alkaline solutions, dilute coolant with oil residue, and wastes containing low concentrations of metals including copper, beryllium, chromium, nickel, and/or zinc. The majority of these wastes contain radioactive constituents and are consequently treated as mixed wastes. The area is also used to store solid waste generated by the wastewater filtration unit as well as empty tanks. The total storage capacity for the area is 22,050 gallons or approximately 400 55-gallon drums.

B.2 PURPOSE AND NEED

The NNSA needs to enhance the efficiency and safety of its current waste operations. NNSA proposes to meet its need by preparing a series of permit modifications, phasing out older facilities, and increasing operations to the design capabilities of the DWTF. The DWTF would continue to consolidate current waste operations, provide a facility to conduct hazardous operations, provide for the treatment and processing of stored wastes, improve waste minimization, and fully implement facility capabilities for waste treatment, storage, and processing. This centralized facility would concentrate like activities in one area, thus providing safer and more efficient working conditions. Other facilities (Area 612 Complex and Site 300 RHWM Facilities) would continue to treat, store, and process waste in support of LLNL programs and missions.

The proposed modifications are evaluated in this LLNL SW/SPEIS because of the integral nature of the radioactive and hazardous waste management operations to the overall LLNL mission. This appendix serves as the NEPA documentation for these modifications. One purpose of this appendix is to provide the NNSA decisionmaker, the DTSC, and the public with permit modification-specific information in one report, even though the impact analysis also appears under the individual environmental resources and issue areas of this LLNL SW/SPEIS.

B.3 DESCRIPTIONS OF THE NO ACTION ALTERNATIVE, PROPOSED ACTION, AND REDUCED OPERATION ALTERNATIVE FOR WASTE MANAGEMENT

CEQ regulations (40 CFR Parts 1500-1508) require that DOE and other Federal agencies use the review process established by NEPA, as amended (42 U.S.C. §4321 et seq.), and the DOE regulations implementing NEPA (10 CFR Part 1021) to evaluate not only the Proposed Action, but also to identify and review reasonable alternatives to the Proposed Action, as well as a No Action Alternative. This comprehensive review ensures that environmental information is available to public officials and citizens before decisions are made and before actions are taken.

NNSA developed the No Action Alternative, Proposed Action, and Reduced Operation Alternative to accomplish this action and to assess environmental impacts of waste management activities at LLNL. This appendix examines and compares the No Action Alternative, Proposed Action, and Reduced Operation Alternative. LLNL activity descriptions, by facility, are also provided. All of the activities discussed in this appendix were used in evaluating the impacts of each alternative presented in Chapter 3 of the LLNL SW/SPEIS. The alternatives are defined in the following sections:

- No Action Alternative (Section B.3.1)
- Proposed Action (Section B.3.2)
- Reduced Operation Alternative (Section B.3.3)

These three alternatives represent the range of levels of operation necessary to carry out the NNSA missions, from the reduced levels of activity that maintain core capabilities (Reduced Operation Alternative) to the highest reasonable activity levels that could be supported by current facilities, closing facilities no longer needed (including Area 514) and the potential expansion and construction of new capabilities for specifically identified future actions (Proposed Action).

Under the No Action Alternative, ongoing NNSA programs and activities at LLNL would continue operating at planned levels as reflected in current NNSA management plans. In some cases, these planned levels would include increases over today's operating levels. The No Action Alternative would include any recent activities that have already been approved by the NNSA (including submitted permit modifications) and that have existing NEPA documentation.

Under the Proposed Action, NNSA programs and activities at LLNL would increase to the highest reasonable activity levels, as set forth in this LLNL SW/SPEIS, that could be supported by current facilities and by their potential expansion and modification for future actions specifically identified in the LLNL SW/SPEIS. The Proposed Action would continue to operate and enhance LLNL waste management facilities. The Proposed Action also provides new facilities that would generate wastes.

Under the Reduced Operation Alternative, NNSA would conduct operations at the minimum levels of activity required to maintain core capabilities. This includes a scale down of the Stockpile Stewardship Program by approximately 30 percent below the level analyzed under the No Action Alternative.

This appendix analyzes the environmental impacts of LLNL waste management activities associated with the No Action Alternative, Proposed Action, and Reduced Operation Alternative.

Table B.3–1 provides a brief summary of the waste management activity levels (DWTF and Area 612) evaluated in this appendix. Table B.3–2 provides a comparison of parameters used in analyzing the alternatives. Table B.3–3 provides planned permit and other activities by alternative. Table B.3–4 provides a brief summary of the waste management activity levels for Site 300 facilities evaluated in the appendix.

TABLE B.3–1.—*Activity Levels Used to Analyze Decontamination and Waste Treatment Facility and Area 612 Facilities Under the No Action, Proposed Action, and Reduced Operation Alternatives (Routine plus Nonroutine)*

Facility	Waste Type	FY2002	No Action	Proposed Action	Reduced Operation
DWTF and Area 612 Combined	TRU	39.2 m^3/yr	105 m^3/yr	110 m^3/yr	100 m^3/yr
	Mixed TRU	2.6 m^3/yr	1.7 m^3/yr	2.8 m^3/yr	0.7 m^3/yr
	LLW	650 m^3/yr	830 m^3/yr	1,040 m^3/yr	730 m^3/yr
	MLLW	111 m^3/yr	133 m^3/yr	169 m^3/yr	105 m^3/yr
	Total Hazardous	1,320 metric tons/yr	1,890 metric tons/yr	2,210 metric tons/yr	1,600 metric tons/yr

Source: TtNUS 2003.
DWTF = Decontamination and Waste Treatment Facility; LLW = low-level waste; m^3/yr = cubic meters per year; MLLW = mixed low-level waste; TRU = transuranic.

TABLE B.3–2.—*Comparison of Parameters Used to Analyze LLNL Waste Management Facilities Under the No Action, Proposed Action, and Reduced Operation Alternatives*

	Units	FY2002 Total LLNL	No Action	Proposed Action	Reduced Operation
			RHWM Facilities		
Land Use					
Total acreage	Acre	Livermore–821 Site 300–6,900	No changes	No changes	No changes
Class 3 permit modification	Acre	NA	Not part of this alternative	No changes Within existing footprints	Same as No Action
Waste storage facility modifications (Current Plans)	Acre	NA	No changes Within existing footprint	Same as No Action	Same as No Action
Class 1 Permit Modifications (Future Plans)	Acre	NA	No changes	No changes	No changes
Class 2 Permit Modifications (Future Plans)	Acre	NA	4 RCRA closures[d] (Buildings 233 CSU, 280, 513, and 514) less than 6 acres	Same as No Action[d]	Same as No Action[d]
Utilities and Energy					
Utilities (Annual Basis)					
5ESS Telecomm. Switch	Voice lines	18,973	520	556	479
Telecomm. Dist. System:					
Copper Trunk Cables (B256 to 13 nodes)	Pairs	20,330	556	596	514
Fiber Trunk Cables	Number	1,468	40	43	37

TABLE B.3–2.—*Comparison of Parameters Used to Analyze LLNL Waste Management Facilities Under the No Action, Proposed Action, and Reduced Operation Alternatives (continued)*

	Units	FY2002 Total LLNL	No Action	Proposed Action	Reduced Operation
			RHWM Facilities		
Utilities and Energy (cont.)					
Copper Distribution (Nodes to buildings)	Number	96,950	2,660	2,840	2,450
Network Speed to Desktop	Mbps	10	10	10	10
Electricity	MW	57	1.5	1.7	1.4
Natural Gas	therms/day	12,900	571	611	528
Domestic Water	GPD	210M	0.04M	0.04M	0.04M
Low Conductivity Cooling Water	MW	36.5	1	1	1
Demineralized Water	GPD	27,700	NA	NA	NA
Sanitary Sewer	GPD	216,400	8,000	9,000	7,800
Compressed Air	SCFM	2,400	74	79	68
Level of Activity	RHWM/ Workers	10,600	160/10,900	170/11,400	140/10,000
Geology and Soils					
Solid Waste Management Units	Number	800	Same as FY2002	Same as FY2002	Same as FY2002
RCRA Closures	Number	NA	4	Same as No Action	4 closures
Water Resources and Hydrology					
Domestic Water	GPD	1.4M	0.04M	0.04M	0.04M
Groundwater Quality	NA	Some MCL exceedance	No degradation	No cegradation	No degradation
Surface Water (stormwater)[a]	NA	NA	No changes	No changes	No changes
Biological and Ecological Resources					
Loss of Habitat	Acre	NA	No changes	No changes	No changes
Cultural Resources					
Cultural Resources Located in all Areas of Potential Effect	Acre	NA	No changes	No changes	No changes
Air Quality					
Permitted Emission Sources	Number	155	8	8	8
Nonradioactive Emissions Rates					
Precursor organic compounds	kg/day	19	0.3	0.3	0.3
Nitrogen oxides	kg/day	53	1.6	1.6	1.6

TABLE B.3–2.—*Comparison of Parameters Used to Analyze LLNL Waste Management Facilities Under the No Action, Proposed Action, and Reduced Operation Alternatives (continued)*

	Units	FY2002 Total LLNL	No Action	Proposed Action	Reduced Operation
			RHWM Facilities		
Air Quality (cont.)					
Carbon monoxide	kg/day	15	0.5	0.5	0.5
Particulates	kg/day	6	0.2	0.2	0.2
Sulfur oxides	kg/day	1	small	small	small
Radioactive Emissions (Dose)		<1 mrem	<1 mrem	<1 mrem	<1 mrem
Construction Related Carbon Monoxide Emissions					
New Construction	tons/yr	NA	0	0	0
Transportation (Normal Operations)					
Waste (Includes Hazardous and Radioactive, annual shipments)	Shipment/yr	88	240	310	200
Sanitary Waste (annual shipments)	Shipment/yr	359-518	370-534	395-570	341-492
TRU legacy waste shipment	Total shipments	0	24	24	24
LLW legacy waste shipment	Total shipments	1	64	64	64
MLLW legacy waste shipment	Total shipments	1	80	80	80
LBNL mixed TRU shipment	One time shipment	0	0	1	0
Mixed TSCA waste shipment	Total shipments	1	13	13	13
Workforce commuter Vehicles	Vehicles/day (Trips/day)	7,500-8,500 (15,000 - 17,000)	267 (534) 160 (320)	286 (572) 170 (340)	247 (494) 140 (280)
Waste Generation (Total, routine plus nonroutine)					
Radioactive Waste					
LLW	m^3/yr	650	830	1,040	730
MLLW	m^3/yr	110	130	170	110
TRU	m^3/yr	39	105	110	100
Mixed TRU Waste	m^3/yr	2.6	1.7	2.8	0.7
Chemical Waste					
RCRA Hazardous Waste	Metric Tons/yr	In total	730	860	610
TSCA (PCBs and Asbestos)	Metric Tons/yr	In total	430	490	360

TABLE B.3–2.—*Comparison of Parameters Used to Analyze LLNL Waste Management Facilities Under the No Action, Proposed Action, and Reduced Operation Alternatives (continued)*

	Units	FY2002 Total LLNL	No Action	Proposed Action	Reduced Operation
			RHWM Facilities		
Waste Generation (cont.)					
Biohazardous	Metric Tons/yr	1.0	1.0	1.0	1.0
State-regulated Waste	Metric Tons/yr	In total	740	850	630
Total Hazardous	Metric Tons/yr	1,300	1,900	2,200	1,600
Sanitary Solid Waste	Metric Tons/yr	4,700	4,800	5,100	4,400
Class 1 Permit Modifications	Total Requests		75	100	50
Class 2 Permit Modifications	Total Requests		10	20	0
Class 3 Permit Modifications	Total Number	0	0	2	0
Number of RCRA Permits	Total Number	3	3	3	3
Permit Renewal	Total Number	0	1	1	1
RCRA Waste Management Facility Closures	Total Number	0	4	4	4
Noise					
LLNL Estimated Noise		CNEL L_d 7 am to 7 pm	CNEL L_d 7 am to 7 pm	CNEL L_d 7 am to 7 pm	CNEL L_d 7 am to 7 pm
Socioeconomics					
LLNL Workforce	Workforce	10,600	10,900	11,400	10,000
LLNL RHWM Workforce	Workforce	150	160	170	140
LLNL Operating Budget	Dollar/yr	1.5 billion[b]	1.5 billion[b]	1.7 billion[b]	1.4 billion[b]

Source: TtNUS 2003, LLNL 2002dm.

[a] Stormwater is collected, sampled, and dispositioned (may include treatment, discharge to sewer, or offsite disposal) at all RHWM facilities.

[b] Estimate based on 2002 dollars.

CNEL L_d = community noise equivalent-level-day; CSU = container storage unit; ER = environmental restoration; FY = fiscal year; GPD = gallons per day; kg/day = kilograms per day; LBNL = Lawrence Berkeley National Laboratory; LLW = low-level waste; M = million; m^3/yr = cubic meters per year; Mbps = million bits per second; MCL = maximum contaminant level; MLLW = mixed low-level waste; mrem = millirem; MW = megawatts; NA = not available; PCBs = polychlorinated biphenyls; RCRA = *Resource Conservation and Recovery Act;* RHWM = radioactive and hazardous waste management; SCFM = standard cubic feet per minute; TRU = transuranic; TPD = tons per day; TSCA = *Toxic Substances Control Act;* WM = waste management.

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TABLE B.3–3.—*Summary of Permit Actions and Other Waste Management Actions by Alternative*

Action	Description	No Action	Proposed Action	Reduced Operation
RCRA Closure Area 514 Treatment Units	Area 514 Storage and Treatment Quadruple Tank Unit	X	X	X
	Area 514 Waste Water Filtration Unit	X	X	X
	Area 514 Waste Water Treatment Tank Farm Unit	X	X	X
	Area 514 Bulking/Blending Unit	X	X	X
RCRA Closure Area 514 Storage Units	Building 513 CSU, Area 514-1 CSU, Area 514-2 CSU, and Area 514-3 CSU would undergo RCRA closure	X	X	X
RCRA Closures	Building 233 CSU and 280	X	X	X
Class 1 (DTSC several dates) modification	Implementation of 77 approved permit modifications	X	X	X
Class 2 (approved 12/23/2002) modification	Implementation of 3 approved permits modifications	X	X	X
Class 2 (submitted to DTSC in March 2003)	Replace drum rinsing station with a new, open-trough bulking station	X	X	X
	Remove room pre-filters from shredder/chopper ventilation systems	X	X	X
	Replace dry fire suppression system in the Reactive Waste Processing Area	X	X	X
Class 2 (submit to DTSC after 2003)	Permit Building 696 for Hazardous and Mixed Waste		X	
	Begin Storage of Hazardous and Mixed wastes in Building 696		X	
Building 695/696 Actions	Building 696 lab packing and waste verification would begin	X	X	X
	Relocation of rad-only Drum crusher to Building 696 from Building 612	X	X	X
	Relocation of Size Reduction Booth to Building 696 from Building 612		X	
	Install second evaporator for radioactive waste in Building 695	X	X	X
	Relocate Building 695 solification equipment and Building 513 encapsulation HEPA filter to Building 695 debris treatment room	X	X	X
	Add a glove-box into the small-scale treatment area, Building 695	X	X	X
	Relocate WAA into Building 696	X	X	X
Permit Renewal	Submit Permit Renewal	X	X	X
TRU Waste	Begin TRU Waste shipments to WIPP	X	X	X
	Receive a one-time Lawrence Berkeley National Laboratory TRU and mixed TRU waste shipment for storage and eventual shipment to WIPP	X	X	X
	Begin TRU Waste Legacy certification campaign	X	X	X
TSCA Waste	Begin TSCA-mixed waste treatment campaign with Oak Ridge, Tennessee, incinerator. Would include return of ash (residues) for storage prior to final disposal	X	X	X

Source: Original.
DTSC = California Department of Toxic Substances Control; RCRA = *Resource Conservation and Recovery Act;* TRU = transuranic; TSCA = *Toxic Substance Control Act*; WAA = Waste Accumulation Area; WIPP = Waste Isolation Pilot Plant.

TABLE B.3–4.—*Comparison of Activity Levels at Three Site 300 Facilities Under the No Action Alternative, Proposed Action, and Reduced Operation Alternative*

Facility	Primary Function	Activity Type or Material	Level of Activity	No Action	Proposed Action	Reduced Operation
EWTF	Waste management	Explosive waste, treatment and 1-year storage of treatment residues	LLW (kg/yr)	0	0	0
			MLLW (kg/yr)	0	0	0
			Total hazardous waste (lb/yr)	3,300	3,300	2,800
Building 883	Waste management	Collection, packaging, handling, and short-term storage of hazardous, radioactive, and mixed wastes	LLW (kg/yr)	0	0	0
			MLLW (kg/yr)	0	0	0
			Total hazardous waste (kg/yr)	12,000	13,000	11,000
EWSF	Waste management	Storage of explosive wastes	LLW (kg/yr)	0	0	0
			MLLW (kg/yr)	0	0	0
			Total hazardous waste (lb/yr)	6,500 (Gross)	7,200 (Gross)	6,200 (Gross)

Source: TtNUS 2003.
EWTF = Explosive Waste Treatment Facility; EWSF = Explosive Waste Storage Facility; kg/yr = kilograms per year, LLW = low-level waste; lb/yr = pounds per year; MLLW = mixed low-level waste.

In order to provide comprehensive existing conditions descriptions (in most cases the base period for data was 1992 through 2002) from which operational levels could be projected, the NNSA gathered the best available data. The following documents have been extensively used in this appendix and are not cited repeatedly:

- *Final Environmental Impact Statement and Environmental Impact Report for Continued Operation of Lawrence Livermore National and Sandia National Laboratories* (1992 LLNL EIS/EIR) (LLNL 1992a)
- 1992 through 2001 routine and nonroutine waste generation data (LLNL 2001aq)
- 2001 and 2002 routine and nonroutine waste generation data in cubic meters and metric tons (LLNL 2002cc, LLNL 2002p)
- Waste minimization and pollution prevention data (LLNL 2002cc)
- Part B Permit application, including previous application data as referenced (LLNL 2002cd)
- Recently submitted Class 1 and Class 2 Permit modifications (Sandhu 1999, Sandhu 2001, LLNL 2003aj, LLNL 2002z, LLNL 2003b)
- Health risk assessments (LLNL 2001ar, LLNL 2000aa, LLNL 2003r)
- Site-Wide Environmental Impact Statement and Supporting Environmental Documentation Comparison of Parameters to be Used to Analyze LLNL Waste Management Facilities Under the No Action, Proposed Action, and Reduced Operation Alternatives (TtNUS 2003)

NNSA is not revisiting any programmatic decisions previously made in other NEPA documents, such as those addressing weapons complex, materials disposition, TRU waste shipments, or waste management and LLNL permit modification submittals. The LLNL SW/SPEIS includes these programmatic activities and permitting activities in order to provide the NNSA, California DTSC, and public with an overall understanding of the waste management activities at LLNL.

B.3.1 No Action Alternative

Under the No Action Alternative, ongoing NNSA and interagency programs and activities at LLNL would continue operating at planned levels as reflected in current DOE/NNSA management plans for 2004 through 2014 (e.g., recent Class 1 and Class 2 Permit modification submittals). The No Action Alternative includes the continuing and historical onsite waste management operations, continuing environmental protection and environmental restoration, continuing pollution prevention and waste minimization programs, and transportation of waste to offsite approved waste management facilities (includes a wide variety of DOE and commercial facilities). The DWTF use would increase by implementing planned permit modifications (see Table B.3.1–1). In some cases, projected waste generation levels would include increases over today's waste generation levels (e.g., National Ignition Facility [NIF] contributions). This would also include any recent activities that have already been approved by NNSA and have existing NEPA documentation. If these planned operations are implemented in the future, they could result in increased activity above present levels. Thus, the No Action Alternative forecasts, over

10 years, the level of activity for LLNL RHWM operations that would implement current management plans (e.g., RCRA closure of Building 514) for assigned programs.

TABLE B.3.1–1.—*Examples of Possible Permit Modifications Under the No Action Alternative*

Class 1	Class 2
Administrative and informational changes	Changes in frequency or content of inspection schedules
Correction of typographical errors	Changes to corrective action program
Equipment replacement or upgrading with functionally equivalent components	Changes to detection monitoring program
Changes in names, addresses, and phone numbers of emergency coordinators	Extensions of post-closure care period
Changes to waste sampling and analysis methods to comply with new regulations	Changes to facility training plan that affect the type or amount of employee training
Changes to analytical quality assurance and quality control plan to comply with new regulations	Changes in number, location, depth, or design of groundwater monitoring wells

Source: 40 CFR §270.42, EPA n.d.
Note: Permit modifications are classified in more detail in 40 CFR §270.42, Appendix I.

The CEQ's NEPA implementing regulations (40 CFR Parts 1500-1508) require analyzing the No Action Alternative to provide a benchmark against which the impacts of the activities presented in the other alternatives can be compared.

Other plans used to prepare the description of the No Action Alternative include the site development plans for LLNL, Programmatic Environmental Impact Statements (PEISs), Part B Permit modifications, and guidance. The activities reflected in this alternative include planned increases in some LLNL operations and activities over previous years' levels.

Over the next 10 years the following actions are planned for the No Action Alternative:

- Increase use of DWTF
- Transfer several Area 514 operations to Building 695 (Table B.3–3)
- Close Area 514 storage and treatment operations (Table B.3–3)
- Continue Class 1 (DTSC-approved, various dates) modifications (Table B.3.1–1)
- Fully implement approved Class 2 (DTSC-approved, December 2002) modifications (Table B.3.1–1)
- Fully implement March 2003 permit modification
- Add (radioactive waste-only) 600-ton per year Drum/Container Crusher to Building 696
- Begin lab packing and waste verification in Building 696
- Install second evaporator for radioactive waste in Building 695

- Relocate Building 695 modification equipment to Building 696
- Relocate Building 513 HEPA filter encapsulation to Building 695 debris treatment room
- Add a glovebox into Building 695
- Submit approximately 75 Class 1 permit modifications over the next 10 years (Table B.3.1–1)
- Submit approximately 5 to 10 Class 2 permit modifications over the next 10 years (Table B.3.1–1)
- Submit one permit renewal
- Begin TRU and mixed TRU waste shipments to WIPP
- Receive a one-time shipment of Lawrence Berkeley National Laboratory TRU and mixed TRU waste at LLNL for interim storage and eventual shipment to WIPP
- Begin TSCA-mixed waste treatment campaign with Oak Ridge, Tennessee, incinerator, including return of ash (residues) for storage prior to final disposal
- Begin closure of Buildings 233 CSU and 280
- Annually manage (routine) waste quantities presented in Table B.3.1–2

TABLE B.3.1–2.—*Routine and Nonroutine Operations Annual Waste Generation Quantities Under the No Action Alternative*

Waste Type	Annual Quantities	
	Routine	Nonroutine
LLW	200 m^3/yr	630 m^3/yr
MLLW	61 m^3/yr	72 m^3/yr
Total hazardous	390 metric tons/yr	1,500 metric tons/yr
TRU	50 m^3/yr	55 m^3/yr
Mixed TRU	1.7 m^3/yr	0
Sanitary solid	4,800 metric tons/yr	Included in Routine
Wastewater	310,000 gal/day	Included in Routine

Source: TtNUS 2003.

gal/day = gallons per day; LLW = low-level waste; m^3/yr = cubic meters per year; MLLW = mixed low-level waste; TRU = transuranic.

The following sections describe the activities that would occur at specific facilities because of implementing assignments under the No Action Alternative.

Radioactive and Hazardous Waste Management Facilities

The DWTF (Buildings 693, 695, and 696) would receive, treat, handle, package, store (short-term), and ship hazardous, radioactive, and nonhazardous chemical wastes. The facility is located in a fenced compound in the northeast corner of the Livermore Site. Except for Building 696, the DWTF is a RCRA, Part B-permitted facility that would support waste generators throughout LLNL. Activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities. The facility would normally operate one shift.

Modifications to the existing facility to improve flexibility and operational efficiencies (see Table B.3.1–1) would be completed. Building 696 would continue to manage radioactive and nonhazardous wastes only. Quantities of total hazardous waste managed (see Table B.3–1) would be up to 1,890 metric tons per year. Quantities of MLLW managed (see Table B.3–1) would be up to 133 cubic meters per year. Quantities of TRU and mixed TRU wastes managed (see Table B.3–1) would be up to 107 cubic meters per year plus the legacy inventory of 106 cubic meters.

Building 694, the Operational Support Building, and Building 697, the Chemical Exchange Warehouse, are situated adjacent to the DWTF. While part of the waste management support operations at LLNL, these facilities do not currently receive, treat, handle, package, store (short-term), or ship hazardous and nonhazardous chemical wastes. Building 694 activities would be limited to office work. Building 697 would be used to prepare chemicals for reuse onsite as a method for avoiding disposal at licensed facilities, but could eventually house a WAA. These facilities would normally operate one shift. Modifications to the existing facilities to improve flexibility and operational efficiencies (see Table B.3.1–1) would be minor.

Area 612 Complex (Buildings 612, 614, 624, and 625) would receive, treat, handle, package, store (short-term), and ship hazardous, radioactive, and nonhazardous chemical wastes. The complex is located in a fenced compound in the southern part of the Livermore Site. The facility is a RCRA, Part B-permitted facility that would support waste generators throughout LLNL. Activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities. The facility would normally operate one shift. Modifications to the existing facility to improve flexibility and operational efficiencies (see Table B.3.1–1) would be completed. Quantities of total hazardous waste managed (see Table B.3.1–2) would be up to 1,900 metric tons per year. Quantities of other wastes managed would be expected as presented in Table B.3–1.

The Area 514 Complex (Buildings 513 and 514) would receive, treat, handle, package, store (short-term), and ship hazardous and nonhazardous chemical wastes until RCRA closure would be initiated. The facility is located in a fenced compound in the southern part of the Livermore Site. The facility is a RCRA, interim-status facility that would support waste generators throughout LLNL. Activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities. The facility would normally operate one shift until RCRA closure would be initiated. Treatment and storage operations would be transferred to the DWTF and the facility would undergo RCRA closure.

Although never made operational, Building 280 would also undergo RCRA closure. The building is located in the northwest quadrant of the Livermore Site. In 2001, LLNL notified the DTSC that the facility was no longer required to support waste generators throughout LLNL. The storage operation planned for Building 280 would be relocated to Building 696.

The Building 233 CSU would undergo RCRA closure. The facility is located in a fenced compound in the southwest quadrant of the Livermore Site. The facility is a RCRA, interim-status facility that prepared wastes for offsite transportation for recycling, treatment, or disposal at approved facilities. The facility does not currently store waste.

The EWTF treats and stores (short-term for treated debris only) hazardous (i.e., explosive) wastes. The facility is located in a fenced compound in the center of Site 300 and is RCRA, Part

B-permitted. This facility would support explosive waste generators throughout Site 300 and at the High Explosives Application Facility (HEAF) at the Livermore Site. The quantities of wastes treated (see Table B.3–4) would be up to 3,300 pounds per year.

The EWSF (M816, M2, M3, M4, and M5) receives, handles, packages (through B805), stores, and ships hazardous (i.e., explosive) wastes. The facility is located in a fenced compound in the southeast central portion of Site 300 and is RCRA Part B-permitted. This facility supports explosive waste generators throughout Site 300 and at the HEAF. Activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities. The facility would operate one shift. The quantities of explosive waste managed (see Table B.3–4) would be up to 6,500 pounds (gross) per year. No mixed hazardous waste would be managed.

Building 883 would receive, handle, package, store (short-term), and ship hazardous and nonhazardous chemical wastes. The facility would not accept radioactive materials and explosives. Activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities. Modifications to the existing facility to improve flexibility and operational efficiencies would be completed.

B.3.2 Proposed Action

The Proposed Action would include all operations and activities identified in the No Action Alternative. The Proposed Action would include the continuing and historical onsite waste management operations, continuing environmental protection and environmental restoration, continuing pollution prevention and waste minimization programs, and continuing transportation of waste to offsite approved waste management facilities (includes a wide variety of DOE and commercial facilities).

Under the Proposed Action, new missions would generate waste volumes currently not managed at Livermore Site or Site 300. In general, over 10 years, waste management activities would change and planned facility operations for the DWTF would increase in support of LLNL's assigned missions. Waste management changes would include implementing a series of recent permit modifications (see Table B.3–3), improving overall RHWM operations, beginning new projects, and routinely submitting additional permit modifications as required. This alternative addresses the same facilities described in Section 3.1 for the No Action Alternative.

This alternative differs from the No Action Alternative in that

- Permitted treatment and storage operations would be conducted in B696 in addition to radioactive and nonpermitted waste handling operations
- Annual waste generation at LLNL would increase 7 percent over the No Action Alternative site-wide over the next 10 years to quantities presented in Table B.3.2–2.
- The 600-ton per year drum/container crusher would be moved from Area 612 to Building 696
- A 250-ton per year size reduction unit operation would be relocated from Area 612 to Building 696

- Building 280 hazardous and mixed wastes storage capacity would be moved to Building 696
- Storage of hazardous and mixed wastes would begin in Building 696
- Approximately 100 Class 1 permit modification requests (which could include one or more items) would be submitted over the next 10 years (Table B.3.2–1)
- Approximately 20 Class 2 permit modification requests (which could include one or more items), would be submitted over the next 10 years (Table B.3.2–1)
- Two Class 3 permit modifications would be submitted over the next 10 years (Table B.3.2–1)
- Waste quantities presented in Table B.3.2–2 would be managed annually

TABLE B.3.2–1.—*Examples of Possible Permit Modifications Under the Proposed Action*

Class 1	Class 2	Class 3
Administrative and informational changes	Changes in frequency or content of inspection schedules	Addition of corrective action program
Correction of typographical errors	Changes to corrective action program	Creation of a new SWMU as part of closure
Equipment replacement or upgrading with functionally equivalent components	Changes to detection monitoring program	Modification or addition of tank units resulting in greater than 25% increase in the facility's tank capacity
Changes in names, addresses, and phone numbers of emergency coordinators	Extensions of post-closure care period	Addition of compliance monitoring to groundwater monitoring program
Changes to waste sampling and analysis methods to comply with new regulations	Changes to facility training plan that affect the type or amount of employee training	Reduction in post-closure care period
Changes to analytical quality assurance and quality control plan to comply with new regulations	Changes in number, location, depth, or design of groundwater monitoring wells	Addition of temporary treatment unit for closure activities

Source: 40 CFR §270.42, EPA n.d.
Note: Permit modifications are classified in more detail in 40 CFR §270.42, Appendix I.
SWMU = solid waste management unit.

TABLE B.3.2–2.—*Routine and Nonroutine Operations Annual Waste Generation Quantities Under the Proposed Action*

Waste Type	Annual Quantities	
	Routine	Nonroutine
LLW	330 m^3/yr	710 m^3/yr
MLLW	88 m^3/yr	81 m^3/yr
Total Hazardous	510 metric tons	1,700 metric tons
TRU	50 m^3/yr	60 m^3/yr
Mixed TRU	2.8 m^3/yr	0
Sanitary Solid	5,100 metric tons/yr	Included in Routine
Wastewater	330,000 gal/day	Included in Routine

Source: TtNUS 2003.
gal/day = gallons per day; LLW = low-level waste; m^3/yr = cubic meters per year; MLLW = mixed low-level waste; TRU = transuranic.

The following sections summarize the activities that would be performed at each of the LLNL waste management facilities.

Radioactive and Hazardous Waste Management Facilities

The DWTF (Buildings 693, 695, and 696) would receive, treat, handle, package, store (short-term), and ship hazardous, radioactive and nonhazardous chemical wastes. The facility is located in a fenced compound in the northeast corner of the Livermore Site. After completing the modification for Building 696, the facility would be a RCRA Part B-permitted facility that would support waste generators throughout LLNL. Activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at approved facilities. The facility would normally operate one shift. Modifications (within the list of Proposed Actions) to the existing facility to improve flexibility and operational efficiencies (see Table B.3.2–1) would be completed. Building 696 would obtain permit status. Quantities of total hazardous waste managed (see Table B.3–1) would be up to 2,210 metric tons per year. Quantities of MLLW managed (see Table B.3–1) would be up to 169 cubic meters per year. For other wastes see Table B.3–1.

Building 694, the Operational Support Building, and Building 697, the Chemical Exchange Warehouse, would continue to support operations at LLNL. As with the No Action Alternative, these facilities would not receive, treat, handle, package, store (short-term), and ship hazardous and nonhazardous chemical wastes. Modifications (within the list of Proposed Actions) to the existing facilities to improve flexibility and operational efficiencies (Table B.3.2–1) would be minor.

Area 612 Complex (Buildings 612, 614, 624, and 625) would receive, treat, handle, package, store (short-term), and ship radioactive hazardous and nonhazardous chemical wastes. As with the No Action Alternative, activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities.

Modifications (within list of Proposed Action) to the existing facility to improve flexibility and operational efficiencies (see Table B.3.2–1) would be completed. Quantities of total hazardous waste managed (see Table B.3–1) would be up to 2,210 metric tons per year. For other wastes see Table B.3–1.

Area 514 Complex (Buildings 513 and 514) would receive, treat, handle, package, store (short-term), and ship hazardous, radioactive and nonhazardous chemical wastes. The facility is located

in a fenced compound in the southern part of the Livermore Site. Prior to FY2005, Area 514 Complex operations would cease. The existing capabilities would be transferred to the DWTF. Once the operations are transferred, the Complex would undergo RCRA closure.

As with the No Action Alternative, Building 280 would undergo RCRA closure. The storage capacity planned for Building 280 would be relocated to Building 696.

As with the No Action Alternative, Building 233 CSU would undergo RCRA closure. The storage operation previously conducted in Building 233 CSU would be relocated to Building 696.

The EWTF would continue to treat and store (short-term for treated debris only) hazardous (explosive) wastes. The facility is located in a fenced compound in the center of Site 300 and is RCRA Part B-permitted. The facility would support explosives waste generators throughout Site 300 and at the HEAF at the Livermore Site. The quantities of wastes treated (see Table B.3–4) would be up to 3,300 pounds per year.

The EWSF (M816, M2, M3, M4, and M5) would continue to receive, handle, package (through B805), store, and ship hazardous (i.e., explosive) wastes. The facility is located in a fenced compound in the southeast central portion of Site 300 and is RCRA Part B-permitted. This facility would support explosive waste generators throughout Site 300 and at the HEAF. Activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities. The facility would normally operate one shift. The quantities of explosive waste managed (see Table B.3–4) would be up to 7,200 pounds (gross) per year. No mixed hazardous waste would be managed.

Building 883 would receive, handle, package, store (short-term), and ship hazardous, toxic, and nonhazardous chemical wastes. The facility would not accept radioactive wastes and explosives. As with the No Action Alternative, activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities. Modifications (within the list of Proposed Actions) to the existing facility to improve flexibility and operational efficiencies (see Table B.3.2–1) would be completed. Quantities of total hazardous waste managed would be up to 13 metric tons per year.

B.3.3 Reduced Operation Alternative

The Reduced Operation Alternative would reflect minimum levels of activity required to maintain waste management operations and activities assigned to support LLNL capabilities over the next 10 years consistent with a 30 percent reduction of the Stockpile Stewardship Program below the No Action Alternative. In some specific operations, waste management operations would increase over the base period. The operations are those that, during the base period, have not yet been operated (e.g., the NIF).

This alternative would not eliminate assigned missions or capabilities, but could entail not consolidating, enhancing, or upgrading operations. However, under this alternative, LLNL waste management operations would not be reduced beyond those required to maintain safety, permit requirements, or other agreements, such as the Site Treatment Plan.

Approximately 50 Class 1 permit modifications would be submitted. No Class 2 or Class 3 permit modifications would be submitted. No new construction would be included. All RCRA closures identified in the No Action Alternative would be completed. Building 696 would not obtain RCRA permit status. It should be noted that the Reduced Operation Alternative would allow only partial fulfillment of the RHWM mission by limiting future permit modifications and limiting Building 696 wastes operations, and it would not fully satisfy the purpose and need for agency action.

This alternative differs from the No Action Alternative in that (see Table B.3–3):

- Approximately 50 Class 1 permit modifications would be submitted over the next 10 years (Table B.3.3–1).
- No Class 2 and Class 3 permit modifications would be submitted over the next 10 years.
- Waste quantities presented in Table B.3.3–2 would be managed annually.

TABLE B.3.3–1.—*Examples of Possible Permit Modifications*

Class 1
Administrative and informational changes
Correction of typographical errors
Equipment replacement or upgrading with functionally equivalent components
Changes in names, addresses, and phone numbers of emergency coordinators
Changes to waste sampling and analysis methods to comply with new regulations
Changes to analytical quality assurance and quality control plan to comply with new regulations

Source: 40 CFR §270.42, EPA n.d.
Note: Permit modifications are classified in more detail in 40 CFR §270.42, Appendix I.

TABLE B.3.3–2.—*Routine Operations Annual Waste Generation Quantities Under the Reduced Operation Alternative*

Waste Type	Annual Quantities	
	Routine	Nonroutine
LLW	180 m^3/yr	550 m^3/yr
MLLW	42 m^3/yr	63 m^3/yr
Total Hazardous	300 metric tons/yr	1,300 metric tons/yr
TRU	45 m^3/yr	55 m^3/yr
Mixed TRU	0.7 m^3/yr	0
Sanitary Solid	4,400 metric tons/yr	Included in Routine
Wastewater	290,000 gal/day	Included in Routine

Source: TtNUS 2003.
gal/day = gallons per day; LLW = low-level waste; m^3/yr = cubic meters per year; MLLW = mixed low-level waste; TRU = transuranic.

This alternative addresses the same facilities described in Section B.3.1 for the No Action Alternative. This alternative differs from the No Action Alternative in that operations would decrease to the lowest reasonably foreseeable levels over the next 10 years. The following sections describe the activities that would occur at specific facilities because of implementing assignments under the Reduced Operation Alternative.

The DWTF (Buildings 693, 695, and 696) would receive, treat, handle, package, store (short-term), and ship hazardous, toxic, and nonhazardous chemical wastes. The facility is located in a fenced compound in the northeast corner of the Livermore Site. Except for Building 696, the DWTF is a RCRA Part B-permitted facility that would support waste generators

throughout LLNL. Activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities. The facility would normally operate one shift per day. Building 696 would not obtain permit status. Future modifications to the existing facility to improve flexibility and operational efficiencies would not be completed. Quantities of total hazardous waste managed (see Table B.3–1) would be up to 1,600 metric tons per year. Quantities of MLLW managed (see Table B.3–1) would be up to 105 cubic meters per year. For other wastes see Table B.3–1.

Area 612 Complex (Buildings 612, 614, 624, and 625) would receive, treat, handle, package, store (short-term), and ship hazardous, radioactive, toxic, and nonhazardous chemical wastes. As with the No Action Alternative, activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities. Future modifications to the existing facility to improve flexibility and operational efficiencies would not be completed. For quantities of waste managed see Table B.3–1.

Area 514 Complex (Buildings 513 and 514) would receive, treat, handle, package, store (short-term), and ship hazardous, toxic, and nonhazardous chemical wastes. As with the No Action Alternative, activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities until RCRA closure would be completed.

Building 280 would undergo RCRA closure.

Building 233 CSU would undergo RCRA closure.

The EWTF would treat and store (short-term for treated debris only) hazardous (explosive) wastes. The facility is located in a fenced compound in the center of Site 300 and is RCRA Part B-permitted. The facility would support explosives waste generators throughout Site 300 and at the HEAF at the Livermore Site. The quantities of wastes treated (see Table B.3–4) would be up to 2,800 pounds per year.

The EWSF (M816, M2, M3, M4, and M5) would continue to receive, handle, package (through B805), store, and ship hazardous (i.e., explosive) wastes. The facility is located in a fenced compound in the southeast central portion of Site 300 and is RCRA, Part B-permitted. This facility would support explosive waste generators throughout Site 300 and at the HEAF. Activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities. The facility would normally operate one shift. The quantities of explosive waste managed (see Table B.3–4) would be up to 6,200 pounds (gross) per year. No mixed hazardous waste would be managed.

Building 883 would receive, handle, package, store (short-term), and ship hazardous, toxic, and nonhazardous chemical wastes. As with the No Action Alternative, activities would include preparing wastes for offsite transportation for recycling, treatment, or disposal at licensed facilities. Future modifications to the existing facility to improve flexibility and operational efficiencies would not be completed.

B.3.4 Alternatives Eliminated from Detailed Review

The CEQ regulations implementing NEPA require that all reasonable alternatives be evaluated in an EIS (40 CFR §1502.14[a]). The term *reasonable* has been interpreted by the CEQ to include

those alternatives that are practical or feasible from a common sense, technical, and economic standpoint. The range of reasonable alternatives is, therefore, limited to continued LLNL operations. NNSA mission line assignments to LLNL define the Administration's purpose and need for action, as discussed in Chapter 1 of the LLNL SW/SPEIS.

NNSA carefully considered public input and comments received during the pre-scoping and scoping processes. No additional alternatives were considered in detail in the LLNL SW/SPEIS because the range of alternatives were adequate for assessing impacts associated with the Administration's purpose and need.

B.4 DESCRIPTION OF THE AFFECTED ENVIRONMENT FOR WASTE MANAGEMENT

B.4.1 Environmental Setting/Existing Conditions

Understanding the environmental setting and existing conditions is necessary for understanding potential impacts from waste operations at LLNL. This section describes the existing conditions of the physical and natural environment for LLNL waste management facilities and operations, and the relationship of people with that environment. Descriptions of the affected environment provide a framework for understanding the direct, indirect, and cumulative effects of each of the No Action Alternative, Proposed Action, and Reduced Operation Alternative. The discussion is categorized by resource area to ensure that all relevant issues are included. This section is divided into the following 16 resource areas and topic groupings that support the impact assessment discussed in Section B.5:

- Land Use and Applicable Plans
- Socioeconomic Characteristics and Environmental Justice
- Community Services and Recreation
- Prehistoric and Historic Cultural Resources
- Aesthetic and Scenic Resources
- Meteorology
- Geological Resources and Hazards (including soils)
- Ecology
- Air Quality
- Water Resources and Hydrology
- Noise
- Minerals
- Traffic and Transportation