions. Mixed TRU waste would include oil, solvents, and lead shielding contaminated with TRU materials (O'Connor et al. 1998a). TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the postirradiation examination facilities. Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading of the TRUPACT for shipment to WIPP would occur at the planned Waste Characterization Facility at INEEL (UC 1998c). Impacts from the treatment of TRU waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for postirradiation examination is estimated to be 3 m^3/yr (3.9 yd^3/yr), less than 1 percent of the 6,500-m^3/yr (8,500-yd^3/yr) capacity of the planned Advanced Mixed Waste Treatment Project. A total of 11 m^3 (14.4 yd^3) of waste is expected to be generated over the operations period. This would be less than 1 percent of the 177,300-m^3 (231,900-yd^3) storage capacity of the RWMC, and less than 1 percent of the 39,300 m^3 (51,404 yd^3) of contact-handled TRU waste currently in storage at INEEL. Assuming that the waste were stored in 208-l (55-gal) drums, each with a capacity of 0.21 m^3 (0.27 yd^3), approximately 52 drums would be required. Assuming that these drums can be stacked two high, and that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of approximately 16 m^2 (19 yd^2) would be required. Impacts of the storage of these additional quantities of TRU waste on less than 0.1 ha (0.25 acre) of land at INEEL should not be major.

The 11 m^3 (14.4 yd^3) of TRU waste generated by postirradiation examination activities would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW may include wipes, used containers and equipment, clad pieces, and protective clothing (O'Connor et al. 1998a). LLW would be packaged, certified, and accumulated before being transferred for treatment or disposal in existing onsite facilities. A total of 140 m^3 (183 yd^3) of LLW would be generated over the operations period. LLW generation for these activities is estimated to be 1 percent of existing annual INEEL waste generation, less than 1 percent of the 49,610-m^3/yr (64,880-yd^3/yr) capacity of WERF, less than 1 percent of the 112,400-m^3 (146,500-yd^3) storage capacity at the RWMC, and less than 1 percent of the 37,700-m^3/yr (49,300-yd^3/yr) disposal capacity of the RWMC.

Using the 6,264-m^3/ha (3,315-yd^3/acre) disposal land usage factor for the RWMC published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 140 m^3 (183 yd^3) of waste would require less than 0.1 ha (0.25 acre) of disposal space at INEEL. Therefore, impacts of the management of this additional LLW at ANL–W and INEEL are not expected to be major. Impacts of the disposal of LLW at INEEL are described in the *DOE Programmatic Spent Nuclear Fuel Management and INEL Environmental Restoration and Waste Management Programs Final EIS* (DOE 1995a).

Mixed LLW may include small quantities of oils, solvents, and lead shielding contaminated with fission products (O'Connor et al. 1998a). Mixed LLW would be treated and disposed of in a manner consistent with the site treatment plan for ANL–W and INEEL. INEEL currently treats mixed LLW on the site and ships some mixed LLW to Envirocare of Utah. Onsite disposal is planned in a new mixed LLW disposal facility. These facilities or other treatment or disposal facilities that meet DOE criteria would be used. Mixed LLW generation for these activities is estimated to be less than 1 percent of existing annual INEEL waste generation, and less than 1 percent of the planned 6,500-m^3/yr (8,500-yd^3/yr) capacity of the Advanced Mixed Waste Treatment Project. The 1 m^3 (1.3 yd^3) of mixed LLW expected to be generated would be less than 1 percent of the 112,400-m^3 (146,500-yd^3) storage capacity of the RWMC. Therefore, the management of this additional waste would not be expected to have major impacts on the mixed LLW management systems at ANL–W or INEEL.

Hazardous waste generated during operations would include small quantities of used oils, solvents, resins, glues, and contaminated containers (O'Connor et al. 1998a). Hazardous waste would be packaged for treatment and disposal at offsite facilities. Hazardous waste generation for these activities is estimated to be less than 1 percent of existing annual INEEL waste generation, and less than 1 percent of the 1,600-m^3 (2,100-yd^3) onsite storage capacity. Therefore, impacts on the hazardous waste management systems at ANL–W or INEEL should not be major.

Nonhazardous solid waste would include paper, plastic, and metal garbage; oils; cleaners; and scrap wood and metal (O'Connor et al. 1998a). Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to onsite and offsite disposal and recycling facilities. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling. The remaining solid sanitary waste would be sent offsite for disposal in the Bonneville County landfill. Nonrecyclable, nonhazardous solid waste generated by these activities is estimated to be 2 percent of existing annual INEEL waste generation. This additional waste load should not have a major impact on the nonhazardous solid waste management systems at ANL–W or INEEL.

Nonhazardous liquid waste would include sanitary waste from sinks, showers, urinals, and water closets (O'Connor et al. 1998a). Nonhazardous liquid waste generation for these activities is estimated to be less than 1 percent of the existing annual INEEL waste generation, and 6 percent of the 6,057-m^3/yr (7,923-yd^3/yr) capacity of the ANL–W sewage treatment facility, and therefore would not be expected to have major impacts.

H.6.2 ORNL

H.6.2.1 Construction

It is expected that postirradiation examination could be performed at ORNL without the need for facility modifications that would generate waste (O'Connor et al. 1998a). Therefore, there would be no construction waste to impact the waste management infrastructure.

H.6.2.2 Operations

The waste management facilities within the postirradiation examination facilities would process, temporarily store, and ship all wastes generated. Table H–52 compares the expected waste generation rates from postirradiation examination at ORNL with the existing generation rates for ORR. No HLW would be generated by the postirradiation examination facilities. Depending in part on decisions in the RODs for the WM PEIS, wastes could be treated on the site or at other DOE sites or commercial facilities. Per the ROD for TRU waste issued on January 20, 1998, TRU and mixed TRU waste would be certified on the site to current WIPP waste acceptance criteria and shipped to WIPP for disposal. Per the ROD for hazardous waste issued on August 5, 1998, nonwastewater hazardous waste would continue to be treated at the TSCA Incinerator, and treated and disposed of at offsite commercial facilities. The SPD EIS also assumes that LLW, mixed LLW, and nonhazardous waste would be treated, stored, and disposed of in accordance with current site practices.

TRU wastes generated during operations would include used containers, paper and cloth wipes, fuel debris, clad pieces, and radiochemical solutions. Mixed TRU waste would include oil, solvents, and lead shielding contaminated with TRU materials. (O'Connor et al. 1998a). TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria at the postirradiation examination facilities. Liquid TRU wastes would be evaporated or solidified before being packaged for storage. Drum-gas testing, real-time radiography, and loading of the TRUPACT for shipment to WIPP would occur at the Waste Examination and Assay Facility or the planned Waste Handling and Packaging Plant (DOE 1996a;E-72). Impacts from the treatment of TRU

Table H–52. Potential Waste Management Impacts of Conducting Postirradiation Examination at ORNL

Waste Type[a]	Estimated Waste Generation (m^3/yr)[b]	Site Waste Generation (m^3/yr)[c]	Percent of Site Waste Generation
TRU[d]	3	9	30
LLW	35	5,181	1
Mixed LLW	<1	1,122	<1
Hazardous	<1	34,048	<1
Nonhazardous			
Liquid	380	2,406,300	<1
Solid	51	49,470	<1

[a] See definitions in Appendix F.8.
[b] O'Connor et al. 1998a. Values rounded to two significant figures.
[c] Includes ORNL, Y–12 and East Tennessee Technology Park (formerly K–25). Data for radioactive wastes from DOE 1996e:15, 16. Data for hazardous and nonhazardous wastes from DOE 1996a:3-220–3-225).
[d] Includes mixed TRU waste.
Key: LLW, low-level waste; TRU, transuranic.

waste to WIPP waste acceptance criteria are described in the WM PEIS (DOE 1997b) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

TRU waste generation for postirradiation examination is estimated to be 3 m^3/yr (3.9 yd^3/yr), 30 percent of existing ORR waste generation and less than 1 percent of the planned 620-m^3/yr (811-yd^3/yr) capacity of the TRU Waste Treatment Plant (DOE 1996a:E-86). A total of 11 m^3 (14.4 yd^3) of waste is expected to be generated over the operations period. This would be 1 percent of the 1,760 m^3 (2,302 yd^3) of the capacity of contact-handled TRU waste storage space (DOE 1996a:3-219). Assuming that the waste were stored in 208-l (55-gal) drums, each with a capacity of 0.21 m^3 (0.27 yd^3), approximately 52 drums would be required. Assuming that these drums can be stacked two high, and that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of approximately 16 m^2 (19 yd^2) would be required. Impacts of the storage of these additional quantities of TRU waste on less than 0.1 ha (0.25 acre) of land at the ORR should not be major.

The 11 m^3 (14.4 yd^3) of TRU waste generated by postirradiation examination activities would be less than 1 percent of the 143,000 m^3 (187,000 yd^3) of contact-handled TRU waste that DOE plans to dispose of at WIPP and within the 168,500-m^3 (220,400-yd^3) limit for this facility (DOE 1997d:3-3). Impacts of disposal of TRU waste at WIPP are described in the *WIPP Disposal Phase Final Supplemental EIS* (DOE 1997d).

LLW may include wipes, used containers and equipment, clad pieces, and protective clothing (O'Connor et al. 1998a). Wastes would be treated and stored on the site before being transferred for onsite or offsite disposal. LLW generation for these activities is estimated to be 1 percent of existing annual ORR waste generation, and less than 1 percent of the 11,300-m^3/yr (14,780-yd^3/yr) capacity of the Waste Compactor Facility (DOE 1996a:E-86).

LLW generated at ORR is currently disposed of on the site or stored for offsite disposal at DOE's NTS or commercial disposal facilities. If the shipment of LLW for disposal were delayed, a maximum of approximately 140 m^3 (183 yd^3) of LLW may have to be stored at ORR. This would be less than 1 percent of the 51,850 m^3 (67,820 yd^3) of LLW storage capacity at ORR (DOE 1996a:3-222, 3-224). Assuming that the waste were stored in 208-l (55-gal) drums, each with a capacity of 0.21 m^3 (0.27 yd^3), about 670 drums would be required. Assuming that these drums can be stacked two high, and that each drum occupies an area of 0.4 m^2 (4 ft^2), and adding a 50 percent factor for aisle space, a storage area of about 200 m^2 (239 yd^2) would be required. Impacts of the storage of additional quantities of LLW on less than 0.1 ha (0.25 acre) of land at ORR would not be major.

As stated above, a total of 140 m^3 (183 yd^3) of LLW would be generated over the operation period. Using the 6,085-m^3/ha (3,221-yd^3/acre) disposal land usage factor for NTS published in the *Storage and Disposition PEIS* (DOE 1996a:E-9), 140 m^3 (183 yd^3) of waste would require less than 0.1 ha (0.25 acre) of disposal space at NTS or some other similar facility. Impacts at the disposal site from the use of this small area for disposal should not be major. Impacts of disposal of LLW at NTS are described in the *Final EIS for the NTS and Off-Site Locations in the State of Nevada* (DOE 1996c).

Mixed LLW may include small quantities of oils, solvents, and lead shielding contaminated with fission products (O'Connor et al. 1998a). Mixed LLW would be treated and disposed of in a manner consistent with the site treatment plan for ORR. Mixed LLW generation for these activities is estimated to be less than 1 percent of existing annual ORR waste generation, and less than 1 percent of the 15,700-m^3/yr (20,536-yd^3/yr) capacity of the TSCA incinerator (DOE 1996a:E-90). The 1 m^3 (1.3 yd^3) of mixed LLW expected to be generated would be less than 1 percent of the 231,753-m^3 (303,133-yd^3) storage capacity at ORR (DOE 1996a:3-220, 3-222, 3-224). Therefore, the management of this additional waste at ORR would not be expected to have major impacts on the mixed LLW management system.

Hazardous waste generated during operations would include small quantities of used oils, solvents, resins, glues, and contaminated containers (O'Connor et al. 1998a). Hazardous waste would be packaged for treatment and disposal at onsite and offsite facilities. Hazardous waste generation for these activities is estimated to be less than 1 percent of existing annual ORR waste generation, and less than 1 percent of the 1,051-m^3 (1,375-yd^3) onsite storage capacity (DOE 1996a:3-220, 3-222). Assuming that all the hazardous waste were to be treated at the TSCA incinerator, this additional waste would be less than 1 percent of the 15,700-m^3/yr (20,536-yd^3/yr) capacity of the system (DOE 1996a:E-90), and therefore would not be expected to have major impacts on the hazardous waste management system at ORNL or ORR.

Nonhazardous solid waste would include paper, plastic, and metal garbage; oils; cleaners; and scrap wood and metal (O'Connor et al. 1998a). Nonhazardous solid waste would be packaged in conformance with standard industrial practice and shipped to onsite and offsite disposal and recycling facilities. Recyclable solid wastes such as office paper, metal cans, and plastic and glass bottles would be sent off the site for recycling. The remaining solid sanitary waste would be disposed of in the Industrial and Sanitary Landfill located at Y–12. Nonrecyclable, nonhazardous solid waste generated by these activities is estimated to be less than 1 percent of existing annual ORR waste generation, and less than 1 percent of the 1,100,000-m^3 (1,438,800-yd^3) capacity of the Industrial and Sanitary Landfill (DOE 1996a:3-220). It is unlikely that this small additional waste load would have major impacts on the nonhazardous solid waste management system at ORNL or ORR.

Nonhazardous liquid waste would include sanitary waste from sinks, showers, urinals, and water closets (O'Connor et al. 1998a). Nonhazardous liquid waste generation for these activities is estimated to be less than 1 percent of the existing annual ORR waste generation, and less than 1 percent of the 414,000-m^3/yr (541,512-yd^3/yr) capacity of the ORNL Sanitary Wastewater Treatment Facility (DOE 1996a:3-223), and therefore would not be expected to have major impacts.

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Appendix I
Socioeconomics

This appendix presents detailed information on the potential socioeconomic impacts associated with the influx of construction workers during the construction of the proposed surplus plutonium disposition facilities as well as the workers needed to operate the proposed facilities. This information supports the socioeconomic assessments described in Chapter 4. Site-specific input data used in the evaluation of these socioeconomic impacts are provided or referenced where appropriate, including projections for employment, unemployment, population, housing units, student enrollment, teachers employed, police officers, firefighters, hospital beds, and doctors. Tables I–1 through I–40 present data[1] for the four candidate U.S. Department of Energy sites: the Hanford Site (Hanford), Idaho National Engineering and Environmental Laboratory (INEEL), the Pantex Plant (Pantex), and the Savannah River Site (SRS).

I.1 HANFORD

Table I–1. Hanford Projected Site Employment

Year	Employment	Change From Previous (%)	Change From 1997 (%)
1997	12,882	–	–
2000	10,800	-16.16	-16.16
2005	11,000	1.85	-14.61
2010	20,600	87.27	59.91
2015	12,100	-41.26	-6.07
2020	11,900	-1.65	-7.62

Source: Mecca 1997a, 1997b:Teal memo.

Table I–2. Hanford Regional Economic Area Projected Employment and Economy, 1996–2010

Regional Economic Area	1996	2000	2005	2010
Civilian labor force	344,611	369,570	393,230	418,465
Total employment	306,396	328,709	349,790	372,278
Unemployment rate (%)	11.1	11.1	11.0	11.0

Source: DOL 1999; Washington State Office of Financial Management 1995.

Table I–3. Hanford Region of Influence Projected Population, 1996–2010

County	1996	2000	2005	2010
Benton	134,359	149,100	157,549	166,476
Franklin	45,590	50,683	54,562	58,738
ROI total	179,949	199,783	212,111	225,214

Source: DOC 1997; Washington State Office of Financial Management 1995.

[1] Table totals may not add precisely due to rounding.

Table I–4. Hanford Region of Influence Projected Number of Owner and Renter Housing Units, 1990–2010

County	1990	1996	2000	2005	2010
Benton	44,877	52,462	58,217	61,516	65,002
Franklin	13,664	16,016	17,806	19,168	20,635
ROI total	58,541	68,478	76,023	80,684	85,637

Source: DOC 1994; Washington State Office of Financial Management 1995.

Table I–5. Hanford Region of Influence Projected Student Enrollment, 1997–2010

County	1997	Capacity (%)	2000	2005	2010
Benton County	28,142	90.7	30,427	32,151	33,973
Findley	1,130	100.0	1,222	1,291	1,364
Kennewick	13,462	83.0	14,555	15,380	16,251
Kiona-Benton	1,701	100.0	1,839	1,943	2,053
Patterson	73	80.0	79	83	88
Prosser	2,794	98.0	3,021	3,192	3,373
Richland	8,982	99.5	9,711	10,262	10,843
Franklin County	10,064	97.7	10,896	11,730	12,628
Kahlotus	98	85.0	106	114	123
North Franklin	1,905	90.0	2,062	2,220	2,390
Pasco	8,048	100.0	8,713	9,380	10,098
Star School	13	65.0	14	15	16
ROI total	38,206	92.5	41,323	43,881	46,601

Source: Nemeth 1997a; Washington State Office of Financial Management 1995.

Table I–6. Hanford Region of Influence Projected Number of Teachers, 1997–2010

County	1997	Student/Teacher Ratio	2000	2005	2010
Benton County	1,785	15.8	1,930	2,039	2,154
Findley	76	14.9	82	87	92
Kennewick	822	16.4	889	939	992
Kiona-Benton	94	18.1	102	107	113
Patterson	4.5	16.2	5	5	5
Prosser	164	17.0	177	187	198
Richland	624	14.4	675	713	753
Franklin County	598	16.8	647	697	750
Kahlotus	14	7.0	15	16	18
North Franklin	132	14.4	143	154	166
Pasco	450	17.9	487	524	565
Star School	2	6.5	2	2	3
ROI total	2,383	16.0	2,577	2,736	2,905

Source: Nemeth 1997a; Washington State Office of Financial Management 1995.

Table I–7. Hanford Region of Influence Projected Number of Sworn Police Officers, 1997–2010

County	1997	2000	2005	2010
Benton	208	225	238	251
Franklin	73	79	85	92
ROI total	281	304	323	343

Source: Nemeth 1997b; Washington State Office of Financial Management 1995.

Table I–8. Hanford Region of Influence Projected Number of Firefighters, 1997–2010

County	1997	2000	2005	2010
Benton	369	399	422	445
Franklin	247	267	288	310
ROI total	616	666	710	755

Source: Nemeth 1997b; Washington State Office of Financial Management 1995.

Table I–9. Hanford Region of Influence Projected Number of Hospital Beds, 1997–2010

County	1997	2000	2005	2010
Benton	251	271	287	303
Franklin	132	143	154	166
ROI total	383	414	441	469

Source: Nemeth 1997c; Washington State Office of Financial Management 1995.

Table I–10. Hanford Region of Influence Projected Number of Doctors, 1996–2010

County	1996	2000	2005	2010
Benton	208	225	238	251
Franklin	49	53	57	61
ROI total	257	278	295	313

Source: Randolph 1997; Washington State Office of Financial Management 1995.

I.2 INEEL

Table I–11. INEEL Projected Site Employment

Year	Employment	Change From Previous (%)	Change From 1997 (%)
1997	8,291	–	–
2000	7,250	-12.56	-12.56
2005	7,250	0.00	-12.56
2010	7,250	0.00	-12.56
2015	7,250	0.00	-12.56
2020	7,250	0.00	-12.56

Source: Abbott et al. 1997.

Table I–12. INEEL Regional Economic Area Projected Employment and Economy, 1996–2010

Regional Economic Area	1996	2000	2005	2010
Civilian labor force	150,403	161,149	168,979	177,199
Total employment	143,182	153,440	169,884	168,784
Unemployment rate (%)	4.8	4.8	4.8	4.7

Source: DOL 1999; Idaho Power 1996; State of Wyoming, Administration and Information 1996.

Table I–13. INEEL Region of Influence Projected Population, 1996–2010

County	1996	2000	2005	2010
Bannock	73,608	78,600	81,808	85,147
Bingham	41,366	44,426	46,236	48,120
Bonneville	79,670	85,650	89,154	92,802
Jefferson	18,903	20,609	21,646	22,736
ROI total	213,547	229,285	238,844	248,804

Source: DOC 1997; Idaho Power 1996; State of Wyoming, Administration and Information 1996.

Table I–14. INEEL Region of Influence Projected Number of Owner and Renter Housing Units, 1990–2010

County	1990	1996	2000	2005	2010
Bannock	25,694	28,352	30,275	31,510	32,796
Bingham	12,664	14,095	15,138	15,754	16,396
Bonneville	26,049	29,036	31,215	32,493	33,822
Jefferson	5,353	6,094	6,643	6,978	7,329
ROI total	69,760	77,576	83,271	86,735	90,344

Source: DOC 1994; Idaho Power 1996; State of Wyoming, Administration and Information 1996.

Table I–15. INEEL Region of Influence Projected Student Enrollment, 1997–2010

County	1997	Capacity (%)	2000	2005	2010
Bannock County	14,673	86.5	15,413	16,042	16,697
Marsh Valley	1,609	74.0	1,690	1,759	1,831
Pocatello	13,064	88.3	13,723	14,283	14,866
Bingham County	11,248	84.7	11,867	12,350	12,853
Aberdeen	1,019	90.0	1,075	1,119	1,164
Blackfoot	4,510	90.0	4,758	4,952	5,154
Firth	1,044	88.0	1,101	1,146	1,193
Shelley	2,300	100.0	2,426	2,525	2,628
Snake River	2,375	65.0	2,506	2,608	2,714
Bonneville County	18,737	91.8	19,782	20,592	21,434
Bonneville	7,750	95.0	8,182	8,517	8,866
Idaho Falls	10,927	90.0	11,536	12,009	12,500
Swan Valley	60	50.0	63	66	69
Jefferson County	5,510	90.6	5,879	6,175	6,486
Jefferson	4,033	90.0	4,303	4,520	4,747
Ririe	750	97.0	800	840	883
West Jefferson	727	88.0	776	815	856
ROI total	50,168	88.4	52,941	55,158	57,470

Source: Idaho Power 1996; Nemeth 1997a; State of Wyoming, Administration and Information 1996.

Table I–16. INEEL Region of Influence Projected Number of Teachers, 1997–2010

County	1997	Student/Teacher Ratio	2000	2005	2010
Bannock County	822	17.9	863	899	935
Marsh Valley	113	14.2	119	124	129
Pocatello	709	18.4	745	775	807
Bingham County	619	18.2	653	680	707
Aberdeen	61	16.7	64	67	70
Blackfoot	240	18.8	253	264	274
Firth	65	16.1	69	71	74
Shelley	121	19.0	128	133	138
Snake River	132	18.0	139	145	151
Bonneville County	930	20.1	982	1,022	1,064
Bonneville	425	18.2	449	467	486
Idaho Falls	500	21.9	528	549	572
Swan Valley	5	12.0	5	5	6
Jefferson County	299	18.4	319	335	352
Jefferson	212	19.0	226	238	250
Ririe	41	18.3	44	46	48
West Jefferson	46	15.8	49	52	54
ROI total	2,670	18.8	2,817	2,936	3,059

Source: Idaho Power 1996; Nemeth 1997a; State of Wyoming, Administration and Information 1996.

Table I–17. INEEL Region of Influence Projected Number of Sworn Police Officers, 1997–2010

County	1997	2000	2005	2010
Bannock	214	225	234	244
Bingham	53	56	58	61
Bonneville	181	191	199	207
Jefferson	27	29	30	32
ROI total	475	501	521	544

Source: Idaho Power 1996; Nemeth 1997b; State of Wyoming, Administration and Information 1996.

Table I–18. INEEL Region of Influence Projected Number of Firefighters, 1997–2010

County	1997	2000	2005	2010
Bannock	179	188	196	204
Bingham	144	152	158	165
Bonneville	149	157	164	170
Jefferson	88	94	99	104
ROI total	560	591	616	643

Source: Idaho Power 1996; Nemeth 1997b; State of Wyoming, Administration and Information 1996.

Table I–19. INEEL Region of Influence Projected Number of Hospital Beds, 1997–2010

County	1997	2000	2005	2010
Bannock	413	434	451	470
Bingham	254	268	279	290
Bonneville	312	329	343	357
Jefferson	–	–	–	–
ROI total	978	1,031	1,073	1,117

Source: Idaho Power 1996; Nemeth 1997c; State of Wyoming, Administration and Information 1996.

Table I–20. INEEL Region of Influence Projected Number of Doctors, 1996–2010

County	1996	2000	2005	2010
Bannock	139	146	152	158
Bingham	22	23	24	25
Bonneville	163	172	179	186
Jefferson	5	5	6	6
ROI total	329	347	361	375

Source: Idaho Power 1996; Randolph 1997; State of Wyoming, Administration and Information 1996.

I.3 PANTEX

Table I–21. Pantex Projected Site Employment

Year	Employment	Change From Previous (%)	Change From 1997 (%)
1997	2,944	–	–
2000	2,500	-15.08	-15.08
2005	1,750	-30.00	-40.56
2010	1,750	0.00	-40.56
2015	1,750	0.00	-40.56
2020	1,750	0.00	-40.56

Source: Mason & Hanger Corporation 1997.

Table I–22. Pantex Regional Economic Area Projected Employment and Economy, 1996–2010

Regional Economic Area	1996	2000	2005	2010
Civilian labor force	234,702	243,043	253,140	263,768
Total employment	223,237	231,799	241,453	251,614
Unemployment rate (%)	4.6	4.6	4.6	4.6

Source: DOC 1997; DOL 1999; Texas State Data Center 1996; University of New Mexico 1997.

Table I–23. Pantex Region of Influence Projected Population, 1996–2010

County	1996	2000	2005	2010
Carson	6,714	6,758	6,843	6,929
Potter	108,636	113,692	119,023	124,603
Randall	97,379	102,841	108,810	115,126
ROI total	212,729	223,291	234,676	246,658

Source: DOC 1997; Texas State Data Center 1996; University of New Mexico 1997.

Table I–24. Pantex Region of Influence Projected Number of Owner and Renter Housing Units, 1990–2010

County	1990	1996	2000	2005	2010
Carson	2,856	2,884	2,903	2,939	2,976
Potter	42,927	45,959	48,098	50,353	52,173
Randall	37,807	41,032	43,333	45,849	48,510
ROI total	83,590	89,875	94,334	99,141	104,200

Source: DOC 1994, 1997; Texas State Data Center 1996; University of New Mexico 1997.

Table I–25. Pantex Region of Influence Projected Student Enrollment, 1997–2010

County	1997	Capacity (%)	2000	2005	2010
Carson County	860	76.4	864	875	886
Groom	195	55.7	196	198	201
Panhandle	125	85.0	126	127	129
White Deer	540	86.0	543	549	556
Potter County	31,707	98.8	32,807	34,346	35,956
Amarillo	29,023	100.0	30,030	31,458	32,912
Bushland	447	85.1	463	484	507
Highland Park	787	85.0	814	852	892
River Road	1,450	90.0	1,500	1,571	1,644
Randall County	7,249	100.0	7,552	7,990	8,454
Canyon	7,249	100.0	7,552	7,990	8,454
ROI total	39,816	98.4	41,224	43,211	45,296

Source: DOC 1997; Nemeth 1997a; Texas State Data Center 1996; University of New Mexico 1997.

Table I–26. Pantex Region of Influence Projected Number of Teachers, 1997–2010

County	1997	Student/Teacher Ratio	2000	2005	2010
Carson County	106	8.2	108	111	115
Groom	20	10.0	20	20	20
Panhandle	59	2.1	61	64	67
White Deer	27	20.0	27	27	28
Potter County	2,122	14.9	2,196	2,299	2,406
Amarillo	1,913	15.2	1,979	2,072	2,169
Bushland	35	12.8	36	38	40
Highland Park	54	14.6	56	58	61
River Road	120	12.1	124	130	136
Randall County	436	16.6	454	481	508
Canyon	436	16.6	454	481	508
ROI total	2,664	14.9	2,758	2,890	3,030

Source: DOC 1997; Nemeth 1997a; Texas State Data Center 1996; University of New Mexico 1997.

Table I–27. Pantex Region of Influence Projected Number of Sworn Police Officers, 1997–2010

County	1997	2000	2005	2010
Carson	16	16	16	16
Potter	445	460	482	505
Randall	81	84	89	94
ROI total	542	560	587	615

Source: DOC 1997; Nemeth 1997b; Texas State Data Center 1996; University of New Mexico 1997.

Table I–28. Pantex Region of Influence Projected Number of Firefighters, 1997–2010

County	1997	2000	2005	2010
Carson	88	88	90	91
Potter	288	298	312	327
Randall	111	116	122	129
ROI total	487	502	524	547

Source: DOC 1997; Nemeth 1997b; Texas State Data Center 1996; University of New Mexico 1997.

Table I–29. Pantex Region of Influence Projected Number of Hospital Beds, 1997–2010

County	1997	2000	2005	2010
Carson	–	–	–	–
Potter	1,208	1,250	1,309	1,370
Randall	52	54	57	61
ROI total	1,260	1,304	1,366	1,431

Source: DOC 1997; Nemeth 1997c; Texas State Data Center 1996; University of New Mexico 1997.

Table I–30. Pantex Region of Influence Projected Number of Doctors, 1996–2010

County	1996	2000	2005	2010
Carson	–	–	–	–
Potter	515	533	558	584
Randall	16	17	18	19
ROI total	531	550	576	603

Source: DOC 1997; Randolph 1997; Texas State Data Center 1996; University of New Mexico 1997.

I.4 SRS

Table I–31. SRS Projected Employment

Year	Employment	Change From Previous (%)	Change From 1997 (%)
1997	15,032	–	–
2000	14,000	-6.87	-6.87
2005	12,000	-14.29	-20.17
2010	10,000	-16.67	-33.48
2015	10,000	0.00	-33.48
2020	10,000	0.00	-33.48

Source: Knox 1997.

Table I–32. SRS Regional Economic Area Projected Employment and Economy, 1996–2010

Regional Economic Area	1996	2000	2005	2010
Civilian labor force	257,101	272,378	287,049	302,663
Total employment	237,611	251,830	265,486	280,022
Unemployment rate (%)	7.6	7.5	7.5	7.5

Source: DOC 1997; DOL 1999; Georgia Institute of Technology 1997; South Carolina Budget & Control Board 1997.

Table I–33. SRS Region of Influence Projected Population, 1996–2010

County	1996	2000	2005	2010
Aiken	133,130	143,167	154,965	167,735
Barnwell	21,640	22,512	23,107	23,718
Columbia	86,173	97,936	104,636	111,795
Edgefield	19,051	19,786	20,318	20,864
Richmond	193,784	202,466	213,133	224,363
ROI total	453,778	485,867	516,159	548,475

Source: DOC 1997; Georgia Institute of Technology 1997; South Carolina Budget & Control Board 1997.

Table I–34. SRS Region of Influence Projected Number of Owner and Renter Housing Units, 1990–2010

County	1990	1996	2000	2005	2010
Aiken	49,266	54,941	59,083	63,952	69,222
Barnwell	7,854	8,334	8,669	8,899	9,134
Columbia	23,745	28,769	32,697	34,933	37,323
Edgefield	7,290	7,716	8,014	8,229	8,450
Richmond	77,288	82,540	86,238	90,781	95,564
ROI total	165,433	182,300	194,701	206,795	219,694

Source: DOC 1994, 1997; Georgia Institute of Technology 1997; South Carolina Budget & Control Board 1997.

Table I–35. SRS Region of Influence Projected Student Enrollment, 1997–2010

County	1997	Capacity (%)	2000	2005	2010
Aiken County	24,830	100.0	26,221	28,382	30,721
Barnwell County	5,055	92.6	5,207	5,345	5,486
District 45	2,770	99.0	2,854	2,929	3,007
District 19	1,230	85.0	1,267	1,300	1,335
District 29	1,055	87.0	1,087	1,115	1,145
Columbia County	18,178	100.0	20,009	21,378	22,840
Edgefield County	4,100	95.0	4,218	4,331	4,448
Richmond County	36,841	125.0	38,072	40,078	42,190
ROI total	89,004	108.2	93,728	99,514	105,685

Source: DOC 1997; Georgia Institute of Technology 1997; Nemeth 1997a; South Carolina Budget & Control Board 1997.

Table I–36. SRS Region of Influence Projected Number of Teachers, 1997–2010

County	1997	Student/Teacher Ratio	2000	2005	2010
Aiken County	1,343	18.5	1,418	1,535	1,662
Barnwell County	304	16.6	313	321	330
District 45	115	24.1	118	122	125
District 19	82	15.0	84	87	89
District 29	107	9.9	110	113	116
Columbia County	1,085	16.8	1,194	1,276	1,363
Edgefield County	312	13.1	321	330	338
Richmond County	2,159	17.1	2,231	2,349	2,472
ROI total	5,203	17.1	5,478	5,811	6,166

Source: DOC 1997; Georgia Institute of Technology 1997; Nemeth 1997a; South Carolina Budget & Control Board 1997.

Table I–37. SRS Region of Influence Projected Number of Sworn Police Officers, 1997–2010

County	1997	2000	2005	2010
Aiken	243	257	278	301
Barnwell	45	46	48	49
Columbia	170	187	200	214
Edgefield	43	44	45	47
Richmond	472	488	513	541
ROI total	973	1,022	1,084	1,150

Source: DOC 1997; Georgia Institute of Technology 1997; Nemeth 1997b; South Carolina Budget & Control Board 1997.

Table I–38. SRS Region of Influence Projected Number of Firefighters, 1997–2010

County	1997	2000	2005	2010
Aiken	875	924	1,000	1,083
Barnwell	130	134	137	141
Columbia	245	270	288	308
Edgefield	150	154	158	163
Richmond	312	322	339	357
ROI total	1,712	1,804	1,924	2,052

Source: DOC 1997; Georgia Institute of Technology 1997; Nemeth 1997b; South Carolina Budget & Control Board 1997.

Table I–39. SRS Region of Influence Projected Number of Hospital Beds, 1997–2010

County	1997	2000	2005	2010
Aiken	225	238	257	278
Barnwell	53	55	56	58
Columbia	–	–	–	–
Edgefield	40	41	42	43
Richmond	3,190	3,297	3,470	3,653
ROI total	3,508	3,630	3,826	4,032

Source: DOC 1997; Georgia Institute of Technology 1997; Nemeth 1997c; South Carolina Budget & Control Board 1997.

Table I–40. SRS Region of Influence Projected Number of Doctors, 1996–2010

County	1996	2000	2005	2010
Aiken	179	189	205	221
Barnwell	11	11	12	12
Columbia	297	327	349	373
Edgefield	13	13	14	14
Richmond	1,222	1,263	1,329	1,399
ROI total	1,722	1,803	1,909	2,020

Source: DOC 1997; Georgia Institute of Technology 1997; Randolph 1997; South Carolina Budget & Control Board 1997.

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