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SUPPLEMENT ANALYSIS

for

Continued Operation of
Lawrence Livermore National Laboratory and
Sandia National Laboratories, Livermore

Volume I: Main Report

March 1999

DOE/EIS-0157-SA-01

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NOTATION

The following is a list of the acronyms, abbreviations, and units of measure used in this document. Some notation used only in tables is defined in the respective tables.

ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ASCI	Advanced Strategic Computing Initiative
BA	biological assessment
BO	biological opinion
CDOT	California Department of Transportation
CEDE	committed effective dose equivalent
CEQ	(President's) Council on Environmental Quality
CEQA	California Environmental Quality Act of 1970
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	chlorofluorocarbon
CFF	Contained Firing Facility
CFR	*Code of Federal Regulations*
CHARM	Complex Hazardous Air Release Model
D&D	decommissioning and decontamination
DOE	U.S. Department of Energy
DOE/OAK	U.S. Department of Energy, Oakland Operations Office
DOI	U.S. Department of the Interior
DOT	U.S. Department of Transportation
DWTF	Decontamination and Waste Treatment Facility
EA	environmental assessment
EDE	effective dose equivalent
EIR	environmental impact report
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ERPG	Emergency Response Planning Guide
ETDP	Expedited Technology Demonstration Project
EWSF	Explosive Waste Storage Facility
EWTF	Explosive Waste Treatment Facility

FMD	Fissile Materials Disposition
FWS	U.S. Fish and Wildlife Service
FY	fiscal year
HEPA	high-efficiency particulate air (filter)
HVAC	heating, ventilation, and air-conditioning
HW	hazardous waste
LLMW	low-level mixed waste
LLNL	Lawrence Livermore National Laboratory
LLW	low-level radioactive waste
MAR	material at risk
MEI	maximally exposed individual
MOX	mixed oxide
MSO	molten salt oxidation
NEPA	National Environmental Policy Act of 1969
NIF	National Ignition Facility
NTS	Nevada Test Site
PCB	polychlorinated biphenyl
PEIS	programmatic environmental impact statement
PM_{10}	particulate matter with aerodynamic particle diameter equal to or less than 10 μm
$PM_{2.5}$	particulate matter with aerodynamic particle diameter equal to or less than 2.5 μm
RCRA	Resource Conservation and Recovery Act
R&D	research and development
RD&D	research, development, and demonstration
RI/FS	remedial investigation/feasibility study
RMP	Risk Management Plan
ROD	record of decision
SA	supplement analysis
SAR	safety analysis report
SCIF	Sensitive Compartmented Information Facility
SEAB	Secretary of Energy Advisory Board
SEIS	supplemental environmental impact statement
SHPO	State Historic Preservation Officer
SNL	Sandia National Laboratories
SNM	special nuclear material
SSM PEIS	Stockpile Stewardship and Management Programmatic Environmental Impact Statement
TEDE	total effective dose equivalent
TRL	Tritium Research Laboratory

TRU	transuranic waste
TSCA	Toxic Substances Control Act
TSR	Technical Safety Requirement
TWMS	Total Waste Management System
UC	University of California
UO_2	uranium dioxide
USEC	U.S. Enrichment Corporation
VISTA	Verification, Intelligence, and Special Technology Analysis
VOC	volatile organic compound
WIPP	Waste Isolation Pilot Plant
WM PEIS	Waste Management Programmatic Environmental Impact Statement

UNITS OF MEASURE

cm	centimeter(s)
cm^2	square centimeter(s)
d	day(s)
ft	foot (feet)
ft^3	cubic foot (feet)
g	gram(s)
µg	microgram(s)
gal	gallon(s)
gsf	gross square feet
h	hour(s)
kg	kilogram(s)
km	kilometer(s)
kW	kilowatt(s)
lb	pound(s)
µm	micrometer(s)
m	meter(s)
m^3	cubic meter(s)
mi	mile(s)
MW	megawatt(s)
ppm	part(s) per million
yr	year(s)

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SUPPLEMENT ANALYSIS FOR CONTINUED OPERATION OF LAWRENCE LIVERMORE NATIONAL LABORATORY AND SANDIA NATIONAL LABORATORIES, LIVERMORE

SUMMARY

This supplement analysis (SA) was prepared in accordance with the U.S. Department of Energy's (DOE's) requirements for implementation of the National Environmental Policy Act of 1969 (NEPA) (10 CFR 1021.314). It considers whether the *Final Environmental Impact Statement and Environmental Impact Report for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore* (1992 EIS/EIR) should be supplemented, a new environmental impact statement (EIS) should be prepared, or no further NEPA documentation is required.

Copies of the draft SA were made available for a 30-day period for public comment. Two public meetings were held at Lawrence Livermore National Laboratory (LLNL), and comments were recorded. This final SA includes changes resulting from those comments as well as from editorial review. A comment and response document addressing all comments has been prepared.

DOE regulations require that sitewide EISs, such as the 1992 EIS/EIR, shall be evaluated at least

Findings

- This supplement analysis evaluated a set of new and modified projects and proposals and other new information and concluded that no supplementation of the 1992 EIS/EIR for Lawrence Livermore National Laboratory (LLNL) and Sandia National Laboratories (SNL), Livermore, is needed. Either the projected impacts are within the bounds of the 1992 EIS/EIR, the impacts were anticipated by mitigation measures established in the 1992 EIS/EIR, or the incremental differences in impacts are not significant.

- While proposed increases in administrative limits for radioactive materials at LLNL might slightly increase radiological releases during accidents, the resulting consequences are expected to remain essentially the same as described in the 1992 EIS/EIR.

- The discovery of new resources not anticipated in the 1992 EIS/EIR included discovery of mammoth and other prehistoric fossil bones at the National Ignition Facility (NIF) site, presence of the California red-legged frog in site drainage ditches, and nesting of the white-tailed kite at LLNL. In addition, capacitors containing polychlorinated biphenyls were unearthed at the NIF site. These discoveries resulted in the application of mitigation measures established in the 1992 EIS/EIR or in project-specific NEPA documents, consultation with appropriate authorities, and additional studies.

- The environmental consequences related to these new circumstances are insignificant, and the overall picture of sitewide LLNL and SNL operations remains very similar to that presented in the 1992 EIS/EIR. For these reasons, no supplementation of the 1992 EIS/EIR is needed.

every 5 years after issuance to determine whether a supplemental EIS is necessary (10 CFR 1021.330[d]). This SA examines the current project and program plans and proposals for LLNL and Sandia National Laboratories (SNL), Livermore, operations to identify new or modified projects or operations or new information for the period from 1998 to 2002 that was not considered in the 1992 EIS/EIR. When such changes, modifications, and information are identified, they are examined to determine whether they could be considered substantial in reference to the 1992 proposed action and the 1992 record of decision (ROD). The determinations of whether changes are substantial are based upon analysis and review that establish whether any changes, new circumstances, or new information results in potential for environmental impacts that exceed the bounds (or envelope) of the consequences of LLNL and SNL operations as presented in the 1992 EIS/EIR; and if the bounds are exceeded, whether these incremental environmental impacts identified in the SA are significant, as defined in 40 CFR 1508.27.

The proposed action evaluated in the 1992 EIS/EIR was "the continued operation of LLNL and SNL, Livermore, including near-term (within 5 to 10 years) proposed projects." The proposed action included "[then] current operations plus programmatic enhancements and facility modifications pursuant to research and development missions established for the Laboratories by the Congress and the President." SNL continues to operate within the levels described in 1992. No significant new programs or projects have been proposed since 1992 or are now planned for SNL for the near future (by 2002). In fact, DOE phased out the operations at the Tritium Research Laboratory and completed its decontamination in 1996. The SNL evaluation revealed that the impacts were within the bounds of the 1992 EIS/EIR or the incremental differences in impacts were not significant. No supplementation of the 1992 EIS/EIR is needed on the basis of SNL activities.

LLNL continues to operate within the general statement of action described in 1992. However, some projects and proposals included in the 1992 EIS/EIR have been cancelled, some have been modified, and some new ones have been developed. In addition, some new information is available on the site environment. A list was made of this modified and new information on the basis of existing environmental documents prepared since 1992, institutional and other plans, changes in regulations, and a recent addendum prepared for the EIR portion of the EIS/EIR pursuant to the California Environmental Quality Act (CEQA). Managers at LLNL and DOE were also asked to identify new proposals or projects and changes in site operations, and they were asked to review the list as it was developed. Nineteen modified or new key projects or proposals were identified that would be implemented between 1998 and 2002. Also identified were proposed changes in administrative limits[1] for radioactive materials and changes in waste generation and management. New information related to the site environment included current employment conditions (a declining, rather than an expanding, workforce); the presence of two animal species of special interest at the Livermore site; the discovery of paleontological

[1] Administrative limits are criteria that establish the maximum quantities of radioactive materials that may be present in a building or group of buildings at LLNL.

resources at the National Ignition Facility (NIF) construction site; and a proposal to improve the drainageway in Arroyo Las Positas.

The following approach was used to determine whether supplementation of the 1992 EIS/EIR is necessary. First, environmental impact areas were screened to determine whether it was clear that impacts of LLNL operations, considering this new information, would remain within the envelope of environmental consequences established in the 1992 EIS/EIR. This screening determined that the impacts of continued operations likely remain within the bounds of the 1992 EIS/EIR for air quality, noise, water quality, hazardous materials, ecology (vegetation, fish, and wildlife), cultural and archeological resources, land use, transportation, socioeconomics, and miscellaneous areas. In none of these impact areas is supplementation of the 1992 EIS/EIR needed.

Second, further analysis was conducted for the seven impact areas not eliminated by the initial screening: sensitive species, wetlands, paleontological resources, radiological consequences of accidents, waste generation and management, environmental justice, and cumulative impacts. These areas were evaluated to establish whether the potential impacts were likely to remain within the bounds of the 1992 EIS/EIR, and, if not, whether any differences were significant. The findings in these seven areas are summarized below.

Sensitive Species — The California red-legged frog (federally listed threatened species), formerly observed only at Site 300, was found on the Livermore site in Arroyo Las Positas in July 1997. In 1994, 1995, 1997, and 1998, white-tailed kites (state protected bird species) nested successfully at the Livermore site. Consultation with the U.S. Fish and Wildlife Service (FWS) regarding the California red-legged frog at the Livermore site was completed in 1998. Impacts at the Livermore site would be mitigated as specified in the 1998 Biological Opinion from the FWS. Projected impacts of activities at the Livermore site and Site 300 would continue to be subject to the mitigation measures described in the 1992 EIS/EIR. During the period 1998 to 2002, any actions at LLNL, including new or modified actions, would be implemented subject to the application of appropriate project-specific mitigation measures. If new sensitive species or habitats are identified, additional levels of protection from inadvertent impacts and mitigation for unavoidable impacts would be developed early in the planning process. For these reasons, the 1992 EIS/EIR and its past and current mitigation measure commitments, including recent refinements, remain adequate to properly protect threatened, endangered, or special status species. No supplementation of the 1992 EIS/EIR is needed for species-related issues at this time.

Wetlands — Maintenance of the floodway in Arroyo Las Positas at the Livermore site would disturb approximately 20% of associated wetlands each year. However, management of the floodway would not result in elimination of associated wetland, and wetland vegetation would be maintained. Impacts to the California red-legged frog would be mitigated on the basis of consultation with the FWS, which has rendered a Biological Opinion for this action. The mitigation plan includes scheduling maintenance activities to avoid involvement with the California red-legged frog, protecting habitat for the California red-legged frog, and

compensating for any incidental take of individual frogs. Impacts related to Arroyo Las Positas are not considered significant for the purposes of this SA because (1) arroyo management would continue to maintain the wetland, (2) issues regarding federally listed species are being resolved with the appropriate regulatory authority, and (3) mitigation measures for minimizing potential impacts have been developed. For these reasons, supplementing the EIS/EIR for wetlands is not needed.

Paleontological Resources — Excavation for the NIF in late 1997 unearthed mammoth and horse fossils. Those fossils that would be affected by construction were excavated and curated at the University of California Museum of Paleontology at Berkeley. Any new discoveries would be managed in accordance with the mitigation measures identified in the 1992 EIS/EIR for prehistoric resources. Supplementation of the EIS/EIR for paleontological resources is not needed.

Radiological Consequences of Accidents — The bounding radiological accident consequences presented in the 1992 EIS/EIR were examined in light of changes proposed in the administrative limits for uranium and plutonium and the change in the bounding accident identified in the 1995 SAR for Building 332. If a uranium criticality event were to occur in Building 332, the estimated number of excess fatal cancers per year among the exposed population would double from that estimated for the plutonium criticality event in the 1992 EIS/EIR, but the risk would still be less than one fatal cancer. The increased number of experiments or operations in Building 332 directly associated with the proposed increase in the uranium administrative limit would add a small incremental risk. Changes in the administrative limits for other buildings would result in no changes or very small changes in potential consequences and risks. Although the calculated consequences and risks to exposed populations and to the maximally exposed individual have increased in some cases since publication of the 1992 EIS/EIR, the impacts still are not significant, and supplementation of the EIS/EIR for radiological accidents is not needed.

Waste Management — The review of current and projected LLNL waste management practices through the year 2002 indicates a shift from on-site storage of low-level radioactive waste (LLW), transuranic (TRU) waste, and low-level mixed waste (LLMW) to off-site treatment, storage, and disposal. This shift and a projected reduction in waste generation by the year 2002 are expected to reduce the associated potential safety and health hazards to LLNL workers handling this waste and to off-site populations. Projected changes in hazardous waste management practices are expected to reduce the waste retention time at the on-site 90-day storage facilities, which would reduce multiple handling of waste containers and, consequently, the potential safety and health hazards associated with that handling. With completion of the Decontamination and Waste Treatment Facility (DWTF) in the year 2000, implementation of the LLW and TRU certification programs, and continuation of the waste minimization program at LLNL, impacts from waste management operations are expected to be below the levels projected for the year 2002 in the 1992 EIS/EIR. This assessment is supported by improved routine waste generation projections from recent actual data and incorporates the assumption that nonroutine waste generation would be at about the current levels in the year 2002. In fact, even with this conservative assumption, total waste generation at LLNL in the year 2002 is expected to be

about 20% lower than the EIS/EIR 1992 baseline levels for LLW, LLMW, and hazardous waste (HW), and about 75% lower for TRU waste. These considerations and analyses support the conclusion that the 1992 EIS/EIR adequately bounds the impacts from waste management activities through the year 2002.

Environmental Justice — After the issuance of the environmental justice Executive Order in 1994, environmental justice issues were assessed for LLNL as part of the Waste Management Programmatic Environmental Impact Statement (PEIS), the Stockpile Stewardship and Management PEIS, and the Surplus Materials and Disposition PEIS. These studies concluded that, for those programmatic actions, there would be no disproportionately high and adverse impacts to minority or low-income populations near the Livermore site. The largest facility to be constructed during this period would be the NIF. The supporting documentation for the NIF portion of the Stockpile Stewardship and Management PEIS concluded that the construction and operation of NIF would not pose disproportionately high and adverse effects on either minority or low-income populations because none of the projected impacts would be high or adverse. This SA also considered the impacts of new and proposed key projects at the Livermore site and Site 300, including consequences of tritium releases. It is not expected that any of the new or modified key proposals and projects from 1998 to 2002, either individually or in combination, would result in disproportionately high and adverse impacts to minority and low-income populations because none of the impacts would be high or adverse. No supplementation with respect to environmental justice is needed.

Cumulative Impacts — A stable workforce would stabilize LLNL's contribution to population-related community and regional impacts. Mitigation measures for vegetation and wildlife, threatened and endangered species, and wetlands would continue to be employed. Construction of NIF and other facilities would result in particulate emissions (PM_{10}) in a nonattainment area, an impact of site operations identified in the 1992 EIS/EIR. Release of tritium from NIF and water and power use by the NIF and the Terascale Simulation Facility are estimated to be less than or substantially similar to cumulative factors projected in the 1992 EIS/EIR. No other federal or non-federal actions have been implemented or are reasonably foreseeable that, in combination with the incremental contribution of LLNL and SNL activities, could have an adverse cumulative impact not anticipated in the 1992 EIS/EIR. Supplementation of the EIS/EIR for cumulative impacts is not needed.

Conclusions — This SA evaluated a set of new and modified projects and proposals and other new information and concluded that no supplementation of the 1992 EIS/EIR is needed for any factor. Either the projected impacts are within the bounds of the 1992 EIS/EIR, they were anticipated by mitigation measures established in the 1992 EIS/EIR, or the incremental differences in impacts are not significant. The discovery of new resources not anticipated in the 1992 EIS/EIR included fossil bones of mammoths and other species at the NIF site, presence of the California red-legged frog in site drainage ditches, and nesting by the white-tailed kite at LLNL. In addition, capacitors containing polychlorinated biphenyls (PCBs) were unearthed at the NIF site. These discoveries resulted in the application of mitigation measures established in the 1992 EIS/EIR or in project-specific NEPA documents, consultation with appropriate authorities, additional studies, and implementation of project-specific regulatory abatement

and/or cleanup actions. As a result, the environmental consequences related to this new information are small, and the overall picture of sitewide LLNL and SNL operations remains very similar to that presented in the 1992 EIS/EIR. For these reasons, no supplementation of the 1992 EIS/EIR is needed.

1 INTRODUCTION

This supplement analysis (SA) was prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA). It considers whether the *Final Environmental Impact Statement and Environmental Impact Report for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore* (DOE 1992), hereafter referred to as the "1992 EIS/EIR," should be supplemented, a new environmental impact statement (EIS) should be prepared, or no further NEPA documentation is required. The main body of this SA focuses on the Lawrence Livermore National Laboratory (LLNL) portion of the 1992 EIS/EIR because of the considerable number of LLNL activities relative to those of Sandia National Laboratories, Livermore (SNL) (now known as Sandia National Laboratories/California). The SNL portion of the SA is presented as Appendix A. The SNL component of the SA when compared with the 1992 EIS/EIR indicates that (1) there are no substantial changes to the proposed action relevant to environmental concerns at SNL and (2) there has not been any significant new information uncovered related to environmental concerns there.

1.1 BACKGROUND

The 1992 EIS/EIR was prepared to meet the requirements of NEPA and the California Environmental Quality Act of 1970 (CEQA); it evaluated the impacts on the environment of existing and proposed operations at LLNL and SNL for the period 1992 through 2002. On November 20, 1992, the University of California (UC), as state lead agency under the CEQA, issued a Notice of Determination certifying and adopting the EIR portion of the EIS/EIR. On January 27, 1993, the U.S. Department of Energy (DOE) issued a NEPA record of decision (ROD) in the *Federal Register* (DOE 1993) for the EIS portion of the EIS/EIR, announcing that the Department had decided to continue operation of LLNL and SNL, including projects proposed for the near term (next 5 to 10 years).

In October 1997, the prime contract between DOE and UC for operation of LLNL was extended for 5 years. As part of the extension process, UC prepared an addendum to the CEQA portion of the 1992 EIS/EIR for the UC Regents entitled *Environmental Impact Report Addendum for the Continued Operation of Lawrence Livermore National Laboratory* (UC 1997). That addendum, issued in September 1997, concluded that "there have been no changes in circumstances or in LLNL operations and no new information of substantial importance that would involve substantial impacts or substantial increase in the severity of previously identified significant impacts from the implementation of the proposed action."

1.2 PUBLIC INVOLVEMENT

The DOE announced its intent to seek public involvement in the Supplement Analysis process in several local newspapers, including the *Tri-Valley Herald*, the *Valley Times*, and the *Oakland Tribune* on January 26 and February 3 and 7, 1999. Copies of the draft Supplement Analysis were made available to the public through the LLNL and DOE public reading rooms. Additionally, copies were provided to individuals upon their request. A 30-day comment period was opened from January 26 to February 25, 1999, to receive comments from interested stakeholders. Two public meetings were held at LLNL, at 2 p.m. and 6 p.m. on February 11, 1999. Several members of the public attended the meetings and provided statements and comments. Transcripts and notes were taken of the proceedings. Additionally, several written responses were provided, the most substantial of which was from Tri-Valley CAREs. Those comments and responses were evaluated to determine where the draft SA should be revised. Issues raised included the following:

- Impacts of past operations at LLNL, particularly contamination by tritium and plutonium;
- Whether changes at LLNL are "new circumstances or significant new information" that would trigger preparation of a new sitewide EIS;
- Desire to have a new sitewide EIS prepared;
- Superfund and site remediation issues;
- Health and safety issues in plutonium facilities, including age and safety of high-efficiency particulate air (HEPA) filters;
- Need for weapons research and purpose of the Laboratory;
- Laser isotope separation of uranium;
- Proposed administrative limits changes;
- Off-site contamination with plutonium and tritium;
- Water use by new and existing facilities, including cumulative impacts;
- Whether a BioHazard III laboratory was planned;

- Waste streams and accident risks from mixed oxide fuels programs; and

- Environmental justice considerations at Site 300.

The DOE's responses to comments on these issues are provided in the *Comment Response Document for the Supplement Analysis for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore* (March 1999) (Volume II of this SA). Because of these comments, the following additions or corrections were made for the final Supplement Analysis. Environmental justice at Site 300 was added in Section 8, cumulative impacts of tritium emissions and cumulative impacts of water and electrical use by new facilities were added to Section 9, and consistency of units was incorporated into Section 6. Other editorial corrections were also made to the SA. In the final SA, changes resulting from public comment and editorial review are indicated by shading.

1.3 NEED FOR AND PURPOSE OF THE SUPPLEMENT ANALYSIS

Both the *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (*Code of Federal Regulations*, Title 40, Parts 1500–1508 [40 CFR Parts 1500–1508]), issued by the President's Council on Environmental Quality (CEQ), and DOE's *National Environmental Policy Act Implementing Procedures and Guidelines* (10 CFR Part 1021) provide direction on when an EIS should be supplemented. The regulations state that a supplemental EIS "shall be prepared if there are substantial changes to the proposal or significant new circumstances or information relevant to environmental concerns." If it is not clear whether a supplemental EIS is required, an analysis is to be prepared by which such a determination can be made. Such an analysis is called a supplement analysis (SA). According to 10 CFR 1021.314(c)(1 and 2), an SA shall "discuss the circumstances that are pertinent to deciding whether to prepare a supplemental EIS." It shall "contain sufficient information for DOE to determine whether: (i) an existing EIS should be supplemented; (ii) a new EIS should be prepared; or (iii) no further NEPA documentation is required."

DOE regulations require that sitewide EISs, such as the 1992 EIS/EIR, shall be evaluated at least every 5 years after issuance to determine whether a supplemental EIS is necessary (10 CFR 1021.330[d]). This SA examines the current project and program plans and proposals for LLNL and SNL operations to identify new or modified projects or operations or new information for the period from now to 2002 that was not available for consideration in the 1992 EIS/EIR. If such elements are found, they are examined to determine whether they could be considered substantial relative to the 1992 proposed action and the 1992 ROD. The determinations of whether changes are substantial are based upon analysis and review that establish whether any changes or new circumstances or information results in environmental impacts that exceed the bounds (or envelope) of the consequences of LLNL and SNL operations as presented in the 1992 EIS/EIR; and if the bounds are exceeded, whether the incremental environmental impacts identified in the SA are significant.

New and modified projects and proposals and new information not addressed in the 1992 EIS/EIR (as identified in Section 1.5) were considered in performing an initial screening of pertinent impact areas to determine whether a more detailed evaluation was justified. This screening analysis was performed for the environmental topics normally included in DOE EISs: air quality, water quality, noise, impacts under normal and accident conditions for radiological materials and hazardous materials, waste management, ecology (vegetation, fish, and wildlife), wetlands, special status species, socioeconomics, cultural and archeological resources, land use, transportation, environmental justice, and cumulative impacts.

The screening review was based on several criteria developed to help determine whether impacts of LLNL operations, considering this new information, would clearly remain within the envelope of environmental consequences established in the 1992 EIS/EIR (see also Section 1.6). These criteria were as follows:

1. Is the environmental baseline condition for an impact area the same as that described in the 1992 EIS/EIR?

2. Do the levels of activity or direct or indirect environmental release factors (e.g., release rate or quantity of material at risk), and thus the consequent environmental impacts, remain within the bounds established in the 1992 EIS/EIR?

3. Have there been any new regulatory requirements or revisions to DOE Orders and guidelines since issuance of the 1992 EIS/EIR that might change the conclusions regarding the significance of impacts?

4. Have there been any unanticipated institutional changes that are relevant to the 1992 EIS/EIR impact areas?

1.4 PROPOSED ACTION

The proposed action evaluated in the 1992 EIS/EIR was "the continued operation of LLNL and SNL, Livermore, including near-term (within 5 to 10 years) proposed projects." The proposed action included "[then] current operations plus programmatic enhancements and facility modifications pursuant to research and development missions established for the Laboratories by the Congress and the President." Activities included in the 1992 proposed action were related to site operations; defense-related research and development (R&D), including weapons development; technology development; energy research; biological and medical research; laser optics and inertial confinement fusion (including the National Ignition Facility [NIF]); nonproliferation verification and analysis; and environmental restoration and waste management.

Today, LLNL continues to operate within the general statement of action described in 1992, and the activities listed above are expected to continue. This conclusion is based on an evaluation of studies and plans such as major programmatic EISs that chart the course of programs within the DOE complex, the Waste Management Programmatic Environmental Impact Statement (WM PEIS) (DOE 1997b), the Stockpile Stewardship and Management (SSM) PEIS (DOE 1996b), and the Storage and Disposition PEIS (DOE 1996d); and LLNL plans, such as the Director's Statement — *Creating the Laboratory's Future* (LLNL 1997f) and the *LLNL Institutional Plan: FY 1998–FY 2002* (LLNL 1997b). These reports and plans create a picture of continuing development of existing core programs to meet changing national needs (Figure 1.1). Section 1.5 of this SA discusses whether the continuing development of such programs has resulted in new or modified projects and proposals or changes in environmental circumstances that should be evaluated in this SA.

SNL continues to operate within levels described in 1992. No significant new programs or projects have been proposed since 1992 or are planned for SNL for the near future. In fact, DOE discontinued the tritium operations at the Tritium Research Laboratory and completed its decontamination in 1996. Appendix A presents the information on the SNL component of this SA.

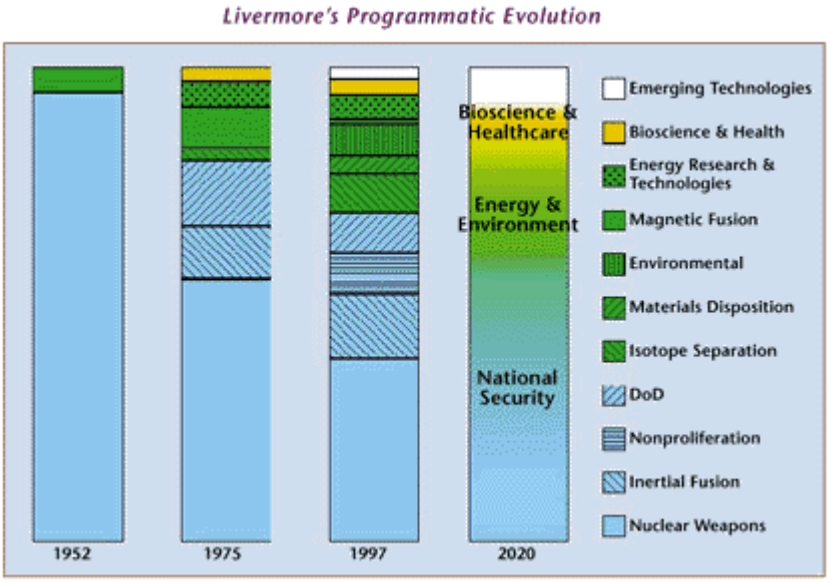

FIGURE 1.1 LLNL's Programmatic Evolution (Source: LLNL 1997f).

1.5 ELEMENTS OF LLNL OPERATIONS CONSIDERED IN THIS SUPPLEMENT ANALYSIS

For purposes of this SA, a number of sources and approaches were used to identify new or modified projects and proposals and new information not anticipated in the 1992 EIS/EIR for the years 1998 to 2002. These sources and approaches included the following:

- NEPA documentation and safety analyses prepared after issuance of the 1992 EIS/EIR were evaluated to determine whether the actions analyzed were included in the EIS/EIR and whether the impacts were within the bounds of those established in the EIS/EIR.

- Institutional and other plans were evaluated to identify major new proposals or projects that would be implemented within the 1998 to 2002 time frame.

- Changes in federal, state, and local regulations were identified.

- The 1997 EIS/EIR CEQA Addendum and other LLNL-related EISs, environmental assessments (EAs), and NEPA reviews were evaluated to identify new programs and projects expected from 1998 to 2002.

- Managers of operational units within LLNL (including facility, program, and area managers) and programmatic staff at DOE's Oakland Operations Office (DOE/OAK) were asked to identify any new proposals or projects proposed for the 1998 to 2002 time frame. They were asked to identify:

  – Ongoing actions that have been modified and proposals for new facilities;

  – Administrative limits proposals for nuclear materials that were not addressed in the 1992 EIS/EIR or that were modifications to the descriptions in the 1992 EIS/EIR;

  – Chemical inventory and management modifications; and

  – Waste generation and waste management modifications, including pollution prevention, decontamination and decommissioning, site cleanup, and upgrade of waste management facilities.

- Other environmental considerations were identified, including new information on the natural and human environment at LLNL and new areas of impact analysis now required for DOE NEPA reviews.

A master list of issue areas, projects, facilities, and new proposals compiled from these sources and approaches was circulated for review by facility, program, and area managers at LLNL and DOE/OAK. The list was also evaluated by LLNL and DOE environmental staff. The results are discussed below.

1.5.1 New and Modified Projects and Modified Ongoing Actions

Since issuance of the 1992 EIS/EIR, new projects beginning between 1992 and 1997 have been described and evaluated in EISs, EAs, and other NEPA-related documents. Plans for some of these projects have been modified from descriptions included in the 1992 EIS/EIR. In addition, new facilities have been proposed that have not yet been subject to NEPA review. Updated descriptions of ongoing, planned, and proposed activities are presented in the *LLNL Institutional Plan: FY 1998–FY 2002* (LLNL 1997b) and the *LLNL Comprehensive Site Plan — 1997* (LLNL 1997a). The most current and comprehensive descriptions of the existing LLNL infrastructure and missions, as well as specific ongoing programmatic activities, are also presented in these plans. These plans, plus the list of new projects and proposals prepared by LLNL and DOE/OAK managers, were compared against five screening criteria to develop a list of new and modified projects and modified ongoing actions considered reasonably realistic for implementation between 1998 and 2002. The five criteria were as follows:

- If a project or action was included in the 1992 EIS/EIR and had already been completed without major modifications, it was not considered.

- If a project or action cited in the 1992 EIS/EIR had been modified, as indicated in additional NEPA reviews or LLNL plans, it was considered.

- If a new or modified project or a recently modified ongoing action had been reviewed and approved or funded through the DOE planning process, it was considered.

- If DOE and LLNL managers considered that a new or modified project or modified ongoing action was likely to go forward within the next 5 years, it was considered.

- If a proposed project or action for LLNL originated from an alternative in a Programmatic EIS (PEIS), it was not considered. Examples include alternatives for LLNL assessed in the WM PEIS and the Surplus Plutonium Disposition PEIS. Preferred alternatives, such as siting the NIF at LLNL, assessed in the Stockpile Stewardship and Management (SSM) PEIS, were considered.

The application of these five criteria resulted in identification of 19 modified or new key projects to be addressed in this SA (Table 1.1). Proposed projects that are not yet funded were only included if there was considerable certainty that they would be funded in the near future and underway by 2002. Other new and modified actions also considered included administrative limits for radioactive materials, waste management practices, and other environmental considerations. These areas are highlighted separately from Table 1.1 in Sections 1.5.2 through 1.5.4.

1.5.2 Environmental Considerations

Since publication of the 1992 EIS/EIR, LLNL has continued to study and evaluate the environmental conditions of the site. The 1992 EIS/EIR anticipated that employment at LLNL would continue to grow as programs expanded. For a variety of reasons, however, employment at the Livermore site has declined by approximately 2,590 to the current 8,713, while employment at Site 300 has expanded by 47 to the current 247. Current projections are that overall LLNL employment will remain stable (DOE 1997a). Changes in employment are analyzed in Section 2.1.

The 1992 EIS/EIR specified monitoring and mitigation measures that have since been implemented. Those monitoring and mitigation measures have been described in annual monitoring reports. Several protected biotic species are now known to occur at the Livermore site (none was known to be there at the time the 1992 EIS/EIR was prepared). The discoveries of the California red-legged frog (federally listed threatened) and the white-tailed kite (state protected) at the Livermore site have necessitated consultation with the U.S. Fish and Wildlife Service (FWS) and the State of California, respectively, and mitigation measures have been developed to reduce the potential for adverse impact on these species from proposed projects. Additional sensitive resources have also been identified at Site 300. This new information is analyzed in Section 3.

The 1992 EIS/EIR described the wetland areas along the Arroyo Las Positas and concluded that groundwater remediation measures might lead to wetland expansion. Indeed, because of a series of wet years, the resulting wetland growth in the arroyo has reduced its capacity to contain a 100-year flood volume. LLNL has proposed that the vegetation clogging the arroyo be removed or controlled. This action would directly affect 20% of the wetland vegetation annually, and thereby reduce habitat value for the California red-legged frog, a federally listed threatened species. A Biological Assessment (BA) was prepared by DOE in 1997 and revised in 1998. A Biological Opinion (BO) was rendered by the FWS in 1997 and amended in 1998. This new information is analyzed in Section 4.

The 1992 EIS/EIR acknowledged that paleontological resources were known from areas within the Livermore Valley near LLNL. However, fossil mammal remains had not been found on the Livermore site. In December 1997, during excavation for the NIF, fossil bones of

TABLE 1.1 New or Modified Key Projects Considered in the Supplement Analysis

Location	Building	Status	Title of Project/Activity	Discussion
Livermore site	292	Funded/ underway	Expedited Technology Demonstration Project (ETDP)	The ETDP involves a molten salt oxidation (MSO) unit consisting of a liquid salt bath in a closed vessel. NEPA review is complete.
Livermore site	New buildings	Underway	National Ignition Facility (NIF) construction and operation	Discussed in 1992 EIS/EIR, modified proposal. Includes laser/target and optics assembly buildings in addition to NIF. Construction started in Fiscal Year (FY) 1997. Included in Appendix I of the SSM PEIS (DOE 1996b), and a Supplemental EIS is in preparation.
Livermore site	693 annex, 694, 695, 696, 697, 280	Funded/ underway	Decontamination and Waste Treatment Facility (DWTF)	Activity is discussed in 1992 EIS/EIR, except for modification of Bldg. 280 (Reactor Dome) to store radioactive and mixed waste. EA is complete (DOE 1996a).
Livermore site	Sitewide: 121, 511, 321, 141, etc.	Proposed, under way, complete	General building and infrastructure upgrades: (1) new Energy Program office building, (2) consolidation of offices, (3) building renovations, (4) general upgrade, (5) sitewide storm drain rehabilitation, and (6) infrastructure modernization	General building upgrades as necessary, beyond those envisioned in 1992. NEPA reviews are mostly complete.
Livermore site	151,154, 241	Proposed	Isotope Sciences Facility	Seismic upgrades, office addition, HVAC retrofit, or decontamination of selected buildings. NEPA review to be prepared.
Livermore site	321 complex	Proposed	Engineering Technology Complex Upgrade	Facility and equipment upgrade and consolidation for engineering functions, FY 2001 start. NEPA review to be prepared.
Livermore site	New building	Proposed	Sensitive Compartmented Information Facility (SCIF)	Renaming and relocation of proposed VISTA.[a] Discussed in 1992 EIS/EIR. Construction of new office building is proposed to begin in FY 2000 and be completed in FY 2002. NEPA review to be prepared.
Livermore site	New building	Proposed	Advanced Strategic Computing Initiative, Terascale Simulation Facility	New proposal. Multistory office building, construction to start in FY 2000 and be completed in 2003. NEPA review being prepared.
Livermore site	490	Proposed	Follow-on to U-AVLIS	Modified from 1992 EIS/EIR. Joint NEPA review by U.S. Enrichment Corporation (USEC) and DOE (Taimi 1999).

TABLE 1.1 (Cont.)

Location	Building	Status	Title of Project/Activity	Discussion
Livermore site	332/334	Funded	Mixed Oxide (MOX) Fuels	New research, development, and demonstration (RD&D) related to nonproliferation. Proposed administrative limit of 500 kg of enriched and 3,000 kg of natural uranium.
Livermore site	331	Funded	Army Tritium Recycle and NIF	Activities in support of other LLNL projects and programs. Administrative limit of 30 g of tritium.
Livermore site	239	Funded	Radiography	Activities in support of other LLNL projects and programs. Administrative limit of 25 kg of uranium and 6 kg of plutonium.
Livermore site	Sitewide	Proposed	Chlorofluorocarbon (CFC) Chiller Conversion	Modified from the 1992 EIS/EIR. Ongoing action to replace Freon. NEPA review complete.
Site 300	801	Funded/ underway	Contained Firing Facility (CFF)	Modified from the 1992 EIS/EIR. Impacts are addressed in Appendix J of the Stockpile Stewardship PEIS (DOE 1996b).
Site 300	809	Proposed	HE Press Installation	Modification to an existing building. NEPA review complete.
Site 300	845	Complete	Explosive Waste Treatment Facility (EWTF)	Activity is discussed in the 1992 EIS/EIR. Separate EA was also completed (DOE 1996c) expanding on the analysis in the EIS/EIR.
Site 300	816 M1-M5	Complete	Explosive Waste Storage Facility (EWSF)	Discussed in the 1992 EIS/EIR. Separate EA is complete (DOE 1995a).
Site 300	New building	Proposed	Fire Station and Medical Facility	Fire Station discussed in 1992 EIS/EIR, medical facility added. Construction is proposed for 1998/1999. NEPA review is complete.
Site 300	829	Complete	B-829 Closure and Cap	Work involved RCRA closure action associated with EWTF. NEPA review is complete.

[a] VISTA = Verification, Intelligence, and Special Technology Analysis.

mammoths and other species were found at the site. Those bones that would be destroyed by excavation were removed after the proper U.S. Department of the Interior (DOI) permit was obtained, and the fossils have been taken to the University of California Museum of Paleontology for curation. Measures have been taken to protect the remaining fossils in place. Any new discoveries would be managed in accordance with the mitigation measures identified in the 1992 EIS/EIR for prehistoric resources. This new information is analyzed in Section 5.

1.5.3 Administrative Limits

Examination of future program requirements by LLNL and DOE identified the need to modify certain radioactive material administrative limits established in the 1992 EIS/EIR. These changes are necessary for continued development of program areas and more efficient materials management. Changes in administrative limits are analyzed in Chapter 6.

The administrative limits evaluated in the 1992 EIS/EIR were achieved, except for the goal of reducing the plutonium limit for Buildings 332 and 334 of the Superblock from 700 to 200 kg. The inventory there was reduced by relocating approximately half of the excess material off-site; however, off-site DOE facilities were unable to accept all the materials and will be unable to accept additional material until after the year 2000. Excess plutonium remaining in Building 332 was packaged and is now being stored until DOE directs its shipment or further disposition (LLNL 1997a). DOE proposes that the 700-kg administrative limit for maximum plutonium stored in Building 332 be retained and that reduction remain a DOE goal. The same buildings also handle, use, and store uranium. The 1992 EIS/EIR evaluated a 300-kg administrative limit for uranium in Buildings 332 and 334. DOE proposes that this limit be modified to allow those buildings to contain 500 kg of enriched uranium and 3,000 kg of natural uranium. This material would be handled, used, and stored in Building 332. Building 334 would be used as a staging area for the mixed oxide (MOX) project; actual experiments would be conducted in Building 332. These changes in administrative limits support research, development, and demonstration (RD&D) of (1) plutonium immobilization as part of DOE's surplus plutonium disposition activities and (2) technologies for uranium conversion, reuse, waste management, and disposal.

The survey of LLNL programs also identified a need to increase the administrative limits for tritium in Building 331 from 5 to 30 g. The administrative limit for Buildings 298 and 391 is 5 g total between the two facilities. In addition, a need was identified to increase the administrative limits in Building 239 from 4.5 to 6 kg for plutonium and from 18.5 to 25 kg for uranium.

1.5.4 Waste Generation and Management

In addition to its scientific program activities, LLNL is continually involved in a wide range of infrastructure repair, improvement, and replacement projects, as well as site remediation and waste management projects related to regulatory compliance and stewardship of DOE lands. Since the 1992 EIS/EIR was issued, some programmatic changes have been implemented to reduce waste generation and move stored wastes to treatment. Several new programs have resulted in increased treatment and storage capacity, capability to more efficiently handle a greater variety of wastes, and an overall long-term reduction in waste generation and on-site storage. These programs include:

1. Implementation of the Site Treatment Plan,
2. Low-Level Waste Certification,
3. Legacy Waste Reduction,
4. Expedited Technology Demonstration Project (ETDP), and
5. Pollution Prevention Program.

Waste generation and management are analyzed in Section 7.

1.6 GENERAL ANALYSIS APPROACH

A four-step review and analysis approach was used in developing this SA. The steps can be summarized as follows:

1. Perform an initial analysis of new or modified projects or proposals, changed circumstances, and new regulations to determine, without further analysis, whether their combined environmental impacts, by impact area, clearly remain within the bounds or envelope of environmental consequences established in the 1992 EIS/EIR (i.e., adverse impacts are not more adverse than or beneficial impacts are not more beneficial than) (Section 1.3[1]). Document this analysis for impact areas meeting the screening criteria and thus requiring no further consideration (Section 2).

[1] The section numbers given in parentheses refer to the specific SA sections that pertain to the review and analysis steps.

2. Perform more detailed analyses of impact areas not passing the screening (step 1 above) to determine whether the combined impacts remain within the envelope of consequences established in the 1992 EIS/EIR (Sections 3–9).

3. For those impacts that are outside the envelope of consequences established in the 1992 EIS/EIR, determine whether the incremental change in environmental consequences is significant as defined in the CEQ NEPA regulations (40 CFR Part 1508.27) (Sections 3–9).

4. Conclude whether the envelope of consequences from operation of the site as a whole has been exceeded because of modified and new projects or new information; and, if exceeded, discuss whether these environmental impacts could be significant, as defined by 40 CFR 1508.17. On the basis of the overall review and analysis, conclude whether the 1992 EIS/EIR should remain as is, whether a supplemental EIS should be prepared, or whether a new EIS should be prepared (Section 10).

These steps included three decision points. The first (DP1 in Figure 1.2) occurs at the conclusion of the screening of impact areas. If impacts within an impact area are not likely to exceed the envelope of consequences established in the 1992 EIS/EIR, the SA for that impact area is concluded without further review and detailed analysis, and no supplementation was needed.

Those impact areas with a greater potential to exceed the envelope of consequences established in the 1992 EIS/EIR receive a more detailed examination. The second decision point (DP2 in Figure 1.2) occurs at the end of that additional analysis. If the impacts for a particular impact area are judged likely to be within the envelope of consequences established in the 1992 EIS/EIR, no supplementation is needed.

If the environmental impacts determined by the detailed analysis are judged likely to be outside the envelope of consequences established in the 1992 EIS/EIR, these impacts are compared with those from the 1992 analysis to determine whether any differences are substantial and could be considered to be significant within the context of NEPA (40 CFR Part 1508.27). If the incremental impacts within an impact area are beyond the envelope of consequences established in the 1992 EIS/EIR but are less than significant (or would be mitigated to be less than significant under the existing mitigation program), no further supplementation is needed. If the incremental impacts are significant, supplementation of the 1992 EIS/EIR to assess those impacts is required. If the new and modified projects and modifications to ongoing actions are such that the 1992 proposed action of continued operations and the laboratory's mission are no longer valid, then a new EIS is required. Note that regardless of the determination provided in this SA, all new proposals are evaluated individually by DOE for potential environmental impacts as they become appropriate for NEPA review.

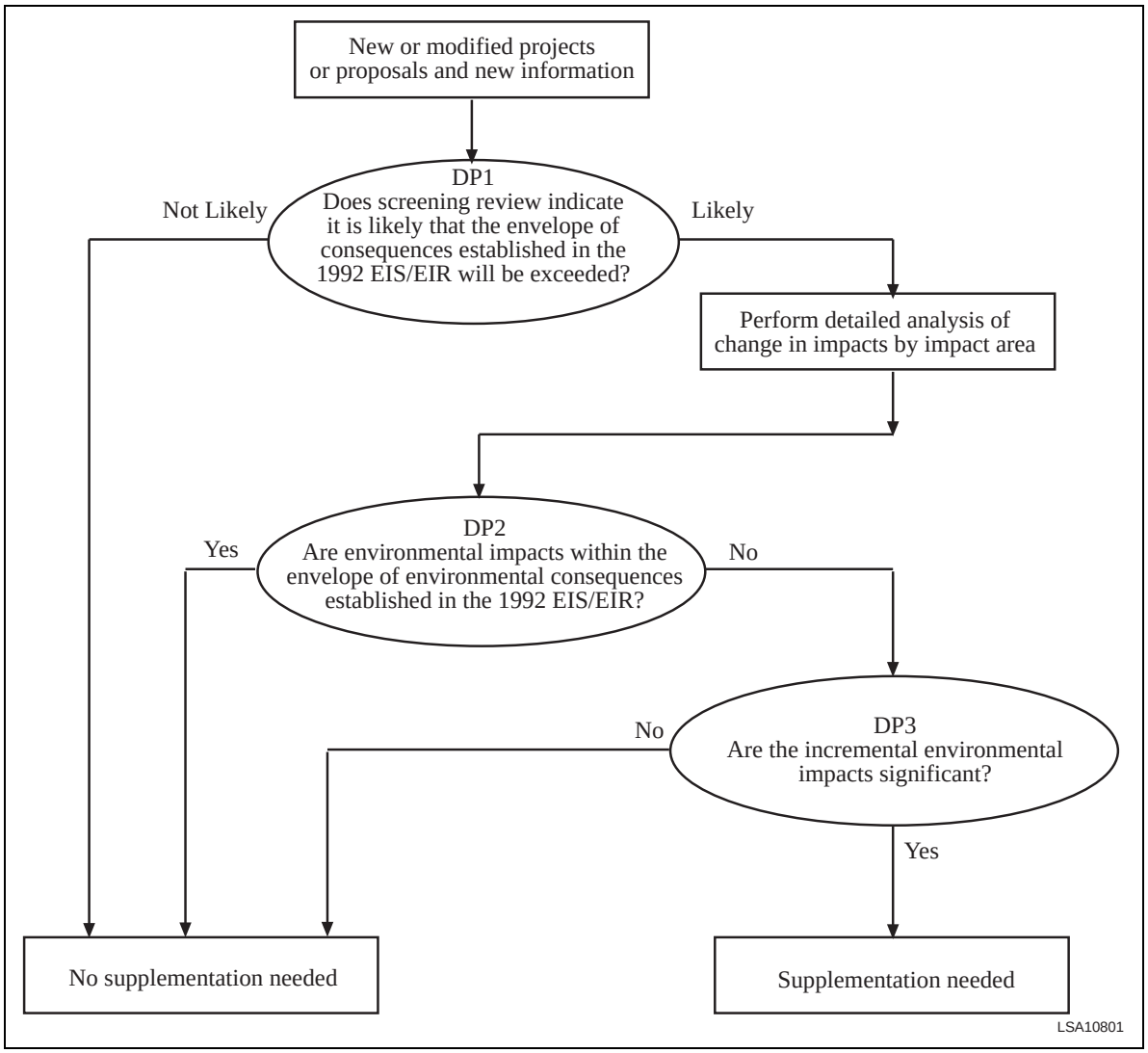

FIGURE 1.2 General Analysis Approach (Note: "DP" stands for Decision Point.)

1.7 DETERMINATION OF IMPACT AREAS FOR DETAILED ANALYSIS

On the basis of the criteria listed in Section 1.3, the potential environmental impacts in the following impact areas were judged to still be within the bounds of the 1992 EIS/EIR: air quality, noise, water quality, hazardous materials, ecology (vegetation, fish, and wildlife), cultural and archeological resources, land use, transportation, socioeconomics, and community services. The reasons for these conclusions are presented in Section 2. The following seven areas were judged to require a detailed analysis for the reasons indicated:

1. *Sensitive Species*: New habitats for special status species and new special status species have been identified (Criterion 1 in Section 1.3); newly

proposed activities may affect these species or their habitats (Criterion 2); and the listing status of several species has changed (Criterion 3).

2. *Wetlands*: Proposed maintenance of floodway along Arroyo Las Positas would result in potential impacts to protected species that are newly discovered at LLNL (Criteria 1 and 2).

3. *Paleontological Resources*: Potential impacts to paleontological resources by future actions were not anticipated in the 1992 EIS/EIR (Criterion 1).

4. *Radiological Consequences of Accidents*: Further analysis is needed to determine whether new or modified projects and/or procedural and operational modifications that require increases in administrative limits would add additional consequences or risk from accidental releases (Criterion 2).

5. *Waste Generation and Management*: Further analysis is needed to determine whether modifications in waste management practices and resulting waste generation could increase impacts associated with waste generation (Criterion 2).

6. *Environmental Justice*: The Executive Order directing agencies to consider environmental justice issues was issued after publication of the 1992 EIS/EIR. This topic is now included in DOE NEPA evaluations (Criterion 3).

7. *Cumulative Impacts*: Whether cumulative impacts in the above six impact areas remain within the bounds of the 1992 EIS/EIR could not be determined until additional analysis was completed (Criterion 2).

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2 IMPACT AREAS NOT REQUIRING FURTHER ANALYSIS

Without further analysis, the potential impacts of new and modified projects and modifications to ongoing operations are judged to be minimal and within the bounds of the 1992 EIS/EIR (DOE 1992) in the following impact areas: air quality, noise, water quality, ecology (vegetation, fish and wildlife), hazardous materials, cultural resources, land use, transportation, socioeconomics, and miscellaneous areas. These impact areas met the screening criteria described in Section 1.3. For each of these impact areas, the 1992 EIS/EIR remains an adequate description of potential LLNL sitewide impacts for the years 1998 to 2002, and no supplementation of the 1992 EIS/EIR is needed.[1]

The reasons for eliminating these impact areas from detailed analysis are discussed below. The following subsections first describe the environmental conditions and impacts evaluated in the 1992 EIS/EIR for each of these impact areas. Next, any new information on impacts of operations and site conditions related to events during the years 1992 to 1997 is presented. Then, the relevant activity level or direct or indirect release terms associated with new and modified proposals and changed circumstances for the period 1998 to 2002 are described, including the potential consequences of new and proposed actions. These impacts are then compared with the consequences projected in 1992.

2.1 SOCIOECONOMICS

The socioeconomic environment of LLNL, including employment, population, housing, economic factors, and community services, as described in the 1992 EIS/EIR (DOE 1992), was based on an expectation for continued growth in the LLNL workforce. Employment was assumed to grow by 20% from 1992 to 2002, increasing the Livermore site workforce by about 2,000 and the Site 300 workforce by about 50. The 1992 EIS/EIR concluded that these increases would have a beneficial impact on employment in the two affected counties, increasing housing demand and employment income and expenditures in the region. The region of influence included Alameda and San Joaquin Counties, particularly the City of Livermore (near the Livermore site) and the City of Tracy (near Site 300).

Since publication of the 1992 EIS/EIR, however, employment at the Livermore site has decreased from a peak of about 11,200 workers in 1989 (DOE 1992) to 8,718 in 1996. From 1992 to 1996, Site 300 employment, on the other hand, grew from 200 to 247 workers (UC 1997).

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[1] Sections 3-9 contain more detailed analyses for impact areas that did not pass the screening criteria described in Section 1.3, thus requiring further analysis.

Socioeconomics

- 1992 EIS/EIR: Socioeconomic impacts were assessed on the basis of an assumed 20% increase in employment from the years 1992 to 2002, potentially increasing the Livermore workforce by 2,000 to 13,200 and the Site 300 workforce by 50 to 250.
- 1992–1997: By 1996, employment at the LLNL site declined to 8,718, and employment at Site 300 increased by 47 to 247.
- 1998–2002: Employment and payroll are expected to remain stable. Any variations in LLNL employment and payroll would be very small compared with projected increases from 1995–2005 in employment (890,000) and annual personal income ($101,400 million) in this strong economic region. Supplementation of the EIS/EIR for socioeconomics is not needed.

New and modified projects and modifications in site operations that are likely to be implemented at LLNL through the year 2002 may not completely reverse the trend of a gradually declining workforce at LLNL. For the site as a whole, current employment is expected to remain stable. During the same period, payroll is also expected to remain stable. Variations in employment and payroll should be very small compared with expected increases in the regional civilian labor force (890,000) and annual personal income ($101,400 million) in the LLNL region between 1995 and 2005 (DOE 1996b). Because the possible variations in LLNL workforce and payroll are very small compared with expected regional economic growth, a change from an increase in workers (1992 EIS/EIR) to a stable workforce would have little influence on regional socioeconomic trends. Thus, supplementation of the EIS/EIR with respect to socioeconomics is not needed.

2.2 AIR QUALITY

2.2.1 Criteria Pollutants

The 1992 EIS/EIR air quality evaluation projected minor increases in emissions of criteria air pollutants, assuming a 9% increase in LLNL point source emissions (on the basis of increase in LLNL facility floor space) and a 20% increase in LLNL mobile source emissions (on the basis of projections of the number of employees and assuming that the increase in vehicle traffic to, from, and on the site would be proportional to the increase in workforce). Only projected increases in emissions of volatile organic compounds (VOCs; ozone precursors) and PM_{10} (particulate matter with aerodynamic particle diameter equal to or less than 10 μm) were considered significant in the EIS/EIR. Even though increases in ambient ozone and PM_{10} concentrations due to LLNL operations were projected to be small, they were considered in the 1992 EIS/EIR to be significant because the area was classed in the nonattainment category for those pollutants (i.e., exceeded air quality standards).

Air Quality: Criteria Pollutants

- 1992 EIS/EIR: Air quality impacts were projected to increase in proportion to assumed increases in new facility space and employment.
- 1992–1997: Mobile sources likely decreased in proportion to decreased site employment. Emissions from stationary sources likely did not reach predicted levels because of facility cancellation or postponement. New federal primary standards for $PM_{2.5}$ and ozone were released in 1997.
- 1998–2002: Emissions resulting from new and proposed projects and anticipated workforce levels are expected to remain within the 1992 EIS/EIR projections. California regulations already encompass protective intent of new regulations. Supplementation of the 1992 EIS/EIR for criteria pollutants is not needed at this time.

After 1992, neither building square footage nor employment increased to the extent envisioned in the EIS/EIR. As described in Section 2.1, employment decreased at the Livermore site, and 70% of the expected increase in square footage of facilities was cancelled or delayed beyond the year 2002. At Site 300, 17% of the projected increase in square footage of facilities was likewise cancelled. Thus, during the period 1992 to 1997, both stationary and mobile criteria emissions at LLNL should have decreased relative to the 1992 assessment.

On July 18, 1997, the U.S. Environmental Agency (EPA) promulgated new federal air quality standards for ozone and for particulate matter with aerodynamic particle diameter equal to or less than 2.5 μm ($PM_{2.5}$). Currently, the State of California does not have a separate $PM_{2.5}$ standard; the primary federal standard is 50 $\mu g/m^3$ (24-hour) and 15 $\mu g/m^3$ (annual arithmetic mean). The State of California and local air quality boards are in the process of establishing monitoring stations by 1999 and will develop implementation plans by the middle of the next decade.

From 1998 to 2002, air emissions from mobile sources related to employment level at LLNL are expected to remain below the levels assumed for the 1992 EIS/EIR because employment will remain well below levels projected in that document.

From 1998 to 2002, air emissions from stationary sources will likely remain at or below the 1992 EIS/EIR projections. The square footage of new key facilities that will be operational by 2002 (Table 1.1) will remain at or below the value assessed in the 1992 EIS/EIR. The approximately 225,000 ft^3 of new key facilities or facility modifications included in Table 1.1 will not exceed the approximately 320,000 ft^3 of facilities covered in the 1992 EIS/EIR that were either cancelled or postponed beyond the year 2002.

The NIF, a facility of 445,000 ft^3, will be under construction from now through 2002. The impacts of PM_{10} releases from construction of NIF have been assessed in Appendix I of the *Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management* (SSM PEIS) (DOE 1996b). On some days during the month when the NIF site is being cleared, fugitive dust emissions may moderately impact air quality at or near the

Livermore site boundary. This assessment is consistent with that in the 1992 EIS/EIR, which similarly predicted short-term impacts from fugitive dust emissions due to construction activities. This impact was judged significant in the 1992 EIS/EIR. The construction of NIF is consistent with this assessment.

Because employment and operational square footage of facilities would remain at or within the EIS/EIR bounds, and because NIF construction would have impacts consistent with those assessed in the 1992 EIS/EIR, no supplementation of the EIS/EIR is needed.

2.2.2 Other Releases to the Air

As reported in the 1992 EIS/EIR, the public exposure cancer risk for the surrounding community from releases to the air of hazardous materials at the Livermore site was assessed as being less than 1 in 1 million. The noncarcinogenic risk (expressed as a hazard index) from these same chemicals was less than 1. The maximum carcinogenic and noncarcinogenic risks for the Livermore site were below the level of concern established by the California Air Pollution Control Officers Association. For Site 300, the emission of hazardous air contaminants, controlled under the Air Toxics "Hot Spots" Information and Assessment Act (AB 2589), estimated from open burning source sampling at the "Iron Horse" was small and did not require a risk assessment by the San Joaquin Valley Unified Air Pollution Control District (McVaigh 1995). The 1992 EIS/EIR assumed that the future increase in other air pollutants above baselines would be comparable to the percentage increase in the square footage of facilities (9%). The EIS/EIR concluded that the public and workers would be exposed to approximately the same level of risks from hazardous and toxic substances as they would under the 1992 baseline conditions. The basis given for this conclusion was that projected increases in use of hazardous and toxic substances and associated risk would be offset by improvements in facility administration and control. The EIS/EIR stated that releases would remain below the California Air Resources Board threshold level and were, therefore, considered less than significant.

Air Quality: Other Releases

- 1992 EIS/EIR: Releases of air pollutants other than criteria pollutants would increase by 9%, on the basis of assumed increases in facility square footage, but would remain below threshold levels.
- 1992–1997: Releases of these other air pollutants remained within 1992 projections, except for formaldehyde in 1994. The federal government now requires that releases of Freon-113 be reported.
- 1998–2002: New and proposed facilities have releases that do not pose unacceptable health risks. Because square footage of new facilities will not exceed levels predicted in 1992, releases of other air pollutants are also not expected to exceed 1992 predictions. Supplementation of the EIS/EIR for other pollutants is not needed at this time.

Since the 1992 EIS/EIR was issued, formaldehyde emissions exceeded 1992 baseline values only in 1994. Current emissions are well within (14% of) 1992 baseline values (UC 1997). Since 1992, the EPA has developed procedures for determining reportable releases of noncriteria air pollutants. For LLNL, the only chemicals required to be reported on the EPA Toxic Chemical Release Inventory form are 1,1,2-trichloroethane and 1,2,2-trifluoroethane (Freon-113). All other releases are below reportable limits. This is a reduction in the number of reportable releases since 1992.

For the period 1998 to 2002, the square footage of facilities listed in Table 1.1 that will be operational by 2002 will remain at or below the square footage assessed in the 1992 EIS/EIR. Approximately 225,000 ft^3 of new facilities or facility modifications will not make up for the approximately 320,000 ft^3 of facilities covered in the 1992 EIS/EIR that were either cancelled or postponed beyond the year 2002. To the extent that emissions of other air pollutants are a function of square footage of facilities, impacts should remain within the bounds of the 1992 EIS/EIR.

Modeling analyses in the EAs related to the EWTF (DOE 1995a) and DWTF (DOE 1996a) indicated that operations of those facilities would not pose unacceptable chemical health risks to site personnel or the public and would be below state-accepted exposure levels. No impacts from hazardous chemicals are anticipated from routine NIF or CFF operations (DOE 1996b). Releases of noncriteria pollutants, hazardous air pollutants, and toxic chemicals are expected to be less than those anticipated in the 1992 EIS/EIR. Thus, no supplementation of the 1992 EIS/EIR for these releases is needed.

2.3 NOISE

The 1992 EIS/EIR identified the principal sources of noise at LLNL as vehicle traffic; mechanical equipment; building construction, repair, and demolition; research and testing involving high explosives at Site 300; and use of the firearms ranges at Site 300. Outdoor testing of high explosives was described as the main source of off-site noise at rural and remote locations near Site 300. The 1992 EIS/EIR projected a decrease in noise because of an expected decrease in the number of tests of high explosives at Site 300.

Since 1992, no major new noise sources have been added to LLNL, either at the main site or at Site 300. Testing of high explosives at Site 300 has remained stable. Noise generated by worker vehicular traffic may have decreased in Livermore and may have increased near Site 300 because of workforce decreases at the former and increases at the latter. The increase in the workforce at Site 300 is within the projections contained in the 1992 EIS/EIR. Since 1992, local noise guidelines and standards have been implemented in the land use plans of communities adjacent to the Livermore site and Site 300: the City of Livermore (1996a-b), the Alameda County's East County Region (County of Alameda 1994), the City of Tracy (1993), and the County of San Joaquin (1992). These plans and associated noise elements are generally

consistent with previously adopted guidelines and standards (UC 1997).

Noise

- 1992 EIS/EIR: Noise sources, including high-explosive testing at Site 300, were projected to decline in proportion to projected decreases in testing.
- 1992–1997: Traffic noise levels declined at Livermore and increased at Site 300 because of changes in sizes of workforces. Noise from testing at Site 300 remained stable and within historical limits. Noise elements of new local and county plans remained consistent with those described in the EIS/EIR.
- 1998–2002: Off-site noise from high-explosives testing at Site 300 may decline when some tests are moved indoors to the CFF. Noise from worker traffic is expected to be stable, but construction traffic could increase noise for short periods. These impacts are within the bounds of the 1992 EIS/EIR. Supplementation of the EIS/EIR for noise is not needed.

New and proposed projects likely to be implemented at LLNL include the CFF at Site 300, which will provide containment for some explosive tests presently conducted in the open. This facility may be in operation before the year 2002. If so, this and other efficiencies and improvements in facilities used for high-explosives testing could reduce impacts from noise sources at Site 300 over the long term. Noise from worker vehicular traffic at both sites is expected to remain stable as a result of stable employment (see Section 2.1). Construction of the NIF and other facilities may at times cause temporary increases in local truck traffic at the Livermore site. Intermittent construction-related noise was included in the 1992 EIS/EIR analysis. Changes in worker-related and construction-related noise are considered to be within the bounds of the 1992 EIS/EIR; therefore, no supplementation of the EIS/EIR is needed with respect to noise impacts.

2.4 WATER QUALITY

The 1992 EIS/EIR concluded that continued operation of LLNL would result in minor and insignificant impacts to surface and groundwater quality. New facilities were projected to create slightly increased stormwater runoff and very slightly decreased groundwater recharge.

Annual monitoring data collected since 1992 show no substantial changes to surface water quality (LLNL 1993, 1994a, 1995a, 1997d). Groundwater quality has been improved by ongoing remediation activities (UC 1997). Groundwater investigations indicate that buried PCB-containing capacitors discovered at the NIF construction site did not result in measurable groundwater contamination (DOE 1998a).

New and proposed activities at LLNL through the year 2002 should not result in increases in stormwater runoff because the increase in facility square footage would be comparable to that projected in the 1992 EIS/EIR. NIF construction would not impact water quality. Ongoing and proposed remediation activities through the year 2002 would continue to improve groundwater quality. No supplementation of the EIS/EIR with respect to water quality is needed.

Water Quality

- 1992 EIS/EIR: Minor and insignificant impacts to surface water and groundwater quality were projected.
- 1992–1997: No changes in surface water quality have been noted. Groundwater quality has improved as a result of remediation.
- 1998–2002: Changes in stormwater runoff for this period are expected to be comparable to those assessed in the 1992 EIS/EIR. Continued improvement in groundwater quality as a result of remediation is expected. Supplementation of the EIS/EIR for water quality is not needed at this time.

2.5 ECOLOGY (VEGETATION, FISH, AND WILDLIFE)

The 1992 EIS/EIR assessed the impacts on biotic resources, other than sensitive species (see Section 3), on the basis of projected increases in building square footage for the Livermore site (9% increase) and Site 300 (6% increase). Habitats affected at the Livermore site were described as grasslands composed of introduced species, lawns, and weedy areas. Wildlife species at the Livermore site, other than those of special status (see Section 3), include species typical of developed suburban areas and marginal habitats. Site 300, which is largely undeveloped, contains a high diversity of vegetation and wildlife, including components associated with seeps and springs, grasslands of native and introduced species, and scattered scrub and woodland habitats. The 1992 EIS/EIR identified disturbance from construction as the predominant impact on vegetation and wildlife. In addition, controlled burning at Site 300 to protect against accidental grass fires was assumed to continue.

Ecology

- 1992 EIS/EIR: Growth of facilities at the Livermore site (9%) and Site 300 (6%) was expected to proportionately disturb vegetation and wildlife.
- 1992–1997: No changes in vegetation or wildlife were noted; surveys identified additional species and habitats, providing for improved protection and mitigation.
- 1998–2002: Construction of NIF would not raise site development above levels described in the 1992 EIS/EIR. This disturbance would impact low-quality habitats, and the ecological character of the Livermore site would remain as described in the 1992 EIS/EIR. Supplementation of the EIS/EIR in the area of ecology is not needed at this time.

Since publication of the 1992 EIS/EIR, no substantial changes have occurred in the vegetation of either the Livermore site or Site 300. Anticipated growth in building square footage has not been realized to the extent originally predicted (see

Section 2.2), and controlled burning of Site 300 continues. Biotic surveys conducted at both locations since 1992 have provided additional information on plant communities and their distribution, a potential environmental benefit that assists in application of protection and mitigation measures when necessary. Impacts to vegetation and wildlife from 1992 to 1997 are presumed to have been less than predicted in the 1992 EIS/EIR because the growth of site facilities was less than assumed (see Section 2.2).

New and proposed projects at LLNL include the NIF (DOE 1996b), which would disturb 3% of the Livermore site area. However, this and other site development would affect low-quality habitats, would not change the character of vegetation or wildlife, and would remain as described in the 1992 EIS/EIR. No supplementation of the EIS/EIR with respect to vegetation or wildlife is needed at this time.

2.6 HAZARDOUS MATERIALS

To assess potential impacts from accidental releases of toxic chemicals, the 1992 EIS/EIR evaluated chemical accident scenarios using the Complex Hazardous Release Model (CHARM, version 6.1[2]). The six chemicals evaluated were chlorine gas, sulfuric acid mist, hydrogen chloride gas, hydrogen cyanide gas, ammonia gas, and arsine. Results of the analyses indicated that three of the accidents considered would produce off-site hazardous material air concentrations in excess of Emergency Response Planning Guide (ERPG)-2 levels.[3] A release of 100 lb of chlorine during a handling accident at Building 518 was considered to be the bounding accident scenario. Airborne concentrations of chlorine from such an accident might exceed ERPG-2 levels at distances of up to 4.1 km from the site boundary.

Since the 1992 EIS/EIR was published, the safety analysis reports (SARs) have been updated for a number of facilities, including Building 332 (the Plutonium Facility) and Building 331 (the Tritium Facility). In addition, an SAR was prepared for the proposed NIF. Preliminary hazard analyses were updated for Building 197 (the Physics and Space Technology

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[2] The current version of CHARM is 8.0, which incorporates major revisions to the model's source terms.

[3] The various ERPG levels are defined as follows:

ERPG-1: The maximum airborne concentration above which it is believed nearly all individuals exposed for up to 1 hour could experience some mild transient adverse health effects or detect a clearly defined objectionable odor.

ERPG-2: The maximum airborne concentration above which it is believed nearly all individuals exposed for up to 1 hour could experience or develop irreversible or other serious health effects or symptoms that could impair their ability to take protective action.

ERPG-3: The maximum airborne concentration above which it is believed nearly all individuals exposed for up to 1 hour could experience or develop life-threatening health effects.

Semiconductor Research and Development Facility) and Building 298 (the Inertial Confinement Fusion Target Development Facility). In addition, EAs were prepared for the EWSF, DWTF, and EWTF (DOE 1995a, 1996a, 1996c). Accidents evaluated for these facilities included operator error, spills, airplane crashes, seismic events, and explosions. The only chemical accident scenario that would exceed an ERPG-2 concentration beyond the LLNL boundary (0.04 km or 400 m away) would be a chemical spill at the DWTF. This scenario presents less risk to the public than the bounding accident evaluated in the EIS/EIR.

Accidental Release of Hazardous Materials

- 1992 EIS/EIR: A chlorine-handling accident might result in ERPG-2 exceedances at distances of up to 4.1 km from LLNL.
- 1992–1997: Updated safety analysis reports (SARs) for new and proposed facilities indicated releases might exceed ERPG-2 levels 0.4 km (400 m) away from the site boundary, which is a reduction in the risk to the public that was identified in the EIS/EIR.
- 1997–2002: Expected risks from accidental releases of hazardous chemicals would be within the bounds of the EIS/EIR and subsequent SARs. Supplementation of the EIS/EIR for accidental release of hazardous materials is not needed.

On June 20, 1996, the EPA promulgated regulations for prevention of accidental releases of hazardous substances under Section 112(h) of the Clean Air Act Amendments. Facilities with chemical inventories exceeding specified "threshold quantities" at "covered processes" are required to prepare a Risk Management Plan (RMP). Review of current chemical inventories at LLNL in the ChemTrack database confirms that none of the chemicals listed in 40 CFR 68.130 are present in quantities that require the preparation of an RMP for LLNL. In fact, "listed" chemical quantities at a process (e.g., building) or connected process are less than 20% (i.e., hydrofluoric acid) of the regulated chemicals threshold quantity that would trigger the preparation of an RMP. Most of the listed chemicals in the ChemTrack database are in very small quantities (much less than 1% of the chemical-specific threshold quantity).

For the period 1998 to 2002, no new facilities are proposed that are anticipated to pose risks from releases of hazardous materials greater than those identified in the 1992 EIS/EIR. Therefore, no supplementation of the EIS/EIR is needed at this time for accidental hazardous materials releases.

2.7 CULTURAL RESOURCES

The 1992 EIS/EIR addressed impacts to prehistoric and historic cultural resources. At that time, no prehistoric cultural resources were known to occur at the Livermore site, and an evaluation of historical cultural resources had just been completed. At Site 300, no prehistoric cultural resources were known from the potentially affected areas. The 1992 EIS/EIR concluded for both sites that impacts to prehistoric cultural resources were unlikely and that impacts to

important historical resources would occur, but would be at less than significant levels. Because previously unknown prehistoric cultural resources might be encountered, mitigation measures were specified for educating workers and contractors, notifying appropriate site organizations, and consulting with state and federal authorities.

Cultural Resources

- 1992 EIS/EIR: Impacts to prehistoric cultural resources would be unlikely, and impacts to historic resources would be less than significant. Measures for protection of unknown resources were specified.
- 1992–1997: No new prehistoric or historic cultural resources were identified. A Draft Programmatic Agreement between DOE and the SHPO and ACHP regarding cultural resources management was developed and is in final review.
- 1998–2002: Impacts of future activities are expected to be as projected in the 1992 EIS/EIR. Supplementation of the EIS/EIR for cultural resources is not needed.

In 1994, consultation was begun with the California State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) to develop a Programmatic Agreement with the DOE Oakland Operations Office. This agreement, which is in draft form, would also guide in the development of a cultural resources management plan and program for LLNL.

During the period 1992 to 1997, no new prehistoric cultural resources of significance were discovered at either the Livermore site or Site 300. Therefore, construction activities for projects listed in Table 1.1 for the years 1998 to 2002 are not expected to impact such resources. Impacts to historic structures could occur during building and site upgrades; however, these resources would be protected pursuant to the measures identified in the 1992 EIS/EIR. Any previously unknown prehistoric cultural resources discovered during excavation would also be protected pursuant to the measures identified in the 1992 EIS/EIR. These potential impacts are as described in the 1992 EIS/EIR. For these reasons, no supplement of the EIS/EIR for prehistoric and historic resources is needed.

2.8 LAND USE

LLNL has been operated as a federal research and development laboratory for more than 40 years. Access to the site is limited by a barbed-wire security fence and buffer zone at the Livermore site and by entrance gates at Site 300. The 1992 EIS/EIR addressed the uses of LLNL, identified the consistency of LLNL use with then-existing land use plans, and concluded that continued operation of LLNL would not change the use of the site nor create any new land use impacts. It was acknowledged, however, that growth of the surrounding community was placing suburban and industrial development closer to the site boundaries.

During the period 1992 to 1997, county and local government units developed new land use plans and zoning regulations (City of Livermore 1996a-b; City of Tracy 1993; County of Alameda 1992, 1994; County of San Joaquin 1992, 1996). Where applicable, these plans acknowledge the continued use of the LLNL site for federal research and development. The City of Tracy has designated an area of very-low-density housing near the eastern and northern boundaries of Site 300. Plans in 1997 limited development from the City of Tracy to no closer than 1.5 mi from the Site 300 boundary. It is uncertain whether this area near the Site 300 boundary would be developed within the next 5 years.

Land Use

- 1992 EIS/EIR: Use of LLNL as a federal research and development facility was expected to remain consistent with existing land use plans and guidelines; suburban and industrial development was expected to continue to increase near LLNL.
- 1992–1997: New land use plans and zoning regulations were issued by county and local governments; use of LLNL for research and development remained consistent with those plans.
- 1998–2002: New and proposed projects should not change the nature of the use of the LLNL site; development will continue to increase near LLNL boundaries. Supplementation of the EIS/EIR for land use is not needed.

New and proposed projects at LLNL should not change the designated use of the LLNL site. New land use plans take into account the continued use of both the Livermore site and Site 300 for federal research and development. New commercial and residential development will continue to increase near the LLNL site boundaries. These conditions are consistent with those analyzed in the 1992 EIS/EIR; therefore, no supplementation of the EIS/EIR with respect to land use is needed at this time.

2.9 TRANSPORTATION

2.9.1 Employee Vehicles

The 1992 EIS/EIR evaluated the contribution of the LLNL workforce to peak-flow traffic congestion in the surrounding community. Both LLNL and the local community had plans to upgrade roadways and improve traffic conditions. These actions included local road widening, resurfacing, installation of traffic signals, and

Transportation: Employee Vehicles

- 1992 EIS/EIR: Transportation system upgrades were planned. An increasing site workforce was expected to increase LLNL's contribution to peak-flow traffic congestion in the surrounding community.
- 1992–1997: Transportation system upgrades at the site were completed; the declining workforce decreased LLNL's contribution to peak traffic flow in the surrounding community.
- 1998–2002: Employment would remain essentially stable, resulting in a stabilizing site contribution to traffic congestion and peak traffic flow in the surrounding community. Supplementation of the EIS/EIR for transportation is not needed at this time.

improvement of LLNL site entrances. Gradual improvement was expected to continue through 2002. Public transportation improvements in the region included an extension of the Bay Area Rapid Transit line to the nearby communities of Dublin and Pleasanton. The transportation analysis in the EIS/EIR was based on the assumption that the LLNL workforce would increase by 20% within a 10-year period.

As discussed in Section 2.1, employment from 1992 to 1997 actually declined. This meant that although LLNL continued to be a major contributor to traffic flow at peak periods, the effect from 1992 to 1997 was less than anticipated.

From 1998 to 2002, the size of the LLNL workforce is expected to remain stable. This trend will result in continuation of reduced traffic congestion from LLNL workers and a stable contribution by LLNL workers to peak traffic flows in the community. The transportation impacts of LLNL will remain within the bounds of the 1992 EIS/EIR. No supplementation of the EIS/EIR with respect to employee vehicle impacts on transportation is needed at this time.

2.9.2 Material and Waste Transportation

The 1992 EIS/EIR concluded that increased use of hazardous or radioactive materials would result in an increased number of shipments of such materials to and from LLNL, but that this increase would not cause a significant impact. This conclusion was based on an expected 9% increase in facility area and planned reduction in the plutonium administrative limit. The 1992 EIS/EIR also acknowledged that packaging requirements of the U.S. Department of Transportation (DOT) and the California Department of Transportation (CDOT) for shipping hazardous and radioactive materials would ensure that no standards of significance were violated.

For the period 1992 to 1997, facility square footage did not increase to the extent expected in 1992 because of project cancellation or delays (see Section 2.2). In addition, only partial quantities of excess plutonium inventory were shipped off-site (see Section 1.5.2), and quantities of chemicals at LLNL declined by over 50% (DOE 1997b). These factors imply reduced shipment of these materials. During this period, low-level waste was certified for

Transportation: Materials and Wastes

- 1992 EIS/EIR: Increase in shipments of materials would have less than significant impacts. DOT and CDOT regulations would ensure that no standards of significance were violated.
- 1992–1997: Some factors related to shipment declined, others increased. Analyses of transportation of radiological materials indicate very low risk to workers and the public.
- 1998–2002: Shipment of wastes are expected to decline. Shipment of radiological materials may increase, but, because of the DOT and CDOT requirements, with no increase in risk to workers or the public. Impacts would be substantially similar to those analyzed in the 1992 EIS/EIR. No supplementation of the 1992 EIS/EIR for transportation of materials and wastes is needed.

shipment off-site, which implies shipment. Several extensive analyses of the shipment of radiological materials demonstrated that such shipments pose very low risks to the public. These studies included the SSM PEIS (DOE 1996b), the Storage and Disposition PEIS (DOE 1996d), and the WM PEIS (DOE 1997b).

A hazard assessment of transportation accidents is being prepared in support of emergency planning at LLNL (Hildum 1999). Container accidents involving spills for on-site transport of chemicals controlled under SARA Title III (40 CFR 355) were analyzed with the Emergency Prediction Information model (EPIcode). The LLNL ChemTrack database, along with a screening procedure using modeling results and the 40 CFR 355 Threshold Planning Quantities, was used to identify maximum chemical transit quantities. This screening produced five chemicals with shipment quantities ranging from 110 lb (hydrogen fluoride) to 844 lb (sulfuric acid). The modeling results showed ERPG-2 hazard distance ranging from less than 30 m (sulfuric acid) to 850 m (ammonia). The maximum impact from the ammonia spill was less than or equal to the impact from the bounding accident assessed in the 1992 EIS/EIR.

For the period 1998 to 2002, changes in administrative limits (see Section 6) for some radioactive materials may increase shipment of these isotopes. Exposure of the public to chemical and radiological effects will be limited by packaging requirements of DOT and CDOT, as was discussed in the 1992 EIS/EIR analysis. Waste shipments are expected to decline from 1998 to 2002 because, on a whole, waste generation is expected to decline. Because the 1992 EIS/EIR assessment was based on optimistic projections of facility growth, chemical usage, and waste generation that should not be exceeded in the 1998 to 2002 period, it is judged that impacts from transportation of these materials will be within the bounds of the 1992 EIS/EIR. This assessment is supported by the above referenced PEISs that assessed the impacts of materials and waste shipment. No supplementation of the EIS/EIR with respect to transportation of materials or wastes is needed.

2.10 MISCELLANEOUS

2.10.1 Occupational Protection

The discussion of the 1992 EIS/EIR was reviewed regarding the status of the occupational protection program at LLNL in the areas of radiation protection and physical hazards, as discussed below:

- *Radiation Protection*: The total collective dose for occupational workers has decreased from 28.5 person-rem in 1990 to 15.1 person-rem in 1996 (LLNL 1998e). This reduction is in large part due to actions taken to reduce exposures to vault workers and reduction of work load at Building 332. An accidental exposure to curium-244 in the Waste Management Division during

1997 resulted in an estimated 15 to 30 rem committed effective dose equivalent (CEDE) to the individual. However, the general trend of reduced occupational exposures is expected to continue.

- *Physical Hazards*: In the 1992 EIS/EIR it was reported that there were 169 recordable injuries resulting in 4,081 lost or restricted activity days. In 1997, the numbers had increased to 534 cases and 4,422 lost workdays. A majority of this increase appears to be due to increases in cumulative trauma (e.g., carpal tunnel syndrome), from 15% in 1990 to 25% in 1997. In 1998, the number of recordable cases had decreased to 476 (2,778 lost work days), but the portion of cumulative trauma cases had increased to 32% (Zahn 1999). This change in the rate of cumulative trauma cases is most likely due to increases in awareness of the syndrome and does not imply a reduction in the quality of the occupational protection program. Regardless, LLNL continues to take actions to reduce the occurrence of all physical injuries within the workforce.

In conclusion, LLNL continues to provide an adequate occupational protection program, and the 1992 EIS/EIR does not need supplementation in that area. In addition, radiation doses are not expected to increase significantly with the proposed higher administrative limits, because the amount of material in process and the amount of ongoing activities will not necessarily directly increase with the higher limits.

2.10.2 Environmental Spills

The environment can become contaminated directly from accidental releases of liquids or from deposition of materials from passing airborne releases. Environmental contamination and spill response is regulated by various federal, state, and county organizations. LLNL has the required spill response plans, equipment, and personnel to respond to such events. Contamination would normally be rapidly contained and cleaned up to established standards, and the materials would be disposed of in accord with regulations for waste. In the unlikely event that the contamination is extensive, the remediation is also mandated and regulated and would be monitored by those regulatory bodies. Radioactive contamination levels of soil, vegetation, and water are monitored, and the public exposure is reflected in the public health assessments presented in the annual Environmental Reports. The public exposure and the pollution prevention and waste minimization programs are adequately addressed in the 1992 EIS/EIR.

2.10.3 Water Consumption

The 1992 EIS/EIR estimated that domestic water usage in 1992 at the LLNL Livermore site was 239.7 million gallons and projected an increase to 264.8 million gallons by 2002 on the

basis of an assumed 9% growth of LLNL. The current projection of usage for 2002, including usage for those portions of the NIF and Terascale Simulation Facility (TSF) operations expected to be underway by that time, is 261.3 million gallons per year, which is substantially similar to the 1992 EIS/EIR projection (Zahn 1999).

2.10.4 Electrical Energy Consumption

The projected year 2002 annual power consumption, based on current LLNL plant engineering estimates, is 474.2 million kWh. This figure includes the addition of all new building loads, including those for the NIF and the TSF. Although the power consumption for 2002 is projected to exceed the amount forecasted in the 1992 EIS/EIR (376.5 million kWh), the impact would not be significant because the LLNL electrical infrastructure capacity exceeds peak demands by a large margin.

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3 THREATENED, ENDANGERED, AND OTHER SPECIAL STATUS SPECIES

In this section, threatened, endangered, and other special status species are discussed pursuant to the federal Endangered Species Act and other federal and state regulations listing protected species. This evaluation relied on a review of site surveys, research, and monitoring reports; other environmental documentation; and documentation of formal consultations with regulators. An SA for ecology, including vegetation, fish, and wildlife, is included in Chapter 2.

3.1 THE 1992 EIS/EIR ASSESSMENT

The 1992 EIS/EIR (DOE 1992) included the results of consultation with the U.S. Fish and Wildlife Service (FWS) regarding federally listed species. The FWS identified 2 endangered and 12 candidate species that potentially could occur at the Livermore site plus Sandia National Laboratories (SNL) Livermore, as well as 2 endangered, 1 threatened, and 13 candidate species that could potentially occur at Site 300. The actual presence of federal- and state-listed species was established by surveys from 1986 to 1991.

At the time the 1992 EIS/EIR was prepared, no threatened, endangered, or other listed species were documented to occur on the Livermore site.

At the time the 1992 EIS/EIR was prepared, 16 federally listed and state listed species or their habitats were known to occur at Site 300.

Threatened, Endangered, and Other Special Status Species

- 1992 EIS/EIR: Special status species were identified for Site 300, but none were found at the Livermore site. Mitigation measures were specified to protect species and habitats.
- 1992–1997: The federal status of several species changed. Additional species and habitat were identified at Site 300. Federal-listed and state-listed species were identified at the Livermore site, and mitigation measures for the California red-legged frog and the white-tailed kite were developed after consultation with appropriate agencies.
- 1998–2002: Consultation with the FWS regarding the California red-legged frog at the Livermore site was completed in 1998. Impacts at the Livermore site would be mitigated as specified in the 1998 Biological Opinion from the FWS. Projected impacts of activities at Site 300 would continue to be subject to the mitigation measures described in the 1992 EIS/EIR. Supplementation of the EIS/EIR for species-related issues is not needed.

Listed below with their 1992 status, they are:

- One species of plant (large-flowered fiddleneck, federal- and state-endangered);
- Habitat for one species of insect (valley elderberry longhorn beetle, federal-threatened);
- Potential habitat for four species of fairy shrimp (federal candidates);
- Two species of amphibians (California tiger salamander and California red-legged frog, both federal candidates and state species of special concern);
- Two species of reptiles (Alameda whipsnake, federal candidate and state threatened species; California horned lizard, state species of special concern);
- Three species of birds (golden eagle, federal and state species of special concern; burrowing owl, state species of special concern; tricolored blackbird, federal candidate);
- Potential habitat for one species of mammal (San Joaquin kit fox, federal-endangered); and
- Two species of mammals (San Joaquin pocket mouse, formerly a federal candidate; American badger, state species of special concern).

For the description of the baseline affected environment in the 1992 EIS/EIR, Site 300 maintenance activities and existing operations were assessed for their impact on these and several additional species (Pacific western big-eared bat, great western mastiff bat, short-eared owl, black-shouldered kite [now called the white-tailed kite], and northern harrier). Maintenance activities considered were continued controlled burning, protection from grazing, ground squirrel poisoning, disking of roadways and firebreaks, explosives testing, surface impoundment maintenance, sewage lagoon maintenance, and all maintenance-related vehicle traffic.

Implementation of the 1992 proposed action at Site 300 included the disturbance of 2.4 acres of upland habitat with the potential to impact the California horned lizard, burrowing owl, San Joaquin pocket mouse, American badger, and potential kit fox habitat (kit foxes are not known to occur at Site 300 but are located nearby). Mitigation measures were recommended to protect sensitive species from activities that might inadvertently affect them. These mitigation measures related to (1) enhancing employee awareness of the need for protection and protective measures, (2) coordinating with the FWS, (3) modifying current operational practices, and

(4) implementing measures for protecting individuals and habitats. Additional mitigation measures were recommended if dens of kit foxes are found.

3.2 CHANGES FROM 1992 TO 1997

Since the 1992 EIS/EIR was published, the FWS has changed the status of several species. Among those changes, the California red-legged frog and the Alameda whipsnake have been listed as federal threatened species.

In 1994 and 1995, special status species were observed for the first time at the Livermore site. These species included the double-crested cormorant (migrant, state species of special concern), ferruginous hawk (migrant, federal candidate and state species of special concern), and western burrowing owl (resident, state species of special concern). The California red-legged frog, formerly observed only at Site 300, was found on the Livermore site in Arroyo Las Positas in July 1997. In 1994, 1995, 1997, and 1998, white-tailed kites (state protected species) nested successfully at the Livermore site. The number of nests increased from one to six. In 1995, 1996, and 1997, burrowing owls resided in the security buffer area at the northern and western boundaries of the Livermore site.

Discovery of California red-legged frogs and nesting white-tailed kites at the Livermore site prompted the development of protection and mitigation measures for maintenance activities in Arroyo Las Positas and for construction and operation of the NIF (Woollett 1997; DOE 1997a). These measures are designed to protect the frog's habitat, minimize project-related impacts, and control the amount of disturbance in the areas of the kite nests from construction and traffic.

The Mitigation, Monitoring and Reporting Program for the EIR and the Mitigation Action Plan for the EIS were developed to implement the 1992 EIS/EIR mitigation measures, requirements, and responsibilities. Annual monitoring reports updated mitigation requirements and described the progress achieved in their implementation. In 1992, a research project was initiated by the LLNL Environmental Protection Department to reintroduce the large-flowered fiddleneck (federal and state endangered) to appropriate habitat at Site 300 (LLNL 1994b). In 1993, agreements and cooperative ventures with the FWS's Natural Heritage Division were developed to establish new populations of large-flowered fiddleneck (LLNL 1995b). New locations of the blue elderberry bush — habitat of the valley elderberry longhorn beetle — were found and mapped. Surveys of Site 300 for fairy shrimp discovered only California linderella (a species that is not listed as threatened or endangered) in three seasonal temporary pools.

In 1994 and 1995, additional special status species were observed at Site 300 (LLNL 1997c). These species included Swainson's hawk (migrant, state threatened), merlin (migrant, state species of special concern), long-eared owl (resident, state species of special concern), and western spadefoot toad (resident, state species of special concern). No active kit fox dens were

found, but 11 potential dens were identified. Additional plant species were also found at Site 300, including the diamond-petaled poppy (potential state endangered species) and the gypsum-loving larkspur and big tarplant (both listed by the California Native Plant Society). Locations of these plants and animals were mapped and are being protected appropriately or mitigated.

All activities at Site 300 continued to operate with insignificant impacts to these species because of the application of mitigation measures developed from the 1992 EIS/EIR.

3.3 ANALYSIS OF PROJECTED CHANGES FROM 1998 TO 2002

In December 1997, DOE prepared an SA for the Stockpile Stewardship and Management PEIS (DOE 1997a) related to a proposal to provide additional access from Greenville Road to the Kirschbaum Field NIF construction laydown area at the Livermore site. This new access would cross the stormwater drainage channel above (well south of) its confluence with Arroyo Las Positas. The SA concluded that the proposal was not likely to adversely affect the breeding habitat of the California red-legged frog or nests of the white-tailed kite. Mitigation measures were proposed to further reduce or avoid the likelihood of impacts to these species.

In 1997, LLNL proposed to implement a maintenance project to remove and prevent further development of accumulated debris in the Arroyo Las Positas channel. A draft DOE *Environmental Assessment for the Arroyo Las Positas Maintenance Project at Lawrence Livermore National Laboratory* is in review. In parallel with preparation of the EA, DOE prepared a biological assessment (BA) as required by Section 7(a)(2) of the Endangered Species Act. This BA was forwarded to the FWS in August 1997, and the FWS issued a Biological Opinion (BO) in October 1997 (FWS 1997). Since the scope of the project has recently been revised, DOE has prepared an amended BA that was submitted to FWS on June 26, 1998. The amended BA identified potential impacts to the California red-legged frog and proposes mitigation measures. In August 1998, FWS issued a revised BO that contained required mitigation measures, including actions to avoid damage to individual frogs, protect and enhance habitat, and provide off-site compensation for incidental take of individual frogs (FWS 1998).

The mitigation and protective measures developed on a project-by-project basis from 1992 to 1997 to protect the white-tailed kite would continue to apply to new proposals and projects for the Livermore site from 1998 to 2002. In addition, the Site 300 mitigation procedure specifying avoidance of resident burrowing owls has also been applied to the Livermore site. Each of the actions identified in Table 1.1 would be subject to (1) the biological review of proposed actions or areas of disturbance and (2) the application of appropriate mitigation measures developed from the 1992 EIS/EIR or developed as refinements to them.

Threatened, endangered, or sensitive species were thought to be absent from the Livermore site in 1992. The recent identification of such species there has resulted in the

application of or development of refinements to mitigation measures originally identified in the 1992 EIS/EIR. Potential impacts have been and will continue to be avoided by (1) enhancing employee awareness, (2) continuing consultation with the FWS and the state when required, (3) modifying current operational practices when needed, and (4) protecting individuals of protected species and their habitats.

Proposed key programs and actions at Site 300 (Table 1.1) will continue to be accomplished within the constraints of the mitigation measures derived from the 1992 EIS/EIR. These measures were designed to avoid impacts where possible and reduce those impacts that cannot be avoided. Mitigation measures generally include (1) enhancing employee awareness, (2) consulting with the FWS and the state, (3) modifying current operational practices when needed, and (4) protecting individuals and habitats of protected species. The potential for presence of the kit fox at Site 300 will continue to be monitored, and potential dens will be avoided.

3.4 CONCLUSIONS

During the period 1998 to 2002, actions that will be implemented at LLNL, including new or modified key actions listed in Table 1.1, will be subject to the application of appropriate mitigation measures. If new sensitive species or habitats are identified, this information will be considered so that any needed additional levels of protection from inadvertent impacts and mitigation for unavoidable impacts can be developed early in the planning process. For these reasons, the 1992 EIS/EIR and its past and current mitigation measure commitments, including refinements, remain adequate to properly protect threatened, endangered, or special status species. Therefore, no supplementation of the 1992 EIS/EIR is needed at this time for species-related issues.

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4 WETLANDS

Wetland assessments are performed in accordance with DOE's "Compliance with Floodplain/ Wetlands Environmental Review Requirements" rule (10 CFR Part 1022). The requirements for review are established in Executive Order 11990, *Protection of Wetlands*, issued on May 24, 1977. The wetland delineation method used for the 1992 EIS/EIR (DOE 1992) was that from the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetlands Delineation 1989).

This evaluation is based on a review of draft NEPA documentation and documentation of consultations with the U.S. Fish and Wildlife Service regarding wetlands issues at LLNL.

Wetlands

- 1992 EIS/EIR: Wetlands at the Livermore site and at Site 300 are not expected to be affected by proposed activities.
- 1992–1997: Wetlands in Arroyo Las Positas at the Livermore site expanded. Wetlands at Site 300 potentially affected by water diversions were maintained by supplementation with drinking water.
- 1998–2002: Maintenance of the floodway in Arroyo Las Positas at the Livermore site would disturb approximately 20% of associated wetlands each year. However, wetland vegetation would be maintained, and impacts to the California red-legged frog would be mitigated. No other proposed activities would affect wetlands. Supplementation of the EIS/EIR for wetlands is not needed.

4.1 THE 1992 EIS/EIR ASSESSMENT

The 1992 EIS/EIR identified the location and extent of wetlands at both the Livermore site and Site 300 as of 1991. Floodplains were delineated on the basis of studies by the Federal Emergency Management Agency, site surveys, and hydrologic modeling. Wetland delineation was accomplished by surveys of floodplain areas, drainageways, and constructed water features. The 1992 EIS/EIR concluded that wetlands at the Livermore site were located away from any planned development related to the proposed action and would not be impacted by it.

At the time the 1992 EIS/EIR was issued, Site 300 contained numerous small, isolated wetlands. The sources of these wetlands were natural springs, runoff from Site 300 buildings, and a seasonal temporary pool. The nature, extent, and vegetation of each wetland were mapped. Total wetland area at Site 300 was 6.76 acres. The EIS/EIR concluded that most of the activities associated with the proposed action would not affect Site 300 wetlands, but that reduction or elimination of surface runoff from some cooling towers would result in the elimination of 0.5 acre of artificial wetlands. Mitigation for loss of these wetlands would be determined in consultation with the California Department of Fish and Game, in consideration of the State of

California's policy of no net loss of wetlands. The groundwater restoration project at Site 300 was mentioned as one possible source for artificial wetland replacement. The 1992 proposed action included clearing 2.4 acres of upland habitat, which would not have any impact on natural wetlands. Some artificial wetlands might be affected.

4.2 CHANGES FROM 1992 TO 1997

After the 1992 EIS/EIR was issued, the wetlands associated with the Arroyo Las Positas at the Livermore site expanded, as predicted in 1992, because of both groundwater remediation activities ("pump and treat" runoff) and a period of wetter weather. An August 1997 survey identified approximately 2 acres of wetland vegetation associated with the arroyo. In addition, other small wetland areas associated with other drainage channels developed on site.

At Site 300, a few new wetlands have been discovered since 1992. Discharges from some cooling towers have been redirected to percolation pits, eliminating some surface drainage that encouraged development of wetland vegetation. Any wetland areas created by water diversions have been maintained by supplementation with potable water.

4.3 ANALYSIS OF PROJECTED CHANGES FROM 1998 TO 2002

In 1997, LLNL proposed a maintenance project to remove and prevent further development of accumulated debris in the Arroyo Las Positas channel. Wetland vegetation has choked the channel so that it is no longer capable of carrying a 100-year storm event. LLNL has proposed to construct a berm on a portion of the southern side of the arroyo to protect the developed portions of the Livermore site. During storm events, water could be diverted into the undeveloped LLNL buffer zone to the north, which is part of the 500-year floodplain. Wetland vegetation in the arroyo would remain largely intact, and a program of removing silt and vegetation has been developed to maintain at least a 10-year storm drainage capacity. In any given year, 20% of the wetland vegetation in the arroyo might be disturbed by the maintenance activities.

A draft DOE EA for the Arroyo Las Positas Maintenance Project is in review. DOE also prepared a BA as required by Section 7(a)(2) of the Endangered Species Act. The BA was forwarded to the FWS in August 1997, and the FWS issued a BO in October 1997 (FWS 1997). Because the scope of the maintenance project was recently revised, DOE prepared an amended BA, which was submitted to the FWS on June 26, 1998. The FWS issued a revised BO in August 1998 (FWS 1998). The amended BO identifies mitigation measures that are required for protection of wetland habitat and protection of the California red-legged frog (see Section 3).

4.4 CONCLUSIONS

The proposed management of flood capacity and sediments in Arroyo Las Positas was not included in the 1992 EIS/EIR. Although some vegetation would be disturbed, such management would not result in a reduction in the size or elimination of this wetland. LLNL has consulted with appropriate agencies, as required by law, and mitigation measures have been approved by FWS for reducing and compensating for potential impacts to the California red-legged frog (see Section 3). The mitigation plan includes scheduling activities to avoid involvement with the California red-legged frog, protecting habitat for the California red-legged frog, and compensating for any incidental take of individual frogs. Impacts related to Arroyo Las Positas are not considered significant for the purposes of this SA because (1) arroyo management would continue to maintain the wetland, (2) issues regarding federally listed species are being resolved with the appropriate regulatory authority, and (3) mitigation measures for minimizing potential impacts have been developed. For these reasons, supplementing the EIS/EIR for wetlands is not needed.

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5 PALEONTOLOGY

Paleontological resources include ancient plant and animals whose hard tissues have been preserved in geological strata. Fossils of Pleistocene and Miocene age, including large mammals such as the mammoth and mastodon, are found in the Livermore area. This analysis was based on consultation with LLNL staff and press releases.

Paleontological Resources

- 1992 EIS/EIR: The EIS/EIR identified known paleontological resources, addressed potential impacts, and identified mitigation measures for prehistoric and cultural resources that could be applied to paleontological resources if needed.
- 1992–1997: Excavation for the NIF unearthed mammoth and horse fossils. Those fossils that would be affected by construction were excavated and curated at the UC Museum of Paleontology at Berkeley.
- 1998–2002: New and proposed projects may result in additional fossil finds. These resources would be managed according to the mitigation measures identified in the 1992 EIS/EIR. Supplementation of the EIS/EIR for paleontological resources is not needed.

5.1 THE 1992 EIS/EIR ASSESSMENT

The 1992 EIS/EIR (DOE 1992) identified the presence of paleontological resources at Site 300, including vertebrate fossils of mastodon, early horses, and canines of Miocene age. Invertebrate and plant fossils from the Neroly Formation were also found at Site 300. No paleontological resources were known to be present at the Livermore site, although fossil remains of several Pleistocene-age mammals had been found in the surrounding hills of the eastern Livermore Valley. The EIS/EIR concluded that none of the proposed action activities were near or on any fossil beds at either the Livermore site or Site 300. Mitigation measures were established, however, in case any prehistoric or cultural resources were identified; these same mitigation measures would be followed if paleontological resources were found during project activities.

5.2 CHANGES FROM 1992 TO 1997

In 1997, mitigation measures were implemented when paleontological resources dating to the late Pleistocene age were found in the northeastern quadrant of the Livermore site during construction of the NIF. Materials found included the fossil remains of two mammoths and two horses in close proximity. The fossils were located at depths of approximately 20 to 35 ft below the ground surface in an unnamed valley fill deposit that lies directly above the Livermore Formation.

One locale contained the partial skeleton of a mammoth (*Mammuthus columbi*), including a portion of the skull, teeth, ribs, vertebrae, humerus, and tusk; and a second locale contained a partial pelvis (innominate bone) of a horse (likely *Equus*). Under the provisions of the Antiquities Act of 1906, these materials were excavated under an Antiquities Permit granted to DOE by the U.S. Department of the Interior. While the Smithsonian Institution has the first rights to the materials, the remains are being curated into the collections at the UC Museum of Paleontology at Berkeley.

A fossil at a third locale was also identified as a partial mammoth skeleton, and a fossil at a fourth locale was identified as a partial horse skeleton. The exact locations of the fossils were recorded, but because these sites would not be disturbed by construction activities, the fossils were left in place. A Supplement Analysis (DOE 1997c) was prepared under DOE regulations implementing NEPA (10 CFR 1021.314) to evaluate the potential adverse impacts of excavating the skeletal remains. The excavation and preservation of paleontological resources discussed in the referenced SA can be considered general ongoing activities that would occur throughout the Livermore site, regardless of the project location or program affiliation of the element that unearthed the find. The 1992 EIS/EIR discusses the potential for impacts to cultural and prehistoric resources and outlines mitigation measures, which were implemented in 1997 to avoid adverse impacts.

5.3 ANALYSIS OF PROJECTED CHANGES FROM 1998 TO 2002

Since the fossil remains discovered during NIF construction were at depths of 20 to 35 ft in a valley fill deposit, it is unlikely that any of the other key projects at the Livermore site listed in Table 1.1 would uncover comparable paleontological materials. None of these projects involves excavation to the depths comparable to NIF. However, proposed or modified projects at Site 300 might uncover paleontological materials at that site.

Future finds of fossils at the Livermore site or Site 300 would be handled under existing procedures, and the mitigation measures outlined in the 1992 EIS/EIR would be applied. Although more is now known about the distributions and types of fossils that might be found during project activities, the potential impacts and applicable mitigation measures remain the same as summarized in the 1992 EIS/EIR, augmented by additional project-specific mitigation measures, if necessary.

5.4 CONCLUSIONS

New and proposed projects may result in additional fossil finds. These resources would be managed according to the mitigation measures identified in the 1992 EIS/EIR. No further supplementation of the EIS/EIR with respect to paleontological resources is considered necessary.

6 ACCIDENTAL RELEASE OF RADIOLOGICAL MATERIAL

This analysis examines changes in potential impacts from accidental release of radiological material associated with proposed or newly funded projects and programs and from the evolution of safety models and guidance documents for conducting safety analyses since 1992. In accordance with the 1992 EIS/EIR (DOE 1992), a deterministic (i.e., nonprobabilistic) approach was used to develop accident scenarios, including those scenarios without a specific initiating cause. The analysis is specific to three buildings or building complexes that have administrative controls on sensitive radiological material (uranium, plutonium, and tritium) used at LLNL. Impacts from these changes are evaluated and compared with the impacts assessed in the 1992 EIS/EIR. The evaluation examines the potential radiological accident impacts under the current and newly proposed administrative limits and accounts for change in safety basis guidance important to the bounding criticality accident in Building 332. The evaluation relied on review of safety basis documentation, safety analysis reports (SARs), program manager descriptions of the reasons for needing higher administrative limits, and the results from some additional consequence modeling.

Administrative limits are criteria that establish the maximum quantities of radioactive materials that may be present in a building or group of buildings at LLNL. These limits are established primarily on the basis of program needs and available space. As the name implies, the limits are administrative in nature rather than regulatory. The limits may or may not directly tie to safety analysis results for specific accident scenarios. In some cases, administrative limits are set as a

Radiological Accidents — Health and Safety

- 1992 EIS/EIR: The bounding accident for Building 332 was determined to be a plutonium criticality event. This accident was estimated to have a probability of occurrence of less than 1×10^{-6} per year. The maximally exposed individual (MEI) dose for this event was evaluated to be 2.0 rem.
- 1992-1997: A safety analysis report (SAR) was issued in 1995 (amended in 1997) for Building 332. A detailed analysis in the 1995 Building 332 SAR indicated that an inadvertent criticality accident in Building 332 is credible; i.e., the probability of occurrence is greater than 10^{-6} per year. The SAR identified a uranium criticality accident in that building as the bounding accident for the facility. That safety review was conducted in accordance with revised safety basis documentation (DOE Orders and guidance) not available during the preparation of the 1992 EIS/EIR.
- 1998-2002: The Building 332 criticality accident consequences presented in the 1992 EIS/EIR were examined in light of changes proposed in the administrative limits for uranium and plutonium and the change in the facility bounding accident identified in the 1995 SAR for Building 332. As identified in the 1995 SAR, if a uranium criticality event occurred in Building 332, the MEI dose would double from that estimated for the plutonium criticality event in the 1992 EIS/EIR. There may also be a small, incremental increase in frequencies of operations because of the proposed increase in the uranium administrative limit. Changes in the administrative limits for other buildings would result in no change or very small change in potential consequences. Although the calculated consequences for Building 332 have increased since publication of the 1992 EIS/EIR, the impacts are still within the bounds of the greatest radiological accident consequences for the entire LLNL site evaluated in the 1992 EIS/EIR.

  An updated SAR and a new Technical Safety Requirement (TSR) document were approved in late 1998 for Building 331. Both support the continued applicability of the 1992 EIS/EIR accident scenario for the facility. The TSR limits tritium consolidation to the 3.5 g used in the accident scenario, and the SAR reaffirmed the adequacy of the bounding accident

building amount so that classified information regarding exact quantities of materials is not revealed. The administrative limits specified for the Building 332/334 complex and Buildings 239 and 331 in the 1992 EIS/EIR need to be increased as a result of proposed projects and plans. These increases will allow LLNL to operate more efficiently and better meet the needs of DOE over the next 5 years.

The potential health and safety impacts from radiological accidents analyzed in the 1992 EIS/EIR are summarized in Section 6.1. The impacts from proposed or newly funded programs and projects projected during the period 1998-2002 and affecting administrative limits in the above buildings are summarized in Section 6.2. This analysis includes review of the radiological accidents addressed in the 1992 EIS/EIR, safety basis documentation and guidance, and current SARs. Conclusions are presented in Section 6.3.

6.1 THE 1992 EIS/EIR ASSESSMENT

The current administrative limits, in effect prior to 1992, for LLNL buildings with proposed limit changes are listed in Table 6.1 (DOE 1992). These limits, which cover the operation of Building 331 (Tritium Facility), Building 332 (Plutonium Facility), Building 334, and Building 239 (Nondestructive Test Facility), were established under then-current and projected defense programmatic and project needs for the period 1992 through 2002. Administrative limits for other facilities that are not proposing changes can be found in the 1992 EIS/EIR.

TABLE 6.1 1992 EIS/EIR Administrative Limits on Radioactive Materials for Buildings 332, 334, 331, and 239 at the Livermore Site

Building	Existing Limit[a] (1992 EIS/EIR)
Plutonium Facility[b]: Bldg. 332 and Bldg. 334	
Uranium	300 kg
Plutonium	200 kg
Tritium Facility[b]: Bldg. 331	
Tritium	5 g
Nondestructive Test Facility: Bldg. 239	
Plutonium	4.5 kg
Uranium-235	18.5 kg

[a] Limits in effect with the 1992 EIS/EIR ROD.

[b] Buildings 331, 332, and 334 are collectively referred to as the "Superblock."

The 1992 EIS/EIR established an accident analysis protocol to assess potential impacts from bounding accidents at radiological or nuclear facilities at LLNL and SNL. A screening process was used that reduced the number of buildings considered for accident scenarios from an initial 653 to 8. This screening process included exclusion of administrative buildings, buildings ranked as low hazard, and buildings without radioactive materials. Additional screening criteria included eliminating all buildings with radioactive materials only in a solid, sealed source and consideration of radioactive material type, quantity, physical form, confinement, use, and storage. The screening process identified nine accident scenarios involving radioactive material in eight buildings, seven of which were at the Livermore site. The Livermore site facilities included Buildings 251, 331, and 332/334, which contain uranium, tritium, and transuranics (TRU) including plutonium; the Building 490 complex; and Buildings 298, 612, and 625. The eighth building assessed was Building 968 at SNL, Livermore. The screening process eliminated Building 334 (a hardened engineering test building containing sealed sources) of the Superblock from further bounding accident assessment consideration since its accident impacts were bounded by those of other buildings.

The 1992 EIS/EIR identified and assessed "reasonably foreseeable" accident scenarios for each of the eight buildings selected in the screening. Accidents can be ranked on the basis of the magnitude of the effective dose equivalent to a hypothetical member of the public (maximally exposed individual, MEI) at the closest site boundary, as was done in the 1992 EIS/EIR, or on the basis of total population dose to the surrounding community, usually out to 80 km distance. More recently, DOE has been quantifying the accident frequencies, striving toward a suite of accidents that characterize the risk to the public from the site operations, and DOE has been quantifying the differences in risk among alternatives. This change in the manner in which accident consequences are presented does not affect or set aside the 1992 EIS/EIR findings as to bounding accidents.

An accident is considered bounding for a particular building, complex, or class of radionuclides if no reasonably foreseeable accident with greater consequence is identified. The highest MEI dose of about 4.2 rem at the 0.3-km site boundary was associated with an americium-241 release from Building 625, which is the bounding radiological accident for the Livermore site. This accident had the highest MEI of the TRU accidents, and an MEI higher than those of accidental releases of tritium (0.2 rem from Building 298 and 0.026 rem from Building 331).

The bounding 4.2-rem MEI dose from the on-site americium-241 release from Building 625 (G12 complex) in the 1992 EIS/EIR is comparable to the 4.4 rem MEI dose at 0.09 km in the recent SAR for the Hazardous Waste Management Facilities (in G12 complex) (LLNL 1998b). The EIS/EIR release was from waste drums impacted by a falling crane during an earthquake; whereas the recent SAR assumes that the contents of one waste drum burn. The MEI dose is sensitive to the assumed location of the burning drum within the complex, but the bounding impact from a TRU release is essentially unchanged from that in the EIS/EIR. When accidents are ranked on the basis of the magnitude of the MEI dose, or on population dose, this waste drum burn scenario is also the bounding radiological accident for the site.

Accident scenarios for the buildings with proposed administrative limit changes in the 1992 EIS/EIR are summarized below for Buildings 331 and 332/334, which have administrative controls on tritium, plutonium, and uranium. Building 239 was eliminated from further analysis with the screening criteria used in the 1992 EIS/EIR. However, an SAR (LLNL 1994c) assessed consequences for the bounding plutonium and uranium accidents for Building 239, and that assessment is discussed below. The impacts from the assessed bounding accident scenarios are discussed and compared in Section 6.2 with impacts that might occur under currently proposed administrative limit changes.

For Building 332, the 1992 EIS/EIR analyzed a hypothetical inadvertent criticality in a glovebox caused by the addition of water to a dispersible quantity of plutonium in an appropriate geometric configuration. The criticality was postulated to yield 10^{18} fissions, with the nuclear reaction terminating as the water evaporated. The energy produced by such a reaction could breach the glovebox, and the resulting fission products could be released into the room. The estimated frequency of occurrence of this event was less than 1×10^{-6} per year. However, despite the extremely low probability of occurrence, the consequences of this accident were analyzed in the 1992 EIS/EIR with the initiator left undefined.

The accident analyzed for Building 332 in the 1992 EIS/EIR involved only a plutonium criticality event, as was required in the regulatory guidance in effect at the time. The 1995 SAR for Building 332 analyzed both uranium and plutonium criticality events because the guidance had been modified to require analyses for both radionuclides. In addition, a detailed analysis in the 1995 Building 332 SAR indicated that an inadvertent criticality accident in Building 332 is credible, i.e., the probability of occurrence is greater than 1×10^{-6} per year.

For Building 331, the 1992 EIS/EIR selected the release of tritium during a large, beyond-design-basis earthquake (peak ground acceleration of 0.8 g) as the bounding scenario. It was assumed that an earthquake occurred while a laboratory technician was opening or transferring the contents of a primary container holding 3.5 g of tritium gas. The tritium gas would be stored in containers with strict quantity limits not to exceed 3.5 g. Administrative restrictions are in place to limit operations to procedures that affect only one primary container at a time.

The SAR for Building 239 postulated an accident that bounds the consequences of radionuclide release for this building. The radioactive material (plutonium or uranium) is brought into the Building 239 basement for radiographic examination. (Radioactive material is not stored at Building 239 but is brought from, and returned to, Building 332 after the test or at the end of each work day.) The radioactive test items are doubly contained. This containment consists, at a minimum, of one hard barrier (metal) and at least one soft barrier (plastic bag). Failure of the containment is unlikely. However, it is conceivable that a seismic event or some other incident involving dropping of the material could result in compromise of the integrity of the containment barriers, thus exposing plutonium or uranium to the building atmosphere and allowing for oxidation of the material and release of some of the oxide. This accident scenario assumes breaching of 4.5 kg of plutonium-239 or 18.5 kg of uranium-235, allowing slow oxidation to the

atmosphere for a 48-hour period. The frequency of the design basis earthquake is 2.0×10^{-3}/year (LLNL 1994c).

6.2 ANALYSIS OF PROJECTED CHANGES FROM 1998 TO 2002

The currently proposed changes in administrative limits for the Superblock Buildings and Building 239 are listed in Table 6.2. The project and programmatic bases for these changes and the direct or indirect changes in building-specific bounding accidents are summarized below.

The proposed change in the administrative limit for uranium in Buildings 332/334 is to raise the limit from 300 kg (covering enriched, natural, and depleted uranium) to 3,500 kg (500 kg of >1% enriched uranium and 3,000 kg of <1% enriched uranium). The principal need for the higher uranium limit is to carry out LLNL's role in the Fissile Materials Disposition (FMD) Program. The specific increased need is for uranium dioxide (UO_2) in support of the prototype mixed oxide (MOX) nuclear fuel rod or lead test assemblies for the MOX fuel project. Other major defense-related programs that will be supported under the newly proposed limit are (1) Dual Revalidation, (2) the Advanced Recovery and Extraction System, (3) plutonium conversion, (4) excess special nuclear material (SNM) stabilization and packaging, and (5) uranium conversion to a form for purification and recycle for use in reactor fuel or to a form suitable for safe disposal.

Before 1992, the tritium limit for Building 331 was 300 g. The 1992 EIS/EIR set an administrative limit of 5 g of tritium in any one facility, with no more than 10 g to be divided among Buildings 298, 391, and 331. As currently proposed, the administrative limit for tritium in

TABLE 6.2 Proposed Administrative Limits on Radioactive Materials for Buildings 332, 334, 331, and 239 at the Livermore Site

Building	Proposed Limit[a]
Plutonium Facility: Bldg. 332 and Bldg. 334	
Uranium	500 kg >1% wt. U-235 3,000 kg <1% wt. U-235
Tritium Facility: Bldg. 331	
Tritium	30 g
Nondestructive Test Facility: Bldg. 239	
Plutonium	6 kg
Uranium-235	25 kg

[a] Sources: Fisher (1998); Goluba (1998); Mintz, (1998a-b); Woo (1998).

Buildings 331 would be raised to 30 g. This increase is considered necessary to adequately support major current and projected future programs involving DOE Mound site decommissioning and decontamination (D&D), the expansion of the U.S. Army Tritium Recovery and Recycle Project, and the NIF (target fills).

The administrative inventory limits for Building 239 are proposed to be raised from 4.5 to 6 kg for plutonium and from 18.5 to 25 kg for uranium to accommodate programmatic needs for radiography inspection in Building 239 of sealed containers transported from and stored in Building 332.

6.2.1 Building 332 of the Superblock

6.2.1.1 Background

As mentioned in Section 6.1, the 1992 EIS/EIR identified an inadvertent plutonium criticality scenario for Building 332, with a less than 1×10^{-6} per year probability of occurrence, as a bounding accident for a specific location in accordance with applicable DOE Orders and U.S. Nuclear Regulatory Commission guidance effective in 1992. However, subsequent detailed analyses in the 1995 Building 332 SAR indicated that an inadvertent criticality event (plutonium or uranium) in Building 332 is credible (i.e., the probability of occurrence is greater than 1×10^{-6} per year). To prevent such accidents, a criticality control system based on the double-contingency principle has been developed and implemented for Building 332. Under this system, two independent and unlikely failures or errors must occur before an accident is possible. The proposed changes in administrative limits for plutonium and uranium do not change the 1995 Building 332 SAR conclusion that the inadvertent criticality accident scenario is a credible event, although the probability of occurrence for the event may be impacted slightly by potential increases in frequencies of operations. However, the probability of occurrence could increase significantly, for example, if workers did not follow approved criticality procedures. Should such a situation occur, Building 332 safety personnel would take immediate actions to ensure that unacceptable practices were corrected before the facility would be allowed to return to normal operations (LLNL 1998a). By doing that, the probability of occurrence for the criticality accident scenario cited in the Building 332 SAR remains valid.

Building 332 operations involving uranium or plutonium require the preparation of an Operational Safety Procedure. Although the proposed administrative limits for uranium for Buildings 332/334 would increase the total amount of fissionable materials within Building 332 (from 300 kg uranium to 500 kg of >1% enriched uranium and 3,000 kg of <1% enriched uranium), the procedures would still limit the "material at risk" (MAR) in a glovebox or workstation. It should be noted that the doses or consequences resulting from postulated plutonium or uranium criticality events relate directly to the estimated number of fissions yielded (i.e., 10^{18} fissions) as concluded in the Building 332 SAR. This estimated fission yield is based on

historical data and is independent of the Building 332/334 administrative limits for plutonium and uranium. Therefore, the consequences of the plutonium criticality accident analyzed in the 1992 EIS/EIR would remain unchanged.

The Building 332 SAR indicated that the uranium criticality event could result in a higher dose at the fenceline than a plutonium criticality event (predicted dose of 0.34 rem for the uranium criticality event versus 0.25 rem for the plutonium criticality event yielding 10^{18} fissions). The SAR used the modeling code MACCS (Jow et al. 1990), while the 1992 EIS/EIR used the modeling code GENII (Napier et al. 1988) to calculate the estimated doses. For the evaluation reported in this SA, the GENII code was used to perform additional modeling for the uranium criticality event to allow for a direct comparison with the plutonium criticality event analyzed in the 1992 EIS/EIR. While differences in model assumptions, parameters, and formulation between GENII and MACCS probably account for differences in results, the GENII results should be considered conservative (higher doses than MACCS) and yielded a two times higher consequence than the 1992 EIS/EIR results for this accident scenario.

6.2.1.2 Uranium Criticality Analysis

The uranium criticality analysis conducted for this SA used the same assumptions and model (GENII) used for the plutonium analysis performed in the 1992 EIS/EIR. The exposure parameters and modeling assumptions are provided in Appendix D of the 1992 EIS/EIR. An estimated population of 1,417,586 people was assumed to reside west of the site boundary. The western sector was selected for the analysis because it contains the largest number of people. The 70-year total effective dose equivalent (TEDE) was calculated for this assessment. The TEDE is the sum of the effective dose equivalent (EDE) from external pathways and the committed effective dose equivalent (CEDE) from internal pathway. The estimated TEDE and the associated health effects for an off-site individual at the fenceline and for the general population from plutonium and uranium criticality events are presented in Table 6.3.

To confirm consistency in the modeling assumptions between the EIS/EIR and this SA, a plutonium criticality event was modeled, and the results were shown to be consistent with the values reported in the 1992 EIS/EIR. Although the estimated TEDEs for both the off-site individual and the general population are nearly two times greater for a uranium criticality event than for a plutonium criticality event (Table 6.3), the EDE for the uranium criticality event estimated for an individual (approximately 3.6 rem) is still about 100 times less than the dose required to cause fatality from acute radiation exposure (350 to 450 rem). The health impacts (expressed as excess fatal cancer) in Table 6.3 are the impacts that would be expected only if the accident actually occurred. These impacts do not take into account the probability of a postulated accident occurring. The probability of less than 1×10^{-6}/year was used in the 1992 EIS/EIR for a plutonium criticality event.

TABLE 6.3 Impacts from Superblock Plutonium and Uranium Criticality Accidents for the Nearest Off-Site Individual and General Population

	Plutonium Criticality Event		Uranium Criticality Event	
Analysis/Receptor	TEDE[a] (rem or person-rem)	Health Effect[b] (excess fatal cancer)	TEDE[a] (rem or person-rem)	Health Effect[b] (excess fatal cancer)
1992 EIS/EIR Analysis				
400-m Individual[c]	2.0	0.0010	NA[d]	NA
General Population[e]	440[f]	0.22	NA	NA
Supplement Analysis				
400-m Individual[c]	2.0	0.0010	3.8	0.0019
General Population[e]	480[f]	0.24	870	0.44

[a] TEDE = total effective dose equivalent. Units are in rem for individual doses and person-rem for population doses.

[b] Health effect for individuals is the increased chance of developing a fatal cancer over the lifetime of the exposed individual. For population, the health effects are the expected number of latent cancer fatalities among the population.

[c] "400-m Individual" refers to an individual at the site boundary 400 meters from the event.

[d] NA = not analyzed.

[e] Affected population of 1.4 million people in the western sector.

[f] The minor difference in TEDE resulted from a difference in ingestion input parameters.

The TEDE of 3.8 rem at the nearest site boundary falls within the whole-body dose range (1 to 5 rem) at which some protective action is recommended by the EPA. This result is consistent with the conclusion in the 1992 EIS/EIR. The TEDE to the off-site population (870 person-rem) is still estimated to result in less than 1 excess cancer fatality among the 1.4 million people who could be exposed.

6.2.2 Tritium Facility: Building 331

The administrative limit for tritium in Building 331 was 300 g before 1992 but was lowered to 5 g in any single facility, or 10 g total for three particular buildings, in 1992 (DOE 1992). The current proposal is to increase the administrative limit for tritium in Building 331 from

5 to 30 g. The administrative limit for Buildings 298 and 391 is 5 g total between the two facilities. The total quantity of tritium material that would ever be at risk during operations would remain the same as presented in the 1992 EIS/EIR (3.5 g) (Mintz 1998a). The administrative control enforced in 1992 has not changed and still limits the inventory stored in any one vessel or connecting process (the "at risk" inventory) to 3.5 g. Today, this control takes the form of a facility Technical Safety Requirement (TSR) (Mintz 1998a).

The material at risk (MAR) is defined as "the amount of radionuclides (in grams or curies of activity for each radionuclide) available to be acted on by a given physical stress. Different MARs may be assigned for different accidents as it is only necessary to define the material in those discrete physical locations that are exposed to a given stress" (DOE 1994). The MAR for the accident scenario analyzed for the Tritium Facility would be a procedural error involving the release of tritium gas from a container in the secondary containment unit or glovebox.

Accidents with potential for releasing the additional tritium from its stored configuration are not considered credible because of the robustness and passive nature of the storage condition (e.g., sealed, approved shipping containers or thick-walled metal vessels, valved-off, capped, and securely stored) (Mintz 1998a). It is also important to note that major improvements in facility systems and operations since 1992 have significantly reduced the expected frequency of accidents leading to tritium release. Most important has been the imposition of a double containment requirement (gloveboxes) for all high-curie activities and the implementation of more rigorous conduct of operations practices. These improvements have resulted in nearly an order of magnitude decrease in routine emissions (e.g., 2,630 Ci in 1987 vs. 299 Ci in 1997). Accidental releases have also declined dramatically; in fact, there have been none since April 1991. By comparison, 10 "significant" releases (>100 Ci) occurred from Building 331 from December 1986 to April 1991. Most (perhaps all) of these would have been prevented by present-day engineered safety features and administrative controls. While tritium facility activities are expected to increase following approval of the proposed 30-g inventory limit, they will not approach the level existing in 1991 upon which the 1992 EIS/EIR was based. Further, as described above, the accident frequency prevailing in 1991 has, in fact, been substantially reduced.

An updated SAR (LLNL 1998c) and a new TSR document (LLNL 1998d) were approved in 1998, supporting the continued applicability of the 1992 EIS/EIR scenario for Building 331. The tritium accident scenario assessed in the SAR gave an MEI dose that was well within the bounds of the MEI dose assessed in the 1992 EIS/EIR. The TSR continues to limit tritium to the 3.5 g used in the scenario. Because there is no change in the MAR, the estimated accident scenario impact analyzed in the 1992 EIS/EIR for this building remains valid. The 1992 EIS/EIR calculated a CEDE of 0.026 rem at the nearest site boundary (400 m to the south) from a beyond-design-basis earthquake, primarily from internal exposure following inhalation of tritium vapor. This dose is significantly lower than the whole-body dose range (1 to 5 rem) at which the EPA recommends protective action for accidental releases (EPA 1992), and is less than the MEI 0.2-rem dose from the bounding tritium accident of a 5-g release from Building 298.

Tritium facility activities are expected to increase as the tritium administrative limits are increased to 30 g. However, they will not approach the activity level existing in 1991 on which the 1992 EIS/EIR was based. Normally, increased activities are associated with increased frequency of accidents. However, as already noted, improvements in facility systems and operations since 1992 have significantly reduced the expected frequency of accidents leading to tritium releases. These safety enhancements will ensure that the MAR assessed in 1992 will not increase, and, therefore, the increased inventory limits are not expected to result in any increase in risk from the accident scenario presented in the 1992 EIS/EIR.

6.2.3 Nondestructive Test Facility: Building 239

Components are brought into Building 239 for radiographic examination. These items are not stored in Building 239 but instead are returned to storage in Building 332 on a daily basis after radiography. All of the plutonium and uranium in the components is sealed in doubly contained packaging that is not removed during radiographic operations. One of the sealed barriers of the double-barrier packaging is always a hard (metal) material. Failure of the containment barriers is unlikely. However, it was assumed for this analysis that a seismic event or accidental dropping of the component could result in compromise of the containment barriers. This breach would expose the plutonium to the building atmosphere, allowing oxidation and release of some of the oxide. The current Building 239 SAR evaluates the consequences of this accident on the basis of an inventory of 4.5 kg of weapons-grade plutonium or 18.5 kg of uranium-235 (LLNL 1994c). The SAR analysis was scaled linearly to provide an estimate for this SA of the potential accident impacts if the administrative inventory limits were increased from 4.5 to 6 kg for plutonium and from 18.5 to 25 kg for uranium. Details of the methodology and assumptions for calculating the dose to an individual at the fenceline are given in the Building 239 SAR (LLNL 1994c).

For this SA evaluation, the potential radiation dose to an individual at the site boundary (366 m from the building) was estimated (by the scaling method) to be 0.017 rem for the increased 6-kg inventory limit for plutonium. For the increased 25-kg inventory limit for uranium, the estimated potential radiation dose to an individual at the site boundary (366 m) (based on the scaling method) was 2.1×10^{-9} rem. These projected doses are much lower than the whole-body dose range (1 to 5 rem) at which the EPA recommends protective action for accident releases (EPA 1992) and are well within the 1992 EIS/EIR bounding accident involving operations with plutonium or uranium at LLNL.

6.3 CONCLUSIONS

For a hypothetical uranium criticality event occurring in Building 332, the estimated MEI dose is 3.8 rem, as noted in Table 6.3. The proposed increased uranium administrative limit for Building 332 would not change the material at risk. The change in the criticality accident consequences assessed here compared with those assessed in the 1992 EIS/EIR is due to the

introduction of the uranium criticality accident. Although the consequences (MEI dose and population dose) of the uranium criticality event are twice those of the plutonium criticality event, they are still less than those of the bounding americium-241 release due to the earthquake as given in the 1992 EIS/EIR. The frequency of the criticality accident is low, and the risk posed to the public remains very small.

The estimated impacts for Building 331 with an increased administrative limit and improved safety features remain the same or less than those identified in the 1992 EIS/EIR. The radiation doses to an individual for the proposed administrative limit of 6 kg for plutonium and 25 kg for uranium-235 in Building 239 were estimated to be 0.017 rem and 2.1×10^{-9} rem, respectively. The estimated dose to an individual at the nearest boundary for both of these facilities is still significantly lower than the whole-body dose range (1 to 5 rem) at which the EPA recommends protective action for accident releases (EPA 1992).

The calculated consequences to the exposed populations and to a maximally exposed individual from an accident involving radiological material have increased in some cases since publication of the 1992 EIS/EIR. However, the calculated impacts still are not significantly different from the envelope of consequences established by the 1992 EIS/EIR. Therefore, the accident analysis presented in the 1992 EIS/EIR still adequately characterizes the potential impacts of such accidents that may occur at LLNL.

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7 WASTE MANAGEMENT

The purpose of this analysis is to evaluate whether the impacts of currently projected waste management practices and waste generation levels at LLNL are bounded by the analysis presented in the 1992 EIS/EIR (DOE 1992). Data on actual waste generation from current (1995–1997) routine and nonroutine (e.g., demolition, decontamination, restoration) operations and projections for anticipated future (i.e., 1998–2002) operations are compared with projections in the 1992 EIS/EIR for the year 2002.[4] Changes in waste generation rates (annual totals) and waste management practices (storage, treatment, and disposal) are compared by waste type.

Waste Management

- 1992 EIS/EIR: Waste management impacts were assessed on the basis of a projected 9% increase in waste generation rates over a 10-year period and planned improvements in waste management practices.
- 1992–1997: Through implementation of the LLNL waste minimization program, the generation of low-level waste (LLW) and hazardous waste (HW) was reduced by approximately 10% and 20%, respectively. The low-level mixed waste (LLMW) and transuranic (TRU) waste certification programs were initiated.
- 1998–2002: With the completion of the DWTF in the year 2000, continuation of the waste minimization program, and implementation of the LLW, LLMW, and TRU waste certification programs, impacts from waste management in 2002 are expected to be below impact levels projected in the 1992 EIS/EIR. With the implementation of these and other waste management programs, current projections indicate a reduction of more than 20% in waste generation compared with 1992 levels. Supplementation of the 1992 EIS/EIR for waste management and generation is not needed.

Actual waste generation data from the current routine and nonroutine operations were obtained from the LLNL Total Waste Management System (TWMS) database (Maloy 1998a). Current waste projections for the period 1998–2002 were obtained by the Hazardous Waste Management Division from individual LLNL directorate facility managers (Maloy 1998b). Information on current and projected changes in waste management practices were acquired from various EAs, recent LLNL annual environmental monitoring reports (e.g., LLNL 1997d), the *Environmental Impact Report Addendum for the Continued Operation of LLNL* (UC 1997), the *Pollution Prevention Plan* (LLNL 1997e), and the

[4] Other than a cleanup action in 1997 (see Section 7.2.2), this SA is not specific to waste that may be generated by future planned or unplanned restoration activities that may be covered under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). As noted in the 1992 EIS/EIR, appropriate environmental documentation for future environmental restoration activities at the LLNL Site 300 would be prepared as a part of the Site 300 CERCLA Remedial Investigation and Feasibility Study (RI/FS) process. Any future environmental restoration activities at the LLNL site not explicitly covered in the 1992 EIS/EIR would be covered by the CERCLA RI/FS process and CERCLA Record of Decision for the LLNL site.

1992 EIS/EIR (DOE 1992). This information was used to evaluate relative changes (compared with the 1992 EIS/EIR analysis) in potential impacts to workers and members of the public from actual and projected changes in waste management activities at LLNL.

7.1 THE 1992 EIS/EIR ASSESSMENT

The 1992 EIS/EIR described the waste management program in effect in 1992 and provided a list of anticipated changes in management activities involving waste treatment, storage, and disposal during the period from 1992 through 2002. Chapter 5 of the EIS/EIR provided waste generation estimates in 1992 for low-level radioactive waste (LLW), low-level mixed waste (LLMW), hazardous waste (HW), transuranic (TRU) waste, and sanitary wastes. For the year 2002, the document projected a conservative increase of about 9% in the volume of each waste type over the baseline projection for 1992. This projected increase was based on the premise that the total square footage of LLNL facilities would increase by approximately 9% during the 10-year period. The projected 1992 and 2002 waste quantities from the 1992 EIS/EIR are listed in Table 7.1.

Various planned improvements for waste management operations at LLNL were identified in Appendix B of the 1992 EIS/EIR. These improvements were targeted at reducing waste generation and improving waste storage, treatment, and/or disposal. Planned enhancements in waste management practices included the implementation of a sitewide waste minimization plan, the completion and approval of the LLNL waste certification plan, and the completion and approval of waste acceptance criteria documents for all LLNL-generated wastes. Facility-specific actions included plans for expansion of waste processing operations in the Building 514 area to include additional equipment for hazardous waste treatment and the use of a compactor/ bailer in Building 612 for volume reduction of compactible LLW. In addition, a high-explosive open burn/open detonation facility was proposed for development near Building 845 at Site 300 to manage wastes from high-explosives operations.

TABLE 7.1 LLNL Main Site and Site 300 Waste Generation Estimates for 1992 and 2002 from the 1992 EIS/EIR

Waste Type[a]	1992	2002
Hazardous		
Liquid (gal)	350,000	381,700
Solid (lb)	604,000	658,000
Low-level		
Liquid (gal)	22,000	24,000
Solid (lb)	587,000	640,000
Low-level mixed		
Liquid (gal)	23,000	25,100
Solid (lb)	47,000	51,230
Transuranic		
Solid (ft^3)	2,700	2,940
Medical (lb)	2,612	2,843

[a] The 1992 EIS/EIR made no distinction between routine and nonroutine waste quantities.

The 1992 EIS/EIR analysis concluded that, with one exception, waste management activities during the period 1992–2002 would not result in significant environmental impacts. The one impact classified as potentially significant and unavoidable was on-site storage of LLMW beyond storage limits established under the Resource Conservation and Recovery Act (RCRA). The four mitigation measures identified to reduce impacts associated with extended LLMW storage were as follows:

1. As available and appropriate pursue alternatives or options for treatment, storage, and/or disposal;

2. Continue efforts to enhance LLNL's waste minimization policies and practices to reduce generation;

3. New or additional quantities of liquid LLMW would be treated at the wastewater treatment tank farm to reduce total volumes; and

4. If future waste generation exceeds LLNL storage capacity, LLNL would apply for additional permitted capacity until additional treatment, storage, and disposal options became available.

7.2 CHANGES FROM 1992 TO 1997

Changes over the period 1992 to 1997 in projected waste management activities covered in the 1992 EIS/EIR are discussed in Section 7.2.1; changes in waste generation are discussed in Section 7.2.2.

7.2.1 Waste Management

LLNL has instituted several changes in managing wastes and reducing routine waste generation since 1992. The *Environmental Impact Report Addendum for the Continued Operation of Lawrence Livermore National Laboratory* (UC 1997) provides an overview of programmatic changes implemented since 1992. One of the major efforts has been to enhance the characterization of wastes to include requirements of off-site treatment and disposal facilities' acceptance criteria. This effort reduces on-site storage times because wastes meet the acceptance criteria of disposal sites destined to receive them, and, therefore, scheduled shipments can proceed in an efficient manner. The following is a list of the most important changes in waste management program activities since 1992:

- An LLW certification program was implemented in 1993. As of 1997, nearly all LLW held at LLNL was fully certified to meet new waste acceptance

criteria at the Nevada Test Site (NTS). Shipments to NTS were resumed in 1993.

- A site treatment plan for LLMW was developed and implemented to comply with the 1992 Federal Facility Compliance Act. The act allowed federal facilities relief from waste storage limitations. After gaining approval from the State of California, LLNL has begun certification and is currently shipping LLMW to Envirocare in Utah for treatment and disposal.

- The LLNL TRU waste certification program was implemented to ensure that TRU wastes generated and packaged by LLNL can be certified for acceptance at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. TRU waste continues to be stored at LLNL until WIPP opens or another disposal option is identified by DOE.

- The LLNL waste minimization program was implemented in 1993 and has reduced routine waste generation volumes for all waste types except sanitary. The program is described in detail in the LLNL *Pollution Prevention Plan* (LLNL 1997e).

Other changes that will improve the efficiency of waste handling and treatment include the following: (1) issuance of a RCRA Part B permit (approval pending) to allow construction of the permitted portions of the DWTF (e.g., Building 695, Building 280, Building 693 annex), which includes use of new technologies for treating hazardous and mixed wastes; and (2) construction of the non-RCRA permitted portions of the DWTF complex (e.g., Building 696, Building 697) to provide additional storage and treatment options for radioactive-only wastes. The DWTF, when fully operational (anticipated to be November 2000), will consolidate LLW, LLMW, and HW management operations from dispersed management facilities that currently treat, store, and prepare wastes for off-site shipment. The consolidation of operations will involve both new and existing buildings at LLNL (DOE 1996a). The DWTF will also add capability to treat a greater variety of LLW and LLMW wastes.

Wastes generated at Site 300 will continue to be managed as described in the 1992 EIS/EIR except that wastes previously disposed of at the Tracy Landfill will be disposed of at the Altamont Landfill in Alameda County. This change took place in 1994 when the Tracy Landfill closed. More importantly, facility and operational changes have occurred or are planned that would lower waste generation rates.

7.2.2 Waste Generation

Information from the TWMS database was analyzed to determine the current actual levels of waste generation at LLNL (Maloy 1998a). The actual quantities of routine and nonroutine waste generated in each of the three calendar years (1995–1997) for which data are available are summarized in Table 7.2. The data show nonroutine waste generation varied from about 40% to about 80% of the total waste generated during this period. Quantities of all the routinely generated waste, with the exception of LLMW, showed sharp declines. Although there was considerable variation in nonroutine LLW and HW generation, routine LLW and HW quantities showed steady declines of over 50% from 1995 to 1997. All of the TRU waste generation, which declined about 25% in this period, was from routine operations.

Scheduled demolition, decontamination, and decommissioning of facilities and an unscheduled emergency removal action in 1997 contributed to the increase in nonroutine waste generation from 1995 to 1997. In 1995, the Building 435 cooling towers were dismantled, and contaminated soil was removed from Building 404; these actions contributed to increases in both LLW and LLMW (LLNL 1996). Nonroutine operations from housekeeping and solid LLW from contaminated gravel produced by explosive tests with conventional ordnance at the Site 300 firing tables in 1994 were major contributors to the one-time HW and LLW quantities generated in 1995. More than 75% of the nonroutine hazardous waste generated in 1997 (1,785,060 lb) came from two cleanup activities. One of these activities was a Comprehensive Environmental Response, Compensation, and Liability Act/Toxic Substances Control Act (CERCLA/TSCA) removal action involving about 770 tons of polychlorinated biphenyl (PCB)-contaminated soil and capacitors uncovered during excavation at the NIF construction site. The capacitors and contaminated soil were expeditiously removed and disposed of in accordance with all applicable regulations (LLNL 1998). The other cleanup activity, replacing a roof on Building 152, generated approximately 120 tons of HW.

In conjunction with the NIF excavation, a Supplemental EIS (SEIS) is being prepared for the NIF portion of the Stockpile Stewardship and Management Programmatic EIS. This action is being taken pursuant to an agreement specified in the Joint Stipulation and Order approved and entered as an order of the court on October 27, 1997, in partial settlement of the lawsuit NRDC v. Pena, Civ. No. 970936 (SS) (D.D.C). This agreement included commitment to and completion of a thorough historical record search (along with worker interviews) relative to potential contamination in seven areas surrounding or adjacent to the NIF site. Commitment was also made to conduct geophysical surveys, soil borings and/or soil vapor surveys, and groundwater monitoring, as appropriate. The Notice of Intent for the preparation of the SEIS was published on September 25, 1998.

TABLE 7.2 Actual Waste Generation Quantities by Waste Type at LLNL for 1995 through 1997

Waste Type	Quantities Generated (lb)[a]			Nonroutine Portion (%)
	Routine	Nonroutine	Total	
Calendar Year 1995				
LLMW	118,841	168,740	287,582	59
HW	1,094,784	913,142	2,007,926	45
LLW	436,801	79,948	516,748	15
TRU	2,997	0	2,997	0
All types	1,653,423	1,161,830	2,815,253	41
Calendar Year 1996				
LLMW	247,341	124,202	371,542	33
HW	737,298	882,028	1,619,326	54
LLW	323,446	373,836	697,282	54
TRU	2,517	0	2,517	0
All types	1,310,601	1,380,066	2,690,667	51
Calendar Year 1997				
LLMW	81,547	161,619	243,166	66
HW	471,331	2,298,306	2,769,636	83
LLW	163,441	547,935	711,377	77
TRU	2,256	0	2,256	0
All types	718,575	3,007,860	3,726,435	81

[a] The original waste quantity units (gal, lb, ft^3) used in the TWMS database are the standard units in which the data are provided on the Waste Disposal Requisitions. Unit conversion factors used in the numbers reported here are as follows: 8.34 lb/gal, 2,205 lb/m^3, 35.3 ft^3/m^3 (Maloy 1998a).

7.3 ANALYSIS OF PROJECTED CHANGES FROM 1998 TO 2002

The 1992 EIS/EIR summarized waste impacts for the year 2002 from projected changes in waste management practices and waste generation. Changes in projected waste management activities covered in the 1992 EIS/EIR are discussed in Section 7.3.1, and changes in waste generation are discussed in Section 7.3.2. Overall, the enhancements in waste management operations highlighted below and the reductions in waste generation and/or storage planned at LLNL for the next 5 years and beyond should reduce potential environmental impacts below those projected in the 1992 EIS/EIR for the year 2002.

7.3.1 Waste Management

Several changes have occurred in waste management practices during the past 5 years that will reduce impacts in the future. Beneficial changes have occurred that reduce the need for increased shipments of materials to and from the LLNL main site and Site 300. The operations of the Chemical Exchange Warehouse will allow LLNL to efficiently identify excess chemicals from ongoing or discontinued programs and make them available for new programs (Quong 1998), thus reducing incoming shipments of chemicals. Use of a gravel washer at Site 300 to recondition used gravel from the firing tables had recovered over 87% of the gravel for reuse by 1995, thus reducing the need for waste treatment and shipment. Other beneficial actions that will reduce potential impacts of waste management activities before 2002 include (1) upgrading or closure of wastewater retention tanks (for nonhazardous, hazardous, LLMW, and LLW categories of waste) to reduce the potential for radionuclide releases to the sewer system, (2) operation of the DWTF in about 2 years (November 2000) to allow use of new treatment technologies and provide for minor increased waste storage, primarily for radioactive-only wastes, (3) continuation of the pollution prevention program, and (4) enactment of the certification program for TRU waste and the continuation of certification and off-site shipments of LLMW and LLW to ensure that wastes are properly characterized and will meet acceptance criteria at disposal sites.

Enhanced characterization of LLW, LLMW, and TRU wastes to meet off-site facility waste acceptance criteria will permit waste acceptance by commercial and federal facilities for disposal. The overall effect of these changes in waste management operations at LLNL will be to reduce on-site legacy waste inventories and storage times. Characterization under the legacy waste program provides information on the process or the research experiment that generated the waste and on the chemical, physical, and radiological characteristics of the waste (Quong 1998). This initial information is used to determine the most likely disposal site. The disposal site's waste acceptance criteria define any additional parameter requirements. Waste certification and other waste management practices planned over the next 5 years will reduce potential environmental, health, and safety impacts at and around the LLNL site and improve the overall Laboratory operation efficiency.

TABLE 7.3 LLNL Waste Generation Comparison: 1992 Baseline and 1992

EIS/EIR Projections for 1997 and 2002 versus 1997 Actual and Current Projections for 2002

	Waste Generation (lb)[a]				
	1992	1997		2002	
Waste Type	EIS/EIR Baseline[b]	EIS/EIR Projection[c]	Actual	EIS/EIR Projection[d]	Current Projection[e]
HW	3,523,000	3,681,500	2,769,600	3,841,400	2,833,200
LLW	770,400	805,100	711,400	840,200	584,700
LLMW	238,000	248,700	243,200	261,100	199,300
TRU	168,700	176,200	2,300	183,600	43,800

[a] All data are in pounds rounded to the nearest 100 lb. Waste volumes expressed in gallons (liquids) and cubic feet (solids) were converted to pounds by assuming specific weights of 8.34 lb/gal for liquid waste and 2,205 lb/m^3 for solid waste, and the following conversion factor: 1 m^3 = 35.3 ft^3.

[b] Quantities are based on data presented in the 1992 EIS/EIR.

[c] Projections are based on a 4.5% increase over generation levels in 1992 for each waste type.

[d] Estimates for 2002 presented in the 1992 EIS/EIR assumed an increase of approximately 9% for each waste type over the 10-year period.

[e] Projections are based on the best currently available LLNL data (Maloy 1998a-b) and the assumption that nonroutine waste generation in 2002 would be at about current levels (nonroutine estimates based on average of 3 years of actual data from waste generation rates in 1995 through 1997 [Maloy 1998a]). These estimates are conservative because of the atypical nonroutine waste generation in 1997 caused by the excavation of capacitors and contaminated soil at the NIF site. See Section 7.2.2 for further discussion of the removal action. The TRU waste projections for the year 2002 are based on the assumption of funding for the proposed MOX project.

7.3.2 Waste Generation

Current projections for both routine and nonroutine waste generation between 1998 and 2002 (existing programs and anticipated new programs) were obtained from LLNL facility managers (Maloy 1998b) for comparison with projections made in the 1992 EIS/EIR for the year 2002. The two sets of projections are included in Table 7.3. The 2002 waste generation quantities, based on projections from 1992 EIS/EIR estimates and current data, enable a comparison with current actual 1997 and 1992 EIS/EIR baseline data.

New LLNL facilities that will become operational before the year 2002 and other activities generating wastes during that period include research and development for the Uranium Atomic Vapor Laser Isotope Separation process (i.e., U-AVLIS Pilot Operations during 1999-2000), the NIF in support of the DOE Stockpile Stewardship and Management Program, and decommissioning and decontamination of various buildings. These facilities will produce LLW, LLMW, TRU waste, and HW, but the quantities of wastes from these activities and other routine LLNL operations in the year 2002 are not expected to exceed the quantities projected for 2002 in the 1992 EIS/EIR. The *Environmental Impact Report Addendum for Continued Operation of Lawrence Livermore National Laboratory* (UC 1997) describes the implications of these facilities on future waste generation levels and impacts during the next 5 years. The overall effect of these changes would be to reduce routine waste generation, although some of these changes may result in one-time increases in nonroutine waste generation.

Operations to manage future waste generation at LLNL are expected to be more than adequate to process the types and quantities of wastes anticipated. An evaluation of the database of estimated waste generation during the next 5 years (Maloy 1998b) suggests that data obtained from LLNL facility managers predominantly represent routine wastes (more than 95% of the total). Further examination of current actual waste generation data (1995 through 1997) suggests that routine wastes are typically less than 50% of the total waste. Although it is not possible to project unanticipated nonroutine waste generation quantities from unknown burial sites, a conservative assumption would be that the total quantities of nonroutine waste (including unplanned waste) generated in 2002 would remain at about the current levels. Even with this assumption, the total projected waste generation for the year 2002 (Table 7.2) is well within the 9% increase predicted in the 1992 EIS/EIR for the period of 1992–2002. In fact, these current projections are lower than the 1992 baseline generation quantities presented in the 1992 EIS/IER.

7.4 CONCLUSIONS

The review of current and projected LLNL waste management practices through the year 2002 indicates a shift from on-site storage of LLW, TRU, and LLMW to off-site treatment, storage, and disposal. This shift and a projected reduction in waste generation by the year 2002 (from that projected in the 1992 EIS/EIR) are expected to reduce the associated potential safety and health hazards to LLNL workers handling this waste and to off-site populations. Projected changes in hazardous waste management practices are expected to reduce the waste retention time at on-site 90-day storage facilities, which will reduce the multiple handling of waste containers and consequently the potential safety and health hazards. With completion of the DWTF in the year 2000, implementation of the LLW and TRU certification programs, and continuation of the waste minimization program at LLNL, impacts from waste management operations are expected to be below the levels projected for the year 2002 in the 1992 EIS/EIR. This assessment is supported by improved routine waste generation projections from recent actual data and incorporates the assumption that nonroutine waste generation will be at about the current levels in the year 2002. In fact, with this assumption, the waste generation at LLNL in the year 2002 is expected to be about 20% lower than the EIS/EIR 1992 baseline levels for LLW,

LLMW, and HW, and about 75% lower for TRU waste. These considerations and analyses support the conclusion that the 1992 EIS/EIR adequately bounds the impacts from waste management activities through the year 2002, and, thus, no supplementation of the 1992 EIS/EIR for waste management and generation is necessary.

8 ENVIRONMENTAL JUSTICE

Environmental justice refers to the fair and equitable treatment of all people with respect to environmental and health consequences of federal laws, regulations, policies, and actions. Environmental justice impacts are defined in Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low Income Populations* (February 11, 1994). This Executive Order requires all federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Executive Order also contains directives related to public participation and consumption patterns of fish and wildlife by indigenous populations.

Environmental Justice

- 1992 EIS/EIR: The EIS/EIR predated the 1994 Executive Order requiring consideration of environmental justice issues.
- 1992–1997: Executive Order 12898 was issued on February 11, 1994. Environmental justice was addressed in subsequent NEPA documents that included proposed LLNL programs and projects. Those analyses concluded that there were no environmental justice concerns within the contexts considered.
- 1998–2002: The projected impacts of new and proposed actions for this period are not disproportionately high and adverse. Cumulative tritium releases would not result in high and adverse impacts to human health or the environment. Supplementation of the EIS/EIR for environmental justice is not needed at this time.

The Executive Order does not define what constitutes minority and low-income populations, nor does it define what constitutes a disproportionately high and adverse environmental effect. However, these terms have been defined by DOE NEPA practice and guidance (DOE 1995b), DOE guidance on the CERCLA process (DOE 1998b), guidance provided by the Environmental Protection Agency (EPA 1998), and guidance by the President's Council on Environmental Quality (CEQ 1997a). For the purpose of this analysis, minority and low-income populations are defined on the basis of the U.S. Bureau of the Census definitions. Minority populations are defined as including Black, American Indian, Asian-Pacific, and Hispanic racial or ethnic categories. Low-income populations have an income level that is below the poverty level as defined by the U.S. Bureau of the Census.

The analysis in this section was based primarily on information in Executive Order 12898, guidance documents, and existing NEPA documentation.

8.1 THE 1992 EIS/EIR ASSESSMENT

The 1992 EIS/EIR predated the 1994 Executive Order related to environmental justice; therefore, this issue was not addressed as a separate topic in the 1992 EIS/EIR.

8.2 CHANGES FROM 1992 TO 1997

After the issuance of the Executive Order in 1994, environmental justice issues were assessed for Lawrence Livermore National Laboratory as part of the Waste Management PEIS (DOE 1997b), the Stockpile Stewardship and Management PEIS (DOE 1996b), and the Surplus Materials and Disposition PEIS (DOE 1996d). These studies concluded that, for these programmatic actions, there were no disproportionately high and adverse impacts to minority or low-income populations for LLNL activities.

8.3 ANALYSIS OF PROJECTED CHANGES FROM 1998 TO 2002

It is not expected that any of the proposals and projects from 1998 to 2002 will result in disproportionately high and adverse impacts to minority or low-income populations near either the Livermore site or Site 300. The locations of areas with minority or low-income populations greater than the state average are indicated in Figures 8.1 and 8.2 for the Livermore site and Figures 8.3 and 8.4 for Site 300. The Livermore site region and the Site 300 region, on average within a 50-mile radius, do not have more minority or low income populations than the state average. The supporting documentation for the NIF portion of the SSM PEIS (Lazaro et al. 1996) evaluated the demographics of the Livermore site in detail. Within the more immediate area there was a tendency for the percentage of minority population to be somewhat higher near the site. As shown in Figure 8.3, in some areas in the immediate vicinity of Site 300, the percentage of the population that belongs to a minority is greater than the state average.

The largest facility to be constructed during this period will be the NIF. The SSM PEIS (DOE 1996b) concluded that the construction and operation of NIF would not pose disproportionately high and adverse effects on either minority or low-income populations in the Livermore site area because none of the impacts would be high and adverse.

The Contained Firing Facility at Site 300 was proposed to be designed to permit experiments that would involve tritium (DOE 1996b, Appendix J). The facility design has been changed, however, to eliminate that capability because of cost. No tritium-containing experiments are planned for the Building 850 Hydrodynamic Test Facility either. Thus, tritium-containing experiments at Site 300 may still be conducted as outlined in the proposed action of the 1992 EIS/EIR or would be done at the Nevada Test Site. Therefore, no changes in the impacts are expected from conditions that would have applied in 1992. No supplementation of the 1992 EIS/EIR relative to tritium releases is needed with respect to environmental justice.

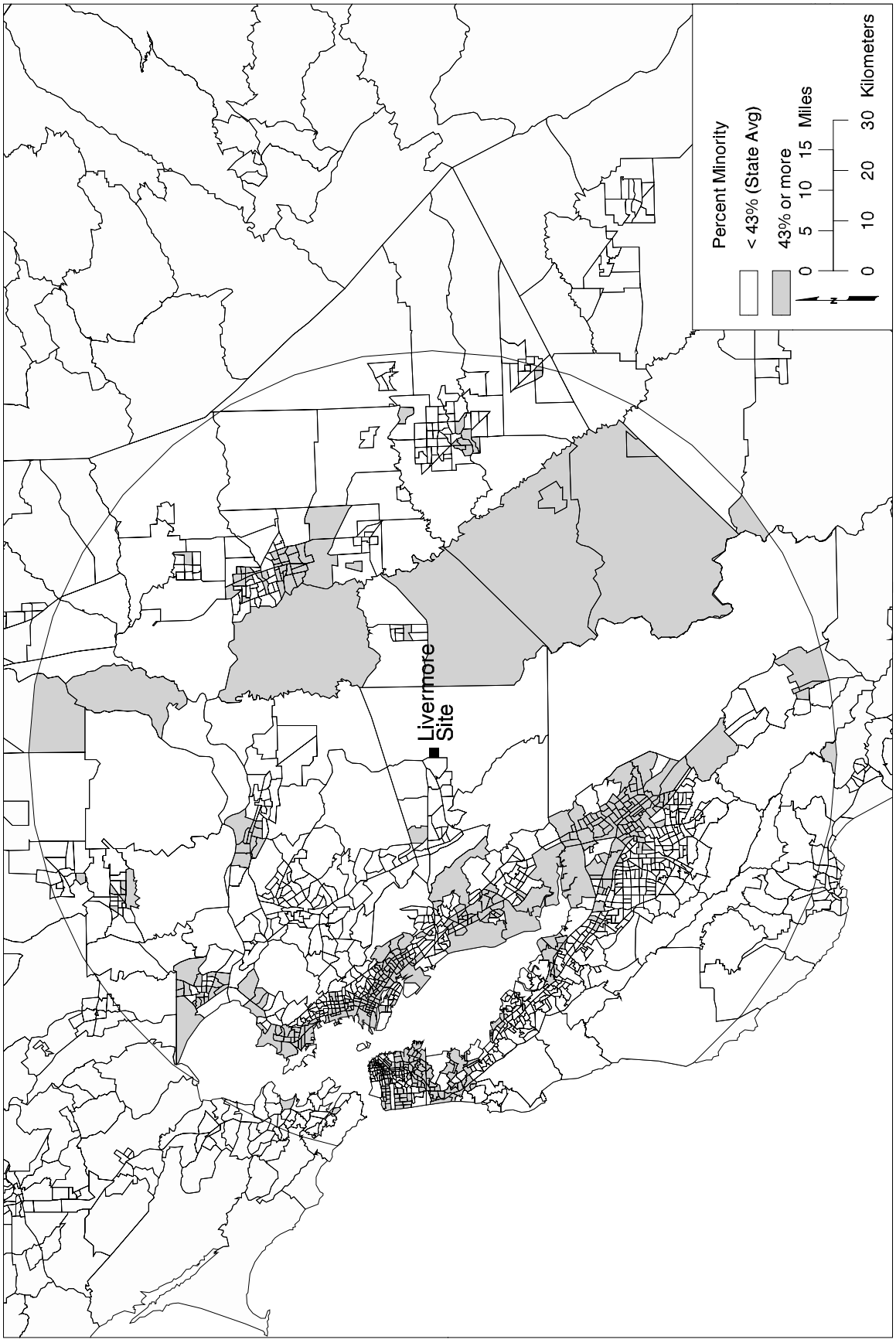

FIGURE 8.1 Distribution of Minority Populations in the Vicinity of the Livermore Site (based on 1990 census data)

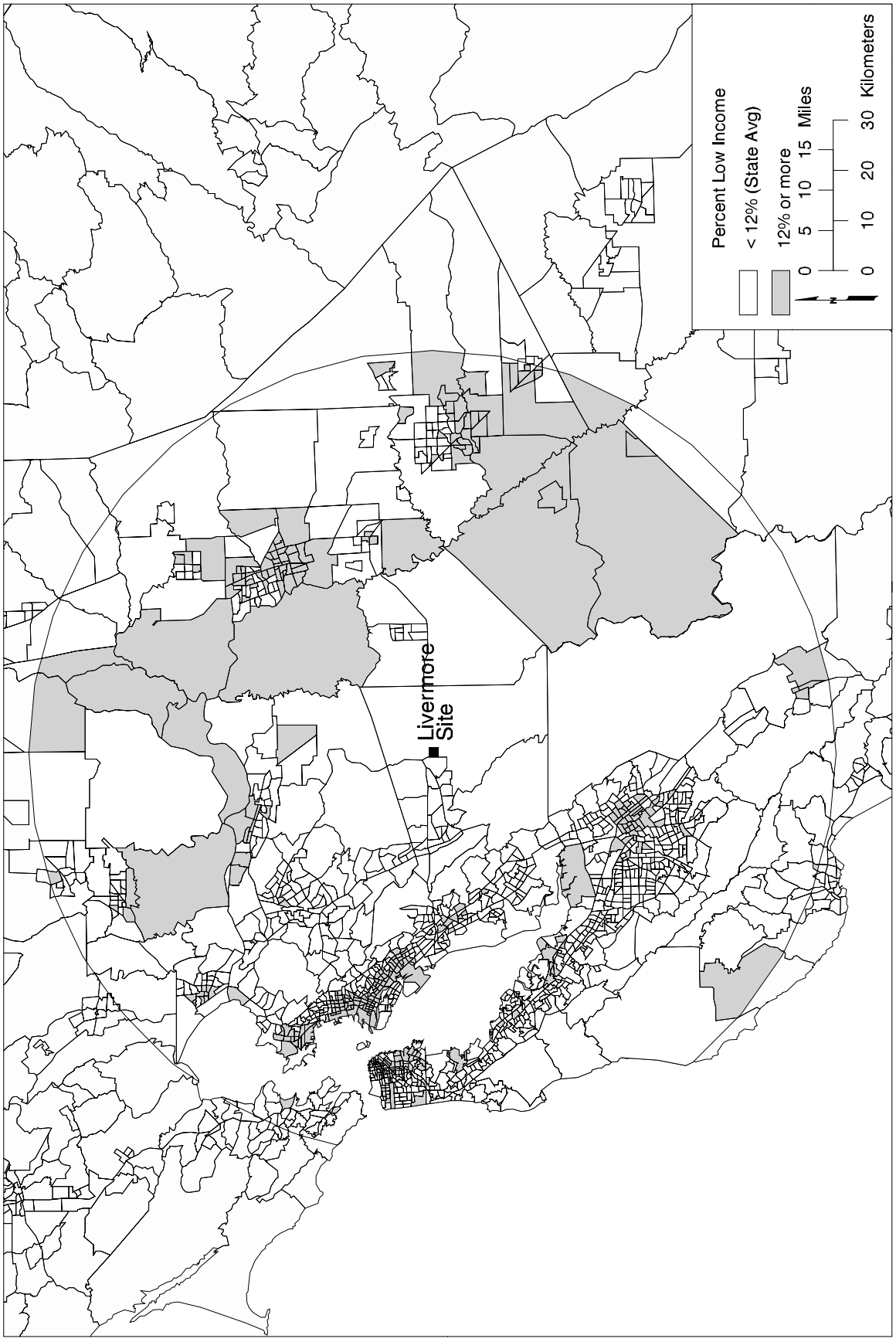

FIGURE 8.2 Distribution of Low-Income Populations in the Vicinity of the Livermore Site (based on 1990 census data)

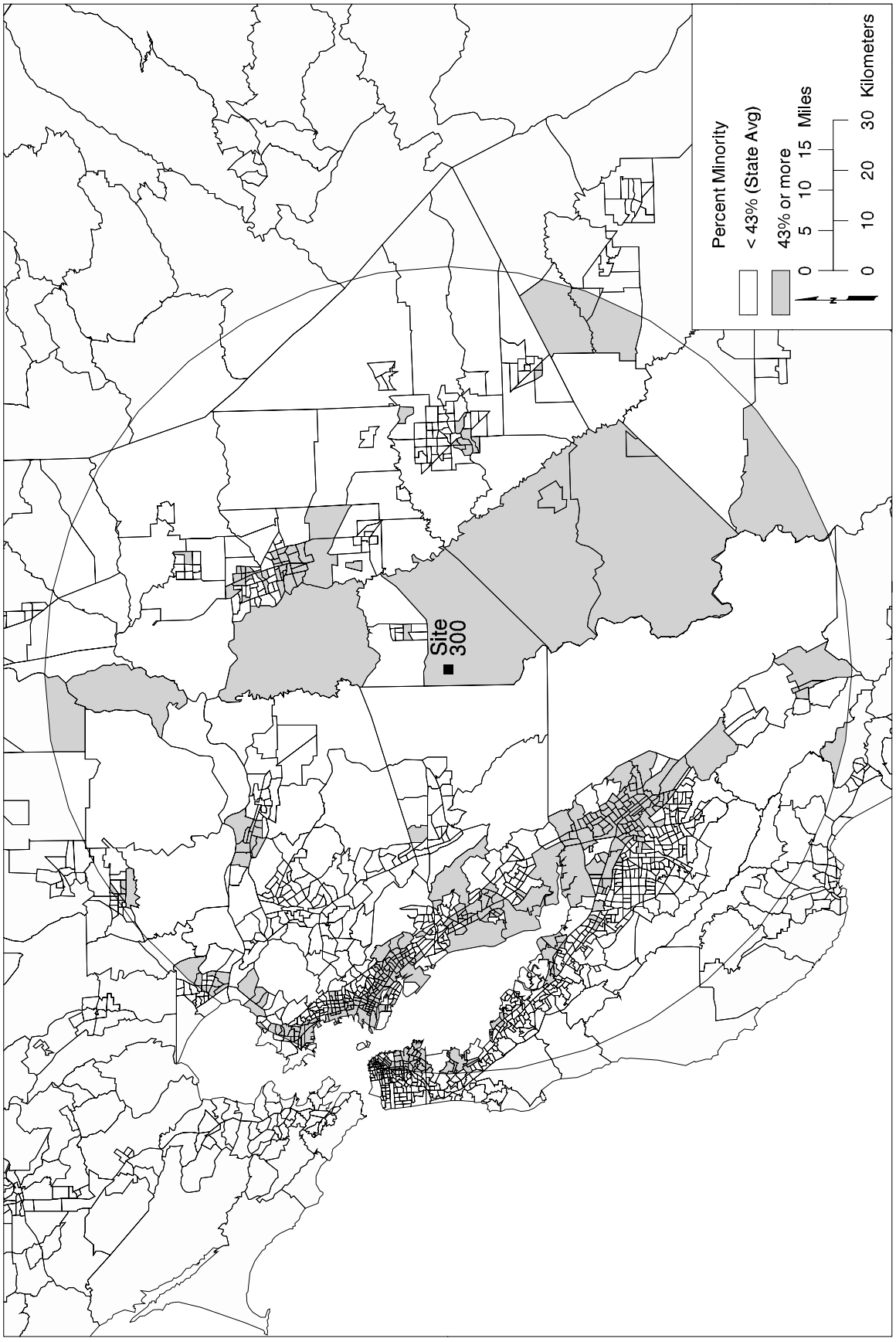

FIGURE 8.3 Distribution of Minority Populations in the Vicinity of Site 300 (based on 1990 census data)

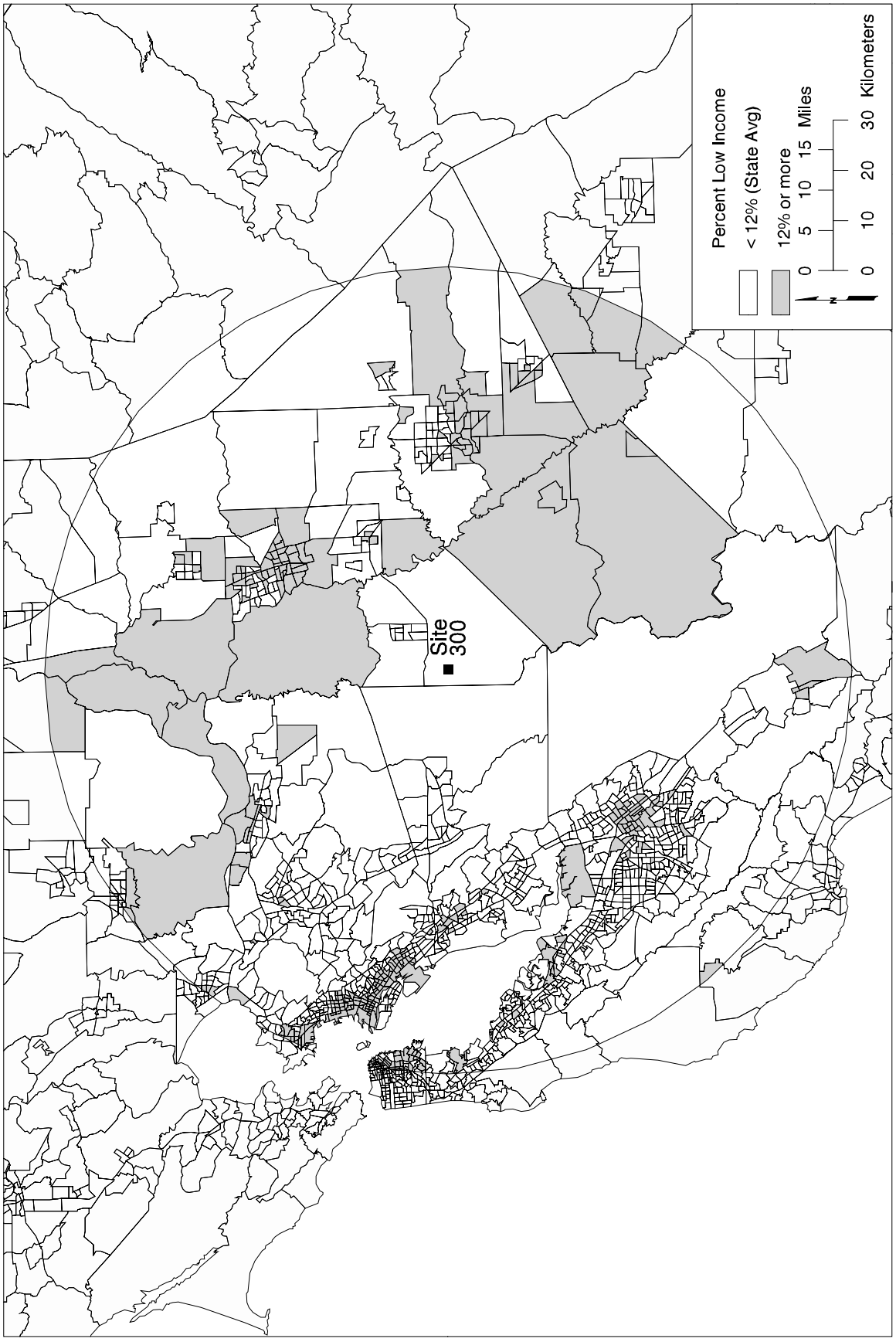

FIGURE 8.4 Distribution of Low-Income Populations in the Vicinity of Site 300 (based on 1990 census data)

8.4 CONCLUSIONS

For the key proposals and projects expected to occur from 1998 to 2002 (Table 1.1), this SA has not identified any impacts not included in the 1992 EIS/EIR that would exceed any regulation, standard, or guideline or that could be considered high or adverse. While minority and/or low income populations are found in the local area of the Livermore site and Site 300, impacts to these populations would not be disproportionately high and adverse, due to the low level of potential impacts. The effects of new proposals and projects would be either minor, confined to the site, or within the historical operational effects of LLNL. No supplementation of the 1992 EIS/EIR with respect to environmental justice is needed at this time.

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9 CUMULATIVE IMPACTS

A cumulative impact is defined in the CEQ regulations as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR Part 1508.7). Cumulative impacts have also been discussed in the CEQ report *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997b). The analysis in this section is based primarily on existing NEPA documentation and Sections 2 through 8 of this report.

Cumulative Impacts

- 1992 EIS/EIR: Cumulative impacts were identified, their significance was determined, and mitigation measures were recommended when appropriate.
- 1992–1997: Declining employment reduced LLNL's contribution to population-related community and regional impacts. Emissions of tritium were reduced approximately fourfold. Mitigation measures were employed to reduce impacts to vegetation, wildlife, threatened and endangered species, and wetlands.
- 1998–2002: Cumulative impacts related to regional economic and population growth are expected to continue through the year 2002. A relatively stable workforce will not substantially increase LLNL's contribution to population-related community and regional impacts. Emissions of tritium will be well within the bounds described in the 1992 EIS/EIR. Mitigation measures for vegetation and wildlife, threatened and endangered species, and wetlands will continue to be employed. Construction of NIF and other facilities would result in particulate emissions (PM_{10}) in a nonattainment area. Other sources of such emissions include land development, agriculture, and natural processes. Water use through the year 2002, including the NIF and TSF, would remain essentially the same as 1992 EIS/EIR projections. Electrical power consumption through 2002, including NIF and TSF, would be greater than projected in the 1992 EIS/EIR, but would not significantly affect the ability of local providers to support LLNL needs and the needs of local customers. No other federal or non-federal actions have been implemented or are reasonably foreseeable that, in combination with LLNL and SNL activities, could have an adverse cumulative impact not anticipated in the 1992 EIS/EIR. Supplementation of the EIS/EIR for cumulative impacts is not needed at this time.

9.1 THE 1992 EIS/EIR ASSESSMENT

The 1992 EIS/EIR (DOE 1992) identified cumulative impacts of the continued operation of LLNL within each topical section. These discussions identified how impacts from operations related to regional impacts and when the cumulative impact was considered significant and unavoidable. Where appropriate, mitigation measures were defined.

Potentially significant and unavoidable cumulative impacts identified in the 1992 EIS/EIR included the following:

- Socioeconomic impacts, including those to community services, that resulted from an expanding workforce;
- Impacts on vegetation and wildlife of surrounding development;
- Impacts on threatened and endangered species from regional development in the vicinity of Site 300;
- Impacts on wetlands from regional development in the vicinity of Site 300;
- Increase in airborne criteria pollutant emissions at LLNL and surrounding communities;
- Incremental addition to highway noise in Livermore;
- Increase in traffic congestion;
- Increase in water demand and consumption and other utility services as a result of surrounding development;
- Increase in waste generation, treatment, and disposal; and
- Shipment and use of hazardous or radioactive materials.

The 1992 EIS/EIR also addressed the impact of normal site operations, including radiological dose and consequent health effects.

9.2 CHANGES FROM 1992 TO 1997

During the period from 1992 to 1997, the Livermore region experienced continued economic growth. Decreasing, rather than increasing, LLNL employment during this period would have acted to reduce the potential contribution from LLNL's operation to (1) regional socioeconomic growth, (2) demand for community services, (3) regional development, (4) highway noise and traffic congestion, (5) air pollutant emissions from mobile sources, and (6) demand for water and other utility services. Vegetation and wildlife, threatened and endangered species, and wetlands would continue to be adversely affected by regional

development as well as by LLNL operations; however, LLNL's reduced contribution to regional growth might have had a minor role in reducing adverse cumulative impacts. Likewise, regional impacts of waste generation and management practices would have been reduced by LLNL's pollution prevention activities, implementation of more efficient waste handling and treatment, and construction of new treatment and storage facilities.

During the years from 1992 to 1997, new facilities continued to be built and old facilities were renovated or demolished. These activities would have resulted in emissions of particulate matter (PM_{10}) in a region that is nonattainment for this pollutant — a continuation of impacts identified in the 1992 EIS/EIR. Other sources of this air pollutant include residential and commercial development, transportation, agriculture, and natural processes.

The operations at the former Tritium Research Laboratory (SNL Building 968) ceased during this period. Emissions of tritium for LLNL were reduced from 1,281 curies to 300 curies, a fourfold decrease (DOE 1992; LLNL 1998).

Since the 1992 EIS/EIR was published, the California red-legged frog and the white-tailed kite have been discovered at LLNL. The kite is state protected and the frog is federally protected. LLNL has consulted appropriate regulatory authorities and has implemented mitigation measures for protection of these species (see Section 3). Other regional sources of impacts to these species include land development and habitat modification.

9.3 ANALYSIS OF PROJECTED CHANGES FROM 1998 TO 2002

Employment for the period 1998 to 2002 is expected to remain stable (see Section 2.1). Thus, LLNL's contribution to the following regional cumulative effects should not increase: (1) regional and local trends in socioeconomic impacts, (2) demand for community services, (3) regional development, (4) highway noise and traffic congestion, (5) mobile source emissions, and (6) demand for water and other utility services. Because LLNL workforce and payroll are expected to be stable and very small compared with expected regional economic growth, a change from a projected increase in workers (1992 EIS/EIR) to a stable condition would have little influence on regional socioeconomic trends.

LLNL's contribution to adverse cumulative impacts related to regional development should continue to decline for vegetation; fish and wildlife; threatened, endangered, and other special status species; and wetland loss. Mitigation measures related to vegetation and wildlife; sensitive, threatened, and endangered species; and protection of wetlands will continue to be implemented to reduce LLNL's contribution to regional habitat losses and to impacts to these resources from regional development.

LLNL's water requirements remain within the bounds of those projected in the 1992 EIS/EIR. Water use declined from 400 million gal annually (average of 1.1 million gal per day)

in 1986 to 239.7 million gal annually (average of 0.66 million gal per day) in 1992. The 1992 EIS/EIR projected that by the year 2002, water use would increase by 9% to 261.3 million gal per year. Projected water demands for the Livermore site, including the NIF and the TSF, is 264.8 million gal per year, substantially similar to the 1992 projections (Zahn 1999). The San Francisco Water Department supplies water from the Hetch Hetchy Aqueduct system, which may reach a capacity of 400 million gal per day (San Francisco Public Utilities Commission 1998). The Alameda County Flood and Water Conservation District, Zone 7 Water Agency (backup supply), distributes about 36 million gal per day (Zone 7 Water Agency 1998). The LLNL water demand is a small fraction of water available from its suppliers. As for any other user, water demand by LLNL contributes to the cumulative effect on water needs of industry, domestic usage, and agriculture in the Livermore Valley. Because LLNL projected water use in 2002 has not changed substantially from 1992 projections, cumulative water use impacts remain substantially the same.

The projected year 2002 annual power consumption, based on current LLNL plant engineering estimates, is 474.2 million kWh. This figure includes the addition of all new building loads, including those for the NIF and the TSF. Although the power consumption for 2002 is projected to exceed the amount forecasted in the 1992 EIS/EIR (376.5 million kWh), the impact would not be significant because the LLNL electrical infrastructure capacity exceeds peak demands by a large margin (Zahn 1999).

U-AVLIS operations would release negligible amounts of airborne uranium that would be below the detection limits. The NIF operation may release 10-30 curies of tritium per year. These releases, together with the 1997 release levels (300 curies per year), are well within the tritium releases reported in the 1992 EIS/EIR (1,281 curies per year). The cumulative doses are well within DOE guidelines for protection of the public and are within the EPA annual dose limit of 0.01 rem for airborne releases under the National Emission Standard for Hazardous Air Pollutants (40 CFR 61). They are also lower than the National Council on Radiation Protection and Measurements negligible individual risk level of 0.001 rem per year. No supplementation of the EIS/EIR is needed with respect to normal operational releases.

The Contained Firing Facility at Site 300 was proposed to be designed to permit experiments that would involve tritium (DOE 1996b, Appendix J). The facility design has been changed, however, to eliminate that capability because of cost. No tritium-containing experiments are planned for the Building 850 Hydrodynamic Test Facility either. Thus, tritium-containing experiments at Site 300 may still be conducted as outlined in the proposed action of the 1992 EIS/EIR or would be done at the Nevada Test Site. Therefore, no changes in the impacts are expected from conditions that would have applied in 1992.

Regional waste generation is expected to increase within the Livermore area due to economic and population growth. However, the impacts of LLNL on regional waste management are expected to continue to be moderated by pollution prevention practices, increased efficiency of waste handling, and improvements in waste treatment and disposal facilities at the site.

PCB-containing capacitors discovered at the NIF site have not contaminated groundwater and have already been remediated (see Section 7). These materials would not contribute to any regional groundwater contamination from past LLNL operations or other sources. Ongoing remediation efforts at LLNL are expected to help reduce existing or potential contaminant events.

The Livermore region is in nonattainment for suspended particulates (PM_{10}) in the air. During the years 1998 to 2002, the NIF and other facilities will be constructed, and these construction activities will result in periods of particulate air emissions (PM_{10}). These impacts for the NIF have been analyzed in detail in the SSM PEIS (DOE 1996b) and supporting documentation (Lazaro et al. 1996). Those studies found that the ambient air quality impacts associated with site clearing would be limited to the area just outside the site boundary. Site clearing would last for a month, so this air quality impact would be temporary. No other federal or non-federal actions have been implemented or are reasonably foreseeable that would interact cumulatively with PM_{10} emissions during site clearing.

To maintain the 100-year flood capacity along Arroyo Las Positas, LLNL has proposed a program to control vegetation and siltation. Maintenance of the arroyo could potentially affect the California red-legged frog, and LLNL has completed a formal consultation process with the FWS. The FWS has issued a Biological Opinion that reaches a "no-jeopardy" conclusion and includes mitigation measures to minimize impacts to this species and compensate for loss of habitat (see Section 3). LLNL's process of identifying species of concern, consulting appropriate regulatory authorities, and proposing and implementing project-specific mitigation was established in the 1992 EIS/EIR and continues to be implemented.

The trend of increasing economic and population growth in the LLNL region is expected to continue through the year 2002. The regional cumulative impacts projected today for the years 1998–2002 are expected to be substantially the same as those from 1992 to 1997. No other federal or non-federal major projects have been implemented or are reasonably foreseeable that would modify these trends. No other federal or non-federal actions have been implemented or are reasonably foreseeable that, in combination with LLNL and SNL activities, could have an adverse cumulative impact not anticipated in the 1992 EIS/EIR. Supplementation of the EIS/EIR for cumulative impacts is not needed at this time.

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10 CONCLUSIONS

The CEQ regulations require that supplemental environmental impact statements be issued when "the agency makes substantial changes to the proposed action" or there are "significant new circumstances or information relevant to the environmental concerns and bearing on the proposed action or its impacts." This SA was written to determine whether either of these two cases apply to the continued operations of LLNL and SNL, Livermore, such that a supplemental sitewide EIS or a new sitewide EIS should be prepared.

The proposed action and alternatives evaluated in the 1992 EIS/EIR (DOE 1992) were related to the operational levels of LLNL and SNL. Impacts were identified and assessed on a sitewide basis, rather than on a project-by-project basis, and mitigation measures were identified for the site as a whole. This SA evaluates whether analysis of changes in actions foreseen in 1992 plus new and modified proposals and projects from now until 2002 presents a seriously different picture of the likely consequences of continued operation of LLNL and SNL than was presented in the 1992 EIS/EIR. This evaluation focuses on determining whether the impacts of continued operation as identified today would be within the bounds of impacts identified in the 1992 EIS/EIR, and if not, whether the additional incremental impacts would be significant.

Chapters 2 through 9 and Appendix A of this SA evaluated a set of new and modified projects and proposals and other changes and concluded that no supplementation is needed for any factor. It was determined that either the projected impacts are within the bounds of the 1992 EIS/EIR, the impacts were anticipated by mitigation measures established in the 1992 EIS/EIR, or the incremental differences in impacts are not significant. The discovery of new resources not anticipated in the 1992 EIS/EIR included fossil bones of mammoth and other prehistoric species at the NIF site, presence of the California red-legged frog in site drainage ditches, and nesting on the site by the white-tailed kite. In addition, PCB-containing capacitors were unearthed at the NIF construction site. These new discoveries resulted in the application of mitigation measures established in the 1992 EIS/EIR and project-specific NEPA documents, consultation with appropriate authorities, additional studies, and implementation of project-specific regulatory abatement and/or cleanup actions. Appendix A evaluates whether analyses of changes in actions foreseen in 1992 plus any new or modified proposals from now until 2002 at SNL, Livermore, present a seriously different picture of the likely consequences of continued operation of SNL, Livermore, than was presented in the 1992 EIS/EIR. This evaluation showed that either the impacts were within the bounds of the 1992 EIS/EIR or that the incremental differences in impacts were temporary and not significant. As a result, the anticipated environmental consequences related to this new information are small, and the overall picture of sitewide LLNL and SNL operations remains very similar to that presented in the 1992 EIS/EIR.

For these reasons, no supplementation of the 1992 EIS/EIR is needed for any impact topic.

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APPENDIX A:

SANDIA NATIONAL LABORATORIES, LIVERMORE, CONTRIBUTION TO THE SUPPLEMENT ANALYSIS

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APPENDIX A:

SANDIA NATIONAL LABORATORIES, LIVERMORE, CONTRIBUTION TO THE SUPPLEMENT ANALYSIS

A.1 INTRODUCTION

This appendix presents the changes from the 1992 EIS/EIR at Sandia National Laboratories, Livermore (SNL), by resource area and evaluates the significance of any increased impacts.

A.2 MISSION

As a U.S. Department of Energy (DOE) national laboratory, Sandia National Laboratories (both New Mexico and California) works in partnership with universities and industry to enhance the security, prosperity, and well being of the nation. Sandia National Laboratories provides scientific and engineering solutions to meet national needs in nuclear weapons and related defense systems, energy security, and environmental integrity, and to address emerging national challenges for both government and industry. The basic mission for SNL, Livermore, has not changed. Three broad programmatic areas for SNL, Livermore are national security, energy research, and integrated manufacturing technologies. National security programs include nonproliferation and counterproliferation. Emphasis has been added to SNL, Livermore, for energy research in combustion science and technology and for integrated manufacturing technologies.

As described in the 1992 EIS/EIR, the SNL mission is engineering research and development for all levels and phases of the nuclear-weapons life cycle; tasks related to national security, including nuclear materials safeguards and security, treaty verification and control, intelligence on foreign technologies and weapons systems, waste management, and programs in support of the DOD; and basic and applied research and development for national energy programs. This mission has not changed and no significant new programs or projects have been proposed since 1992 or are planned for SNL for the near future (2002). In fact, DOE has phased out the operation of the Tritium Research Laboratory (TRL) and completed its decontamination in 1996.

A.3 IMPACTS

Table A.1 provides a comparison of the 1992 EIS/EIR impacts with 1996 conditions by resource area/issue. For those areas for which there is an increase or potential impact, an evaluation is provided below.

TABLE A.1 Comparison of 1992 EIS/EIR Impacts with 1996 Conditions at SNL

Issue	1992 EIS/EIR	FY 1996 Status[a]	Impact
Land Use	830,000 gsf[b] with a projected 6% increase	820,000 gsf	Decrease
Socioeconomic	Site population is approx. 1,500 (450 contractors)	Site population is 1178 (965 Sandians, 213 contractors)	Decrease
Community Services	205 students enrolled in Livermore schools were from Sandia families	129 children of Sandians attend Livermore schools	Decrease
Prehistoric and Historic Resources	No impact anticipated	No changes	No change
Aesthetics and Scenic Resources	Projected small site changes	No changes	No change
Geology	No impact anticipated	No changes	No change
Ecology			
Vegetation	No impact anticipated	No changes	No change
Wildlife	No impact anticipated	• CA tiger salamander • Burrowing owl • Ferruginous hawk	Minor change
Threatened and Endangered Species	No impact anticipated	No threatened or endangered species present on SNL	No change
Wetlands	No impact anticipated	Repair to SNL's perimeter security fence could have interim impact on the wetlands, but will be mitigated	Temporary change
Air Quality			
Criteria Pollutants	Particulates - 0.35 lb/day (+0.02) VOCs - 14.1 lb/day (+0.85) Sulfur oxides - 0.01 lb/day (+0.001) Nitrogen oxides - 18.7 lb/day (+1.12) Carbon monoxide - 2.4 lb/day (+0.14)	Particulates - 0.001 lb/day VOCs - 3 lb/day Sulfur oxides - 0.00 lb/day Nitrogen oxides - 19 lb/day Carbon monoxide - 1.0 lb/day	Decrease or essentially no change
Toxic Air Contaminants	TCE - 1,765 lb/yr (+88.3) Gasoline vapors - 170 lb/yr (+8.5) CFCs - 300 lb/yr (+15)	TCE - 360 lb/yr Gasoline vapors - 2 lb/yr CFCs - 613 lb for 1996	Decrease Decrease Increase
Beryllium	None	None	No change
Radiation	Emissions decrease projected	Total tritium emissions in 1996 were 0.078 Ci.	Decrease
Decommissioning Tritium Research Laboratory	Short-term increase due to cleanup projected	Tritium emissions during the cleanup period steadily decreased	Decrease
Water			
Surface Water	No impact anticipated	No changes	No change
Groundwater	No impact anticipated	No changes	No change

TABLE A.1 (Cont.)

Issue	1992 EIS/EIR	FY 1996 Status[a]	Impact
Noise	Increase impact	No data available	Unknown
Traffic	Projected increase to 3,130 vehicle trips/day	1,178 people x 2 trips/day = 2,356 vehicle trips/day	Decrease
Utilities and Energy			
Water	58 million gal/yr estimate for 1992 (projected increase to 61.5 million gal/yr)	58 million gallons were consumed in 1996	No change
Electricity	40.1 million kilowatt-hours/yr (projected to increase to 42.5 million kW-h/yr)	37.4 million kW-H were used in 1996	Decrease
Fuel (gasoline and diesel)	16,600 gal of fuel/yr (projected to increase to 17,600 gal/yr)	10,541 gal of fuel for 1996	Decrease
Sewage Discharges	Estimated discharge of 27.7 million gal/yr for 1992 (projected increase to 29.3 million gal/yr)	18.7 million gallons was discharged in 1996	Decrease
Materials and Waste Management			
Materials Management (chemicals)	Liquid - 3,420 gal (+210 gal increase) Solid - 6,320 lb (+380 lb increase) Gas - 197,000 ft^3 (+11,900 ft^3 increase)	Liquid - 49,321 gal Solid - 44,770 lb Gas - 377,525 ft^3	Increase
Waste Management			
Radioactive (low level)	72,805 lb (+4,377 lb projected increase)	5,590 lb for FY1996	Decrease
Hazardous	Liquid - 3,940 gal (+240 gal projected increase) Solid - 6,320 lb (+380 lb projected increase)	Liquid - 14,455 gal for FY1996 Solids - 96,865 lb for FY1996	Increase
Mixed	liquid - 250 lb (+ 15 lb projected increase) solid - 73 lb (+4 lb projected increase	0 lb for FY1996	Decrease
Medical	124 lb (+ 7 lb projected increase)	416 lb for FY1996	Increase
Decommissioning Tritium Research Laboratory	Waste projections for cleanup and transition of TRL: 100,000 lb of low-level waste; 310 gal of mixed waste; low-level waste shipped less than 10,000 Ci	Net waste weight from TRL cleanup and transition was 103,900 lb; mixed waste generation was 323 gal; total shipped was 14,090 Ci (tritium)	Short-term increase leading to long-term decrease
Occupational Protection			
Radiation	Collective radiation dose to workers was 3.5 person-rem in 1990	505 workers were monitored in 1996 resulting in a 0.361 person-rem dose	Decrease

TABLE A.1 (Cont.)

Issue	1992 EIS/EIR	FY 1996 Status[a]	Impact
Decommissioning Tritium Research Laboratory	2 to 3.3 person-rem/yr for 3 years	Total exposure for all individuals for the 3 years was 0.58 person-rem	Decrease
Toxic Substances and Physical Hazards	For the 5-year period 1986-1990 there were 133 accidents recorded: 27% (36 cases) lacerations 21% (28 cases) backpain or strains	For the 5 year period 1992-1996 there were194 injuries: 40% (77 cases) repetitive trauma 18% (34 cases) strains 12% (24 cases) backpain or strain	Increase
Site Contamination	Low	CCl4 identified in monitoring well NLF-6	Possible increase

[a] Sources for 1996 data were EH&S databases and personal communications from EH&S program managers.

[b] gsf = gross square feet.

A.3.1 Wildlife

Over the past two years, there have been several sightings on SNL property of wildlife classified as federal candidate species and/or California state "species of special concern." These species include the California tiger salamander, the ferruginous hawk, and the burrowing owl. California tiger salamanders were sighted at the southern boundary, near the Lawrence Livermore National Laboratories (LLNL) water tanks, and in the western buffer zone near the LLNL percolation ponds. Burrowing owls were also sighted near the LLNL percolation ponds. The ferruginous hawk was sighted in SNL's eastern buffer zone.

In July 1998, a biological survey was conducted at SNL (SNL 1998). The western buffer area was found to contain suitable habitat for California tiger salamanders, burrowing owls, and loggerhead shrikes, a California state "species of special concern." Several loggerhead shrikes were also observed on fences throughout the SNL property. Loggerhead shrikes are likely to nest in the riparian corridor in the eastern buffer and in the scrubby habitat south of the water tanks.

At the time the 1992 EIS/EIR was prepared, no sensitive species were present on the SNL site. If other than routine activities are planned that may impact sensitive species, then additional NEPA analysis will be conducted. Current site practice is to minimize disturbance to all wildlife species, even sensitive species for which there are no regulatory requirements.

A.3.2 Wetlands

Projects to repair SNL's perimeter security fence and to conduct maintenance of a trash rack located within the Arroyo Seco will be conducted within a wetland. The repairs will consist of improving the stream channel at the fence crossing by cementing and placement of rip-rap. Maintenance would consist of removing debris and sediment that has formed a dam across the arroyo. Any wetlands that are disturbed during these projects will be restored in accordance with regulatory permits and agreements, resulting in no net loss of wetland area.

A.3.3 Air Quality

It was not until June 14, 1993, that Section 8 of the amendments to the Clean Air Act of 1990 required service records be kept on equipment containing more than 50 lb of ozone depleting substances (ODSs), as well as the quantity of refrigerant added. Before that time, there was no formal tracking of the amount of refrigerant used at SNL. Since tracking records did not exist in 1992, purchase orders were used to calculate the 300-lb usage of chlorofluorocarbons (CFCs) in 1992. Data from 1996 show an increase of 313 lb of CFCs used over the usage reported in the EIS/EIR. This increase is likely a result of the change in tracking requirements and implementation of a tracking system rather than an actual increase in the amount used.

As part of planned activities described in the 1992 EIS/EIR, SNL committed to reducing the tritium limit to 0 g and to decontaminate and decommission the TRL. In 1993, SNL initiated an in-house cleanup and transition project for the TRL. The 0 g tritium limit was reached on October 18, 1994. Final cleanup and transition of the facility was completed in 1996. The facility has since been reclassified as a non-nuclear, low-hazard facility and is currently used for bench-scale chemical and radiation detector research and development activities. Transition of the TRL has resulted in an appreciable decrease of radiological emissions to the environment from SNL operations.

A.3.4 Noise

An increase in noise was identified in the 1992 EIS/EIR because of planned construction and infrastructure upgrade projects. Infrastructure upgrade projects have been completed. The two construction projects that were proposed in the EIS/EIR were not implemented, and there are no current plans to move forward with these projects. Because operations have remained steady between 1992 and 1997 and no new facility construction projects were initiated, no additional sitewide noise surveys were conducted.

A.3.5 Materials Management (chemicals)

The chemical inventory data supplied from the line in 1992 was collected through a voluntary process much different than the mandatory bar-coded container tracking process used today. The 1992 inventory also focused on classic research chemicals. The current chemical inventory is far more comprehensive, including not only research chemicals but also janitorial supplies, paints, maintenance chemicals (fuel oil and gasoline), and all gases (liquid nitrogen and liquid argon) on the site. Although the 1996 data show an increase in quantities of chemicals on-site, these differences are likely due to changes in chemical inventory tracking and implementation of a comprehensive tracking system. It is expected that inventories will slowly reduce as on-site chemical users are educated on the importance of reducing their inventories. Improvement in the just-in-time chemical purchasing and a comprehensive chemical inventory system will also help to reduce inventories.

A.3.6 Waste Management (hazardous)

The amount of liquid hazardous waste generated in FY 1996 is considerably more than the amount presented in the 1992 EIS/EIR. This increase is due primarily to the nonroutine cleaning of the Liquid Effluent Containment System (LECS) at Building 913. The cleaning of the 913 LECS resulted in the one-time generation of 6,750 gallons of lead-contaminated wastewater that was disposed of as hazardous waste. Data for 1996 also show an increase in solid hazardous waste generated. This is most likely due to the following categories of waste, totaling 74,176 lb, included in 1996 data but not in the 1992 EIS/EIR data:

- Waste generated from asbestos projects,
- Used empty drums,
- Waste resulting from the dismantling of the incinerator,
- Batteries, and
- Mercury.

A.3.7 Medical Waste

The increase in medical waste was due to a nonroutine sewerline cleanout project. Some of this waste was disposed of as “medical” waste because of the potential biohazard component. Routine medical waste quantities were believed to be approximately the same.

A.3.8 Waste Transportation

Impacts associated with transportation of waste off-site from SNL from the 1992 EIS/EIR have not changed. Although the quantity of waste generated is higher than that stated in the EIS/EIR, the transportation impacts are lower. The 1992 EIS/EIR analyzed six shipments per month, while the site presently ships, on average, less that three times per month.

A.3.9 Physical Hazards

The increase in injuries seen for the years 1992 through 1996 appears to be due to an increase in one specific injury category: repetitive trauma. Reportable cases of this type of injury have gone from 1 for the period of 1986–1990 to 77 cases for the period 1992–1996. Most likely this increase does not represent an actual increase in the number of repetitive trauma injuries occurring, but rather, an increase in the number of repetitive trauma injuries that are being *reported* due to an increased awareness of these types of injuries on the part of employees and SNL management.

A.3.10 Site Contamination

As part of planned activities described in the 1992 EIS/EIR, SNL committed to reducing the tritium limit to 0 g and to decontaminate and decommission the TRL. In 1993, SNL initiated an in-house cleanup and transition project for the TRL. The 0 g tritium limit was reached on October 18, 1994. Final cleanup and transition of the facility was completed in 1996. The facility has since been reclassified as a non-nuclear, low-hazard facility and is currently used for bench-scale chemical and radiation detector research and development activities. Transition of the TRL has resulted in an appreciable decrease of radiological emissions to the environment from SNL operations.

As part of the Navy Landfill investigations in 1993, groundwater monitoring wells were drilled outside the boundary of the landfill. One of these monitoring wells, NLF-6 located to the east of the landfill, has shown carbon tetrachloride to be present at levels ranging from nondetectable (detection level is 0.5 ppb) to 2.3 ppb. These concentrations are above the California maximum contaminant level (MCL) of 0.5 ppb. It seems unlikely that the source of the carbon tetrachloride in NLF-6 is the landfill. First, NLF-6 is located outside of the NLF perimeter and is cross-gradient to the general groundwater flow direction beneath the NLF. In fact, the potentiometric contours indicate that NLF-6 could very likely be in a groundwater zone of stagnation (i.e., a point in the groundwater flow field where groundwater is not moving). Therefore, it would be highly unlikely that groundwater would flow from the landfill toward NLF-6. Secondly, there is no historical information indicating that chlorinated hydrocarbons were disposed of in the NLF. In fact, with this one exception, over 10 years of quarterly monitoring has shown all wells associated with the NLF to be free of any chlorinated

hydrocarbons. Finally, the levels of carbon tetrachloride in NLF-6 have remained at a low, constant level for nearly three years, indicating the absence of a migrating plume. The low level of carbon tetrachloride seen in NLF-6 is most likely not associated with the landfill or its past operations.

At the suggestion of the Regional Water Quality Control Board, SNL evaluated the risk associated with the carbon tetrachloride observed in NLF-6. A risk assessment for the landfill was completed in 1997. The results indicated an extremely low risk, (approximately 10^{-5} risk) to off-site populations, which falls within the U.S. Environmental Protection Agency's acceptable range of 10^{-4} to 10^{-6}. Regional Board staff found that the landfill does not pose a significant threat to the environment and approved closure of the site in March 1998.

A.4 REFERENCES

Ruderman, M., 1998, letter from Ruderman (San Francisco Bay Regional Water Quality Control Board) to M.J. Zamorski (U.S. Department of Energy, Oakland Operations Office), March 17.

Sandia National Laboratories, 1998, *Botanical and Wildlife Survey Report, Sandia National Laboratories, Livermore, California,* July.

U.S. Department of Energy
Oakland Operations Office, Oakland, California

SUPPLEMENT ANALYSIS

for

Continued Operation of
Lawrence Livermore National Laboratory and
Sandia National Laboratories, Livermore

Volume II: Comment Response Document

March 1999

DOE/EIS-0157-SA-01

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CONTENTS

ABBREVIATIONS AND ACRONYMS

ADAPT	Advanced Design and Production Technology
ARIES	Advanced Recovery Integrated Extraction System
AVLIS	Atomic Vapor Laser Isotope Separation
°C	Degrees Celsius
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CTBT	Comprehensive Test Ban Treaty
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DTSC	California Department of Toxic Substances Control
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPC	Engineered Plume Collapse
ES&H	Environment, Safety and Health
°F	Degrees Fahrenheit
FONSI	Finding of No Significant Impact
g	Gram
HEPA	High Efficiency Particulate Air (filter)
IPD	Integrated Process Demonstration
JON	Judgements of Needs
kg	Kilogram
LLNL	Lawrence Livermore National Laboratory
LLMW	Low-Level Mixed Waste
LLW	Low-Level Radioactive Waste
MOX	Mixed Oxide (fuel)
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazards Air Pollutants
NIF	National Ignition Facility
NOD	Notices of Deficiency
NOV	Notice of Violation
NTS	Nevada Test Site
OAK	DOE Oakland Operations Office
ORPS	Occurrence Reporting and Processing System
PEIS	Programmatic Environmental Impact Statement
Pu	Plutonium
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SA	Supplement Analysis
SAER	Site Annual Environmental Report
SAR	Safety Analysis Report
SNL-L	Sandia National Laboratories, Livermore
START	Strategic Arms Reduction Treaty

TSF	Terascale Simulation Facility
U	Uranium
USEC	U.S. Enrichment Corporation
VOC	Volatile Organic Compound
WIPP	Waste Isolation Pilot Plant
WM	Waste Management (PEIS)

1 INTRODUCTION

1.1 BACKGROUND

The U.S. Department of Energy (DOE), prepared a draft Supplement Analysis (SA) for Continued Operation of Lawrence Livermore National Laboratory (LLNL) and Sandia National Laboratories, Livermore (SNL-L), in accordance with DOE's requirements for implementation of the National Environmental Policy Act of 1969 (NEPA) (10 Code of Federal Regulations [CFR] Part 1021.314). It considers whether the Final Environmental Impact Statement and Environmental Impact Report for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore (1992 EIS/EIR) should be supplemented, whether a new environmental impact statement (EIS) should be prepared, or no further NEPA documentation is required.

The SA examines the current project and program plans and proposals for LLNL and SNL-L, operations to identify new or modified projects or operations or new information for the period from 1998 to 2002 that was not considered in the 1992 EIS/EIR. When such changes, modifications, and information are identified, they are examined to determine whether they could be considered substantial or significant in reference to the 1992 proposed action and the 1993 Record of Decision (ROD). DOE released the draft SA to the public to obtain stakeholder comments and to consider those comments in the preparation of the final SA. DOE distributed copies of the draft SA to those who were known to have an interest in LLNL or SNL-L activities in addition to those who requested a copy. In response to comments received, DOE prepared this Comment Response Document.

1.2 PUBLIC PARTICIPATION

DOE issued and distributed the draft SA for public review and comment on January 26, 1999. The public comment period extended to February 25, 1999. DOE held two public briefings on the draft SA on February 11, 1999, in Livermore, California. The public briefings were held to receive oral and written comments and to provide information on the SA to the public. Spoken comments given during the public briefings were recorded by a court reporter and a transcript produced. The briefings on the SA were conducted using an informal format with a facilitator. The format chosen allowed for a two-way interaction between DOE and the public. The facilitator helped to direct and clarify discussions and comments, allowing every commentor the chance to formally present comments.

DOE considered all comments to evaluate the accuracy and adequacy of the draft SA and to determine whether its text needed to be corrected, clarified, or otherwise revised. DOE gave equal weight to spoken and written comments, to comments received at the public briefings, and

to comments received in other ways during the response period. Comments were reviewed for content and relevance to the environmental analysis contained in the draft SA.

2 COMMON ISSUES

Several topics were considered by DOE to need further explanation or clarification. These topics, called common issues, relate to comments received on the draft SA or are topics not related to the environmental review but are considered by DOE to be of broad interest or concern to stakeholders. The common issues include the following topics:

- Supplement Analysis Process
- Proposed Changes in Administrative Limits
- Opposition to Nuclear Activities
- Concerns With HEPA filters

2.1 SUPPLEMENT ANALYSIS PROCESS

DOE issued the Final Environmental Impact Statement and Environmental Impact Report (EIS/EIR) for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore in 1992, to meet the requirements of the National Environmental Policy Act and the California Environmental Quality Act. The 1992 EIS/EIR evaluated the impacts on the environment of existing and proposed operations at LLNL and SNL-L for the period 1992 through 2002. On January 21, 1993, DOE issued a ROD to continue operation of LLNL and SNL-L, including projects proposed for the near term (next 5 to 10 years). The preferred alternative included current operations, programmatic enhancements, and facility modifications in support of research and development missions established by the President and Congress.

DOE prepares site-wide EISs for certain large, multiple-facility DOE sites to assess the environmental impacts of operations at these sites. DOE's regulations require the evaluation of site-wide EISs at least every five years by means of a supplement analysis to determine whether the existing EIS remains adequate, whether to prepare a new site-wide EIS, or supplement the existing EIS. DOE issued *the Draft Supplement Analysis for the Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore Site-wide Environmental Impact Statement* for public review and comment on January 26, 1999.

The Council on Environmental Quality regulations for implementing NEPA state that a supplemental EIS "shall be prepared if there are substantial changes to the proposal or significant new circumstances or information relevant to environmental concerns." In preparing this SA, DOE examined the current project and program plans and proposals for LLNL and SNL-L to

identify new or modified projects or operations or new information for the period from now to 2002 that was not available for consideration in the 1992 EIS/EIR. When such elements were found, they were examined to determine if they resulted in environmental impacts that exceeded the bounds of the impacts of LLNL and SNL-L operations presented in the 1992 EIS/EIR analysis; and if the bounds were exceeded, whether the incremental environmental impacts were significant. A *bounding analysis* is an analysis designed to overestimate or determine an upper limit to potential impacts or risks.

The SA determined that SNL-L continues to operate within the levels described in 1992. No significant new programs or projects have been proposed since 1992 or are planned for SNL-L for the near future. The SNL-L evaluation revealed that the impacts were within the bounds of the 1992 EIS/EIR analysis or the incremental differences in impacts were not significant. No supplementation of the 1992 EIS/EIR is needed on the basis of SNL-L activities.

LLNL continues to operate within the general statement of action described in 1992 EIS/EIR and its associated ROD; however, some projects and proposals have been cancelled or modified and some new ones have been developed. In addition, some new information is available on the site environment. A number of key projects or proposals were identified that would be implemented between 1998 and 2002. Also identified were proposed changes in administrative limits for certain radioactive materials and changes in waste generation and management. Administrative limits are the total quantities of certain materials allowed in LLNL facilities.

When environmental impact areas were screened to determine whether it was clear that impacts of LLNL operations, considering this new information, would remain within the envelope of environmental consequences analyzed in the 1992 EIS/EIR, DOE found that further evaluation was required for seven impact areas. These areas included sensitive species, wetlands, paleontological resources, radiological consequences of accidents, waste generation and management, environmental justice, and cumulative impacts. The SA presents the results of these evaluations, and concludes that either the projected impacts are within the bounds of the 1992 EIS/EIR analysis, or that the incremental differences are not significant. The overall picture of site-wide LLNL operations remains very similar to that presented in the 1992 EIS/EIR, and supplementation is not needed.

2.2 PROPOSED CHANGES IN ADMINISTRATIVE LIMITS

In response to its research and development mission and programmatic needs to the year 2002, DOE is proposing changes in administrative limits for certain radioactive materials in some of the LLNL buildings that carry out these activities.

Administrative limits are controls on the maximum amounts of material that can be processed at one time or kept in storage. As the name implies, these limits are administrative rather than regulatory. Administrative limits are set only at the level that is needed to meet

programmatic activities and take into account safety and material accountability restrictions. Administrative limits may be established for a group of buildings, a single building or room, a storage vault, a glovebox, or even a container. DOE analyzes the associated environmental impacts of the administrative limits in NEPA documents for nuclear and hazardous facilities. Administrative limits for plutonium, uranium, and tritium are within the capacity and infrastructure capabilities analyzed by the safety analysis report (SAR) process. The enhanced programs that require higher material inventories are listed in the SA. The safety implications of proposed changes to the administrative limits that were analyzed in the 1992 EIS/EIR and its ROD are reviewed in this SA.

DOE is proposing to change the administrative limit for uranium in Buildings 332 and 334 from 300 kilograms to 3500 kilograms. This would consist of 500 kilograms of enriched uranium (greater than 1% in the U-235 isotope), and 3,000 kilograms of depleted or natural uranium (less than 1% in U-235). The isotope U-235 is capable of fission, that is, when collocated in sufficient quantity (called a critical mass), it can be the source of criticality accidents, and can serve as a fuel in reactors and nuclear weapons. The 3,000 kilograms of uranium with less than 1% U-235, while radioactive at a low level and toxic to humans, is not capable of a sustained nuclear reaction under current facility conditions. This latter form is the uranium found naturally in soils and rocks throughout much of the world.

Although the proposed administrative limits for uranium would increase the total amount in the building complex, controls would continue to limit the material in a glovebox or at a work station well below that of a critical mass. In other words, the amount of material in storage would increase, but the amount of material being worked on at any one time would not increase. Nevertheless, a criticality accident of low probability is possible with uranium. The 1992 EIS/EIR identified as possible an inadvertent plutonium criticality accident for Building 332 with a dose of 2.0 rem at the LLNL fenceline as the bounding criticality accident for the Building. Subsequent analysis in the 1995 SAR indicated a uranium criticality accident could result in a dose of 3.8 rem at the fenceline. To put this in perspective, this dose is within the range (1 to 5 rem) at which some protective action is recommended by the U.S. Environmental Protection Agency (EPA), and is not unlike the 2.0 rem dose from a plutonium criticality accident in the 1992 EIS/EIR. The offsite population dose is still conservatively estimated to result in less than one fatal cancer among the public, as discussed in both the SA and in the 1992 EIS/EIR.

DOE is proposing to raise the administrative limit for tritium in Building 331 to 30 grams. The increase is necessary to enable LLNL to support programs associated with decommissioning and decontamination of DOE's Mound site, the expansion of the U.S. Army Tritium Recovery and Recycle Project, and the target fills for the National Ignition Facility (NIF). Before 1992, the tritium limit for Building 331 was 300 grams. The 1992 EIS/EIR set an administrative limit of 5 grams of tritium in any one facility, with no more than 10 grams to be divided among Buildings 298, 391 and 331. While the current proposal is to increase the administrative limit to 30 grams, the total quantity of tritium material that would ever be at risk during operations would remain the same as analyzed in the 1992 EIS/EIR. The administrative control enforced in 1992 has not changed and still limits the inventory stored in any one vessel or connecting process (the "at risk" inventory) to 3.5 grams. Accidents with potential for releasing the additional tritium from

its stored configuration are not considered credible. Major improvements in facility systems and operations since 1992 have significantly reduced the expected frequency of accidents leading to tritium release. While tritium facility activities are expected to increase if the proposed 30 grams inventory limit is approved, they would not approach the level upon which the 1992 EIS/EIR analysis was based.

DOE proposes to raise the limits for Building 239 from 4.5 to 6 kilograms for plutonium and from 18.5 to 25 kilograms for uranium, as discussed in section 6.2.3 of the SA. Components are brought into Building 239 for radiographic inspection; all of the plutonium and uranium in the components is sealed in doubly contained packaging that is not removed during radiographic operations, and the sealed containers are returned to storage in Building 332.

The current Building 239 SAR evaluates the consequences of a seismic event or accidental dropping of a component, compromising the containment barriers, based on an inventory of 4.5 kilograms of plutonium or 18.5 kilograms of uranium. The SAR analysis was scaled linearly to provide an estimate of the doses that would result from an accident with the proposed larger amounts of radioactive material. These projected doses are much lower than the whole-body dose range at which the EPA recommends protective action for accident releases and are well within the 1992 EIS/EIR bounding accidents involving operations with plutonium or uranium at LLNL.

The SA demonstrates that while the calculated consequences to the exposed populations and to a maximally exposed individual from an accident would increase in some cases over those published in the 1992 EIS/EIR, these impacts still are not significantly different from those established by the 1992 EIS/EIR. The accident analysis presented in the 1992 EIS/EIR still adequately characterizes the potential impacts of such accidents that may occur at LLNL, even under the proposed increased limits for radioactive materials in inventory.

2.3 OPPOSITION TO NUCLEAR ACTIVITIES

DOE acknowledges that many people are opposed to the development and testing of nuclear weapons. Since the 1940's, Congress has directed DOE and its predecessor agencies to develop and produce the nation's nuclear weapons, and to ensure the reliability and safety of the nuclear weapons stockpile. With the end of the Cold War, DOE has been developing strategies for appropriate adjustments to DOE site missions and activities consistent with current national security policies that reflect post-Cold War impacts, including a smaller enduring stockpile. However, even in the post-Cold War period, international dangers remain, and nuclear deterrence will continue to be a cornerstone of U.S. national security policy for the foreseeable future.

In 1992, the United States declared a moratorium on underground nuclear testing. In 1995, the President extended the moratorium and pursued a Comprehensive Test Ban Treaty (CTBT). Before the extension of the moratorium, Congress passed the *National Defense Authorization Act of 1994* (Public Law 103-160) which directs DOE to maintain a high level of

confidence in the safety, reliability and performance of the nuclear weapons stockpile, and to maintain the ability to design, develop, manufacture, and test nuclear weapons.

DOE has developed a comprehensive program of stockpile stewardship and management that maintains essential capabilities for stockpile safety and reliability, while meeting other legal and policy directives. Stockpile stewardship capabilities are currently viewed by the United States as a means to further U.S. nonproliferation objectives in seeking a zero-yield CTBT. It is also reasonable to assume that U.S. confidence in its stewardship capabilities would remain as important, if not become more important, in future arms control negotiations to further reduce its stockpile.

LLNL is one of several national laboratories that support DOE's responsibilities for national security. DOE assigns mission elements to LLNL based on the facilities and expertise of the staff located there. Such assignments are made within the context of national security needs as expressed, for example, in Presidential Decision Directives; the National Defense Authorization Act for Fiscal Year 1994 (Public Law 103-160) and other congressional actions; the U.S. Department of Defense Nuclear Posture Review; treaties in force, such as the Nuclear Nonproliferation Treaty and the Strategic Arms Reduction Treaty (START I), and treaties signed but not yet entered into force, such as the START II and the CTBT.

2.4 CONCERNS WITH HEPA FILTERS

Plutonium work in Building 332 is normally done in filtered gloveboxes. If the filter on the glovebox should fail, the plutonium would be carried downstream to the confinement filters. The confinement filters are two stage filters used to prevent release of contamination to the environment. Plutonium operations at Building 332 have two stages of High Efficiency Particulate Air (HEPA) filters to prevent releases to the environment. Should airborne plutonium escape the primary containment barriers with their associated glovebox exhaust/filtration systems, the ventilation systems will carry it to exhaust plenums with two stages of confinement filters. One stage of filtration under normal conditions is adequate to prevent environmental releases. The second stage, in series with the first, provides redundancy in case the first stage leaks or fails, and also increases the total efficiency of collection for the system. *When a filter fails, it would capture less of the particles in the airstream, depending upon the size of the opening, but most of the previously filtered particles would remain with the damaged filter.* Although additional stages may be in use in some facilities elsewhere, and provide even more redundancy, they are not necessary. The confinement filters for Building 332 are of fire-resistant construction and are operable for at least 2 hours at temperatures of 120^{o}C (248^{o}F).

All HEPA filters that are relied on to provide confinement (final stages) of ventilation system transmitted contamination are monitored on a weekly basis for particle load as a function of differential pressure. If any single filtration stage is found to have a pressure drop greater than 4 inches WG (water gauge), filters are replaced as routine maintenance. The maximum acceptable differential pressure is 5 inches WG for all final stages of filtration. At the time of replacement,

and on an annual basis, all final stage HEPA filters are in-place tested to confirm filtration efficiency and integrity of the installation with respect to gasket/frame seal. The acceptance criteria for the in-place test is in accordance with ERDA 76-21 (99.97% efficiency at a mean particle diameter of 0.7 micrometers).

To assure that the filters are not subjected to excessive pressure due to dust loading under routine operations, the pressure drop across the filters in Building 332 is monitored, and when it exceeds 4 inches WG, the filter is replaced as routine maintenance. The efficiency for filters in each stage is checked annually, and individual filters are replaced when they cannot meet 99.97% efficiency for particles ranging from 0.1 to 1.0 with an average particle size of 0.7 micrometers diameter. The Facility has recently decided to change the efficiency test criteria to a particle size of 0.3 micrometer diameter.

A concern was raised that HEPA filters are "translucent" to 0.1 micrometer diameter particles, implying that the particles have a very low capture efficiency and high penetration. The dissertation by Ronald C. Scripsick, published as LA-12797-&, Leaks in Nuclear Grade High Efficiency Aerosol Filters, 1994, Table IV-VI, provides the diameter of particles with the lowest capture efficiency, i.e., the ones that penetrate the most. For nine filters tested at the air speeds usually used in public protection, the particle diameter with the least efficiency ranged from 0.148 to 0.196 micrometers. For all nine filters, the collection efficiency for these particles was 99.97% or higher. This performance can be expected on all HEPA filters used by DOE, as the DOE acceptance testing standard rejects all filters with less than 99.97% efficiency at 0.3 micrometers, which is quite close to the particle size of maximum penetration.

DOE contractors are currently using the heterodisperse 0.7 micrometer average particle size aerosol (range from 0.1 to 3 micrometers) as recommended in ASME N510 to leak test their HEPA filters. The 0.3 micrometer monodisperse particle generators are too cumbersome to use in the field, as they weigh several tons.

Current laser particle counters allow in-place efficiency testing of HEPA filters to determine filter efficiency at any particle size, including 0.15 micrometer, the particle size at which HEPA filters are least efficient. Preliminary lab measurements show that the two methodologies (laser particle counter looking at 0.15 micrometer and the heterodisperse 0.7 micrometer average particle size aerosol) give essentially the same results when the leakage rate reaches 0.1%. This is the leakage rate assumed in the SAR and the 1992 EIS/EIR analyses for the final stage HEPA filters. Therefore, LLNL believes the current leakage checks are adequate to check for all particle sizes (including the 0.15 micrometer size).

DOE has promulgated HEPA filter standards: DOE-STD-3020-97, Specification for HEPA Filters Used by DOE Contractors; DOE-STD-3022-98, DOE HEPA Filter Test Program; DOE-STD-3025-99, Quality Assurance Inspection and Testing of HEPA Filters; and DOE-STD-3026-99, Filter Test Facility Quality Program. These standards are available at the internet site http://www.explorer.doe.gov:1776. These standards are being evaluated for incorporation into the LLNL "WorkSmart Standards" for possible inclusion in future contract modifications.

The burning of plutonium creates a substantial number of very small particles, 0.1 micrometer and smaller. However, only 0.01 % or less of the total mass of airborne plutonium formed by burning is less than 0.2 micrometers in diameter (K. Stewart, *The Particulate Material Formed by the Oxidation of Plutonium*, in Progress in Nuclear Energy Series IV, Vol. 5, 1963). The number of these particles is not as important as their total mass. To a first approximation, the potential health effect of a particle deposited in the lungs is proportional to the mass of the particle. Therefore, the particles that have the greatest penetration of tested HEPA filters are not those of the greatest health significance.

A concern was raised that many HEPA filters have been in place for a longer period of time than what experts say is appropriate and that their age has probably affected their ability to withstand a high pressure difference that could occur from loading by smoke or water in some accident scenarios. The laboratory has monitored and tested the filter performance and there have been no environmental releases of airborne plutonium except for the release in 1980. That release resulted from an incorrect changeout and sealing of HEPA filters, rather than from failure of the HEPA filter. Continuous monitoring of the facility, using methods sanctioned by the EPA, indicates that the HEPA filter systems have been operating so that emissions have not been occurring. Environmental monitoring data and assessments of public dose are discussed in the LLNL Site Annual Environmental Report (SAER).

With LLNL's continuing missions involving plutonium operations in Building 332, the priority of HEPA filter replacement has been raised. In October of 1998, detailed plans were completed to replace all confinement filters older than 8 years by October 1999. Meanwhile, the weekly surveillance of pressure drop and the annual leak testing of confinement filters will continue. These filters are not subjected to excessive cold or heating, and the ventilation design and fire protection system is intended to protect them during accidents involving fire. Analyses have been made of accidents of credible fire releases in the Building 332 SAR. An accident that loses the integrity of both banks of confinement filters was regarded as incredible (a probability of less than one in one million per year). The consequences of the credible accidents do not exceed radiological dose guidelines at the site boundary or the impacts of bounding accidents in the 1992 EIS/EIR. Nevertheless, DOE recognizes that accidents of low probability can occur.

DOE acknowledges that one type of filter in use is only partially qualified for nuclear applications. This filter is commonly referred to as a "box" or "birdcage" filter, and is used in some locations. The facility assures adequate performance in routine operations by weekly

surveillance of the pressure drop and by annual tests of filtration efficiency. Confinement filter systems served by this type are:

- Downdraft room exhaust sub-system containing 4 filters

- Increment III glovebox exhaust containing 2 trains of 4 filters each for a total of 8 filters.

After the near-term exchange is made to attain filters that are less than 8 years old, the laboratory will consider the design changes necessary to replace the box filters.

LLNL currently has policies and procedures in place for the proper management of used HEPA filters from programmatic operations. Used HEPA filters are characterized for waste acceptance criteria either through process knowledge or sampling and analysis. Depending on the results of the characterization, HEPA filters may be disposed of as low-level radioactive waste (LLW) or low-level mixed waste (LLMW). If the quantities and types of radionuclide contamination meet the definition of transuranic waste, the filters have been stored onsite or at the Nevada Test Site until they can be disposed of at the Waste Isolation Pilot Plant (WIPP). These HEPA filters are stored in metal drums or metal boxes.

A concern was raised that DOE does not have a single, central office that oversees and provides guidance in the use of HEPA filters complex-wide. DOE is a large organization whose structure does not lend itself to a separate, central office for every aspect of environment, safety and health (ES&H). Rather, DOE relates its ES&H performance expectations to its contractors, and enforces these through contractual mechanisms, changing contractors if necessary. DOE offices in the field provide oversight of the contractor ES&H programs. The Defense Nuclear Facilities Safety Board (DNFSB) provides further oversight. DOE expectations include meeting requirements in the DOE orders and Federal regulations that provide for protection of workers and public from radiation. Violations of the Federal regulations are enforced under 10 CFR 820 by an independent office in DOE.

3 COMMENT DOCUMENTS

3.1 INTRODUCTION

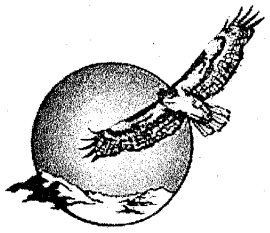
This section presents the documents submitted to the DOE during the 30-day public comment period on the draft SA and the transcripts of the two public briefings held on February 11, 1999. DOE reviewed each document and transcript and identified the public comments provided. Each comment identified is marked in the margin with a bar and the document number and sequential comment number in that document. For example, Comment 3-11 was identified in Document 3 (3) as the eleventh (11) comment within that document. DOE has responded individually to each identified comment in Section 4 of this Comment Response Document.

3.2 Document 1: Tri-Valley CAREs

Tri-Valley CAREs

Citizens Against a Radioactive Environment

5720 East Avenue #116, Livermore, CA 94550 • (510) 443-7148 • Fax (510) 443-0177



Peace Justice Environment since 1983

February 10, 1999

U.S. Department of Energy
Oakland Operations Office
1301 Clay St.
Oakland, CA 94612

Re: DOE/EIS-0157-SA-01, January 1999 - Draft Supplement Analysis for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore, California

Dear Sirs and Madams:

This letter is Tri-Valley CAREs' (Communities Against a Radioactive Environment) response to the above-referenced Draft Supplement Analysis (DSA) on behalf of Tri-Valley CAREs' approximately 2200 family-members in the communities surrounding the Lawrence Livermore National Laboratory (LLNL) and the Sandia National Laboratories (SNL).

Tri-Valley CAREs, a 16-year-old grassroots environmental organization, is a community-based "watch dog" over LLNL's activities. Further, we hold two U.S. Environmental Protection Agency Technical Assistance Grants to monitor environmental cleanup at both LLNL's Main Site and its Site 300 weapons testing station.

Tri-Valley CAREs strongly disagrees with the DSA's conclusion that no supplementation of the 1992 EIS/EIR is needed. In fact, an entirely new EIS/EIR is needed. Our reasons are as follows:

1-1 **A. Since 1992, LLNL has 1) remained a "Superfund" Site; 2) had chronic pollution problems; 3) had frequent accidents involving radioactive and toxic contaminants; 4) had chronic problems with noncompliance with safety regulations; 5) received numerous Notices of Deficiency and Notices of Violations from the State Dept. of Toxic Substances Control (DTSC); 6) continued to have groundwater contamination problems; 7) continued to have sewer system problems; and 8) continued to have problems with noncompliance with safe storage requirements.**

On December 9, 1997, Tri-Valley CAREs sent a letter to the California Environmental Protection Agency Department of Toxic Substances Control, Region 2 (in Berkeley, California) as a public comment on LLNL's application for a Hazardous Waste Treatment & Storage Facility Permit (WTSF). This letter included a list of the following ongoing, chronic problems at LLNL:

1-2 1. **Both LLNL's Main Site and Site 300 are on the National Priorities List as extremely contaminated "Superfund" sites.** A federal regulation promulgated by past DOE Secretary Watkins requires environmental review of DOE facilities, including LLNL, every 5 years. LLNL's last full EIS/EIR was in 1992, nearly 7 years ago, and therefore out-of-date. More than a supplement analysis is needed in this instance. A new EIS/EIR is the appropriate and necessary level of environmental review.

1-3 2. **LLNL has chronic pollution problems**. As reported in May, 1997, **the City of Livermore cited LLNL** for chronic discharges of heavy metals and corrosive chemicals into the municipal sewer system. According to city officials, there had been **14 releases from LLNL**

1-3 cont.

above its permit limits since January, 1996, a rate of about one violation per month. One February, '97, accident involved a discharge of silver, **costing $41,000**, and another discharge in March, '97, this time of lead, **cost $8,000.**

3. **LLNL has a history of frequent accidents right up to the present**. Examples of on-site accidents reported **just for 1997** include: **February** – LLNL doctors cut a small hunk of plutonium-contaminated tissue from an employee's thumb after the worker had accidentally stuck himself with a sliver of the radioactive metal during routine cleanup. **March** – Three LLNL workers were contaminated when **uranium** filings caught fire. **April** – It was reported that earlier in '97, a **chlorine** gas leak forced about 20 workers to flee after an alarm sounded. **May** – The City of Livermore cited LLNL, again, for chronic discharges of **Heavy metals and corrosive chemicals**. Since January, 1996, LLNL has violated its permit discharge limits about once a month. **June** – It was reported that in May, '97, two workers were contaminated with **tritium** (radioactive hydrogen) while packaging the radioactive waste in the Tritium Facility. **July** – On July 2, workers shredding used air filters were **radioactively contaminated**. One worker was contaminated with **curium**, an alpha emitter, on his chest, face and in his nostrils. A DOE report credited **inadequate safety procedures** for this accident. Another July, '97, accident (a hazardous waste technician accidentally mixed nitric acid and alcohol while workers were "bulking," i.e., pouring spent chemicals into waste drums; this combination of chemicals could cause fire, explosion or fumes), resulted in fumes that triggered alarms and caused 25 workers to evacuate and LLNL to suspend "bulking" for a week.

1-4

4. **LLNL has a history of noncompliance with safety procedures.** As mentioned in #3 above, on **July 2, '97,** an LLNL worker was radioactively contaminated with **curium** in an accident that DOE itself admitted was due to inadequate safety procedures. **Also, in this instance, procedures that had been recently put into place with the State Department of Toxic Substances Control's (DTSC) guidance were apparently ignored by LLNL,** which raises questions about whether LLNL really follows agreed-upon safety procedures. This problem is underscored by another 1997 LLNL report (titled *Incident Analysis of Criticality Safety Control Infractions in building 332"*) confirming that a total of **15 criticality violations** (a "criticality accident" is a runaway nuclear chain reaction) occurred over a two-month period **(mid-May, '97 to mid-July, '97)** in LLNL's plutonium facility (Building 332) – where, again, **safety procedures were ignored.** Since then, **another criticality violation** has occurred in Building 332, underscoring the systemic nature of this problem.

1-5

5. **LLNL has a history of receiving Notices of Deficiency and Notices of Violation from the State Department of Toxic Substances Control, raising reasonable questions as to LLNL's good faith in complying with regulations and statutes, as well as with safety procedures implemented with the assistance of agencies such as DTSC.** Please see sections 6a through 6g of the above-referenced 12/9/97 letter from Tri-Valley CAREs to DTSC for details of LLNL's ongoing compliance problems.

1-6

6. **For years, LLNL's groundwater has been contaminated.** Although steps have been taken to monitor, control and remedy it, this environmental threat still persists. Some examples include: **1)** in 1997, LLNL's storm drains were found embedded with **mercury, an extremely toxic material. The drains may have contributed mercury-laden runoff to the already-contaminated groundwater, as well as to surface water and to soil;** and **2)** At LLNL's **Site 300** weapons testing station (located midway between Livermore and Tracy), during 1982-83 (and possibly again in 1996, 1997 and 1998), groundwater rose, saturating waste buried in disposal pits, and then receded, thus contaminating ground-water at deeper levels. At the recent **January 26, 1998 Site 300 TAG (Technical**

1-7

1-7 cont.

Assistance Grant) meeting with LLNL cleanup staff and representatives from various regulating agencies, Tri-Valley CAREs learned that, indeed, **Site 300 has a current, serious problem with elevated levels of tritium in the groundwater which has contaminated an aquifer** and which has formed a **tritium plume** nearly 2 miles long which must be dealt with before it reaches beyond the boundary of Site 300. The current elevated levels of tritium are, again, exacerbated by heavy rainfall which caused the groundwater to rise into tritium-contaminated disposal pits and then recede, taking tritium back into the groundwater at lower levels.

1-8

7. **LLNL has a history of sewer system problems.** LLNL's current "Interim Status" (from DTSC) liquid waste treatment process discharges treated wastewater (WW) **directly** into the Livermore municipal sewer. Theoretically, treated WW is safe for discharge into the sewer, but, in view of **1) LLNL's repeated violations** of its sewer discharge permit (see #2 above), **2)** past **sewer leaks** into the adjacent soil and groundwater, **3) the highly contaminated groundwater** at both the Main Site and Site 300 (see above), and **4) the close proximity of the surrounding communities** (Livermore and Tracy for the Main Site and Site 300, respectively), **it is reasonable to question the safety of this practice.**

1-9

8. **LLNL has a history of being out of compliance with safe storage requirements** (see # 5 & 6 above, also). Examples of this include: **1) "Old" waste** – LLNL has had many violations in how long it stores hazardous waste, e.g., in 1989-90, a DTSC inspector inspected 21 of LLNL's 100 hazardous waste site areas and found that 11 had waste **stored for more than 1 year** (1 year is the maximum allowed under California's Health & Safety Codes before such waste must be treated and/or disposed). **2) Undocumented satellite accumulation areas** – LLNL has **never provided DTSC** of these areas (where waste is kept "temporarily"), making inspection difficult to carry out. In the past DTSC **Notices of Deficiency** have been issued to LLNL for waste stored over 90 days. **3) Problems with mixed waste** -- DTSC has had difficulty in determining just how LLNL treats its mixed waste (i.e., hazardous waste combined with radioactive waste) in order to evaluate, among other things, whether **a)** an **incompatible wastes** are combined, and **b) cross-contamination** occurs between these two types of waste. One unanswered question is: Does LLNL ever label mixed waste as "radioactive?" In the past, Nevada Test Site, which accepts only radioactive waste, has returned waste shipments to LLNL because mixed wastes were included in the shipments, but were not labeled as such.

B. LLNL's Plutonium Facility (Building 332) has a history of problems with its High Efficiency Particulate Air (HEPA) filters and with ongoing criticality violations.

1-10

Tri-Valley-CAREs has recently received DOE documents in response to an April,1998, Freedom of Information Act request for information concerning the maintenance of Building 332's HEPA filters. These responsive documents indicate that a **history of chronic safety problems** exists where these HEPA filters are involved. Tri-Valley CAREs' areas of concern include: **1)** the use of at least one type of HEPA filter that is **only partially qualified for nuclear applications**; **2)** the fragility of these filters – e.g., **they may fail when wet, hot, cold, or have too much air pressure applied**; **3)** the use of filters beyond the recommended length of time for on-line service (in some cases, they have been **in service for 20-30 years,** despite warnings by at least one LLNL Hazard Control Specialist that, for instance, filters should be retired at 8 years maximum); **4) DOE may not have a centralized division that oversees the use of HEPA filters complex-wide,** leaving each facility on its own to cope with the problem of protecting employees and the public from plutonium contamination; and **5)** LLNL may have **problems with storage and disposal** of old HEPA filters, thus encouraging the use of filters beyond recommended time periods, and also creating yet another area of concern re: radioactive waste at LLNL. (At least one document shows that used, off-line filters are considered to be TRU waste. If so, does this mean, for instance, that used filters have been accumulating for years at LLNL awaiting the opening of WIPP?).

1-10 cont. As mentioned above in section A.4, **a series of criticality violations** occurred in LLNL's Plutonium Facility during 1997-98. These violations resulted in the Defense Nuclear Facilities Safety Board recommending shut-down of the Plutonium Facility while investigations were being made as to inadequate adherence to safety regulations and guidelines. The Plutonium Facility has since been operating on a limited status, "restart" mode. Even then, an additional criticality safety violation has occurred (on August 7, 1998).

1-11 **In view of these concerns, among others, Tri-Valley CAREs strongly advocates that the above problems in Building 332 are clearly "significant new circumstances or information relevant to environmental concerns..." (40 CFR Parts 1500-1508, 10 CFR Part 1021) since the 1992 EIS/EIR for LLNL, thus requiring a new EIS/EIR.**

1-12 A further plutonium issue surfacing since the 1992 EIS/EIR is the discovery of plutonium up to 1,000 times "background" found in Big Trees Park, Livermore.

1-13 **C. DOE proposes significantly increased administrative limits for the amounts of plutonium and uranium to be on-site at LLNL, yet does not consider this major change important enough to require a new EIS.**

DOE wants administrative limits to be increased for both plutonium and uranium as follows:

1) The 1992 EIS/EIR goal for the amount of plutonium to be in Buildings 332 & 334 of the Superblock was to reduce it from 700 kg to 200 kg. DOE claims that this goal has not been achieved because only ½ of LLNL's inventory was relocated off-site, and other DOE facilities cannot take any more LLNL plutonium until after the year 2000. Therefore, DOE now asks that the total amount at LLNL be kept at **700 kg, with the eventual goal of reducing it. Tri-Valley CAREs considers this new goal a major change from the 1992 EIS/EIR which requires analysis per a new EIS.**

1-14

2) The 1992 EIS/EIR limit for uranium in the same buildings was 300 kg. **DOE now wants to increase the limit for enriched uranium to 500 kg and for natural uranium to 3,000 kg, an enormous increase!** Again, these new suggested goals are a **major change** from the 1992 EIS/EIR, which requires analysis per a supplemental EIS. If, as the DSA claims, these changes are to support RD&D (research, development and demonstration) of 1) plutonium immobilization and 2) technologies for uranium conversion, reuse, waste management and disposal, Tri-Valley CAREs then requests they be analyzed per a new EIS as major changes from the 1992 EIS/EIR.

1-15

1-16 **Since Tri-Valley CAREs knows, by virtue of DOE's own "Green Book," which describes DOE's intent to carry out new nuclear weapons R&D, and, since LLNL is a primary nuclear weapons design facility, Tri-Valley CAREs seriously questions DOE's given justifications for requesting these weapons-related materials' significant increases. Tri-Valley CAREs humbly reminds DOE that the "cold war" is supposedly over.**

1-17 **Further, to answer Tri-Valley CAREs' questions about why DOE wants increased administrative limits for uranium (e.g., is it for the U-AVLIS?), Tri-Valley CAREs requests that DOE lay out in detail the programmatic elements required under NEPA.**

D. New and/or changed programs at LLNL since 1992.

1-18 There are a plethora of new and/or significantly changed programs at LLNL since 1992, including the National Ignition Facility, the afore-mentioned U-AVLIS program, subcritical nuclear tests and the ADAPT work on plutonium at LLNL.

1-19 Tri-Valley CAREs, for all the foregoing reasons, among others, demands that the DOE's conclusion (i.e., that no supplemental EIS is required for LLNL and SNL) be put aside, and that, in its place, the conclusion be reached that, due to clearly "significant new circumstances or information relevant to environmental concerns..." (40 CFR Parts 1500-1508, 10 CFR Part 1021) **a new or, at a minimum, a supplemental EIS is required.**

Sincerely,

Marylia Kelley
Executive Director
Tri-Valley CAREs

Sally Light
Nuclear Program Analyst
Tri-Valley CAREs

RS
mk for
Rene Steinhauer
Community Organizer
Tri-Valley CAREs

ATTACHMENT A

Tri-Valley CAREs
Citizens Against a Radioactive Environment
5720 East Avenue #116, Livermore, CA 94550 • (510) 443-7148 • Fax (510) 443-0177

Peace Justice Environment since 1983

December 9, 1997

Cal/EPA
Dept. of Toxic Substances Control, Region 2
700 Heinz Avenue, Suite 300
Berkeley, CA 94710
Attn: Sheila Alfonso, Project Manager

Re: Lawrence Livermore National Laboratory's (LLNL) Application for a Hazardous Waste Treatment & Storage Facility Permit (WTSF).

Dear Ms. Alfonso,

This letter is Tri-Valley CAREs' (Citizens Against a Radioactive Environment) response to LLNL's application for the above-referenced WTSF permit on behalf of Tri-Valley CAREs' approximately 1900 family-members in the communities surrounding the Lawrence Livermore National Laboratory (LLNL). Our letter is part of the public comment mandated by the California Environmental Quality Act (CEQA) pursuant to this permitting process. Additionally, we submit this response on behalf of other interested organizations listed as signatories at the end of this letter.

Tri-Valley CAREs is a grassroots environmental organization that is a community-based "watch dog" over LLNL's activities. We also hold two U.S. Environmental Protection Agency Technical Assistance Grants to monitor environmental cleanup at both LLNL's Main Site and its Site 300 weapons testing station.

Tri-Valley CAREs was present at both Dept. of Toxic Substances Control's (DTSC) Sept. 23, 1997 Public Workshop (at which our Executive Director, Marylia Kelley, was a panelist representing the community viewpoint, giving a 15-minute presentation) and the Oct. 9, 1997 Formal Public Hearing. A number of our members spoke at these two events, and at least one member handed over a written comment to DTSC at the Hearing. We mention this to underscore Tri-Valley CAREs' members' ongoing participation as to their serious concerns re: risks to public health and to the environment created by LLNL's programs, most of which are related to the research and design of nuclear weapons, and which involve numerous toxic and nuclear substances.

Tri-Valley CAREs strongly advocates that the DTSC <u>not</u> issue LLNL a permit to

operate its own on-site Hazardous Waste Treatment & Storage Facility at this time for the following reasons:

1. An Environmental Impact Report (EIR) should be done at LLNL's Main Site and Site 300. For 45 years (since 1952), LLNL has generated a wide variety of nuclear and toxic wastes resulting from its work on nuclear weapons, fusion, lasers, etc. In 1987, LLNL's Main Site was placed on the National Priorities List as an **extremely contaminated "Superfund" site**. LLNL's Site 300 was added to the "Superfund" list in 1990. Since LLNL is already a "Superfund" site, rather than issuing a WTSF permit, which would allow LLNL to continue "business as usual," DTSC should carry out an EIR of LLNL's Main Site and Site 300, pursuant to **CEQA**. Further, a federal regulation promulgated by past DOE Secretary Watkins requires environmental review of DOE facilities, including LLNL, every 5 years (LLNL's last full EIS/EIR was in 1992, nearly 6 years ago, and therefore is out-of-date).

2. Recent excavation at LLNL's National Ignition Facility (NIF) construction site has uncovered unauthorized toxic waste dumping. In Sept., 1997, construction crews excavating earth at LLNL's NIF construction site ran into what appears to be an unauthorized "dumping ground." Excavated to-date are over 100 capacitors (reportedly from earlier fusion programs), with many leaking highly toxic PCBs, 75 crushed waste drums marked "radioactive," and contaminated soil (37 truckloads have already been sent to a Utah disposal site). **This discovery raises serious questions about LLNL's past hazardous waste practices.** Under the federal Resource Conservation and Recovery Act, which DTSC is authorized to implement in California, DTSC should require a comprehensive **RCRA Facility Assessment (RFA)** to identify the NIF "burial" site's areas of concern before proceeding any further with the WTSF permitting process. This RFA should augment other applicable state and federal regulations, and, we believe could be incorporated into the EIR on the overall site. Additionally, we are concerned that the proposed site for WTSF may also sit on top of unuathorized buried waste because it abuts the north side of the NIF construction site.

3. LLNL has chronic pollution problems. Under CEQA, DTSC, as the permitting agency, **must** take note of existing problems of on-site and off-site pollution at LLNL. As reported in May, 1997, the City of Livermore cited LLNL for chronic discharges of heavy metals and corrosive chemicals into the municipal sewer system. According to city officials, there had been **14 releases from LLNL above its permit limits since January, 1996, A rate of about one violation per month.** A February, '97, accident involved a discharge of silver, costing $41,000. Another discharge, in March, '97, this time of lead, cost $8,000.

4. LLNL has a history of frequent accidents right up to the present. This history includes a 1990 accident when **tritium** (radioactive hydrogen) spilled out of a tank at LLNL's Building 292, resulting in soil and groundwater contamination.

Examples of on-site accidents reported **just for 1997** include: **February** -- LLNL doctors cut a small hunk of **plutonium**-contaminated tissue out of an employee's thumb after the worker had accidentally stuck himself with a sliver of the radioactive metal during routing cleanup. **March** -- Three LLNL workers were contaminated recently when **uranium** filings caught fire. **April** -- It was reported that earlier this year, a **chlorine** gas leak forced about 20 workers to flee after an alarm sounded. **May** -- The City of Livermore cited LLNL, again, for chronic discharges of **heavy metals and corrosive chemicals**. Since January, 1996, LLNL has violated its permit discharge limits about once a month. **June** -- It was reported that in May, '97, two workers were contaminated with **tritium** (radioactive hydrogen) while packaging the radioactive waste in the Tritium Facility. **July** -- On July 2, workers shredding used air filters were **radioactively contaminated.** One worker was contaminated with **curium**, an alpha emitter, on his chest, face and in his nostrils. A DOE report credited **inadequate safety procedures** for this accident. Another July, '97 accident (a hazardous waste technician accidently mixed nitric acid and alcohol while workers were "bulking," i.e., pouring spent chemicals into waste drums; this combination of chemicals could cause fire, explosion or fumes), resulted in fumes that triggered alarms and caused 25 workers to evacuate and LLNL to suspend "bulking" for a week Certainly, it is reasonable that LLNL should not be issued a permit without DTSC's thorough investigation into LLNL's accidents and safety procedures, and, again, the appropriate vehicle is an EIR.

5. LLNL has a history of noncompliance with safety procedures. As mentioned in issue #4 above, on **July 2, 1997**, a worker at LLNL was radioactively contaminated with **curium** in an accident that DOE itself admitted was due to inadequate safety procedures. **Also, in this instance, procedures that had been recently put into place with DTSC's guidance were apparently ignored by LLNL,** which raises questions about whether LLNL really follows agreed-upon safety procedures. This is underscored by another recent LLNL report (see attached report, *"Incident Analysis of Criticality Safety Control Infractions in Building 332"*) confirming that a total of **15 criticality violations** (a "criticality accident" is a runaway nuclear chain reaction) occurred over a two-month period **(mid-May,'97 to mid-July,'97)** in LLNL's plutonium building (Building 332) -- where, again, **safety procedures were ignored.** This internal LLNL report reveals deep, pervasive, systemic deficiencies in management, worker understanding and employee attitudes, citing **1) inadequate training**, with **workers unaware of rules** and some even stating that there is nothing wrong with violating rules to get a job done; and **2) ineffective management**, with supervisors not recognizing the problem. **It is therefore reasonable that DTSC should not rely on informally advising LLNL re: safety procedures, but should use formal processes (such as an EIR) to ensure LLNL's compliance with safety procedures.** Moreover, Tri-Valley CAREs has an information request into DOE regarding a **subsequent criticality violation.** We have been told that report is in draft, and is not yet publicly available. Again, this underscores the systemic nature of the problem.

6. LLNL has a history of receiving Notices of Deficiency and Notices of Violations from DTSC, right up to the present, as seen in the following:

a. A May 21, 1997 letter from Rick Robison, Unit Chief of DTSC's Statewide Compliance Division to Harry Galles, Head of LLNL's Environmental Protection Dept., cites the following **combined waste (CW) violations**: **1)** possible hazardous & radioactive constituents of CW remaining on-site weren't identified; **2)** waste generating processes for wastes inspected were not identified; **3)** accumulation start dates of CW were not listed at Satellite Accumulation Areas; **4)** the treatment process description, as well as the reason for the treatment, for CW that was treated and then sewered was not provided, nor was information provided regarding the disposition of the sludge produced by the treatment process; **5)** a date of treatment was not provided; **6)** no information was provided for attempts to find available treatment and/or disposal options for CW; **7)** no manifest number was given for CW shipped off-site.

b. A May 23, 1997 Inspection Report by Barbara Barry, Hazardous Substances Scientist with DTSC's Statewide Compliance Division, refers to the **May 23, 1993 Stipulation and Order #HWCA 93/94-047 signed by DTSC and LLNL for the latter's violations of the Hazardous Waste Control Law from 1989 until 1992.**

c. Ms. Barry's May 23, 1997 Inspection Report also cites **later violations** by LLNL, including: **1) DTSC's 8-14-92 Compliance Evaluation Inspection (CEI) report's findings of 11 violations** including storage of incompatible wastes, failure to certify a repaired tank before returning it to service, having an open waste container, and failure to complete employee training; **2) DTSC's 8-6-93 CEI report's findings of 17 violations,** including improper storage of incompatible wastes, incomplete inspection logs, inadequate aisle space in waste storage area, improper labeling of hazardous wastes, inadequate employee training, failure to do tank certification, storage of waste over 90 days without authorization, failure to maintain land ban notification/certification records, and falsification of records; and **3) DTSC's 6-1-94 field-issued CEI report's findings of 7 violations,** including storage of hazard-ous waste over 90 days without authorization or permit, failure to properly label hazardous wastes, failure to meet treatment standards, notification failures, failure to maintain inspection logs with required information, failure to inspect hazardous waste tankers each operating day, and failure to provide annual refresher employee training.

d. Ms. Barry's May 23, 1997 Inspection Report also describes how **LLNL's Total Waste Management System (TWMS),** a method of tracking waste sitewide (e.g., waste source, treatment method, treatment results, storage, discharge, movement throughout the site, ultimate destination, shipping date and manifest number) using computer and waste drum bar codes, was **inoperable** at the time of her

inspection.

e. Ms. Barry's May 23, 1997 Inspection Report also cited LLNL for violating **1)** 22 California Code of Regulations section 6626.23(a) (1-3); (b) and (e) for **shipping CW off-site without a manifest; 2)** 22 CCR 66265.71(a)(1-6) for **receiving CW from Site 300 without a manifest; (3)** 22 CCR 66262.34 (f) (1-3) for **storing CW labeled "Radioactive Waste Only,"** instead of using the required hazardous waste label (the statute requires hazardous waste labels for all Resource Conservation and Recovery Act (RCRA) wastes, all mixed wastes, all California wastes and all combined wastes, in addition to any labeling required by the AEC (sic) for the radioactive portion of the waste); **4)** California Health and Safety Code (CH & SC) sections 25200.5(b)(1-2) and (c), and 25201(a) for **storing and treating CW's not listed** on the DTSC-approved Part A permit as well as **treating CW with processes not listed** on the DTSC-approved Part A permit, and also for **storing CW for more than 1 year** without DTSC's written authorization (this latter also violates CH&SC section II part 1(a) and the Interim Status Document issued by DTSC); **5)** 22 CCR 66265.13(a)(1) and (b)(1-2) for **excluding from its Waste Analysis Plan (WAP) the appropriate methodolgy and parameters for making analyses** of California hazardous wastes as well as RCRA hazardous wastes; and **6)** 22 CCR 66265.16(a)(1-2) and (3)(A-F); (c) and (d)(3) for **inadequate training procedures**, in that a) LLNL's Training Plan for employees in the Hazardous Waste Management Dept. (HWMD) was below minimum requirements, and b) the WAP requires extensive lectures and practical training in sampling procedures and the handling of samples, yet none of the HWMD training descriptions referred to any practical training other than first aid and fire/earthquake training.

f. DTSC's 3-7-97 Notice of Deficiency re: LLNL's Part B Application for the WTSF permit now under consideration signed by Pauline Batarseh, Unit Chief of DTSC's Northern California Permitting Branch, found **160 deficiencies.**

g. As of this writing, **DTSC is carrying out an investigation of the July 2, 1997 curium-contamination accident** (see issue #4 above) in view of LLNL's having ignored safety regulations recently implemented with DTSC's guidance.

The above samples of ongoing compliance problems at LLNL raise reasonable questions as to LLNL's good faith in complying with regulations and statutes, as well as with safety procedures recently implemented with DTSC's assistance. Further, If LLNL has not been complying with its Part A permit, or its "Interim Status" authorization, can it now be trusted to comply with a Part B permit even if that permit has mitigtion measures? Again, we ask that DTSC carry out an EIR before making its decision whether to issue a Part B WTSF permit.

7. For years, LLNL's groundwater has been contaminated. Although steps have been taken to monitor, control and remedy it, this environmental threat still persists. Some examples include: **1)** earlier this year, LLNL found its storm drains embedded with large amounts of mercury -- an extremely toxic material. **The drains may have contributed mercury-laden runoff to the already-contaminated groundwater, as well as to surface water and to soil; 2)** LLNL has acknowledged that there's a possibility that they will run into contaminated groundwater while excavating the **NIF site** (they've applied for a dewatering permit to pump the area dry, if necessary); and **3)** at LLNL's **Site 300** weapons testing station (located midway between Livermore and Tracy), during 1982-83 (and possibly again in 1996), groundwater rose, saturating waste buried in disposal pits, and then receded, thus contaminating groundwater at deeper levels.

8. LLNL has a history of sewer system problems. LLNL's current "Interim Status" liquid waste treatment process discharges treated wastewater (WW) **directly** into the Livermore municipal sewer, and the WTSF permit as written would allow this practice to continue. Theoretically, treated WW is safe for discharge into the sewer, but, in view of **1)** LLNL's repeated violations of its sewer discharge permit (see above), **2)** past sewer leaks into the adjacent soil and groundwater, **3)** the highly contaminated groundwater at LLNL (see above), and **4)** the close proximity of the surrounding community, it is reasonable to question the safety of this practice.

9. LLNL has a history of being out of compliance with safe storage requirements (see issue #6 above for additional discussion). Examples of this include: **1) "Old" waste** -- LLNL has had violations in how long it stores hazardous waste, e.g., in 1989-90, a DTSC inspector inspected 21 of LLNL's 100 hazardous waste areas and found that 11 had waste **stored for more than 1 year** (1 year is the maximum storage period allowed under California's Health & Safety Codes before such waste must be treated and/or disposed). **2) Undocumented satellite accumulation areas** -- LLNL has **never provided DTSC** with lists of its satellite accumulation areas (where waste is kept "temporarily"), making inspection difficult to carry out. In the past, **Notices of Deficiency** have been issued to LLNL by DTSC for waste stored beyond the 90-day limit. **3) Problems with mixed waste** -- DTSC has had difficulty in determining just how LLNL treats its mixed waste (i.e., hazardous waste combined with radioactive waste) in order to evaluate, among other things, whether **a)** any **incompatible wastes** are combined, and **b) cross-contamination** occurs between these two types of waste. One unanswered question is: Does LLNL ever label mixed waste as "radioactive?" In the past, Nevada Test Site, which accepts only radioactive waste, has returned waste shipments to LLNL because mixed wastes were included in the shipments, but were not labeled as such.

10. Problems with LLNL's Application (see issue #6 f above for additional discussion). DTSC has accepted LLNL's underlying 11-volume WTSF permit application as the permit's basic "game plan." However, LLNL's application

has inadequacies. One example is: **Wastewater (WW) analysis and discharge** -- As mentioned above, all of LLNL's WW is first combined and then discharged from a single point within LLNL. **It then flows directly to the Livermore Water Reclamation Plant (LWRP).** Per an agreement between LLNL and LWRP, a DTSC-certified lab is not required to verify WW analyses prior to discharge into the sewer. The given rationale is that verification by LLNL facilities shortens the turn-around time for sample collection and analysis. However, this contrasts with **other** LLNL waste analyses, which **are** required to be done by DTSC -certified labs. In view of LLNL's history of accidents and discharge violations (see above), and to ensure public health & safety and the environment, it is reasonable that **DTSC, as a condition of either LLNL's "Interim Status" authorization, OR a WSTF permit, should require some sort of oversight by DTSC-certified labs** of such verification prior to WW discharge into the sewer (assuming that a completed CEQA EIR has examined all issues and alternatives and points toward an "all-clear" for a permit to be issued -- see discussion above).

11. Problems with DTSC's Initial Study (IS) and Draft Negative Declaration (Neg Dec). Pursuant to CEQA, before issuing a WTSF permit, DTSC must complete an IS based on LLNL's application and then draft **either 1)** a Neg Dec (a statement that there will be no significant impacts to the environment), **or 2)** a Mitigated Neg Dec (a statement that there will be impacts which will be remedied by conditioning the permit on LLNL's carrying out mitigation measures), **or 3)** require an Environmental Impact Report (EIR) be done if DTSC has found the facility **could have** a significant effect on the environment. **In this case, although we recommend an EIR be done (since it is patently obvious to us that, in view of the problems already discussed, LLNL's proposed facility has a great likelihood of causing significant environmental impacts), DTSC has chosen to draft a Neg Dec based on its completed IS.** Both the IS and the Neg Dec have inadequacies, including:

a. Offsite transportation of waste. The IS fails to describe the routes and destinations for transporting hazardous waste from LLNL to dumpsites. Only LLNL's peripheral streets and on-site roads are described. **When it leaves LLNL, where does the waste go and how does it get there?** These are major questions because of waste transport's potentially adverse impacts on public health and safety, as well as on the environment.

b. The IS fails to address waste streams. The IS should describe where waste streams are generated, name hazardous substances involved, as well as their amounts, and indicate the movements of waste streams within LLNL. The IS fails to do this.

c. Seismic Issues. The IS states that all buildings at LLNL either meet or exceed the 1994 Uniform Building Code seismic requirements for concrete and steel

structures, implying that the buildings could withstand seismic activity. Yet, LLNL's permit application has a letter to LLNL from Geomatrix Consultants that concludes "...evidence ... **could** provide documentation for compliance with the seismic location standard. **However, it is recognized that after reviewing the same evidence other reasonable people may disagree with these conclusions."** (emphasis added) That is, such compliance is disputable and uncertain by reasonable seismic consulting industry standards. Another report, from Public Geotechnical Engineering, conditions satisfactory seismic standards compliance on **1)** high foundation capacities, **2)** replacement of silty-clay soils with well-compacted soil fill, and **3) reviews every three years.** This may indicate a need for constant scrutiny of a chronic problem. Additionally, there is no real analysis of earthquake risk based on **1)** the crack opened in LLNL's southeast corner (near where waste is stored), that may have been caused by a 1980 quake, or on **2)** other past seismic events (the area is very active seismically).

d. Small Scale Treatment Laboratory. According to the IS and LLNL's application, there would be a "small scale" treatment lab within the larger WTSF complex, purportedly to process small amounts of waste. There appear to be at least four major problems with this: **1)** the "small scale" lab's waste processing limits would be up to **250 kg per day**, a large amount of waste, not "small scale;" **2)** LLNL would be able to process these wastes without much more than **slim bureaucratic oversight** by DTSC (LLNL would be allowed to work up individual plans for this lab); **3)** DTSC could **waive the 250 kg per day limit case-by-case**, depending upon the specific plan submitted by LLNL; and **4)** there are **no provisions for public notice and participation.** Altogether, this section seems to be a "loophole" potentially allowing LLNL to conduct hazardous waste processing without adequate regulation and public participation.

e. Future On-Site Land Use. The IS does not adequately deal with possible future increases in hazardous waste production amounts and whether the facility would be able to handle them. This issue also relates to cumulative impacts (see below).

f. Cumulative Impacts. The IS inadequately addresses the question of how the hazardous waste processes would interface with LLNL's other activities, i.e., how **all** LLNL's activities would impact the environment, as well as human health and safety.

g. The IS concludes that the proposed project COULD NOT have a significant impact on the environment. This is a challengeable conclusion, since, as discussed previously, LLNL is a highly-contaminated Superfund site with an ongoing history of accidents, pollution and unauthorized dumping of hazardous waste (done under DTSC's "Interim Status" authorization), raising reasonable questions about the proposed project's **future** impacts to the environment.

h. The Draft Negative Declaration is Ambiguous. Despite its title of "Draft Negative Declaration," DTSC's Neg Dec contains language that makes it unclear whether DTSC is drafting a straightforward Neg Dec (i.e., without required mitigative measures) or a Mitigated Neg Dec (i.e., with required mitigative measures). Further, only small projects normally receive a Neg Dec without mitigated measures, while LLNL is a **major nuclear facility** producing a wide range of hazardous and mixed (as well as radioactive wastes). Under the circumstances, it's reasonable that the DTSC, even if it believes there are no risks to health, safety & environment (which is a challengeable conclusion), explore **some sort** of mitigation measures such as waste reduction or pollution prevention.

In conclusion, Tri-Valley CAREs requests that DTSC not issue LLNL a WTSF permit at this time. For all the reasons discussed above, we ask that DTSC require a thorough environmental investigation (i.e., an EIR, as detailed above) of both LLNL's Main Site and Site 300 to determine whether, in light of LLNL's "Superfund" site status and in view of LLNL's lengthy history of hazardous waste accidents, spills, releases and violations, a WTSF permit should be issued. Tri-Valley CAREs would be happy to provide "scoping" and other comments regarding the EIR. First, however, DTSC must determine that one will be done.

We look forward to your response to this public comment.

Sincerely,

Marylia Kelley
Executive Director
Tri-Valley CAREs

Sally Light
Nuclear Program Analyst
Tri-Valley CAREs

Additional Signatories:

1. Ban Waste -- Phil Klasky, Director
2. Bay Area Action -- Susan Stansbury, Director
3. Buddhist Peace Fellowship -- Alan Senauke, Director
4. Center for Economic Conversion -- Michael Closson, Executive Director
5. Citizens Opposing a Polluted Environment (COPE) -- Jami Caseber, Director
6. Committee to Minimize Toxic Waste -- Gene Bernardi & Pamela Sihvola, Co-Chairs
7. Earth Island Institute -- John Knox, Executive Director
8. Mount Diablo Peace Center -- Dennis Thomas, Administrator
9. Nuclear Democracy Network -- Mary Beth Branagan, Co-Director
10. Planning and Conservation League -- Gary Patton, General Counsel
11. Physicians for Social Responsibility, Greater San Francisco Bay Area Chapter -- Dr. Robert Gould, President

12. San Jose Peace Center -- Joni Thissen, Coordinator
13. San Mateo County Peace Action -- Max Bollock, President
14. Sierra Club California -- Bonnie Holmes-Gen, Senior Lobbyist
15. St. Joseph the Worker -- Father Bill O'Donnell, Social Justice Committee
16. Sonoma County Center for Peace and Justice -- Elisabeth Anderson, Executive Director
17. Toxics Asessment Group -- Thomas C. Sparks, CEO
18. Western States Legal Foundation -- Mike Veiluva, Foundation Counsel

cc: Secretary Federico Pena, DOE Headquaters, Washington D.C.
Assistant Secretary Al Alm, DOE Headquaters, Washington D.C.
Jim Turner, DOE, Oakland, California
Jim Davis, DOE, Oakland, California
Bruce Tarter, Lawrence Livermore National Laboratory
Mike Gill, U.S. Environmental Protection Agency, San Francisco, California
Kathy Setian, U.S. Environmental Protection Agency, San Francisco, California
U.S. Senator Dianne Feinstein
U.S. Senator Barbara Boxer
U.S. Representative Ellen Tauscher
U.S. Representative Pete Stark
U.S. Representative George Miller
U.S. Representative Nancy Pelosi
U.S. Representative Lynn Woolsey
U.S. Representative Richard Pombo

Sources - Tri-Valley CAREs requests that the following sources, along with the organization's comments, be made part of the Administrative Record:

Incident Reports/Occurrence Reports/Other Reports:

Incident Analysis of Criticality Safety Control Infractions in Building 332, IA 0485, August 15, 1997, Lawrence Livermore National Laboratory

"Lawrence Livermore National Laboratory -- Building Evacuated," Daily Operations Report, May 2, 1997, DOE Oakland Operations Office.

"Lab's staff was found lacking in radiation safety training," *The Valley Times,* February 11, 1997.

"Uranium called risk to lab staff, not public," *The Valley Times,* January 16, 1997.

Violations:

"Violations curtail lab plutonium operations," *The Valley Times,* October 30, 1997.

"Lab violations," *Tri-Valley Herald,* October 18, 1997.

"Lab Exceeds Sewer Limits," *The Independent,* May 14, 1997.

"Livermore cites lab for sewer discharge," *The Valley Times,* May 10, 1997.

"Lab violations," *Tri-Valley Herald,* May 10, 1997.

Accidents:

Type B Accident Investigation Board Report of the July 2, 1997 Curium Intake by Shredder Operator at Building 513 Lawrence Livermore National Laboratory, Livermore, California, DOE/OAK-504, Rev. 0,U.S. Dept. of Energy, Oakland Operations Office.

"Lab accident a result of poor safety," *The Valley Times,* September 13, 1997.

"Lab technician exposed to radiation, report says," *Tri-Valley Herald,* September 13, 1997.

"Livermore lab looks into odd radiation exposure of worker," *The Valley Times,* July 4, 1997.

"Worker exposed to radiation at Lab," *Tri-Valley Herald,* July 4, 1997.

"25 Livermore lab workers evacuate after accident," *The Valley Times.* July 25, 1997.

"Plutonium spills on 3 lab workers," *Tri-Valley Herald," August 7, 1987.*

"Lab chlorine leak forced evacuation," *The Valley Times,* April 9, 1997.

"Site 300 blaze," *Tri-Valley Herald,* May 9, 1997.

"Mishap wrecks a dozen lasers," *The Valley Times,* May 3, 1997.

"Lab evacuation," *Tri-Valley Herald,* May 3, 1997.

"3 lab workers contaminated with uranium traces," *The Valley Times,* February 11, 1997.

"Radioactive material put out shortly after catching fire," *Tri-Valley Herald,* February 11, 1997.

"Lab worker contaminates finger," *The Valley Times,* February 9, 1997.

"Plutonium exposure," *Tri-Valley Herald,* February 8, 1997.

"Lab tracks exposure to metals," *Tri-Valley Herald,* June 29, 1994.

National Ignition Facility (NIF):

Discovery of Leaking Buried Capacitors (NIF Constr Site), Lawrence Livermore National Laboratory, Daily Field Management Report, DOE, September 9, 1997.

"Investigators check lab for additional toxic waste," *Tri-Valley Herald,* September 11, 1997.

"Lab discovers 112 capacitors with PCBs at superlaser site," *The Valley Times,* September 11, 1997.

"Toxic waste discovery rattles EPA, scientists," *Tri-Valley Herald,* September 16, 1997.

Monthly report dated June 20, 1997, from James Littlejohn (Project Leader, Environmental Restoration Division, DOE/OAK) and Albert L. Lamarre (Livermore Site Project Leader, Environmental Restoration

Division, UC/LLNL) to Robert Feather (DTSC), Michael Gill (U.S. EPA - San Francisco Office) and Michael Rochette (Regional Water Quality Control Board - San Francisco Bay Region) re: LLNL Livermore Site may 14, 1997 Remedial Project Managers' Telephone Conference Summary.

"NIF foes move to stop project, citing toxic find," *The Valley Times,* September 23, 1997.

"laboratory staff faces toxic waste charges," *The Valley Times,,* September 23, 1997.

"Judge orders Livermore Lab to search for buried wastes," *The Valley T Times,* October 28, 1997.

"Livermore Lab to expand search for toxic waste," *Tri-Valley Herald,* October 28, 1997.

Public Meetings:

" "Volatile" reaction at lab meeting," *Tri-Valley Herald*, July 20, 1997.

"Lab's Site 300 cleanup on tap," *Tri-Valley Herald",* June 22, 1997.

"Citizen's Watch" Newsletters:

Each 1997 edition of Tri-Valley CAREs' monthly newsletter (except for February, 1997), *Citizen's Watch*, contains coverage of issues that are relevant to Tri-Valley CAREs' comment on LLNL's application for the WTSF permit. Therefore, to conserve space, we refer to them collectively here.

Federal Statutes

Resource Conservation and Recovery Act (RCRA).

California Statutes and Regulations:

California Environmental Quality Act (CEQA).

Title 22 California California Code of Regulations sections 6626.23(a) (1-3), (b) and (e); 66265.71 (a)(1-6); and 66262.34(f)(1-3). (CCR)

3.3 Document 2: U.S. Enrichment Corporation (USEC)

USEC
A Global Energy Company

February 25, 1999

Ms. Lois Marik
U.S. Department of Energy
Lawrence Livermore National Laboratory
7000 east Avenue
Livermore, California 94550

RE: Comments on Draft Supplement Analysis for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratory, Livermore DOE/EIS-0157-SA-01

Dear Ms. Marik:

The United States Enrichment Corporation (USEC) has reviewed the Draft Supplement Analysis for the Environmental Impact Statement (EIS) for the Lawrence Livermore National Laboratory (LLNL). We would like to supply comments addressing the adequacy of the document in general, and a specific comment we believe will add clarity.

2-1 The analysis appears to be both comprehensive and thorough. All areas of potential impact were reviewed and adequately addressed. The Supplement Analysis meets the intent of the National Environmental Policy Act in that, as a planning document, it identifies areas of the environment that need to be protected in future activities.

2-2 One change we suggest to add clarity to the document is to revise an entry in Table 1.1. Specifically, the wording under "*Discussion*" to "Follow-ons to U-AVLIS" would indicate that only USEC performed NEPA review for this activity. The environmental review for this activity was done as a joint effort. Under an interagency agreement between USEC and DOE, USEC did have the lead in preparing the Environmental Assessment document. However, the analysis was performed jointly by USEC and the LLNL staff, with close involvement by DOE. The Finding of No Significant Impact was issued jointly by DOE and USEC. We suggest you change the entry under "*Discussion*" to read "Joint NEPA review by U.S. Enrichment Corporation (USEC) and DOE".

Sincerely,

T. Michael Taimi
Manager, Environmental Assurance and Policy

6903 Rockledge Drive, Bethesda, MD 20817-1818
Telephone 301-564-3200 Fax 301-564-3201 http://www.usec.com
Offices in Livermore, CA Paducah, KY Portsmouth, OH Washington, DC

3.4 Document 3: Briefing Transcript, Livermore, February 11, 1999, 2:00 p.m.

TRANSCRIPT OF COMMENT AND QUESTION PORTION

OF PUBLIC BRIEFING

Regarding:

DRAFT SUPPLEMENT ANALYSIS
FOR
CONTINUED OPERATION OF
LAWRENCE LIVERMORE NATIONAL LABORATORY AND
SANDIA NATIONAL LABORATORIES, LIVERMORE

Proceedings before: BARRY LAWSON, Facilitator

Thursday, February 11, 1999

2:00 p.m. session

Taken by LETICIA A. RALLS,
a Certified Shorthand Reporter,
in and for the State of California
CSR No. 10070

PROCEEDINGS

BE IT REMEMBERED, on Thursday, the 11th day of February 1999, commencing at the hour of 2:09 p.m. of said day, at the LAWRENCE LIVERMORE NATIONAL LABORATORY, EAST GATE VISITOR'S CENTER, Trailer No. 6525, Greenville Road, Livermore, California, before me, LETICIA A. RALLS, a Certified Shorthand Reporter in the State of California, the said briefing proceedings were had.

APPEARANCES

BARRY LAWSON, of BARRY LAWSON ASSOCIATES, Mountain Road, P.O. Box 26, Peacham, Vermont 05862, appeared as the Facilitator.

LOIS MARIK, of the DEPARTMENT OF ENERGY, Deputy Director for Livermore Operations Division, appeared as the presenter and as a panel member.

CHUCK TAYLOR, of PAI CORPORATION, appeared as a panel member.

MICHAEL LAZARO, of ARGONNE NATIONAL LABORATORY, Chicago, Illinois, appeared as a panel member.

APPEARANCES (continued)

KENNETH ZAHN, Group Leader, Environmental Evaluations Group of LAWRENCE LIVERMORE NATIONAL LABORATORY, appeared as a panel member.

KATIE MYERS and CAROL KIELUSIAK of LAWRENCE LIVERMORE NATIONAL LABORATORY, appeared as notetakers.

LIBBY STULL of ARGONNE NATIONAL LABORATORY, appeared as a notetaker.

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(Whereupon, subsequent to Ms. Marik's presentation, the following comment and question period began at 2:27 p.m.)

PROCEEDINGS

THE FACILITATOR: Thank you very much.

Okay. Let's start our comment period. I invite you to go one at a time for an initial period of a maximum of five minutes or thereabouts, whether asking questions or making comments regarding the Supplement Analysis.

I would ask you to introduce yourself and your affiliation, if you like, and indicate before you start whether you're offering a question or a comment so that the people who are taking notes will be primed for either one.

Now, I don't know how many people plan to make comments, and I don't want to be -- and I don't feel like being in the mood to be a harsh timekeeper here, but I do want to make sure that with the number of people in the room, most of whom I don't know, that we go at least through one round of five minutes, and then there will be plenty of time for more questions, if you have any.

If you are coming near within that five minutes, I'll ask you to complete your first round as gracefully and graciously as possible. Okay.

Also, if you have written comments with you today, you're certainly welcome to submit those. As I said before, oral comments and written comments are given the same amount of credence.

Okay. Is there anybody here who would like to speak after all that?

THE COMMENTOR: I'll go.

THE FACILITATOR: Please.

THE COMMENTOR: Could I talk here?

THE FACILITATOR: If you could at least stand, if it would make it easier. If you'd like to come up here?

THE COMMENTOR: Yeah. It's easier.

THE FACILITATOR: Sure. Come on up.

THE COMMENTOR: My name is Sally Light. I'm from Tri-Valley CAREs, Communities Against Radioactive Environment. We did prepare a written comment, and I'm just going to briefly use that as a consulting kind of note that I can look at as I'm talking.

And I'm going to only do part of this, and then I'll share it with my colleague, our Executive Director, Marylia Kelley, who will finish it out.

Just to briefly mention that most people here probably know who we are, but we've been

around for 16 years, right here in Livermore. We're a watchdog group, grassroot environmental organization that watchdogs the Lab here. And we've been intimately involved in the history of the Lab in a way and in the community, and we continue to do so.

Just basically, we really are very concerned -- I mean, as I'm looking at the actual analysis and the presentation today, it just seems to be a very perfunctory kind of presentation that everything is just fine and hunky-dory at the Lab here; there's no need for any kind of an EIS/EIR again. And we very much oppose that view. 3-1

We feel at Tri-Valley CAREs that an EIS/EIR, a new one, needs to be done. And I'll just break it down to why, some of the reasons.

For one thing, since 1992, the Lab has remained a Superfund Site; both Main Site and Site 300 still are on the national priorities list. 3-2 That, in itself, says to me that there are still problems that need to be -- big problems that need to be resolved here and that there are I believe -- ex-Secretary of DOE Watkins, actually during his time, there was a regulation that came up that 3-3 these DOE facilities really are required to go

through some sort of environmental analysis again every five years.

3-3 cont. And I know that maybe that doesn't specifically lay out the fact that it should be an EIS/EIR every five years, but we feel in this case that it does merit that.

3-4 So the Lab here continues to have chronic 3-5 pollution problems. It's had frequent accidents involving radioactive and toxic contaminants.

3-6 These problems are also chronic with non-compliance of safety regulations. The Lab has received numerous notices of deficiency and notices of violations from the State Department of Toxic Substances Control which is indicative of problems ongoing since 1992.

3-7 It's continued to have groundwater contamination problems both here and at Site 300. 3-8 There are also sewer system problems in terms of releases into the municipal sewer system from Main Site. And the Lab continues to have problems with 3-9 non-compliance with safe storage requirements.

All of this we have documented on, and I have attached to our report our comment, a previous letter that we worked up for -- as a response to -- as a comment, a public comment to the Part B Permit

Application that the DTSC right now is considering for the Lab.

And so a lot of this draws on material that I developed in 1997. And this is all documented, and I have it here. So I'm just summarizing from that.

I really don't want to take a lot of time to go into the details, unless people ask questions, but to go on to the other thing that I wanted to mention is that in terms of the increased administrative limits for plutonium and uranium in the Super Block buildings that were presented here, it's interesting that it seems that in some cases these are very significant increases, and yet the DOE doesn't consider these major enough to require 3-10 a new EIS.

And under the CFR sections that have to do with when you do need some kind of a new environmental analysis, it says, you know, significant new circumstances or information relevant to environmental concerns.

And I do feel that when you're dealing with such deadly materials as uranium and plutonium, 3-11 that certainly does come into environmental concerns both for the employees here and for the

3-11 cont.

community outside who are relying on the Lab's HEPA filtration system to actually try to protect them against releases and so forth.

I think that these major changes do warrant a new EIS/EIR just on that basis alone as far as that section of it.

And also there are other issues here. I mean, we are not -- we wonder why you really -- I mean, I understand that the report is saying that in terms of the uranium that they are to support the RD&D, the Research Development & Demonstration, of plutonium immobilization and technologies for uranium conversion, reuse, waste management and

3-12

disposal, but that just doesn't seem to fit it because, for one thing, we know from the DOE's "Green Book" that the DOE intends to carry out new nuclear weapons research and development, and the Lab here is a primary nuclear weapons laboratory.

3-13

So we are seriously questioning the given justifications in this report for having significant increases of these weapons-related materials. And we are humbly reminding you that the Cold War is supposedly over.

3-14

And then also we would like to know specifically NEPA programmatic element analysis

3-14 cont.

which is required for such a large change in such a significant increase in terms of the uranium amounts, is it going to be specifically for the U-AVLIS? I mean, can we have some information? It is just very -- I just don't know from looking at this report what they're really talking about.

Those are some of my major concerns. And, as I say, we have copies of our comments, and I have attached the comments before to the DTSC on which a lot of this is based. And so we are very interested in passing out this information, and we do have a few copies with us today.

Thanks.

THE FACILITATOR: Very well done. Thank you.

Is there somebody else who would like to speak? Please.

THE COMMENTOR: And I'm too chicken to step over this chair.

THE FACILITATOR: Yes, please.

THE COMMENTOR: Hi. I'm Marylia Kelley, and I'm Executive Director at Tri-Valley CAREs, and I also live on East Avenue right between Vasco and Charlotte.

So I'm speaking today, as well, as a very

close neighbor of the Livermore Laboratory and as someone who has raised a child and lived in this community since 1976.

And again, I want to reiterate that Tri-Valley CAREs has looked at the Supplement Analysis and looked at the daily sort of operations of the Lab and the proposed operations of the Lab

3-15

and believe beyond a shadow of a doubt that a new environmental impact statement is required in this instance.

I'll just talk again about a couple of things, since I have five minutes, and invite people to ask us for copies of our comment if they would like the details, and also out on the table is a sign-up sheet if folks want to get our newsletter and any other information that we have.

We've been doing some research on the Plutonium Facility, that's the Building 332 discussed, and the history of problems with the HEPA filters in that building.

3-16

And again, there has been burning of plutonium to oxidize the chips, and that's an extremely dirty enterprise. And we need more information on that and the projected plans for the future.

3-17

In addition, just to digress a little bit, uranium chips are also burned. And that's equally dirty, and we equally need information on how much of that is going on at present and how much of that is projected into the future.

Also, Sally, you didn't have time to really cover the documents we got back from the HEPA Information Act request, right?

PREVIOUS COMMENTOR: No.

THE COMMENTOR: Okay. We have a lawsuit in under the Freedom of Information Act for documents that the Department of Energy and the Lab have not given us in a timely manner, and, after filing the lawsuit, they have begun showing up.

So thank you for what's come, and we expect another batch soon.

The documents that we have so far indicate a history of chronic safety problems. There's one type of HEPA filter that's discussed that's only partially qualified for nuclear applications.

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The filters we know theoretically but now we know from internal documents that this is a problem. They are very fragile. They fail when wet, hot, cold, or just plain have too much pressure applied. And all of those things have

3-18 cont.

been a problem in the Plutonium Facility here at Livermore.

The use of filters has gone on here way beyond the recommended length of time in service. What that means is somebody, maybe even here -- but Lab folk have said eight years is about what they should stay in and then they should be changed out.

There are filters that were in for 20 to 30 years. That means that they're building up gunk. That means that a little rip, and all the gunk that's in them gets out, you know, just to put it in real plain language.

And it also means they're getting increasingly fragile so that there are increasing opportunities for those kinds of leaks into the air. There have been numerous documents regarding problems inside the facility, including having rips in the duct where the plutonium dust has fallen out.

So this is a safety issue for workers and for the public. And these are things that were not really part of the 1992 EIS. Information has come to light since then, and they're also not problems that were solved back then.

3-18 cont.

So these are current and ongoing problems which need to be analyzed in a full NEPA, that's National Environmental Policy Act, kind of document.

DOE may not have a centralized division that oversees the use of HEPA filters complex-wide. The documents we have suggested each facility is kind of on its own to develop some of these things and that they are in many cases inadequately tested.

And also, Livermore Lab appears to have problems with storage and disposal of the filters and that -- the fact that they don't have a disposal available, as discussed in the documents we have, may be one of the reasons why they're left in so long.

And you just heard, "We don't need to do an EIS because we think we're going to reduce our transuranic waste by 75 percent."

Well, does that mean leaving HEPA filters in the Plutonium Facility for decades and decades? What if those filters were changed out and regularly, which they need to be as a safety measure? What does that do to the waste stream?

These things are all things that should be analyzed in a full EIS.

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And also, are we assuming -- what kind of assumptions are being made about whip opening and other things that may or may not happen? And what kind of contingencies exist? All of that needs to be part of an EIR/EIS.

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Also, the plutonium was discovered in Big Trees Park, right across the street and down the road from me where my son grew up playing. Again, discovered since 1992, the Lab has gone out three -- well, there have been three samples: one by EPA, two by the Lab.

Every time anybody's gone out there to take a sample, they have found plutonium above the level that can be attributed to global fallout, up to 1,000 times, in fact. So this may -- there are three hypotheses. This is maybe airborne. This may be related to some of the filter issues we're talking about on Building 332.

All of those things deserve a full EIS. And all of those things deserve to really, really be looked at seriously and some proposals put forward as to how to better safeguard the workers and the community.

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Also, there have been plutonium criticality violations there regularly. As probably most of

3-21 cont.

you know, but I'll say it for the record, the Plutonium Facility was shut down because of a recommendation by the Defense Nuclear Facility Safety Board after there were 15 violations, when you guys were getting ready a subcritical test.

And then that shutdown really wasn't as complete as it was supposed to be. And there were an additional -- about ten criticality safety violations.

The facility was shut down. Then it was allowed to operate in a restart mode, which is a very limited, carefully controlled, supposedly, mode. And then last August there was another criticality violation even while it was in restart mode.

Again, this does not look like a facility that doesn't have problems. These things need to be analyzed in an EIS and not in a little book-report size Supplement Analysis that doesn't even talk about them and goes on to say, "We don't need to do an EIS."

3-22

There are a whole lot of programs at Livermore Lab that are new or have changed substantially since 1992. And I was one of the people who commented on the 1992 EIS. And, if

you'll remember, I'm one of the people who told you that even in 1992 your EIS was way behind the curve of coming events.

And the fact that the document was almost obsolete by the time the record and decision was signed in 1993 really doesn't sort of help things now that we're another six years down the road. It is incredibly obsolete.

You may recall there were just a couple of paragraphs about something called the NOVA upgrade. There wasn't even a National Ignition Facility that was being proposed.

The SSM/PEIS looked at siting and issues like that. It doesn't take the place of a site-wide. It needs to be considered. It will have an environmental footprint here at Livermore Lab and in our community.

3-23

It will mean more tritium in our air. It will mean more waste. And what does that mean with -- given that we already have a burden of tritium -- that's radioactive hydrogen -- in our air from other Laboratory operations?

That's the kind of thing that only a site-wide EIS really looks at. And the cumulative effects of that has to be looked at now not

3-24

beginning maybe in 2002.

3-24 cont.

THE FACILITATOR: Under the assumption that there are other people, do you want to finish up and then come back? Because it looks like you've got some more there.

THE COMMENTOR: Right. Why don't I give you a short laundry list and perhaps come back?

THE FACILITATOR: Okay.

THE COMMENTOR: Other new programs are big changes in the Uranium Atomic Vapor Laser Isotope Separations. And let me -- well, let me just -- subcritical nuclear testing, the ADAPT program, which means that there's work going on right now on new ways to make plutonium pits in the Plutonium Facility, and also ASCI, the Accelerated Strategic Computing Initiative, may have a bigger environmental footprint than had been considered.

3-25

And the new building, the last time I spoke to DOE and the Lab, they were deciding whether or not they needed a whole new bank of cooling towers for it. And I've been promised a conceptual design report as soon as it's ready, and as soon as I look at it, I'll let you guys know if they are.

But all of these things are different; they have environmental impact, and they deserve to have

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a full environmental impact statement.

3-26 cont.

Thanks.

THE FACILITATOR: Thank you.

Is there anyone else who would like to speak? Yes, please.

THE COMMENTOR: Oh, hi. I'm Jackie Babasso. I'm Executive Director of the Western States Legal Foundation in Oakland.

And I would like to remind everybody here that the 1992 site-wide EIR/EIS was prepared as the result of a settlement negotiated by Western States on behalf of Tri-Valley CAREs with the University of California Regents. So we have a very long and deep interest in this issue.

We have done a partial review of the Draft Supplement Analysis, and we plan to submit written comments later. So I'm just going to make a few points now.

First, I want to start with a quote from the 1992 Livermore Lab Final EIR/EIS. And this quote was included despite many requests for the -- for review of possible re-configuration, facts that affects the re-configuration proposals on Lawrence Livermore as well as a variety of disarmament alternatives.

Here's what it said. Quote,

"Nevertheless, DOE is considering what activities necessary to support DOE's nuclear weapons mission should be carried out at Lawrence Livermore and Sandia National Laboratories, Livermore."

"The Secretary of Energy has proposed to re-configure the nuclear weapons complex to be smaller, less diverse, and more economical to operate. As part of this proposal, DOE is examining whether certain weapons research, development, and testing activities now taking place at the national laboratories should be consolidated."

"DOE is preparing a programmatic EIS on this re-configuration proposal. The re-configuration PEIS will address the long-term mission of Lawrence Livermore and Sandia National Labs in Livermore."

"This EIS/EIR addresses the

near-term continued operation of Lawrence Livermore and Sandia National Laboratories, Livermore. The focus of possible new long-term missions cannot be addressed until after completion of the re-configuration PEIS; therefore, identification and description of new missions for Lawrence Livermore and Sandia and analysis of associated environmental effects would be highly speculative and beyond the scope of this EIS/EIR." "However, this document is expected to facilitate the environmental assessment of future changes in missions or activities. Such changes would be reviewed against this EIS/EIR and further NEPA and/or CEQA review effect efforts undertaken if appropriate. This could include the preparation of a supplemental EIS/EIR."

End of quote.

3-27 So here we have the Livermore Lab 1992 EIS

telling us that it has to be re-evaluated after the re-configuration PEIS has been completed. Well, now re-configurations has come and gone and has been replaced by the Stockpile Stewardship and Management program, complete with a PEIS with an entirely new set of alternatives.

3-27 cont.

We believe that the Livermore site-wide EIS should be redone to reflect those changes. And in terms of thinking about those changes, I was reminded sitting here that the 1992 EIS was completed before a nuclear testing moratorium was in place, before the comprehensive test ban treaty was signed, before the President had committed the United States to the Stockpile Stewardship program.

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And there have been very major changes in laboratory operations since then. These include the National Ignition Facility, as well as possible future NIF applications.

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NIF was not in the 1992 EIS, and future possible applications need to be covered. Weapons effects testing, use of fissile materials if these applications are now foreseeable.

At the very least, we should know the existing state of planning and when decision points will be for these applications which could have

serious effects on the environmental impacts.

Now, I also want to remind you that disarmament alternatives remain highly relevant.

In 1996, four years after the 1992 EIS/EIR, the International Court of Justice, which is the highest court in the world on questions of international law, the judicial branch of the United Nations, unanimously found that there exists an obligation on the part of all states to conclude negotiations on the elimination of nuclear weapons.

That is the authoritative interpretation of Article VI of the Nuclear Nonproliferation Treaty which was extended indefinitely in 1995 due largely to very strenuous international efforts by the United States. Article VI requires the elimination

3-30 of nuclear weapons.

The International Court of Justice closed a loophole in Article VI by saying there exists an obligation on the part of all states to conclude

3-30 cont. negotiations, to finish the process, of nuclear disarmament. That alternative is not reflected in the 1992 EIS or in the Supplement Analysis.

Now, a couple of other specific points and questions that I'd like to raise. Plutonium in the park was mentioned. Western States Legal

Foundation, like Tri-Valley CAREs, participates in the ATSDR/CHDS site team, and so we also have a great deal of interest in that issue and some familiarity with it.

The new information that has emerged about the plutonium findings off site need more analysis. And this analysis needs to be combined with other

3-31 problems and changes in plutonium operations like the ones Marylia mentioned -- criticality violations, the ADAPT pit production program and so on.

This suggests to us the need to re-evaluate the purpose and need of plutonium operations at the

3-32 Lab, risks and alternatives of plutonium operations in a densely-populated suburban area which this area has become even more so since 1992.

On another point, in its response to the Western States' comments in the 1992 EIS, DOE also pushed off substantive discussion of waste management alternatives in the waste management PEIS which also is now complete. This information

3-33 needs to be integrated into a new site-wide EIS to inform the public, state regulators, local decision-makers, emergency services and so on.

3-34 Again, the whole NEPA approach in our view

has been like a shell game, just pushing off decisions, pushing off alternatives, pushing off analyses into different kinds of speculative PEISes and then never coming back to re-integrate them. (3-34 cont.)

Along these lines, as a result of the recent settlement in our lawsuit against DOE challenging the adequacy of the stockpile stewardship PEIS and the failure of DOE to prepare an environmental restoration PEIS, we have established a database which is going to include new information available for the first time at least to the public about waste -- waste streams including waste streams from defense programs.

So this new information will be coming out, will be available, and this is the time to inform the public about the cause and effect, the relationship between the waste streams and the programs at this Laboratory, possibly for the first time.

A couple of other specific points and questions. In the table 1-7, the line item regarding the Accelerated Strategic Computing Initiative, we know from looking at the ASCI program at Los Alamos that supra computing requires large amounts of water for cooling. (3-35)

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So we're wondering what the requirements are for Lawrence Livermore in the near future for the ASCI program, and this becomes immediately important because, for example, we just read in the paper yesterday that the Del Valle Reservoir will be drawing more water for the development in the near future. This is Zone 7, the water district. (3-35 cont.)

And given the tremendous demand for water in the Valley, you know, have -- there needs to be a thorough evaluation for the water demand for ASCI including its cumulative impact. And we don't see that in here.

Also, we wonder about the additional electrical power draw. Will there be new utility lines or power upgrades for ASCI? What will the cumulative impacts be? (3-36)

Regarding AVLIS -- and again, we're involved in a lawsuit trying to force environmental review of AVLIS, so we have a long-standing interest in that issue. And I have to say we have been able to get very little information about the status of this program.

This says that USEC is doing NEPA review of AVLIS. This is news to us. Does USEC do NEPA reviews? We'd like an answer to that question. We (3-37)

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don't think so.

In any event, for site-wide total impacts, AVLIS must be analyzed. And just because something will have project-specific review doesn't mean it can be omitted from NEPA analysis site-wide which would defeat the entire purpose of having site-wide EISes. And at the very least a cumulative impact has to be evaluated. (3-37 cont.)

How am I doing on time?

THE FACILITATOR: Over a little bit.

THE COMMENTOR: I'm over a little bit. I have just a couple more questions, but they're relatively quick.

THE FACILITATOR: Is there anyone else who is going to be at this podium to ask questions?

Go ahead.

THE COMMENTOR: Okay. So here's another question: Is the AVLIS pilot project up and running, and more generally, what is the status of the AVLIS program which has essentially gone underground since USEC took over? (3-37 cont.)

A couple -- another specific point, in table 1-8 regarding MOX fuels. It seems to us that the HEU and uranium numbers represent major increases. And we think that if this was a free-standing (3-38)

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issue, it would represent a very significant level. (3-38 cont.)

And we don't think there's adequate -- I mentioned about the waste streams and accident risks from the MOX fuels program. Similarly, we have questions about the tritium.

Building 331, Army Tritium Recycle, 30 gram limit, we haven't had a chance to check this, but we thought that the '92 EIS set a 5 gram limit. This also seems to represent a significant increase. And if it's not for that building, it should be used for -- as a standard of comparison. (3-39)

Almost finally, we read -- it was reported, I believe, in the "Albuquerque Journal" that the DOE was considering establishing a biohazard three facility at Lawrence Livermore National Laboratory.

This was certainly not analyzed in 1992. Is it true? Is it going to happen in the foreseeable future? Is it going to happen at some point in the future? That could have very significant environmental impacts. (3-40)

And finally, two related questions. Are there classified annexes to the 1992 site-wide EIS, and are there classified annexes to this Supplement Analysis? (3-41)

Thank you.

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THE FACILITATOR: Is there anyone in a position to answer any of those questions at the meeting?

MS. MARIK: I think the best thing to do -- because there is such an extensive list of comments, I would prefer to have the formal comments. If you'd like us to answer some of those questions right now, though, we'd be more than willing to do that.

THE COMMENTOR: Yeah. Any of them.

THE FACILITATOR: There's a question about the biohazard facilities.

MS. MARIK: The biohazard facility. In that circumstance, there are no plans to have a biohazard three facility at this site at this time. Should such a facility be determined to be necessary here, we would have to follow the NEPA process.

And, as you know, that's a DOE process. And until DOE decides that that facility is going to be placed at the Livermore site, it will not be placed at the Livermore site. And there are no plans to do that at this time.

THE FACILITATOR: You had two questions at the end.

3-41 cont.

THE COMMENTOR: Have you talked about annexes?

MS. MARIK: No, there's not.

3-41 cont.

THE COMMENTOR: Have you talked about annexes in the 1992 site-wide?

MR. MARIK: No, there is not.

MR. ZAHN: Not that I know of.

THE FACILITATOR: Is there -- before you go any further, I just want to -- is there anybody else who has questions or comments along that?

Yes, sir? Please.

THE COMMENTOR: I assume this is an official, approved thing I just picked up out here.

MS. MARIK: The fact sheets?

THE FACILITATOR: What is it?

MS. MARIK: Is it the fact sheets?

THE COMMENTOR: No. It's just an article; promotes your stuff.

MS. MARIK: Okay.

THE COMMENTOR: Andrea.

MS. MARIK: Widener.

THE COMMENTOR: Something.

Now, I doubt that she makes these things up, so someone had to tell her this. I doubt that she knows enough -- if you're present, excuse me.

MR. TAYLOR: She may be here.

THE COMMENTOR: I just doubt that you know enough to do a civilized calculation in a specific activity.

But let me take up what you put down. It was handed out out here. Some 6,000 pounds of depleted uranium which has less than 1 percent radioactive material.

Now, do you agree with that?

MS. MARIK: No. We were -- I think that she's referring to uranium 235 content of that material.

THE COMMENTOR: Depleted uranium is all radioactive.

MS. MARIK: Yes, it is. But --

THE COMMENTOR: Okay. Now that thought said here.

3-42

Now next, in case you misunderstood, about -- it was a statement requiring a statement of rate. Now, in case you misunderstood, it's still not a factor of 100 difference. If you look up the half lives, I doubt that they're a factor of 100 difference.

And that's the only factor that occurs in a specific activity calculation. And the specific

3-42 cont.

activity, I doubt, is 100 times different between those two isotopes.

MS. MARIK: I'm sorry. I'm missing -- I'm missing the question.

THE COMMENTOR: I'm sure he didn't; some of these other people didn't. You talk to them.

MS. MARIK: Uh-huh.

THE COMMENTOR: So that's a misinformation or misleading thing.

3-42 cont.

Now, that's somewhat better than the fact that they've been -- the newspaper people have been told that depleted uranium is non-radioactive which has occurred on two separate occasions. I hope the newspaper people here learn to get the statements and use them as a quotation when they're told those dumb things.

THE FACILITATOR: Would you give us your name and also the citation for that article?

THE COMMENTOR: You've got it out there.

THE FACILITATOR: I know. I want to get it for the stenographer.

THE COMMENTOR: Oh, okay. It's not her fault.

THE FACILITATOR: I understand. I just want to make sure for the record it's down.

THE COMMENTOR: All right.

If they give you these things and you doubt it -- you should be careful about things that PR people tell you. I will show you the calculations.

Let me go to one more thing.

THE FACILITATOR: Okay. Forget it.

THE COMMENTOR: The filters in the plutonium building were over-aged when I retired 15 years ago. Now, I know that they have probably all lost at least half of their potential strength, and 3-43 their hydrophobic ability is -- starts severely downhill after five years.

Now, all these things the internal filter people know. And we've got some of the best filter people in the world here and in Los Alamos. You should talk to them; see what should be done with that damn plutonium building which is a risk to the public. And I'm a part of the public because I live right over here.

Those filters are a serious threat to this community. And you pump 13 -- 10 to 15 inches of 3-44 water pressure through those things. I'll bet you they won't stand the cyclone test that they're supposed to take right now.

If you don't know what that means, you talk

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to the filter people here. You've got some good filter people here who are knowledgeable; some of the best in the world. And if they won't talk to you, talk to the people in Los Alamos so they won't get fired here or put in a dark room with no windows.

I'm not kidding; I'm serious.

MS. MARIK: I understand.

THE COMMENTOR: Because this is to your discredit to allow these things to continue.

MR. TAYLOR: We'll definitely include a response to the filter issue in our comment response document.

THE COMMENTOR: I don't know whether they're right or not. I talk to people about it, and nothing ever happens.

MR. TAYLOR: I think we have enough with Marylia. It will definitely be included.

MS. MARIK: We'll be responding.

THE COMMENTOR: Okay. Good.

THE FACILITATOR: Is there any other questions before we go on?

PREVIOUS COMMENTOR: Give them your name now. For the stenographer, they need to know your name.

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THE COMMENTOR: I'm sorry?

PREVIOUS COMMENTOR: There's a stenographer who wants your name.

THE COMMENTOR: Oh. I'm Marion Falk. Sorry. M.M. Falk is the best way to put it down.

THE FACILITATOR: Take a time out.

(Pause for the reporter.)

THE COMMENTOR: I have a question that I didn't get to. As I'm looking at the administrative limit here of projected change to 500 kilograms of highly-enriched uranium and I'm remembering -- and I'm doing this by memory, but I'm pretty sure that when Secretary O'Leary did the declassification initiative, that allowed for the public to know how much plutonium and uranium -- highly-enriched uranium were here at that time, which was only a few years ago and it's still the most recent numbers we have. It was 880 pounds of plutonium and 440 pounds of highly-enriched uranium.

So if I'm doing my math right, you're talking about going from 440 pounds of 3-45 highly-enriched uranium to 1,100 pounds of highly-enriched uranium.

Now, under the National Environmental Policy

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3-45 cont. Act, don't you think that's a significant change?

MS. MARIK: Well, part of the answer to that is that we're dealing with administrative limits, and so what we were talking about in that particular circumstance is that the -- the amount of material that can come into the building is going to increase, but the amount of material that we actually have operations being performed out of -- at any single time is not going to increase.

So what we are saying is that although we have increased the administrative limits on the building, the actual material that will be at risk at any one time is going to remain the same.

THE COMMENTOR: Well, two things. One is: 3-46 I think you're using the word "administrative limit" to be the same thing as the amount of uranium on hand site-wide.

MS. MARIK: Yes.

THE COMMENTOR: Okay.

MS. MARIK: Within that particular building, yes.

THE COMMENTOR: So the amount of uranium on 3-46 cont. hand may, under this, be increasing more than 100 percent -- way more.

MR. TAYLOR: Uh-uh.

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MS. MARIK: For that particular building. It's going from 300 kilograms to 500 kilograms enriched.

Now if -- but if you take into account the depleted and the natural, yeah, we are increasing it. But originally the 300 kilogram number was all types. So it was enriched, depleted, and the natural.

THE COMMENTOR: My point is that at a point -- at a particular point in time only a couple years ago -- and if you guys want to jump up and say that the Department of Energy was wrong, you know, then set me straight.

The Department of Energy said there were 440 pounds of highly-enriched uranium at Lawrence Livermore National Laboratory. And that's a set number. Okay. Now we're talking about we want to have 1,100 pounds of highly-enriched uranium at Lawrence Livermore National Laboratory.

3-46 cont.

And I understand you're talking about, "Well, we won't play with more of it at one place at one time." But nonetheless, when you do hazards analysis, oftentimes you look at the total amount that you have on hand. And that's going to more than double.

I think that requires, particularly in light of all the other changes we've talked about, a significant analysis which is beyond what's contained in that.

3-46 cont.

MR. TAYLOR: You know, I don't think we know the answer -- that's very possible. We could have -- at one specific time in history, we could have had 440 pounds --

MS. MARIK: Of enriched.

MR. TAYLOR: -- at that specific time, but it has varied.

THE COMMENTOR: Well, you have the date exactly.

MR. TAYLOR: I don't know that we can give that answer.

THE COMMENTOR: I have a question on environmental justice. I know that since 1992, the presidential directive on environmental justice came forward with this issue. And my question has to do with Site 300 and the nearby town of Tracy because I know that since we have tag grounds and we have tag meetings of clean up of those same type, we're kept up to speed on pretty much, as I guess we can be, on some of the ongoing problems out at Site 300.

3-47

And what's on my mind right now is the two-mile long tritium plume headed toward the boundary. And I'm thinking that there was no analysis of -- in the 1992 EIS/EIR and certainly not in any depth here about the relationship of the tritium contamination problems which are on the rise there because of the increased amount of tritium that's been released to the groundwater because of the problems with the rising of the groundwater levels during the high -- you know, heavy rainfall seasons and then receding back down and then heading it -- taking it with it to the groundwater. And obviously this threatens the aperture below. And that could be a major problem in addition to plume.

3-47 cont.

So I was hoping to see somewhere mentioned of the relationship of that problem to the people in Tracy because the populations closest to it are basically Spanish-speaking people who do not speak English.

They do not know -- I can guarantee that they don't know any of this information. They don't get anything in English or Spanish that are directed to them as a community.

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And I do feel that there's an environmental

3-47 cont.

justice issue, if not in fact, potentially there. So, I mean, it was not addressed here, and I think that in terms of Site 300 it needs to certainly be addressed. It's a very serious problem.

There probably are other ways that I could describe the environmental justice issues in terms of the safety between 1992 and now. The increased population around the Main Site as well, and that includes some of the lowest housing areas, in terms of income-related people. That is also something that also should be addressed since the 1992 EIS/EIR.

3-47 cont.

And I do think that both of these things merit a full-out review, not just a supplemental analysis or a supplement to an EIS but an actual new one.

Some of them are new issues -- are old issues that have never been addressed, and some of them should be re-addressed.

THE FACILITATOR: You started off saying it was a question; it seemed like a comment. Do you still want an answer on your --

THE COMMENTOR: I want an answer whether or not they would intend to -- based on my question now, to do something and do some kind of

3-47 cont.

3-47 cont.

environmental justice review that's worthy of the name.

MS. MARIK: Mike, would you like to address that?

MR. LAZARO: All I can say about the environmental justice chapter that's included in here is that we tried to look at something similar to what was done in the Stockpile Stewardship and Management program in drawing these circles of low-income populations in 20- to 50-kilometer radiuses of the Site, and then looking at environmental justice for various pockets of minorities and low-income people that might be associated with the routine releases from the Lab site.

In examining that and in looking back at what we've done in the Stockpile Stewardship and Management program, we really couldn't say that there was any projected impacts from -- from the proposed action for these new projects and for part of the programs at the Livermore site since 1992 that would adversely impact these minority populations.

3-47 cont.

THE COMMENTOR: How about Site 300?

MR. LAZARO: Site 300 was --

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MS. MARIK: It looks like it's a good point, and we'll have to --

3-47 cont.

THE COMMENTOR: My question is: Can I expect to see some good analysis done?

MS. MARIK: Yes, we will address it.

THE COMMENTOR: And I would add one thing about the Main Site, since you come from Argonne. As you go down East Avenue, the very closest neighbor to the Lab is a new apartment complex; it's red and yellow. It's a low-income complex.

3-47 cont.

And the complex next door to it has a high proportion of low-income including some Section 8.

MR. LAZARO: That's right down East Avenue?

THE COMMENTOR: Yeah. The first two. The first two you come to are -- one is a HUD, I think it is, Housing and Urban Development, and the other one is not. But I think it has a high proportion of low-income and Section 8.

3-47 cont.

So we're not talking about the 20- and 40-kilometer; we're talking about the nearest neighbors.

MR. LAZARO: Thank you for that.

THE FACILITATOR: Yes, ma'am?

THE COMMENTOR: I have a question. In the Draft Supplement Analysis it mentioned the species

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of special concern like white -- a pair of nesting white-tailed kites were observed.

3-49 cont.

I was wondering: Where were they observed, and what -- it says, "Mitigation measures will be implemented" -- what those mitigation measures are? Can you identify them?

MS. MARIK: We've actually had successful nestings on-site.

And, Ken, would you like to expand on that?

MR. ZAHN: Yes, I would like to address that.

The white-tailed kite is not a federally-protected species that is threatened or endangered. It is a protected species. And we have been watching for raptors here at the site, as most wildlife biologists are prone to do.

And we have -- about four years ago began picking up sightings of the white-tailed kite. And each year we seem to be increasing in the number of white-tailed kites who have chosen the Livermore site for their primary nesting site.

First year, we had one pair, and they nested in the eucalyptus tree right here at the main intersection which is outside this trailer building. Last -- and that has increased each

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year; sometimes double nestings.

And last year we had four completely successful nesting pairs and two follow-on nest sites, one right here behind this trailer, right at the base of the stoplight, if you can imagine that. For some reason they seem to prefer the Livermore site peripheral area's pine trees.

And what we do there, since we are seeing these birds pop up now at the Main Site, is we develop each year -- as soon as we can understand where they're going to nest and they start nesting activity, we actually build separate exclusion areas or restriction zones around those trees with precautions to certain clients that we know will be operating in those areas.

And we coordinate that with Fish and Wildlife Service and let the clients know, and we follow them during their entire life cycle to fledgling and independence so we can keep track of how it's going.

So this is actually a success story. In a sense we're actually trying to watch for them to study them. And even though they're not federally protected under the Endangered Species Act, just in the interest of improving the potential for their

44

continued recovery, we're supporting that here on site.

THE COMMENTOR: I may have forgotten in my little diatribe against the filters that I am in favor of a new environmental review. So this -- new, open, and total review again so that you've got to talk to your filter experts and get it aboveboard. 3-50

As a matter of fact, I checked with some classified that there are only two filters in series in that building. It's been that way for many years. Only two HEPA filters in series. That's the lowest number in any part of the Department of Energy complex. 3-50 cont.

Two filters. That's just enough to get the orientation of the translucent spot fixed up to go through the second one. Now, if you don't know what I'm talking about talk to your filter people.

Now, he's laughing. But I bet he knows. This is the point. I think it should be brought -- told to the people what the threat is in those filters in that plutonium building, especially if you're going to up the metal material. 3-50 cont.

Is it going to be metal, or is it going to be metal off site, these new additions?

45

MR. TAYLOR: We can address that.

THE COMMENTOR: Huh?

MR. TAYLOR: We can address that.

THE COMMENTOR: What is it? Can you tell me?

MR. TAYLOR: No. I don't know.

THE COMMENTOR: Well, it makes a difference.

Also, if they get around to having that new committee re-can them, then that scares me again, like the re-can of the plutonium that will start to blow up. 3-51

THE FACILITATOR: Ma'am?

THE COMMENTOR: Yeah. I had asked a question that wasn't answered about AVLIS. Can you tell me if the AVLIS pilot is up and running or anything else about the status of the AVLIS program? 3-52

MR. ZAHN: I might be able to respond partially to that. I'm not an AVLIS program representative. I'll tell you what I know or what I think I know about that.

You did ask a question about a NEPA documentation for the follow-on to the AVLIS project that was outlined in 1990 EA on AVLIS activities.

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The follow-on IPD project had -- did go underway, and it began after an EA was prepared. The EA was, in fact, prepared by USEC. And in that particular case the USEC was a quasi-governmental agency which had its own NEPA guidelines. And I don't know whether there were guidelines or regulations, but they did have their own NEPA process.

DUE and USEC came to an agreement as to which agency would provide documentation of that project, and USEC was given -- given proponency for NEPA review for that follow-up project.

So there was an EA --

THE COMMENTOR: When was that?

MR. ZAHN: This is a guess on my part. Probably 1993, perhaps 1994.

It is -- but it is a federal EA under NEPA, so it's available. There was a funding issued by USEC. And as far as I know, that project is underway and is covered by that USEC environmental assessment.

THE COMMENTOR: We have a letter just about that same year that says, "We don't need to do that."

PREVIOUS COMMENTOR: You represented to us

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over and over and over again orally and in writing that they did not have to comply with NEPA and that they weren't doing --

THE COMMENTOR: Is this an unclassified EA?

MR. ZAHN: Yes, it is.

And I believe -- again, I can't speak to USEC's process, per se, but that's my understanding of it. And again, I'm guessing on the date. So I can't tell you whether or not that's correlatable with your letter from USEC.

But USEC did have a NEPA process, and did with DUE -- through an agreement DUE -- I'm sorry -- USEC did provide the environment assessment for that work.

And I don't know, again, whether or not that -- the project that you have in mind characterized by your -- your topical title for it is exactly the same as in the EA, but I certainly would invite you to see if you can get a copy of the EA. You'd be able to compare what you think the project was and what's in there.

THE COMMENTOR: Well, actually, just to follow on, because I was going to ask for a copy of that, and there were a couple of other things that were mentioned that I would like to get a copy of

48

to help do an analysis.

MR. ZAHN: I wouldn't be able to provide you a copy of the USEC EA, but there may be an opportunity either through DUE or through one of the programs it can be made available.

THE COMMENTOR: One of the reasons that we're appealing to you is because that's not always a timely process, and you have a short comment period.

MR. ZAHN: That's true.

THE COMMENTOR: If you could get me the 1995 Safety Analysis Report for Building 332? And I do have the unclassified version -- the declassified version of the older one, but I do not have the 1995 one. And also the 1998 Updated Safety Analysis Report for Building 331?

And my point in saying that I had the earlier declassified one is if it's classified, declassify it.

MS. MARIK: It has to go through that process.

THE COMMENTOR: I'd just like to make a comment about this surprising news of this EA prepared by USEC.

Whenever we had asked the Laboratory, right

up to Ted Garberson, the head of Public Affairs, for updated information on AVLIS, we have been -- after months of waiting around, we have gotten things like the 1990 EA in response.

3-53

And we've tried to track this down both through USEC and through the Lab numerous times. So this is actually very surprising information, and I don't know exactly who to be asking for assistance at this point, but that's just not acceptable.

MR. ZAHN: Okay. I will say on the Laboratory's behalf that although I'm involved in the Laboratory's assistance to DUE in its NEPA mission, I hadn't received a request, but I wouldn't -- I -- in any case, I'm sure there is one.

THE COMMENTOR: Just imagine being given a runaround. Just imagine that you're us and that we've sent a letter asking, "Is there anything new that happened," and what you eventually get back months later is the 1990 EA that your organization sued over so that they know that they're giving you something you had.

MR. ZAHN: I can't tell you again the time correlation, but I -- but I have seen the EA. I

was not involved nor was the Lab involved in any way. It's public --

THE COMMENTOR: We'll take it. Thank you.

MR. ZAHN: But I'm sure there is one. I'm confident that there is one.

THE COMMENTOR: Could I get one of those reports so I don't have to go to the library and work on it?

MR. ZAHN: Which is that?

MR. TAYLOR: Would you grab one out of that box, please?

THE COMMENTOR: Just going to the library and sitting in those uncomfortable chairs. I want to read what I want to read not what somebody else --

THE FACILITATOR: Anybody else?

THE COMMENTOR: I'll take an extra if you have it. Give everybody else first because I have one.

MR. ZAHN: I might interject also for you that the follow-on -- I don't know the extent to which the follow-on program, the pilot program that you may be speaking of, as far as what was actually being followed on.

And I would just encourage you once you get

the EA to compare that with what is being proposed there with what your concept of the follow-on is because I'm not sure that they might be exactly the same.

The follow-on, larger-scale programs may not, in fact, be going on or be assessable or assessed. So what level of activity after the AVLIS of the 1990 has been done, I believe has been covered by Assembly A.

THE COMMENTOR: Okay. But I don't want to

3-54

lose the point that the cumulative impacts for the site need to be addressed.

THE FACILITATOR: Okay. Anybody else?

Well, thank you all. I appreciate it. Thank you, too.

THE COMMENTOR: Excuse me. I'm sorry.

THE FACILITATOR: Sure.

THE COMMENTOR: Since I'm not going to get up to speak, I would like to hear some more of Marylia Kelley, what she -- it seemed to me that she didn't quite get out what she wanted. I was wondering if I could donate my time so that she could speak?

THE FACILITATOR: Do you have more that you'd like to say?

PREVIOUS COMMENTOR: That's fine.

THE COMMENTOR: I thought she was on a roll.

THE FACILITATOR: She was on a roll.

MS. MARIK: Come on up.

THE COMMENTOR: And it seemed to me she had a lot more to say, and I would really like to hear it.

MS. MARIK: You're more than welcome to come up, Marylia.

3-55 THE COMMENTOR: Well, basically what I was sort of wrapping up with are the fact that all of these programs -- the Accelerated Strategic Computing Initiative, we know may be, as was briefly mentioned, a huge user of water at the same time -- and that wasn't conceived of in 1992 -- at the same time the National Ignition Facility is slated to be a huge user of water, and that wasn't conceived of in 1992.

At the same time, there is new contamination in the groundwater that has been discovered since 1992, and other contamination in these areas that, in fact, the construction of these facilities could have an impact on.

And all of these related impacts individually and cumulatively -- meaning looking at

them all together and how each one affects the

3-55 cont. other -- hasn't happened. And you have really a whole different -- in some ways, a whole different site here than you had in 1992.

Subcritical nuclear tests may, in fact, involve operations in the Plutonium Facility that may be different than some of the prior operations.

3-56 I mean, certainly I doubt if they would use more plutonium; they probably use less. But when you're looking at issues like dust and how much lathe work is done and that kind of thing, it brings up some questions which this document doesn't answer and some document should.

When you're talking about AVLIS that has been mentioned. I know "Newsline" has talked about hundred-hour runs where you're using -- basically a system where you use toxic-size lasers and copper lasers to enrich uranium.

3-57 And the EA -- the 1990 EA talked about putting a gram of uranium annually into our air in finely divided particles, 13 tons of freon and an undisclosed but large amount of TCF.

3-58 And so, you know, how many hundred-hour runs are run, what the impacts are, what the proposals are, whether those were integrated-pod runs, you

know, how much uranium.

3-58 cont. All of those kinds of things need to be analyzed, and these are all new since 1992.

And the National Ignition Facility, again, is going to add tritium, other radioactive wastes, other contaminants, even during routine operations. 3-59 And that needs to be looked at carefully with respect to other Lab operations, not just sort of on its own, the way that it's been analyzed before.

Livermore Valley wines, according to the Livermore Lab's annual environmental monitoring 3-60 reports, routinely show elevated levels of tritium. And these are Livermore Valley wines that the Lab takes off the shelf in the supermarket.

So this may certainly be less tritium than the grapes right across the street where I live on East Avenue because, you know, you mix grapes together when you make wine.

3-60 cont. And in 1989 Livermore Valley wines taken off the shelf had four times the tritium of other California wines. It's not like a 10 percent kind of an increase.

And we've taken a look at the DOE's own figures. We have a DOE document where they look at

3-60 cont. the annual releases that they know about from

Livermore Lab for tritium, for the radioactive hydrogen, and you can take that document and you can correlate it directly with how much tritium is on site and being used.

There's a direct correlation between the amount of tritium being released in a year and the operations that go on at the Lab, so that the more 3-60 cont. tritium is used at the Lab the more gets into the environment because it's gaseous; it becomes tritiated water so quickly; it diffuses through everything that exists just about, and it's just flat true that you cannot contain it and control it here.

So when the National Ignition Facility gets going, there's going to be incrementally some additional tritium. And that should be looked at.

And as Jackie alluded to, there are proposals, very serious proposals that we have with DOE logos on them and what was then the Defense Nuclear Agency logos on them and Livermore Lab logos on these reports which we'll be happy to share which say that they may use fissile and

3-61 fissionable materials in the National Ignition Facility.

Plutonium 239, uranium, and, in fact, the

Lab has come forward and said, "Yes, we at least plan to use uranium 238," but potentially uranium 235, if they make that decision, and also lithium hydride -- large amounts potentially of lithium hydride.

3-61 cont.

And while a final decision hasn't been made, under NEPA in terms of site-wide analysis, is it a plan -- is it a proposal that might happen in the foreseeable future?

And, as Jackie said, if that question isn't answered in an EIS, it should at least lay out a time frame for when that question is going to be answered and what those impacts might be.

So we're looking at huge new facilities that didn't exist before -- and different kinds of operations that didn't exist before that could have a very substantial impact on the environment. Everything from water, which is at a premium here, to exotic contaminants like plutonium.

3-62

This document just -- just ain't enough.

MR. ZAHN: We'd like to respond on the water if we can, please.

THE COMMENTOR: Now, if you don't know the stuff is metal oxide, those two things make a big difference about the threat. So you should find

3-63

that out.

And it should be in the report because this business of always saying that the risk is only one in a million, that's oil on the water for public consumption and misleading because everything seems to be a one in a million risk that comes from this place. I think somehow there's a hard-wired key that's punched that they tell the newspaper people that number.

3-63 cont.

Now, in addition, the formal structure of that slope factor should be included with all the assumption that goes into the slope factor that you tell the people in these reports it applies to. Not just tell them that the Earth is only 50 percent flat. You can't do that in all honesty. You've got to tell them it's either flat or some other thing and give the structure because more and more people can read mathematics.

They don't have to be told the Earth is flat and expect them to believe it anymore. I don't. And even if it comes from the right hand of God, someone tells me, "The Earth is flat," I have reason to be suspicious. Even when they tell me it's round, I have reason to be suspicious.

So, please, support these absurd statements.

If they're not absurd, don't be afraid of them.

MS. MARIK: Thank you.

THE FACILITATOR: Anyone else?

Well, thank you very much. I appreciate it. I'll just remind you there is a comment form, if you want to grab one of these on the table before you leave.

I wish to thank you everybody, including the stenographer reporting and the people over here. Thank you very much.

There's a meeting again at 6:00 tonight if any of you would like to return.

(Whereupon, the briefing proceedings concluded at 3:32 p.m.)

STATE OF CALIFORNIA)
) ss.
)

I, LETICIA A. RALLS, a Certified Shorthand Reporter in and for the State of California, do hereby certify:

That said proceedings were reported by me at said time and place, and were taken down in shorthand by me to the best of my ability, and were thereafter transcribed into typewriting, and that the foregoing transcript constitutes a full, true and correct report of comment and question portion of the proceedings which took place.

I further certify that I am not of counsel nor attorney for either or any of the parties hereto, nor in any way interested in the outcome of the said briefing.

IN WITNESS WHEREOF, I have hereunder subscribed by hand this 15th day of February 1999.

LETICIA A. RALLS, RPR
CSR. NO. 10070

3.5 Document 4: Briefing Transcript, Livermore, February 11, 1999, 6:00 p.m.

TRANSCRIPT OF COMMENT AND QUESTION PORTION

OF PUBLIC BRIEFING

Regarding:

DRAFT SUPPLEMENT ANALYSIS
FOR
CONTINUED OPERATION OF
LAWRENCE LIVERMORE NATIONAL LABORATORY AND
SANDIA NATIONAL LABORATORIES, LIVERMORE

Proceedings before: BARRY LAWSON, Facilitator

Thursday, February 11, 1999

6:00 p.m. session

Taken by LETICIA A. RALLS,
a Certified Shorthand Reporter,
in and for the State of California
CSR No. 10070

PROCEEDINGS

BE IT REMEMBERED, on Thursday, the 11th day of February 1999, commencing at the hour of 6:01 p.m. of said day, at the LAWRENCE LIVERMORE NATIONAL LABORATORY, EAST GATE VISITOR CENTER, Trailer No. 6525, Greenville Road, Livermore, California, before me, LETICIA A. RALLS, a Certified Shorthand Reporter in the State of California, the said briefing proceedings were had.

APPEARANCES

BARRY LAWSON, of BARRY LAWSON ASSOCIATES, Mountain Road, P.O. Box 26, Peacham, Vermont 05862, appeared as the Facilitator.

LOIS MARIK, of the DEPARTMENT OF ENERGY, Deputy Director for Livermore Operations Division, appeared as the presenter and as a panel member.

CHUCK TAYLOR, of PAI CORPORATION, appeared as a panel member.

MICHAEL LAZARO, of ARGONNE NATIONAL LABORATORY, Chicago, Illinois, appeared as a panel member.

APPEARANCES (continued)

KENNETH ZAHN, Group Leader, Environmental Evaluations Group of LAWRENCE LIVERMORE NATIONAL LABORATORY, appeared as a panel member.

HANK KAHN and BRUCE CAMPBELL of LAWRENCE LIVERMORE NATIONAL LABORATORY, appeared as notetakers.

LIBBY STULL of ARGONNE NATIONAL LABORATORY, appeared as a notetaker.

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(Whereupon, subsequent to Ms. Marik's presentation, the following comment and question period began at 6:17 p.m.)

PROCEEDINGS

THE FACILITATOR: Thanks.

Now, let's start our comment period.

I invite you to go one at a time for an initial period of a maximum of about five minutes either asking questions or making comments regarding the Supplement Analysis.

Please introduce yourself and affiliation, if you'd like, and indicate before you start whether you're asking a question or making a comment. That will help our notetakers.

If you're closing in on the five-minute mark, I will request that you conclude your comments as gracefully and graciously as possible. Remember, you'll have a chance to supplement those later in the evening.

Oh, yes. If you have some written comments that you would like to leave with us, you're certainly welcome to do it, and you don't have to feel that you have to read the whole thing to which you can summarize the oral comments and submit the written ones for the record. Written and oral comments will receive the same attention.

So is there anybody who here would like to ask a question or make some comments?

All right. Good night.

Yes, sir? Please, Mr. Falk.

THE COMMENTOR: What is Building 490 complex?

MS. MARIK: The U-AVLIS complex.

4-1 THE COMMENTOR: Why do you need the ability to handle 80 tons of uranium?

MS. MARIK: That's in the 1992 EIS. Those conditions have not changed.

4-1 cont. THE COMMENTOR: Why do you need the ability for 80 tons? I didn't read that thing, so I can't tell you, or I can't answer that -- I mean, I didn't read it.

MR. TAYLOR: What they're doing in there is separating uranium --

4-1 cont. THE COMMENTOR: I know. But 80 tons?

MR. TAYLOR: Well, that was the programmatic evaluation of the amount of material they needed, and that's what we evaluated in 1992 for that facility.

4-2 THE COMMENTOR: Okay. And then in some of the other questions you were talking about three tons. I thought this was a research facility not a

4-2 cont. storage depot.

MS. MARIK: Three tons or --

THE COMMENTOR: I always had the impression this was mainly a research laboratory, and still

4-2 cont. do. So, therefore, I'd like -- how come such a mammoth amount? Is someone getting rid of it, and you need to store it here or what?

MS. MARIK: Well, it's to support your programmatic activities. And within the plutonium --

4-2 cont. THE COMMENTOR: Can you tell me what programmatic activity needs that much?

MS. MARIK: Yes. Within Section 6 of the document we talk about the programs that -- that will be -- that are currently or planned for the future. And the largest -- the largest project --

THE COMMENTOR: I just got that document.

MS. MARIK: -- is the MOX. And what that is is a -- I'm drawing a blank -- it's a -- I'm drawing a blank. I went blank. It's a prototype for a fuel rod.

THE COMMENTOR: Yeah?

THE FACILITATOR: Is that still within the research question?

THE COMMENTOR: Can you say any more?

MS. MARIK: Do you want to expand on it?

MR. TAYLOR: Do I want to expand? The programs are identified on page 6-5. We can get you a copy.

THE COMMENTOR: I just got it. I haven't read that yet.

MR. TAYLOR: We went through and indicated each of the programs that we're going to conduct activities in there and why we need to expand the uranium. So we've provided that.

We can provide a detailed -- a more detailed explanation of those programs if you wish to make that comment.

MR. LAZARO: I think what he's looking for specifically is why do we need 40 tons -- it's really 40 tons of uranium in Building 490? Why such a large amount?

I think we'll give you a specific response to that. What the programs need to require the 40 tons of uranium in Building 490? Is that essentially --

THE COMMENTOR: Yeah, that will do.

MR. LAZARO: -- the question that you have?

THE COMMENTOR: Yeah.

THE FACILITATOR: Somebody else?

Yes, sir? Please.

4-3 THE COMMENTOR: Why here? Why Livermore? Why not -- for a fuel rod, why not Brookhaven? Why not down in New Mexico or Los Alamos?

MS. MARIK: Well, there are three national laboratories that the President has mandated do weapons research, and those laboratories include Sandia and Livermore and Los Alamos.

THE COMMENTOR: There aren't many fuel rods and bombs.

THE FACILITATOR: Sir, would you give your name, please? Sir?

THE COMMENTOR: Ernest Terrier. I'm a resident here in Livermore.

And it concerns me that any risk,

4-4 whether -- I mean, just glancing at this briefly -- that's all I've had a chance to do -- the risk seems minor.

I've had worked for nuclear facilities with the aircraft carrier. I'm familiar with the risks involved in a nuclear environment. And as far as I'm concerned, any risk is too great, and that

4-4 cont. concerns me greatly.

And it worries me that an accident will happen beyond the scope of planning and

4-4 cont.

expectations. And it worries me that we're doing it here, in the Bay Area. And why not somewhere quite a bit removed and safer? Is there -- is it because the people are here? What is the reason?

MS. MARIK: It's the mission of the Laboratory. It's the mission of the research laboratories that they -- the weapons laboratories are those three laboratories. They're Sandia, Los Alamos, and Lawrence Livermore.

4-5

THE COMMENTOR: Then my next question is: Why can't the theoretical research be done here? That's what I've always heard was done here, not the practical research. Carrying large amounts of materials here is not what everybody is led to believe who lives in the area, unless you work here in the labs.

MR. TAYLOR: Maybe I can respond to that issue.

One of the issues that -- that is very difficult for us to respond to here is what is mandated by Congress when funds are appropriated to the Livermore Laboratory.

Congress tells the Livermore Laboratory within certain areas what activities are to be conducted here. And we at this -- at the local

level don't really have control over that; we're pretty much mandated by Congress of what programs we do.

So what we're trying to evaluate is what Congress and the President have told us to do here.

4-6

THE COMMENTOR: And what say does the public have in all of that?

MR. TAYLOR: Well, that's the purpose of this.

4-6 cont.

THE COMMENTOR: So what is the recourse to -- I don't want to say "stop it" because obviously it's a very valuable thing and that's not my intention, but to -- what recourse do we have as residents of Livermore, I guess is the best --

MR. TAYLOR: I don't know if I want to say that, but the -- yeah. I guess, just to be blunt, the outcome of this process, we go through this process and it's signed; the document is signed.

And then the public's recourse, if they're not happy with that, is to bring suit against the Department of Energy. I mean, I don't like saying that, but that's --

THE COMMENTOR: You're a candidate.

THE FACILITATOR: But you do have a couple of other options. One is you can talk to Congress.

The second is that, by making your comment or asking a particular question -- for instance, if you wanted to ask the question, "Why doesn't this take place at Los Alamos," somebody will have to answer that question. It may not be the right answer that you want, but they probably will give you an answer in writing.

THE COMMENTOR: I also understand that Los Alamos is about as big as Livermore, and they would have the same complaints that we have here.

THE FACILITATOR: Right.

4-7

THE COMMENTOR: It's just moving it from us to them. I don't consider that fair, but it seems like there's some wonderful places in the middle of nowhere that this could be done and not bothering anyone. And that concerns me.

THE FACILITATOR: Thank you for your comment.

Anyone else care to go? Yes, sir.

THE COMMENTOR: Yes. I related to the same questions that were just coming along in there. Part of my question would be: When he asked, "why here," is part of the answer "why here" because -- and I'll break it apart for a moment here.

I remember during the Star Wars history a

few years back that a good deal of the "why here" answer was because it was very heavily advocated by Mr. Teller.

4-8

Is the reason "why here" with regard to these questions because either Mr. Teller or other people here are strongly lobbying for that activity here?

And -- well, then I'll go on with the second part after I get an answer. But is the answer that the Laboratory and other people here have lobbied for here? Can we get an answer?

THE FACILITATOR: Anybody want to be on record to saying that?

MR. TAYLOR: First of all, I think it's illegal for the Laboratory to lobby Congress as well as DUEs. I can just say that.

Beyond that, I don't know what....

THE COMMENTOR: So when Teller was talking to Congress about the Star Wars, it was illegal? Is that right?

MR. TAYLOR: If he is invited by Congress --

THE COMMENTOR: It may be illegal -- excuse me. Lynn Haus, Livermore Police Report.

It may be illegal for you to spend government money to lobby Congress. It's not

illegal for you to write letters and talk on the telephone.

MR. TAYLOR: To inform Congress when they request.

THE COMMENTOR: Lobbying and -- the money part is what makes it illegal.

I'm sorry. I didn't mean to interrupt you.

PREVIOUS COMMENTOR: That's quite all right.

THE FACILITATOR: May I ask you for your name?

THE COMMENTOR: My name? Rene, R-e-n-e, Steinhauer, S-t-e-i-n-h-a-u-e-r.

THE FACILITATOR: Do you want to continue?

THE COMMENTOR: Yes. Well, I was questioning them about this because then what you're saying is that the resolution to this thing, if we wanted to change it, is then for us as citizens to lobby Congress directly against this ongoing procedure here.

4-9

THE FACILITATOR: That's one --

MR. TAYLOR: That's right.

THE FACILITATOR: That's one road that you could take.

MR. TAYLOR: Your representatives represent you and....

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THE FACILITATOR: Yes, sir?

THE COMMENTOR: Again, Lynn Haus from Police Report in Livermore.

I would like to call on and question the math of the gentleman here in the middle of the table.

I believe he said the number here is 40 tons, correcting the gentleman over there who said it was greater than that. Now, I happen to know that a kilogram is 2.2 pounds, and you've got 80,000 kilograms. That's 176,000 pounds which divided by 2,000 --

MR. LAZARO: All right.

THE COMMENTOR: -- comes out more like --

MR. LAZARO: You're correct. I thought he said 80,000 pounds, so you're correct.

THE COMMENTOR: 80 tons. 80 tons. 80 tons is set aside in the 1992 document as an acceptable number.

4-10

So my comment is: Therefore, if you would just like to bring in 8200, which is a mere four tons, that makes it okay?

I had the opportunity to cut the article out of the paper, which is a very nice piece of propaganda, and I would just like to read a portion

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of it.

THE FACILITATOR: Could you cite it for the record, please?

THE COMMENTOR: Pardon?

THE FACILITATOR: Could you cite it? What date was it?

THE COMMENTOR: This no longer has the date. Oh, it's February 4th, and it was an article written by -- "Tri-Valley Herald" written by Nancy Mayor, staff writer. And it says, "Lab asks to raise uranium limits."

4-10 cont.

So I guess perhaps we're not really raising the limits at all; we're working within the limits of 80 tons that are already here perhaps.

MS. MARIK: That's an administrative limit for the 490 complex.

What we're proposing here is that we raise the administrative limit that is at Building 332 where the Plutonium Facility complex is.

THE COMMENTOR: Okay. If I read this,

> "If the proposal is approved, the limit would raise from 660 pounds of uranium of any type. That's 300 kilograms" --

MS. MARIK: Of highly-enriched --

15

THE COMMENTOR: -- "of uranium of any type to 8200 pounds of uranium of varying kinds. Of the 8200 pounds, only 1100 pounds would be highly radioactive. The present limit compares roughly to the amount the size of a basketball. The proposed limit is about the size of a 19-inch television set."

Isn't that an interesting analogy? How many tangerines go into a grapefruit?

Again, if I do a little bit of math, I determine that if 660 pounds is one basketball, 8200 pounds is 12 basketballs. So the amount of material that you want to bring on site or have active on site here is 12 times greater.

4-10 cont.

And my neighbor asked me on the way over if I would bring a basketball home for his son; he likes to play basketball.

The propaganda sort of is there's not much to this; it's just the size of a TV set. It's actually a 12-fold increase in the amount of material that we have to deal with.

4-10 cont.

And I just happen to live across the other side of Vasco Road. You probably live in Chicago,

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4-10 cont.

and he lives over in Berkeley, and so on, and there's rather little concern on your part about what happens here.

MS. MARIK: Well, one of the things that I'd like to explain to you is the administrative limits issue. And what an administrative limit means is that that is the maximum amount of material that you can have within that facility. That doesn't mean that that's the amount of material that's at risk at any one time.

And what we're saying is: To manage the materials better for the programmatic activities. Most of that will be in storage; the amount of material that we actually perform operations on at any one time or the material at risk is not changing within those facilities.

MR. TAYLOR: Maybe --

THE COMMENTOR: The actual amount or the limit?

MS. MARIK: The administrative limit is only a number that we say, "This is the maximum amount of material you can have in that building."

But we have very -- we have procedures that say, "This is the amount of material that we are actually performing operations on at any one time."

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That is not changing within those buildings.

We're saying that we need to have -- we need to be able to manage our materials better. Most of that material remains in storage at any one time.

The material at risk or the -- what you evaluate when you're doing the analyses documents or the safety analyses and say, "This is my accident scenario," that's not changing because it's the same amount of material that we're always going to be working on at any one time.

We have a fact sheet on -- on this. It's not the easiest concept to explain.

MR. TAYLOR: If I could maybe give you my concept?

THE COMMENTOR: Well, do it in terms of basketballs. Can you help me with it in terms of basketballs?

MR. TAYLOR: If we do the -- enriched uranium is, I think, what DUE is more concerned about because it's a higher hazard to the public. Depleted uranium is in airplane ballasts and a lot of places -- sailboats. So it's out in the public.

So that 3,000 kilograms that we're talking

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about there is depleted natural uranium that you would find in nature or, like I said, in ballasts and that.

So what we're actually saying is: We could have had 300 kilograms of enriched uranium in that facility; we would like to raise that from 300 to 500.

So that, in your basketball analogy, you know, that's -- 300 is 1 basketball, so we're going one plus one and three-quarter basketballs, or something like that -- say two basketballs of highly-enriched uranium. So hopefully -- rather than 12 basketballs of highly-enriched uranium which is much more hazardous.

THE COMMENTOR: May I ask a quick question? You're saying highly-enriched uranium. Can you define that for me, please?

MR. TAYLOR: It's in the 80- to 90-percent enrichment, where natural and depleted is less than one percent enrichment. So there's a tremendous spread there. It's weapons-grade and that type of materials, yeah. Weapons-grade, reactor-grade, at that level.

4-11

THE COMMENTOR: You made reference to some of this material being stored. Where is it being

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4-11 cont.

stored? Locally? Elsewhere?

MS. MARIK: It's being stored within the building, but it's not at risk at any one time because the operations aren't being performed on it. It's in storage.

It's not considered -- it's not considered feasible to have an accident scenario that covers all material that's in storage. You analyze accidents for the material that's being operated on and that you -- is a foreseeable accident scenario.

If anybody wants to expand?

MR. TAYLOR: I guess, it's -- it's stored in the vault, is the answer to the question, in sealed cans. And they put those in a -- like a regular -- like, you know, safety deposit-type vault. So that's where it's stored, and it's only brought out when they're going to use it.

THE COMMENTOR: But then it's still on premises.

MR. TAYLOR: Yes, it is.

MS. MARIK: Yes, it is.

THE COMMENTOR: Part of the way I understood your answer is, "Well, we're using some of it, but the rest is somewheres else in storage. But we

20

still have all of this material here within the confines of the Lab."

MS. MARIK: Yes.

THE COMMENTOR: I was in Harrisburg, Pennsylvania, in March 1979. And all of their material that was stored at Three-Mile Island was in a safe way with regard to any foreseeable accident.

MS. MARIK: That was an operating reactor plant.

THE COMMENTOR: Yes, it was.

MS. MARIK: Right. It's --

THE COMMENTOR: And what you're suggesting is that you've foreseen everything that's possible in your program, and, therefore, there's no possibility that any accident could ever involve the material in the vault; it's only what you actually have in your hands at the moment that's -- that's possible to have an accident.

4-12

Because if we do have a big accident with that, what's the possibility that the stuff in the vault becomes involved also? Like Reactor 2 and Reactor 1 on Three-Mile Island. If Reactor 2 had gone, Reactor 1 would have gone also.

MS. MARIK: Do you want to explain the

analyses process?

MR. LAZARO: Well, I guess with respect to the accidents at the facilities that we're talking about at Lawrence Livermore Lab, it's not really appropriate to compare the types of activities that are going on in these buildings to what you would have going on in a commercial nuclear reactor.

All the material in the core of a commercial nuclear reactor would be at risk in the event of a failure or a meltdown, as what happened at Three-Mile Island.

The types of operations at these facilities and in the sealed sources -- most of the material is left in these sealed sources -- and the possibility of the material getting into the environment, for example, from an earthquake, it wouldn't happen.

If the material was outside the sealed source in the Laboratory in a glove box -- they do the experiments in glove boxes -- if there was an earthquake during a glove box, then you -- then there's a potential that that material -- that small amount of material that they're doing the experiment on could be released as a result of an earthquake.

And that's what was assessed in this document, the release of the material during the -- during the experiment which could -- could be released to the environment; whereas, the material that's stored in these sealed sources, the probability of a release to the environment would be extremely small. It would be incredible for that to happen.

So you have to look at it from a risk perspective. It's a very minute risk with respect to this large amount of material that's in storage versus the amount that's actually being worked with.

THE COMMENTOR: I hear, you know, a lot of sensible talk coming over here from the end of the table, but I also know -- and I'll follow it over the years -- different problems that are related with the situation.

And you sound like very responsible people, yet both this Main Site and Site 300 are on the Superfund cleanup, meaning that they're on the major contaminated areas in the entire country.

4-13

That tells me that somebody's not doing their homework; somebody's not doing their cleanup. That tells me that accidents happen and that people

get sloppy and that you're not taking the proper precautions.

We are having plutonium ventings into the atmosphere. We're getting that stuff out here in the parks in the area. We're having tritium leaks. You discovered PCBs out there in the area where you're going to put in the NIF facility -- that's redundant, but I'll let it pass at that.

4-13 cont.

What kind of assurances can you give us that your people are any better prepared today then they have been over the last 10, 15 years to cope with the problems of what you're dealing with?

MS. MARIK: Well, one of the important things to note is that the regulations have changed over the years. And over the years, it's been an ongoing process of getting smarter about releases into the environment and the impacts that those have at our sites.

And some of those issues are difficult to deal with because I consider them to be legacy issues. In the case of releases to groundwater and everything, we didn't have regulations that required things to be disposed of in containers, or we weren't aware of the issues that, you know, were happening within the environment.

And all I can really say as a result of all this is is that it's always the full intent of the Department of Energy to ensure that we perform operations safely both for the safety of our workers as well as the safety of the public and the environment.

And other than that, I --

THE COMMENTOR: Where do you live, may I ask?

MS. MARIK: I live in Fairfield.

THE COMMENTOR: Well --

MS. MARIK: I can't afford to live in Livermore.

4-14 THE COMMENTOR: So what you're saying is that some of these things have happened because they are unforeseen. And what assurance can you give us that there are not new problems with the work going on that have yet not been foreseen and that were not -- we still have to reclaim all those plumes of pollutants under the ground that have gone beyond the perimeter of the Laboratory, gone into private residential areas. We still have to pull all that back.

What can you tell us -- what can you do for us to really assure us? I mean, is there some sort

of outstanding liability policy that the Lab has to cover all of these kinds of things? I doubt it.

4-14 cont. You know, you're just talking. What do you have out there to guarantee the citizens like us if we lose, let's say, home equity value, that you're going to pick up on it and pay us a difference?

4-14 cont. What can you say when the vineyards around here that have four times the tritium rate -- and as soon as consumers really get -- find out about that, they're going to start buying -- they're going to start buying something else -- what are you going to do to offset the losses to those people?

What are you going to do to the little businesses that we have around here, to the restaurants and other things, that when people find

4-14 cont. out that we have so much pollution related to the nuclear industry that we're going to start going out of business and selling our homes at a loss and paying the price of our children coming up with these cancer clusters and other things, melanoma

4-14 cont. clusters?

What are you going to do about that? What kind of policy or funding do you have for that?

THE FACILITATOR: It seems like that's a very reasonable question. It probably involves some other people besides these folks to answer that. But I think the questions that you asked -- and you would address that in your public response document, would you not?

MS. MARIK: Yes.

THE FACILITATOR: I mean, I've tried this in many other places. This is a tough question to answer. There's no doubt about it. It's a good question to raise.

4-15 THE COMMENTOR: Well, I don't see facilities like this going up like in Beverly Hills. I don't see facilities like this going up in Manhattan. I don't see facilities like this going up in downtown San Francisco.

So it seems to me that selections are being made where people are maybe not as well organized and don't have as much money to resist this kind of operation.

THE FACILITATOR: Okay. Comment taken. Understood.

Mr. Falk?

THE COMMENTOR: Comment about your report or whatever this is, Draft Supplement Analysis.

I haven't had time to read it, but on page 6-1, I want to comment. Why don't you stick to a given unit dimensionality so you don't confuse the

4-16 non-mathematical person? In two of these sentences, you've changed the units.

MS. MARIK: What units?

THE COMMENTOR: And not everyone has the moxie to translate it.

MR. TAYLOR: Could you be more specific?

MS. MARIK: Yeah. Could you let me know what sentence?

THE COMMENTOR: This is on the little box thing that you have on page 6-1. You're talking about chances of one in a million -- one in a

4-16 cont. million years. And then you get down here, talking about in six-part linear.

Why do you change the units like that? This confuses the reader, unless they're already familiar with these things.

MS. MARIK: Well, all I can say is that your comment is noted, and with that comment we'll try to make it clearer to the reader what -- what we're -- what the conclusions are there.

THE COMMENTOR: You'll try to make it clearer --

THE FACILITATOR: Are you saying you'll try to be consistent?

THE COMMENTOR: -- is that what you said?

MS. MARIK: I'll try to make it clearer.

THE COMMENTOR: Well, it's confusing to some pretty well-educated readers. Reasonably well-read in science, too.

PREVIOUS COMMENTOR: If we're going to talk about powers of 10 in one paragraph, then they should continue in powers of 10 in the others. (4-16 cont.)

MR. LAZARO: Your comment is well-taken.

THE COMMENTOR: One in a million changes, that's as the gentleman represents. (4-16 cont.)

MS. MARIK: We will try to make that clearer.

MR. LAZARO: That's an easy fix.

THE COMMENTOR: And why not -- why not also put beside these curies the equivalent in becquerels and tell them exactly the meaning of that because I don't know how many people know what a curie is. (4-16 cont.)

It's a word related to some woman, but I don't know they know the value of that. That's a big, big number when you talk about 3.7 times 10 to the 10th. That's a whopping -- that's comparable

to the number of stars in our galaxy. You see?

They don't have a feel for that kind of thing. So talk about something that -- tell them about the number of disintegration per second. They'll catch onto that damn quick if you don't confuse the issue. And that's what you should use anyway, you see. (4-16 cont.)

Those are so-called what? International units? Do it.

MS. MARIK: Your comment is noted.

THE FACILITATOR: Good. Anyone else?

THE COMMENTOR: Well, I'd just like to say that, again, over the years -- I should mention, by the way, that I've lived in the community for 25 years. And sometimes that number, just like this gentleman was saying, you know, if you don't deal in the same relative conversion tables, sometimes that doesn't mean anything.

To me, 25 years means a quarter of a century. A quarter of a century. And I've lived here and I've watched over the years the reports coming in of all the various problems that we have had with non-compliance with safety regulations, non-compliance with a number of issues in here that have led to these accidental leaks of

plutonium, tritium, the PCBs and other things and, furthermore, very clearly -- although I didn't realize that you would deny it -- the overt attempt to cover up all of this until it gets out, until some newspaper digs up the story, until some insider, some whistleblower gives the information.

But I have -- for a quarter of a century, I have been watching, hearing, and reading the insidious way and the arrogance of the people who are here that feel that they can do whatever they want to do in quest of knowledge, in quest of science, but they don't give a damn about how they involve us, how they endanger us. They don't give a damn about the democratization of the process.

You're all on some sort of a high-flying loop about the quest of knowledge. But you're endangering all of us: my life, my children's life, my grandchildren's life.

And you don't live here, and you're not part of it. And that's part of what this community resentment is about.

And over the years, there have been countless examples of accidents, of leakages, of ventings. The places where our children go to play, the parks and all of that, you have the

higher plutonium levels. And you don't live here, and you don't pay that price, but we do.

And I want you to know that -- I mean, we're part of a community in here that are getting a little bit fed up with this, and we want to hold you and we intend to hold you to a higher standard.

And one of you mentioned reference to, well, if we're not happy with it, we can sue you. And there have been suits being brought lately. And there have been some very, very significant results coming out of that thing.

And I want you to know, I mean, speaking for myself but there's many other people in here, that we're a little bit tired of this process. And it's very easy -- I'm thinking right now -- has nothing to do with us. (4-17)

A year or so ago, the federal government decided to set up a waste incinerator plant over there in the Ward Valley area in an Indian reservation area. Right?

Nobody's going to stand up to fight to that. You go where the people don't have the ability to organize themselves, don't have to money the resist this. But the things are getting better publicized, and there's a better accounting going

on.

And even though you live in Chicago or New York or D.C., the time will come that we hold you accountable to these very sensible explanations that you're giving. And so when you go back home, you better make sure you've got the right liability insurance.

THE FACILITATOR: One thing that could be done is to explain in the comment response document just what provisions are out for letting people know if there's a problem with the site. This is something -- it probably is done within that analysis, but it could be included.

Thank you.

MR. ZAHN: I might also invite the readers and the commentors, too, to refer to our annual -- site-wide annual environmental report which does summarize each year many of the mission histories or event-type of events that do occur that you may be concerned about.

And they're published annually, and they do give trending information. And I think you'd find in many cases -- most of the cases that you're speaking of that we actually have a good track record.

And I think that those site-wide annual reports are a valuable asset for the public readership, written to be well-understood, and they do reflect the true monitoring progress here at the Laboratory.

THE COMMENTOR: It seems to me that information comes out only when it's forced.

For example, after the 5.5 earthquake that

4-18

we had here in Livermore, there were several leaks that the Lab remained absolutely silent about until the information began to leak out from insiders. That does not give me any confidence in the reports that you're citing.

THE FACILITATOR: Okay. Yes, sir?

THE COMMENTOR: Talking about the environmental reports you put out, are you involved in it?

MR. ZAHN: Am I involved in it?

THE COMMENTOR: Yeah, the yearly report?

MR. ZAHN: Yes. I have a small portion that's in there that represents some of those --

THE COMMENTOR: Let's talk about that a minute.

Now let's take the tritium monitor that's sits out here by Zone 7 Plant. Assuming that it

works and functions properly for the full year and it is monitored and whatnot correctly and does its job properly, if you take the numbers in that environmental report collected from a man who's been out there for the full year, he breathes -- only in the air now -- enough tritium in a year to have beta disintegration in every cell of his body. You do the arithmetic.

I'll tell you that the number of cells in your body is approximately 10 to the 13. You pick your own numbers and do it.

Now, that's not what I call "no health threat." And that's the vocabulary that's used in things that are stated around here. "Our yearly report shows there is no" -- the word "no" keeps showing up -- "no health threat." No means zero.

It's been known for 30 years there is no such thing as a safe dose of ionizing radiation. And, furthermore, only one cell needs to become an outlaw to form cancer.

And cancer is only the tip of the iceberg if there's any damage from this stuff. If you have immune depression, you've got so many different DNA damages of which cancer is only the one. And you like to keep talking about cancer because you know

damn good and well it's a multi-factorial thing that takes from three to seven injuries of the same cell to get the show on the road.

Now let's talk about immune. Why don't you talk about immunity? I object to you using the word "no health threat." That is a scientific deception on people that don't know that -- zero. "No" means zero to me. I assume it means zero to everyone else.

Say that that is "small" not "no" threat.

THE FACILITATOR: Okay.

THE COMMENTOR: Now, you do the arithmetic on tritium only in the last couple of years of the environmental report. Since you're part author, do it. See if I'm wrong. Call me up. My phone number is in the book.

THE FACILITATOR: Please. Sir?

THE COMMENTOR: Are there -- you bring up

4-19

the safety issue again in the report. Are there no experiments going on at this facility which are so secret that were there an accident you could not report it?

MS. MARIK: No. We would always report.

THE COMMENTOR: But you didn't after the earthquake.

MS. MARIK: What exactly didn't we report? There was a Type B investigation done on the release from Plutonium Facility, and that report is public. I can get you a copy of that.

THE COMMENTOR: The report became public after other people reported it. You did not come forward with it. And you did not come forward with some of the other accidents that have happened here until other people find out about it.

4-20

That's the part that puts citizens like me at issue with an institution or an organization such as yours.

MR. TAYLOR: Maybe I can -- excuse me -- answer that.

What we have done that actually Marion's group and -- have requested that we have what we call occurrence reports that identify each and every accident that we have at this Laboratory and every other Laboratory.

And those occurrence reports are made public as soon as they're finalized. And everyone in the public has the ability to get a copy of those reports.

And we -- we discuss and explain every single accident that meets a certain threshold at

this Laboratory. Every single one is in the occurrence reporting process. And those are available to the public.

THE COMMENTOR: "A certain threshold." What does that infer?

MR. TAYLOR: If an individual cuts their finger or we have a truck accident, you know, those -- we don't report those types of things in occurrence reports. Those types of things do go in a report. They go in accident and injury reports.

THE COMMENTOR: Could I ask you to give some information then, as long as this is so open, about those employees that were injured a few years back when there was a criticality accident?

4-21

We've never been able to get the names of them or find out what happened to them when there was a situation with that explosion and four people? Can you give me now, for the record, the names of those four employees?

MR. TAYLOR: No. We would never do that. That's a violation of their personal rights.

THE COMMENTOR: Of course it is. Their personal rights?

MR. TAYLOR: Yes.

THE COMMENTOR: You have no concern over what happened to them or how it might affect us or concern us, right? It's their personal rights?

MR. TAYLOR: We explained the details of what happened and that it happened to a certain number of people and exactly what happened to those people, but the medical records are not --

THE COMMENTOR: I don't think we even know exactly what happened to those people. We do know about the accident. What did happen to those --

4-21 cont.

what was the outcome of those people? Without giving us names, what did happen to those four people that were involved, if that was -- if that was the number?

MR. TAYLOR: If you could -- if you could give me the accident you're referring to? You know, I don't know if I'm talking about the same one you're talking about.

THE COMMENTOR: You know perfectly well.

MR. TAYLOR: If you can tell us the accident you're referring to, we could get you the report. You know, you could read that report. It explains what happened.

THE COMMENTOR: I'll give you my name and card, and you can send it to me.

THE FACILITATOR: Okay. I'd like to turn the attention back a bit to the Supplement Analysis if we can. People are certainly welcome to stay afterwards and ask questions about things that are tangential to that.

THE COMMENTOR: I'd like to ask the gentleman on the end who's involved with the yearly environmental report, when did they start reporting organically-bound tritium in the environmental report?

MR. ZAHN: I don't know, sir. You asked if I had a part to play in the documentation preparation; I do. My areas are sensitive natural resources and some others.

THE COMMENTOR: I read them all up to about this year, and I haven't found them. It's reported in the air but not the organically-bound or the free waters.

And is Chris here?

NEW COMMENTOR: Here.

THE COMMENTOR: Did it start this year?

NEW COMMENTOR: No. We haven't reported it.

THE COMMENTOR: See? You're not even doing a good job in your environmental reporting.

And that's where the tritium gets hunkered

in and stays and cycles in the community. The rest of it was -- gets into the air; it gets blown away; it get blown into Tracy, you see. We're rid of it, and it goes over to Tracy.

When are you going to start reporting the organically-bound tritium and giving an estimate of what it is that's bound up totally in this Valley? Because you've exposed people in this Valley to nearly a million curies of tritium. 4-22

NEW COMMENTOR: Oh, come on, Marion. We've talked about tritium and tritium releases at length. And I've invited you to contact me, to come in and talk to me and talk tritium.

THE COMMENTOR: Well, I'm asking this man here.

NEW COMMENTOR: You don't want to talk to the person who knows.

THE COMMENTOR: I want to talk to a person about addressing some of these things so that --

THE FACILITATOR: Your question and your comment is on the record. I would just say: They have to address that in the comment.

I'm sure Mr. Zahn can't give you an answer right now whether they're going to do what you think you'd like to have them do. But he can find

out from other people what can be done and what is being done now.

And I think that's as far as we're going to go with it tonight. They have some limitations here. We're talking about a Supplement Analysis.

THE COMMENTOR: I know, but there's a chance someone who has something to do with the environmental report diddling it out properly for the people here. That's all.

THE FACILITATOR: Okay. That's fair enough.

THE COMMENTOR: Do the rest of it that way, see? Then you'll get the confidence of people. Once you do these things properly and explain it to them, then you'll get more confidence.

THE FACILITATOR: I think that's the major point, that you want to see the people have more confidence in what's going on.

Anyone else?

THE COMMENTOR: I -- just reviewing in my mind some of the information I heard earlier, I wanted to ask for a clarification.

Talking about the experiments that are going on and the amount of material that is here, it's going to be in storage; it's not going to be actively involved in research projects. 4-23

Are we going to have a great many more experiments going on? Is that the reason why we need to have more material in storage? 4-23 cont.

MS. MARIK: At any given time, we don't expect to have more experiments going on. But the programmatic activities at the site --

THE COMMENTOR: What does that mean? "Programmatic activities at this site"? Say that in English. Something about the programmatic activities. 4-23 cont.

MS. MARIK: The research and development projects. And, like I said, in this particular example, we've listed what the -- what the projects that -- the amount of material that we're proposing is on page 6-5 of the document, and those are the programs that will be supported.

So this is like a list of the different research and development programs.

THE COMMENTOR: You've said there will not be any more research going on, but there is a need for more material in storage. 4-23 cont.

MS. MARIK: No. You asked about an increased number of experiments. And what I'm saying is at any given time, there won't be any more material at risk. You can only have a certain

amount of material out at any given time.

But the different -- the different programs that will be going on at that time -- I mean, these are the programs' activities -- I'm wrapping myself here --

THE COMMENTOR: Let me see if I can paraphrase that then and say that there will be more programs going on that are using the material than there is presently. 4-23 cont.

MR. LAZARO: Let me give you a concrete example. If you look at chapter 6 or Section 6.2 of the document, it talks about -- about Building 332 and the programs that would be driving the need for more uranium to be stored in the vault in Building 332.

What Lois is trying to tell you is: Okay, you have these individual experiments; the amount of material that would be at risk at any one time would not change.

However, your question is: Well, why do you need more material in the vaults? What it does change is the frequency. You're going to have more experiments that are going to be conducted than we've had in the past. So the frequency is going to increase.

4-23 cont.

THE COMMENTOR: So you're working 24 hours a day instead of just one shift, as an example? The frequency goes up per day but not per hour?

MR. LAZARO: It's not like a routine operation at a manufacturing plant where you have shifts. I mean, you're going to do experiments based on a schedule that the manager of the facility sets out for the projects that he's working on.

So it's not going to be like we're going to have five experiments on April 25th and five experiments the next day and so forth. It's going to vary throughout the year.

But the total number for the entire year is going to go up a fractional amount because of some of these programs.

For example, the MOX program was mentioned as one of the drivers in here. So there's going to be some additional experiments that would be needed to conduct the MOX program, and you'll have more operations in the glove box associated with that program.

Does that answer your question?

THE COMMENTOR: I think it answers the question. It certainly raises another one. The

4-24

number of experiments is going up a "fractional amount." I think I heard you say that.

MR. LAZARO: It's going up more -- I can't give you an exact number.

4-24 cont.

THE COMMENTOR: What's the fraction of 12 divided by 1, which is the increase in the amount of material? That's hardly --

MR. LAZARO: It's not going to go up the same proportion as the increase in the amount of material. I could tell you that.

4-24 cont.

THE COMMENTOR: Then why increase the material to that level? If you're going to increase your experimental rate by 25 percent or 75 percent, why multiply the amount of material by 12?

THE FACILITATOR: I suggest that you take the comment and that you explain more clearly than you do probably in Section 6-5 just the number of experiments, how often the material is going to be actively used, how often it is not going to be used so that we can have a clearer understanding on differentiation for the gentleman.

MR. TAYLOR: You're asking, "Why do we need this much?" Is what you're asking?

THE COMMENTOR: Right.

PREVIOUS COMMENTOR: And perhaps related to that, I realize again that the Lab has an extensive history of safety violations and other things. But one thing that has come to my attention lately, for example, is where you do work with plutonium.

And you use certain filters, and they're called HEPA filters. And I have seen some declassified information that was obtained under the Freedom of Information Act. And while these

4-25

have a limited lifetime and they're subject to damage by moisture and excessive heat, excessive cold, that there are indications in here that some of those HEPA filters have not been changed in 30 years. And that has lead to some of these accidental plutonium ventings.

Now it's there; it's in the record. We have requested that from the government, and we've gotten it.

When things like this happen, how can you assure people like us that you are doing a sensible, responsible safety job? And I would feel a lot better if all four of you said, "Okay, we feel so good about it, we're going to come over here, and we're going to move in, and we're going to buy houses across the street."

4-25 cont.

But you're exposing us to this stuff. How do you account for that? Why can't these HEPA filters be exchanged or replaced? What's going on?

MS. MARIK: They can be replaced. But what I would like to state is the last accidental release of plutonium that we had at the Lawrence Livermore Lab occurred in 1980. So I think that we have a pretty good record.

And if anybody has any other information or they think that there's other issues, let me know. But that is the last release that we have had of plutonium, and it was 1980.

4-26

THE COMMENTOR: Was that what got vented or put into the sludge that citizens over here took home and put into their gardens? That Livermore Lab handed out and gave out to citizens to take home to nurture their soil, and it had plutonium in it?

MR. TAYLOR: That was in the '60s.

THE COMMENTOR: Yeah. That's pretty bad.

THE FACILITATOR: Mr. Falk?

4-25 cont.

THE COMMENTOR: I'll give you one. The HEPA filters have a translucency built into them. You can't avoid tenth-micron particles.

So tenth-micron particles are zipping out of

4-25 cont.

that work area and going through the filters. They're translucent to the tenth-micron particle. It's the physics of the filters.

Now, tenth-micron particles can go by those ionization chambers or through them because a tenth-micron particle will disintegrate only maybe once or three times a day.

The workers in that building, if they have those tenth-micron particles, they go up to these monitors and stick a foot on those and go, they haven't been really checked. So those workers are at risk because those monitors, they do not do that; they do this: Put the foot on there, and they're gone.

I don't have to do the arithmetic, but they can be covered with many tenth-micron particles and get by all of those monitors. I've watched them.

And your ionization chambers that monitor those things, they go through there -- those tenth-micron particles walk. You do an activity calculation yourself.

One to three times a day for a tenth-micron particle. That size is going to be -- it's only from outside, if I understand.

4-25 cont.

You do the arithmetic yourself. And that means that those filters -- and there are only two of them in series -- you go check. If there's any activity that will produce tenth-micron particles, they're wandering through those filters all the time, every day. Any day that causes tenth-micron particle populations.

When I say "tenth-micron," you understand it's a function of a little window right in there. Not exactly. It's a function of the speed of gas and things of this nature. But you do the arithmetic personally.

MR. LAZARO: The key point or statement that you made there is if -- if there are tenth-micron particles that small that are generated during these experiments. I don't know if anyone has done an aerosol-size distribution of the particles that are generated, but I don't -- I don't -- I would be surprised that you're going to have particles that would be generated that are that small, unless you have some data to show otherwise.

THE COMMENTOR: Yeah. Any time you have a burn, you produce a high population of tenth-micron particles. Any time you have metal fumes from a burning particle -- you know, hunk -- little, tiny

4-25 cont.

chips from machining -- any time that burns, it produces a high population of tenth-micron particles.

Burning both uranium metal now -- you understand what I'm saying. If you burn either plutonium or the uranium metal, the metal fumes from that, the metal oxides produce them.

Just like when you burn a ribbon of magnesium oxide? You see that big smoke? A lot of tenth-micron particles are produced there, too. But when you burn uranium and plutonium, there's a high population of tenth-micron particles.

THE FACILITATOR: Okay. Any other comments?

Well, if not, I want to thank you all for your time tonight and remind you about the comment form, which I've lost. Here's one. Here it is.

And I'll remind you that the end of the comment period is February 25th. And you can get your comments in either written form, or I suppose you can call them in or fax them in if you'd like. And then we'll be looking forward to the comment response document which will be done subsequent to that and then a final determination.

Thank you very much. Sorry about my -- my slithering -- whatever you want to call --

stuttering of my voice, but I appreciate it very much, especially those of you who were both in this afternoon and tonight.

I want to thank you, Leti, for your work, and the notetakers and certainly the folks from the Lab and from Argonne.

Thank you very much.

(Whereupon, the briefing proceedings concluded at 7:15 p.m.)

STATE OF CALIFORNIA)
) ss.
)

I, LETICIA A. RALLS, a Certified Shorthand Reporter in and for the State of California, do hereby certify:

That said proceedings were reported by me at said time and place, and were taken down in shorthand by me to the best of my ability, and were thereafter transcribed into typewriting, and that the foregoing transcript constitutes a full, true and correct report of the comment and question portion of the proceedings which took place.

I further certify that I am not of counsel nor attorney for either or any of the parties hereto, nor in any way interested in the outcome of the said briefing.

IN WITNESS WHEREOF, I have hereunder subscribed by hand this 15th day of February 1999.

LETICIA A. RALLS, RPR
CSR. NO. 10070

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4 RESPONSES TO COMMENTS

4.1 RESPONSE TO COMMENTS FROM DOCUMENT 1: LETTER DATED FEBRUARY 10, 1999, FROM TRI-VALLEY CARES

Comment Code 1-1
Response:

DOE disagrees that a new EIS/EIR is needed because LLNL, since 1992, has "continued to have environmental concerns." DOE's evaluation of the environmental impacts of LLNL operations, considering changes since 1992 and new projects or proposals to be implemented by 2002, indicates they would remain within the envelope of environmental consequences established in the 1992 EIS/EIR. The SA concludes that either the projected impacts are within the bounds of the 1992 EIS/EIR analysis, or that the incremental differences are not significant. See the responses to comments below and also Common Issue 2.1, Supplement Analysis Process, above, for further discussion.

Comment Code 1-2
Response:

DOE disagrees that a new EIS/EIR is needed because both the Livermore Site and Site 300 are on the National Priorities List. The Livermore Site and Site 300 were placed on the NPL in 1987 and 1990, respectively, primarily as a result of trichloroethylene contamination in the groundwater. A discussion of the level of contamination was presented in the 1992 EIS/EIR (section 4.17), as were the proposed remediation program and the status of the review and approval of the appropriate Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) documentation.

For a discussion of the NEPA process, see Common Issue 2.1, Supplement Analysis Process.

Comment Code 1-3
Response:

DOE agrees it has exceeded National Pollutant Discharge Elimination System permit values at LLNL 14 times since January 1996, with two of those exceedances resulting in Notices of Violation (NOV); no fines were assessed. In response to the releases that occurred in 1996-1997, LLNL increased its employee awareness and source control efforts. These have been effective. The last release to the sanitary sewer that exceeded LLNL's permit limits occurred in December 1997. In September 1998, LLNL completed the installation of its upstream triggers pH-monitoring station. In the past, pH releases outside of permit conditions were detected and diverted to the Sewer Diversion Facility by the Building 196 monitoring station. Building 196 generally took about two minutes after initial detection to confirm that a release was occurring

and activate this diversion. Thus, the first few hundred gallons of a release were not captured. This new station remedies that situation. It is located upstream of Building 196 and is configured to detect and divert a pH release to the Sewer Diversion Facility before any of the release can leave the site.

Comment Code 1-4

Response:

DOE disagrees that LLNL has a history of recent, frequent accidents. The Laboratory has implemented programs, policies, and procedures to manage industrial and nuclear safety. In the event of an occurrence, the Laboratory or DOE investigates the incident, determines the root-cause, develops corrective actions, monitors their implementation, and disseminates lessons learned to ensure the recurrence of similar incidents is prevented.

As an example, in January of 1997, a gas sensor detected the presence of chlorine gas in a cabinet containing a pressurized cylinder of chlorine. The sensor automatically sounded an alarm and shut off the flow of chlorine from the cylinder. No detectable gas concentration reached the inhabited portions of the building, although the building was evacuated for 15 minutes in response to the alarm. The cause of the leak was a defective commercial chlorine gas pressure regulator that had just been placed into use in the gas cabinet. The defective part was immediately fixed. Several elements of the LLNL defense-in-depth program were displayed here. An alarm notified personnel to evacuate until the level of concern could be identified. The automatic shutoff system worked and prevented further release. The location of the gas cabinet in the building gas vault prevented general release of the gas at a detectable concentration. This incident yielded no detectable chlorine concentrations within the inhabited portions of the building and was within the bounds of potential impacts from an accidental 100-pound release of chlorine gas presented in the 1992 EIS/EIR.

Another example is the July, 1997 “shredder accidental exposure” in which workers shredding used air filters were radioactively contaminated. One worker was contaminated with curium, an alpha emitter, on his chest, face, and in his nostrils. A DOE report credited inadequate safety procedures for this accident. This incident was investigated by DOE. The report, “Type B Accident Investigation Board Report of July 2, 1997 Curium Intake By Shredder Operator At Building 513 Lawrence Livermore Laboratory,” dated August 1997, was the result of a detailed investigation into the events that led to the exposure. The investigation resulted in several corrective actions called Judgments of Need (JON). The JONs were designed to eliminate any future accidents of this nature. LLNL’s corrective action plan, which consisted of 47 separate actions, was accepted by DOE Oakland Operations Office (DOE/OAK) and a Headquarters DOE Price Anderson Amendment Act audit panel. LLNL has demonstrated to DOE, through an assessment of its corrective action implementation, that it has met the requirements of the JONs.

Comment Code 1-5
Response:

DOE acknowledges that in a facility with a large number of employees and operations, such as LLNL, it is possible to operate with an occasional employee failing to observe a procedure, such as inattention, miscommunication, or lack of discipline. However, DOE and LLNL take these failures seriously, recognizing that one reason for following a procedure is to prevent accidents and to protect the worker and the public. Every failure that crosses a reporting threshold is reported to laboratory management, to the DOE site/area office, and to DOE Headquarters through the formal "Occurrence Reporting and Processing System." Each report includes a root cause analysis and a corrective action to prevent it or similar recurrences. Lessons learned that could be of value elsewhere are distributed throughout DOE contractors. DOE program managers also trend these occurrence reports, and when a pattern or specific process or facility appears to be having a generic problem, formal action is taken by DOE management. Accidents that exceed certain thresholds are formally investigated by formal Accident Investigation Boards. Incidents that violate Nuclear Safety Requirements (e.g., 10 CFR 830 and 10 CFR 835, and their implementation plans) are investigated by an independent office in DOE Headquarters, and if that incident reflects a pattern or carelessness, formal enforcement actions are pursued under 10 CFR 820, which may result in fines and even imprisonment, and have resulted in fines at this laboratory. The commentor has identified two notable examples (the curium accident and the infractions in Building 332) for which DOE has launched formal investigations and enforcement actions, even extending to mentoring programs to improve the safety culture in Building 332.

When the July 1997 criticality infractions occurred in Building 332, the Laboratory management took an immediate action to place the facility into "STANDBY MODE." This decision was made without influence of the DNFSB. These criticality infractions were related to the fact that workers failed to follow approved procedures containing criticality controls. The infractions were self-reported by the facility workers and, most importantly, no radioactive materials were released and no worker contamination occurred. Furthermore, the Criticality Safety Group conducted thorough evaluations of both infractions and concluded that neither infraction, even if not identified, would have led to any criticality events, even under the most conservative of assumptions.

Work in the Plutonium Facility has been restricted since July 1997. During this time, the safety processes and procedures used in the Plutonium Facility have been extensively modified, workers re-certified, and work conducted to assess the viability of these changes. DOE and LLNL believe these changes have corrected the fundamental causes leading to the criticality infractions. In the course of the resumption process, DOE HQ, DOE/OAK, and the DNFSB have been exercising close oversight roles in enhancing Building 332's safety culture.

Comment Code 1-6
Response:

DOE disagrees that LLNL has a history of "receiving Notices of Deficiency (NOD) and NOVs from the California Department of Toxic Substances Control (DTSC)." DOE believes that

LLNL operates safe, environmentally sound, and regulatory compliant waste management facilities for all its hazardous and mixed waste activities. Specifically, there were no violations with significant impacts to human health or the environment during the 1991 through 1994 annual DTSC inspections of LLNL. All violations during this period were corrected in a timely manner. No violations of the regulations were found during the 1995 and 1996 inspections. During the 1997 inspection, DTSC cited LLNL for handling "combined waste." Combined wastes are radioactive wastes that contain California-only hazardous constituents. The citations stemmed from a disagreement between DTSC and DOE over regulatory status and DTSC's jurisdictional authority over the waste streams; the citations did not stem from unsafe handling of the wastes and did not pose a threat to human health or the environment. These waste streams are being handled as LLW under the requirements of the DOE. The DTSC and the DOE are in discussions regarding the regulatory status of these wastes and are in the process of negotiating a Memorandum of Agreement. LLNL was also inspected in 1998; however, the report of that inspection has not yet been finalized.

As part of LLNL Resource Conservation and Recovery Act (RCRA) Part B permit application, on March 1997, DTSC issued a NOD. The NOD are DTSC's comments and questions to clarify and complete the information in the LLNL application and are not considered violations of regulations. This is a routine part of the review of a Part B application by DTSC for any facility and is not specific to the LLNL Part B application.

Comment Code 1-7

Response:

DOE agrees that there is still contamination of the groundwater at LLNL. However, significant improvements have been made over the last few years. In 1997 LLNL found hazardous levels of mercury in soils cleaned out of a single stretch of storm drain. That soil was removed as hazardous waste and the storm drain lined. Following this activity, LLNL detected mercury downstream of this location in a single storm water sample. This was the first detection of mercury in LLNL storm water runoff since 1994. Mercury has not been detected in subsequent samples.

The groundwater tritium plume at Site 300 extends about 9,500 ft from its sources at landfill Pits 3 and 5 and the Building 850 firing table. No part of the plume extends offsite and no human receptors are threatened. Maximum current groundwater tritium activities are about 475,000 pCi/L. The majority of the plume is in a laterally extensive perched water-bearing zone. Radioactive decay reduces the activity of tritium by one half every 12.3 years. Time-series plots of total tritium in groundwater have generally shown a decline in total tritium activity with time, resulting from both radioactive decay and dispersion. Until recently, the total tritium activity in the plume has generally decreased at a rate similar to or greater than the radioactive decay rate. Despite occasional slug releases from the landfills, the horizontal extent of the Pits 3 and 5 portion of the tritium plume has not increased during the 1986-98 time period, thus supporting that natural attenuation by radioactive decay and dispersion is occurring. From 1985-98, the horizontal extent of the Building 850 portion of the tritium plume has increased only along its distal edges; the extent of the 20,000 pCi/L contour (which is the State and Federal Maximum Contaminant

Level) has markedly retreated. Using conservative assumptions and hydraulic parameters, fate and transport modeling indicates that when the tritium plume reaches the northern Site 300 boundary, the tritium activities will be at background levels (100 pCi/L). Modeling indicates that tritium activities at the southern Site 300 boundary will also be low, around 1,000 pCi/L. There are no contaminant transport pathways to humans on or offsite, and thus there is no risk to humans. The issue of tritium in Site 300 groundwater in the Pits 3 and 5 areas, and at Building 850 Firing area, was discussed extensively in both the 1992 EIS/EIR (Section 4 and Volume IV). This issue has also been discussed in the Site Annual Environmental Reports.

To address the rise and fall of groundwater levels at Site 300, LLNL had installed, by April 1992, an interceptor trench system upgradient of the west firing area landfills at Site 300. The trench was constructed as part of the RCRA capping of landfill pit 7. The purpose of the interceptor trench system was to intercept shallow subsurface groundwater flow and divert it away from landfill pit 7. This trench has reduced the amount of water available to get into the pit. In addition, by the summer of 1999, LLNL will sample and calculate the inventory of tritium in landfill pits 3 and 5. Computer modeling of the tritium values will be conducted to determine if this source of tritium contamination to the groundwater could potentially present a risk to human health and the environment. Should such a potential risk be identified, then source isolation technologies would be implemented to prevent risk to human health and environment from tritium.

Comment Code 1-8

Response:

DOE believes it has managed sewer system problems at LLNL in a responsible and proactive manner. During the period of 1992-1995, LLNL investigated over 22,000 source connections (including approximately 7000 drains) and their respective destinations. Approximately 150 of these sources required some form of repair. These repairs were complete at the end of 1995. During the same interval approximately 24,000 linear feet of sewer line was relined using an in-situ form liner to endure the integrity of the sewer system. LLNL's source control effort has proven effective. There has not been a discharge from the sanitary sewer that exceeded permit conditions since December 1997.

After signing the CERCLA ROD in 1992, new innovative technologies have been employed to accelerate cleanup in a more cost-effective manner. LLNL has implemented a strategy called Engineered Plume Collapse (EPC). EPC utilizes the appropriate technologies needed to cost-effectively achieve the required remedial objectives and increase contaminant mass removal. Mass removal rates at the Livermore Site have more than tripled since the implementation of EPC in 1997. An additional example is that rather than constructing seven permanent groundwater treatment facilities as outlined in the CERCLA ROD, LLNL has developed alternative treatment units to accomplish site cleanup. Currently, LLNL is operating 4 permanent groundwater treatment facilities, 2 vapor extraction facilities, 10 portable treatment units, 1 mini treatment unit, 1 in-situ catalytic reductive dehalogenation unit, and 1 solar powered groundwater treatment unit.

Rather than extracting groundwater from 18 initial locations, LLNL currently treats groundwater from 60 extraction wells at 16 locations in 11 separate areas, treating approximately 725,000 gallons of groundwater per day or about 22 million gallons per month. Most groundwater treatment is accomplished by air stripping, with some ion exchange where needed. Remediation of the one area at the site that contained fuel hydrocarbons was completed in 1995 and resulted in a determination of No Further Action by the regulatory agencies in 1996. Hydraulic collapse of the western offsite contaminant plumes has been dramatic, resulting in pull-back of one plume by more than 1000 feet and a decrease in volatile organic compound (VOC) concentrations by an order of magnitude. Currently, VOC concentrations offsite are generally below 50 parts per billion (ppb) and are approaching the Maximum Contaminant Level of 5 ppb. The affected groundwater is not used by the public, and therefore the risk to the public is minimal.

See also the response to comments 1-2, 1-3, and 1-7, above.

Comment Code 1-9

Response:

DOE disagrees that "LLNL has a history of being out of compliance with safe storage requirements." DOE and LLNL conduct all waste management activities in compliance with the applicable regulations. All hazardous and mixed waste are managed in accordance with the California Code of Regulations Title 22 and CFR Title 40. In addition, the treatment and storage facilities used for regulated wastes will comply with a RCRA permit that will incorporate an approved operations plan.

DOE and the State DTSC have entered into an agreement dealing with mixed waste, pursuant to the Federal Facilities Compliance Act of 1992. This agreement has resulted in a Site Treatment Plan that addresses all mixed waste streams, describes the treatment process planned for them, and gives dates for completion of treatment. Regular reports are required and have been provided by LLNL. DOE believes DTSC has a thorough understanding of how LLNL manages its mixed wastes, combines waste, and manages issues regarding cross-contamination through inspections and the permitting process.

In 1998, LLNL provided DTSC with a list of Satellite Accumulation Areas. LLNL has never refused accessibility of inspectors to areas within the laboratory or within buildings that house Satellite Accumulation Areas.

DTSC is aware of how LLNL treats its hazardous and mixed waste. The regulated waste operations during "interim status" are outlined in the interim status documents. Interim status documents for hazardous and mixed waste operations at LLNL include the approved August 1996 (revised January 1997) Part A and the interim status document dated May 16, 1983. Currently, LLNL hazardous and mixed waste operations are annually inspected by the DTSC against the hazardous waste regulations and the interim status documents. LLNL does not employ waste treatment and handling activities other than the ones authorized by the DTSC. LLNL has also explained in detail its future hazardous and mixed waste operations in the Part A and Part B

permit application. The permit application has been reviewed by the DTSC and has been deemed complete. LLNL is required to label mixed waste as such. The labels for mixed waste include the words “Hazardous and radioactive mixed waste”.

In 1990, there were questions concerning one shipment of waste to the Nevada Test Site (NTS). Once the waste reached NTS, the generator belatedly informed Hazardous Waste Management (HWM) that there might have been some Kimwipes (paper tissues) which may have been used in conjunction with solvents to degrease radioactive components. LLNL suspected the waste was mixed waste. LLNL representatives went to NTS and were able to verify, through the paperwork, that 12 of the containers did not contain the Kimwipes but that 18 may have contained Kimwipes. The containers could not be opened at NTS without the proper facilities; therefore, the containers were returned to LLNL for additional characterization.

Comment Code 1-10
Response:

DOE acknowledges that there have been problems with the use of HEPA filters at LLNL. However, DOE and LLNL disagree with the comment that the nuclear safety program and the safety of the public have been compromised by LLNL operations. As safety concerns are identified, corrective actions are developed and implemented in a timely manner. As an example, the Facility is in the process of replacing aging HEPA filters, starting with systems relied on to provide confinement of nuclear materials. The Facility expects to be complete with the replacement of the confinement HEPA filters by the end of fiscal year 1999.

See also, Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 1-11
Response:

DOE does not believe that there are “significant new circumstances or information relevant to environmental concerns… since the 1992 EIS/EIR for LLNL, thus requiring a new EIS/EIR.” Operations at Building 332 are included in the analysis of the 1992 EIS/EIR.

See Common Issue 2.1, Supplement Analysis Process, Common Issue 2.2, Proposed Changes in Administrative Limits, and Common Issue 2.4, Concern with HEPA Filters, above. See also the response to comments 1-1 and 1-5, above.

Comment Code 1-12
Response:

DOE agrees that plutonium has been found in Big Trees Park at concentrations above those that can be attributed to worldwide fallout, but DOE disagrees the plutonium came from an airborne pathway or is related to the HEPA filtration issues for Building 332. After finding a sample with 1.02 pCi/g in 1995, the laboratory has taken a large number of samples in 1998 to

determine the degree of and extent of the plutonium levels, and to determine the source. The data establish that the elevated plutonium is generally confined to the southeast corner of the park, and is not found outside the park or above background levels at the adjacent school. Because of the nature of atmospheric dispersion, it is not possible that such a very limited distribution could have resulted from an airborne pathway, such as from a building release or re-suspension of contaminated soil by wind or human activity. The deposition pattern from an airborne pathway would most likely be cigar- or fan-shaped, with increasing concentrations extending back nearly to its source.

The laboratory considered whether there might have been an aquatic pathway. The park contains a filled, former channel of Arroyo Seco, which in the past received runoff water from LLNL. However, sampling along that channel between LLNL and the park, as well as within the park to the depth of the former channel, did not detect plutonium above 0.043 pCi/gm, which is near the upper range of fallout background.

The soil samples with plutonium above fallout levels are nearly all within the treewells and in the immediate proximity of ornamental trees planted in the 1970s. These soil samples also had higher level of metals. The laboratory believes that the plutonium must have come to the park in sewage sludge used as an amendment or mulch during and/or after planting of the trees. The City of Livermore treats sanitary sewage from the laboratory. The levels and locations of the plutonium and its association with metals strongly suggests that past releases of plutonium to the sewer about 1967 may have become mixed with the sludge at the Livermore Water Reclamation Plant.

The 1998 samples were collected under the observation of state and federal regulatory agencies, and about 10% of the samples were separately analyzed by three different certified analytical laboratories, with good agreement. The highest concentrations found in the 1998 sampling was 0.774 pCi/g, which is less than a third of the EPA residential screening level of 2.5 pCi/g, at which further assessments of health risk are suggested. The data can be found on the web at http://www-erd.llnl.gov/bigtrees/, and will be included in the 1998 SAER.

The EPA, California Department of Health Services, DTSC, and the Agency for Toxic Substances and Disease Registry all agree that the levels do not present a health hazard and that cleanup is not warranted. In view of the comprehensiveness of the sampling program and the low levels observed, no further sampling expeditions are planned.

Comment Code 1-13

Response:

DOE disagrees that the proposed change in plutonium and uranium limits pose a significant increase in the operational impacts at LLNL. These changes are mostly in the allowable quantities of storage and not in the material at risk.

See Common Issue 2.2, Proposed Changes in Administrative Limits.

Comment Code 1-14
Response:

DOE is still committed to reducing the total amount of plutonium at LLNL to 200 kg when feasible. This issue was addressed in the 1992 EIS/EIR. However, DOE is still analyzing the issue of surplus plutonium disposition throughout the DOE complex.

See also the response to comment 1-13, above.

Comment Code 1-15
Response:

DOE disagrees that the proposed changes in uranium limits require the preparation of a new EIS/EIR. The need for enriched uranium (greater than 1% U-235) derives primarily from projected near-term projects involving the Dual Revalidation Program, a portion of the Fissile Materials Disposition (Immobilization) Program, and the Advanced Recovery Integrated Extraction System (ARIES) R&D work (a total of approximately 200 kg). Most of this need occurs in Fiscal Years 1999 and 2000 and most of this material will not remain at LLNL, but will be shipped to other DOE facilities prior to Fiscal Year 2002. The Dual Revalidation Program will assess the status of the LLNL and LANL stockpiled weapons. The Immobilization Program will evaluate the option for long-term disposition of surplus plutonium to immobilize it in either glass or ceramic for disposal in a geologic repository or for long-term safe storage. The ARIES project will recover plutonium from old weapons; the LLNL work will focus on pit disassembly and converting plutonium into an oxide form for disposition.

A portion of the need for additional natural or depleted uranium (less than 1% U-235) stems mainly from the Fissile Materials Disposition (Immobilization) related R&D projects which will involve approximately 700 kg of natural or depleted uranium, most of which will be shipped to other DOE facilities by Fiscal Year 2003 as the R&D progresses.

The additional portion of the need for natural or depleted uranium would derive from Mixed Oxide (MOX) Lead Test Assembly work currently being considered for implementation at LLNL in the Draft Surplus Plutonium Disposition EIS. As in the other projects, natural or depleted uranium would be brought in for the work, but would also be shipped out as work is incrementally completed, so that only an additional approximately 1000 kg would remain onsite after Fiscal Year 2003. The MOX Lead Test Assembly project at LLNL will fabricate nuclear fuel rods for nuclear power plants by using surplus weapon plutonium (PuO_2) and vendor supplied (UO_2); this process will convert surplus plutonium for peaceful applications.

As discussed in Section 6 of the SA, administrative limits are established to administratively control maximum quantities of radioactive materials in Buildings 332 and 334.

These limits reflect program needs. Postulated accident analyses associated with radioactive materials are documented in the 1992 EIS/EIR (including this SA) and the SAR for each facility.

For Buildings 332 and 334, LLNL proposes to increase the current administrative limit for uranium from 300 kg (depleted, natural, and enriched) to 500 kg of enriched uranium and 3,000 kg of natural and depleted uranium. It is known that natural and depleted uranium do not pose significant hazards as compared to enriched uranium. There is considerable natural uranium in the LLNL region; the significant consideration is the increase in the administrative limit from 300 kg to 500 kg, since the majority of current inventory in Building 332 is enriched uranium. In addition, hazards resulting from a proposed Building 332 administrative limit of 3,000 kg of uranium with less than 1% enrichment of U-235 would be bounded by that from the Building 493 administrative limits for natural and depleted uranium of 80,000 kg (Table 4.15-1 of the 1992 EIS/EIR).

The proposal to increase the administrative limit for uranium does not change the restriction on the maximum material at risk imposed on workstation or glovebox operations. As an example, the quantity of fissile material, including uranium, will still be limited to 20 kg in each of laboratory rooms with the exception of the vaults. Only the amounts in storage will be increased, not the working inventories.

Comment Code 1-16

Response:

The "Green Book" is the program plan that describes DOE's strategy to ensure high confidence in the safety and reliability of the nuclear weapons stockpile. As part of the weapons complex, LLNL continues to have a role in the stockpile stewardship program, confirmed in the ROD for the Stockpile Stewardship and Management Programmatic EIS (SSM PEIS). While DOE is charged with maintaining the *capability* for research and development of nuclear weapons, the Department of Defense has no requirements for new nuclear weapons and DOE is not developing new weapons.

Comment Code 1-17

Response:

The SA is correct in stating that the increased administrative limits for uranium are partly required to support the research and demonstration work for the MOX fuel project. This is part of DOE's program for disposition of surplus plutonium as a result of the downsizing of the nuclear weapons stockpile. Also, the R&D-related work on the projects cited above is considered within the scope of operations and potential impacts of ongoing programs at LLNL encompassed by the 1992 EIS with the exception of the Lead Test Assembly work, which is an alternative that is being considered by DOE for assignment to LLNL through the vehicle of a DOE Programmatic EIS currently in process. If LLNL is selected to perform this activity, an appropriate project-specific NEPA review will be conducted.

The increased administrative limit for uranium in Buildings 332 and 334 is not to support the Atomic Vapor Laser Isotope Separation (AVLIS) follow-on program.

Comment Code 1-18

Response:

DOE does not agree that there is "a plethora of new and/or significantly changed programs at LLNL since 1992." DOE considers NIF, AVLIS Integrated Process Demonstration (IPD) follow-on activities, subcritical nuclear tests, and the Advanced Design and Production Technology (ADAPT) work at LLNL to be projects that represent variations of existing programs at LLNL. AVLIS is a technology which can selectively separate the isotopes of uranium to enrich the product stream in U-235, thus generating a product that is commercially valuable for fabrication of fuel for nuclear power reactors; the IPD at LLNL is intended to support the confirmation of technical performance and validation of economic projections. The ADAPT Program is a DOE-wide effort to develop technologies for new processes and practices to enable cost-effective production of stockpile weapon components; the enduring stockpile, as well as workforce skills, will be maintained by a combination of repairs, refurbishments, and as needed replacements. Where there was a need for more project-specific impact analysis, it was provided.

Comment Code 1-19

Response:

DOE disagrees that "a new or, at a minimum, a supplemental EIS is required" due to "clearly significant new circumstances or information relevant to environmental concerns." DOE's evaluation of the environmental impacts of LLNL operations, considering changes since 1992 and new projects or proposals to be implemented by 2002, indicate they would remain within the envelope of impacts established in the 1992 EIS/EIR.

See also the response to comments 1-1 and 1-2, above. Also, see Common Issue 2.1, Supplement Analysis Process, and Common Issue 2.2, Proposed Changes in Administrative Limits.

4.2 RESPONSE TO COMMENTS FROM DOCUMENT 2: LETTER DATED FEBRUARY 25, 1999, FROM U.S. ENRICHMENT CORPORATION (USEC)

Comment Code 2-1
Response:
Comment acknowledged.

Comment Code 2-2
Response:
Comment noted. Changes were incorporated as suggested by the commentor.

4.3 RESPONSES TO COMMENTS FROM DOCUMENT 3: PUBLIC BRIEFING, LIVERMORE, FEBRUARY 11, 1999, 2:00 P.M.

Comment Code 3-1
Response:
See the response to comment 1-1, above.

Comment Code 3-2
Response:
See the responses to comments 1-2 and 1-8, above.

Comment Code 3-3
Response:
See the response to comment 1-1, above. Also, see Common Issue 2.1, Supplement Analysis Process.

Comment Code 3-4
Response:
See the response to comments 1-3, 1-7, and 1-8, above.

Comment Code 3-5
Response:
See the response to comments 1-4 and 1-5, above.

Comment Code 3-6
Response:
See the response to comments 1-5, 1-6, and 1-9, above.

Comment Code 3-7
Response:
See the response to comment 1-7, above.

Comment Code 3-8
Response:
See the response to comment 1-8, above.

Comment Code 3-9
Response:
See the response to comment 1-9, above.

Comment Code 3-10
Response:
See Common Issue 2.1, Supplement Analysis Process, and Common Issue 2.2, Proposed Changes in Administrative Limits. Also, see the response to comments 1-1 and 1-19, above.

Comment Code 3-11
Response:
See Common Issue 2.3, Concerns With HEPA Filters, and Common Issue 2.2, Proposed Changes in Administrative Limits. Also, see the response to comments 1-1 and 1-19, above.

Comment Code 3-12
Response:
See the response to comments 1-15 and 1-16, above.

Comment Code 3-13
Response:
See the response to comments 1-15 and 1-16, above. Also, see Common Issue 2.3, Opposition to Nuclear Activities.

Comment Code 3-14
Response:

See the response to comment 1-15, above. The AVLIS project is not a driver for the increased limits; see also the response to comment 3-25, below.

Comment Code 3-15
Response:

See the response to comments 1-1 and 1-19, above. Also, see Common Issue 2.1, Supplement Analysis Process.

Comment Code 3-16
Response:

DOE believes that the current rate of processing plutonium or uranium to their oxide forms at LLNL does not exceed the rates analyzed in the 1992 EIS/EIR.

Several programmatic operations at LLNL generate quantities of plutonium and uranium that are in the form of chips, fines, or thin layers deposited by vapor deposition. Programmatic operations that generate these materials are nuclear material machining and grinding operations, casting operations, and vapor deposition (AVLIS and other programs). Both uranium and plutonium in the form of finely divided dust or chips, or in the form of thin metal sheets are potentially pyrophoric and can spontaneously ignite and burn in the presence of air or oxygen. The pyrophoricity is highly dependent on the fineness of the material, surface condition, temperature, humidity and atmospheric composition. The equipment that generates these fines or sheets is usually enclosed in either a glovebox, hood or vacuum chamber from which air or oxygen is (usually) excluded. Once generated, potentially pyrophoric fines or other metal forms are expeditiously transported in closed containers or enclosures to designated workstations (hoods or gloveboxes depending on the material and quantity) where they are oxidized. Finely divided quantities of fissile material (plutonium or enriched uranium) are oxidized in small batch sizes due to criticality safety requirements. The oxidation process is always carried out in a manner designed to minimize dispersal of the material. In the case of plutonium, the oxidation is usually carried out in small furnaces. Once oxidation is complete, the material is in a very stable chemical form and can then be packaged for storage or other disposition depending on the nature and value of the material. In all cases, the oxidation processes for these metals are carried out in enclosures equipped with redundant HEPA filtration to prevent any dispersal of material to the environment. In addition, care is taken to minimize the handling or any other step that would lead to dispersal of the material within the enclosures. Since long-term storage of pyrophoric, unoxidized fines would create a significantly greater hazard than the above oxidation process, oxidation is routinely used to render any potentially pyrophoric uranium or plutonium safe for storage, transport, or other disposition.

Plutonium and uranium in liquid solution are also converted to oxide when the value of the material or disposition pathway requires it. This is typically accomplished though precipitation of the material from solution, filtration, and then furnace oxidation.

In addition to the oxidation of programmatically generated plutonium or uranium fines, LLNL is also processing material in storage to meet the requirements of the DNFSB's Recommendation 94-1.

See also the response to comment 3-51, below.

Comment Code 3-17
Response:

See the response to comment 3-16, above.

Comment Code 3-18
Response:

See Common Issue 2.4, Concerns With HEPA Filters. See also the response to comments 1-5 and 1-11, above.

Comment Code 3-19
Response:

DOE and LLNL will continue to manage wastes in accordance with the RODs (RODs have not yet been issued for LLW and LLMW) for the Waste Management Programmatic Environmental Impact Statement (WM PEIS) (DOE/EIS-0200-F) and the 1992 EIS/EIR. As discussed in Section 7 of this SA, LLNL has implemented a transuranic waste certification program to ensure that transuranic waste generated and packaged by LLNL can be certified for acceptance by WIPP. Transuranic waste will continue to be stored at LLNL until WIPP opens or another disposal option is identified by DOE.

Comment Code 3-20
Response:

See the response to comment 1-12, above.

Comment Code 3-21
Response:

DOE disagrees that the Plutonium Facility was shut down as a result of a recommendation by the DNFSB. In July1997, LLNL placed Building 332 into "Standby Mode" under which programmatic operations (machining, processing, etc.) with fissile, radioactive, or hazardous materials were suspended while transfer, handling, sampling and/or storage of the materials were

allowed. Stringent compensatory measures (e.g., increased oversight and review of all activities) were imposed on any work to be performed. By October 1997, all activities associated with materials transfer were under close scrutiny; senior management approval was required before such activities could be conducted.

In February 1998, a resumption plan was developed by LLNL with concurrence by the DOE/OAK and input from the DNFSB. Upon approval of this process, Building 332 started preparation of the resumption activities. LLNL completed resumption activities by February 1999. In March 1999, the final phase of the resumption process is under review by a team of LLNL and DOE/OAK staff. Based on the assessment and recommendations from this team, LLNL senior management, with DOE/OAK concurrence, will determine whether Building 332 will resume normal operations.

Also, see the response to comments 1-5 and 1-11, above.

Comment Code 3-22
Response:

See the response to comment 1-15, above.

Comment Code 3-23
Response:

See the response to comment 3-60, below.

Comment Code 3-24
Response:

The cumulative impacts of continuing to operate LLNL and SNL-L are presented in section 9 of the SA, including the impacts of the proposed projects through 2002. Section 9 was revised to update water and electrical usage, and airborne radionuclide emissions. Based on the level of emissions of existing and planned facilities and proposals, the impacts from these operations would be below limits and guidelines and within the envelope of the 1992 EIS/EIR, and are not considered significant.

Comment Code 3-25
Response:

The AVLIS program is proceeding as planned. The scope of current work for the LLNL operation of the AVLIS project is covered by the Environmental Assessment (EA) for the AVLIS IPD, USEC/EA-96001, January 1996. This document was finalized by the U.S. Enrichment Corporation (USEC) in January 1996, under an interagency cooperative agreement that

designated USEC as the lead agency and DOE as the cooperating agency for all environmental reviews at the LLNL site.

Based on the analyses in the EA, both USEC and DOE determined that the IPD scope of work was not a major action significantly affecting the quality of the human environment, and that preparation of an Environmental Impact Statement was not required. USEC and DOE jointly issued a Finding of No Significant Impact (FONSI) for the AVLIS IPD. Copies of the EA and FONSI were transmitted to all appropriate regulatory agencies and to the Western States Legal Foundation and other interested parties.

The AVLIS project is in the process of conducting the IPD phase. These demonstrations are planned to be completed by the year 2000. After IPD, AVLIS uranium operations through 2002 would continue within the scope of existing NEPA documentation. Any future AVLIS work at LLNL that is outside of the scope of the January 1996 USEC EA or the 1992 EIS/EIR would be subject to additional NEPA reviews.

A copy of the Terascale Simulation Facility (TSF) Conceptual Design Report has been placed in the LLNL public reading room for review. The potential impacts of construction and operation of the TSF at LLNL are being analyzed in an EA currently being prepared. Preliminary projections of water and electrical energy usage are included in section 2.10 and section 9 of the SA.

See also the response to comment 1-15, above.

Comment Code 3-26
Response:

See the response to comments 1-1, 1-11, and 1-18, above.

Comment Code 3-27
Response:

The 1992 EIS/EIR was issued when DOE was considering reconfiguration of the nuclear weapons complex; thus, Chapter 1 of the EIS/EIR acknowledged that potential changes in missions and activities resulting from this reconfiguration would be reviewed against the EIS/EIR. Since the issuance of the 1992 EIS/EIR, DOE has prepared the SSM PEIS, addressing the downsizing of the nuclear weapons complex. The SSM PEIS addressed the impacts of proposed actions on various DOE sites, including LLNL. Appendices to the SSM PEIS include specific NEPA analyses of two such long-term projects that were proposed for LLNL: the Contained Firing Facility and NIF.

This SA has systematically reviewed the ongoing and projected activities at LLNL through the year 2002 to identify significant changes from the 1992 EIS/EIR. This process of identifying

changes is described in Section 1.4 of the SA. The key projects identified in this process were evaluated to see if their impacts were outside the envelope of consequences established in the 1992 EIS/EIR, and whether, if exceeded, these impacts were significant. The remainder of the SA presents the results of that evaluation. As a result of this review, DOE has concluded that no supplementation of the 1992 EIS/EIR is required. As other new projects are proposed in the future, their potential impacts will also be evaluated against the analyses and bounding impacts outlined in the 1992 EIS/EIR and, if necessary, separate NEPA reviews will be undertaken.

Also, see Common Issue 2.1, Supplement Analysis Process.

Comment Code 3-28
Response:

See the response to comment 3-27, above. Also, see Common Issue 2.3, Opposition to Nuclear Activities.

Comment Code 3-29
Response:

The NIF was evaluated in the 1992 EIS/EIR in the Proposed Action and Alternatives (section 3.0). Appendix A of the 1992 EIS/EIR discussed the proposed project and discussed risks to workers and the public from routine radiological operations and waste generation. Additionally, the SSM PEIS Project Specific Analysis for the NIF, Appendix I, SSM PEIS, September 1996, DOE/EIS-0236, evaluated the siting, construction and operation of the NIF. As indicated in Appendix I, "The purpose of this project-specific analysis is to assess the environmental impacts of construction and operation of NIF. This document describes the project and its purpose and need, considers site alternatives and project design options, delineates the affected environments, assesses potential environmental impacts, and suggests mitigation measures."

As a result of the Memorandum Opinion and Order on Count II of the Second Amended Complaint issued by the U.S. District Court for the District of Columbia under Civil Action No 97-0936 (NRDC v. Peña), DOE is required, no later than January 1, 2004, (1) to determine whether any or all experiments using plutonium, other fissile materials, fissionable materials other than depleted uranium, lithium hydride, or a Neutron Multiplying assembly, shall be conducted in the NIF; or (2) prepare a Supplemental SSM PEIS, in accordance with DOE NEPA Regulation 10 CFR 1021.314, analyzing the reasonably foreseeable environmental impacts of such experiments.

Comment Code 3-30
Response:

The United States, consistent with Article VI of the Nuclear Nonproliferation Treaty, is continuing negotiations on the elimination of nuclear weapons. The U.S. Senate voted to give its

advice and consent to ratification of the START II, which awaits action by the Russian Duma and the Federation Council to enter into force. In 1997, the President and President Yeltsin reached an understanding to begin negotiations on START III immediately after START II enters into force.

Meanwhile, however, a credible nuclear deterrent remains a cornerstone of U.S. national security policy. In President Clinton's September 22, 1997 letter transmitting the CTBT to the Senate for its advice and consent to ratification, he reiterated that "I consider the maintenance of a safe and reliable nuclear stockpile to be a supreme national interest of the United States."

LLNL performs activities in support of DOE's national security mission, which is assigned to DOE through Presidential Decision Directives and congressional actions. As required in10 CFR 1021.330(d), the SA addresses the adequacy of the 1992 EIS/EIR for ongoing and projected activities through the year 2002. These activities reflect the current mission assignments to LLNL; Section 1.4 of the SA describes the process that DOE used to identify these activities and evaluate changes from the 1992 EIS/EIR. It is not reasonable for the SA to consider alternatives that are inconsistent with current national security policy.

Also, see Common Issue 2.3, Opposition to Nuclear Activities, and Common Issue 2.1, Supplement Analysis Process.

Comment Code 3-31
Response:

LLNL has published data on the distribution of plutonium in the local environment. These data come from the comprehensive environmental monitoring program where all potentially affected environmental media are monitored for plutonium, including air, water, soils, and individual facility potential emission points. The data are published each year in the SAER. In addition, LLNL conducts computer dispersion modeling, based on both actual and potential emissions and actual meteorological data collected from our on-site meteorological tower.

See also the response to comments 1-5 and 1-12, above, and Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 3-32
Response:

The public dose from normal operations of LLNL and SNL-L, as well as the public dose from potential accidents evaluated in this SA take into account the densely populated area surrounding LLNL and SNL-L.

Very low levels of plutonium have been found in at least one area offsite. The plutonium is part of the legacy of past operations of LLNL. Practices that might have resulted in past

plutonium releases to offsite areas are no longer allowed today. Cleanup of plutonium involves remediation activities and consultation with appropriate authorities under CERCLA.

Also, see Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 3-33
Response:

See the response to comment 3-19, above.

Comment Code 3-34
Response:

DOE believes that continued operation of LLNL and SNL-L is within the impacts analyzed in the 1992 EIS/EIR and is consistent with the analyses present in the SSM PEIS, WM PEIS, and other NEPA documents.

Comment Code 3-35
Response:

The water use for TSF at LLNL is not as high as that projected for the Los Alamos National Laboratory. The total water use for LLNL in 2002, counting all users including NIF, is approximately the same amount projected for the year 2002 in the 1992 EIS/EIR. This projected amount can be provided with the current infrastructure and supply. Section 9 of the SA was revised to include the most recent cumulative water use projections for the TSF at LLNL.

Comment Code 3-36
Response:

The electrical use, including NIF and part of TSF, is expected to increase beyond levels originally projected in the 1992 EIS/EIR, but these increases would not have significant impacts since infrastructure and suppliers currently have the capacity to handle the projected use and peak load.

Comment Code 3-37
Response:

Now that the U.S. Enrichment Corporation has been privatized, DOE is responsible for NEPA reviews for new, future AVLIS operations at LLNL. However, the most recent NEPA document, Environmental Assessment for the AVLIS Integrated Process Demonstration, USEC/EA-96001, was completed by the USEC in January 1996. This EA was prepared under an interagency cooperative agreement that designated USEC as the lead agency and DOE as the cooperating agency. A FONSI was signed by USEC and DOE on January 3, 1996. As indicated in

the FONSI, "On the basis of the analysis in the EA, the Proposed Action to conduct the Integrated Process Demonstration at LLNL would not constitute a major action significantly affecting the quality of the human environment. Therefore, an Environmental Impact Statement is not required." Copies of these documents were provided to the public for review and comment during the review process.

Also, see the response to comment 3-25, above.

Comment Code 3-38

Response:

The MOX Lead Test Assembly work is currently being considered for implementation at LLNL in the Surplus Plutonium Disposition EIS. The MOX R&D work would require natural or depleted uranium which would be brought into Building 332, but would also be shipped out as work is incrementally completed, so that only an additional approximately 1000 kg would remain onsite after Fiscal Year 2003. This work would remain well within the proposed 3000 kg administrative limit for natural or depleted uranium for Building 332. The MOX program is expected to generate small quantities of transuranic waste (such as transuranic-contaminated glovebox gloves, bags, empty bottles, analytical waste, etc.) and LLW (such as wipes, gloves/shoe covers, decontamination wastewater, etc.). These wastes are not expected to significantly increase the waste streams at LLNL. The accident risk from performing the R&D activities of the MOX program will be within the envelope of accident impacts outlined within the 1992 EIS/EIR and this SA.

Comment Code 3-39

Response:

The program drivers for the higher tritium inventory limit are the Army Tritium Recovery/Recycle Project, Mound Tritium D&D support, and NIF target development and loading capability. The Army recycle work involves accepting shipments containing several grams (5 - 10 grams) of tritium, followed by a processing period, then transfer offsite. This sequence will occur repeatedly, occasionally with new shipments arriving before shipment of previous accumulations. An inventory of up to 20 grams could occasionally develop as a result of this activity, but only for the next 2 - 3 years when the Army change-out of tritium illumination devices will be the most intense. In assisting the Mound site with ongoing D&D activities it may become necessary to accept (and process for recycle) tritium storage vessels, beds or traps. The shipments could contain as much as 5 grams. Finally, the NIF developmental target work will require an inventory of several (2 - 5) grams. Follow-on installation of a target loading station will add an additional 5 grams or more to the maximum inventory requirement, but not for 3 - 4 years. The combined tritium requirements of these programs shows that a 30 grams inventory limit is appropriate and would provide sufficient flexibility if carefully managed.

Comment Code 3-40
Response:

A biohazard level III facility is not currently planned for LLNL. Nevertheless, if programmatic needs change, appropriate NEPA and safety reviews would be undertaken before such a facility is established at LLNL.

Comment Code 3-41
Response:
There are no classified annexes to the 1992 EIS/EIR or the SA.

Comment Code 3-42
Response:

Natural and depleted uranium consist of several isotopes, each with its own specific activity and very long half-life. The dominant isotope is U-238 (99.3%). The U-235 isotope decays about 6 times faster than U-238. Uranium with an increased proportion of U-235 (enriched) is used in reactor fuels and weapons. All uranium is toxic, as well as radioactive, although at a low level compared to many other radionuclides. The real difference in the isotopes of uranium is the ability of U-235 to fission.

DOE and LLNL make every effort to produce fact sheets and disseminate information to the public and media that is accurate.

Comment Code 3-43
Response:

See Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 3-44
Response:

See Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 3-45
Response:

See Common Issue 2.2, Proposed Changes in Administrative Limits.

Comment Code 3-46
Response:

DOE agrees an analysis is necessary to support the need for increased administrative limits for operations proposed in the Superblock Complex. The SA explains the results of such analyses but relies on the supporting documentation contained in SARs.

Nuclear SARs are prepared in accordance with DOE Order 5480.23. Contractors who are responsible for the design, construction, or operation of DOE nuclear facilities are required to perform safety analysis that develops and evaluates the adequacy of the safety basis for each such facility. The safety basis to be analyzed includes management, design, construction, operation and engineering characteristics necessary to protect the public, workers, and the environment from the safety and health hazards posed by the nuclear facility.

SARs have been prepared for all the nuclear facilities contained within the Superblock Complex and for the Nondestructive Test Facility, Building 239. These documents contain the analyses that support continued safe operations within the facilities.

Comment Code 3-47
Response:

The environmental justice section of the SA (section 8) has been revised to include Site 300. This site is located in a census block that is greater than the state average for minorities, but not for low income. Because impacts at Site 300 are within the bounds of 1992 EIS/EIR and are considered low or negligible, there would be no disproportionately high and adverse impacts near Site 300. The tritium-contaminated groundwater plume is within the site boundary and is receding due to ongoing remediation activities. This plume is not expected to affect offsite water users. See also the response to comment 1-7, above.

Comment Code 3-48
Response:

DOE provides information in English about Site 300 to interested stakeholders. However, no information is prepared in Spanish at this time.

Comment Code 3-49
Response:

Mitigation measures consisted of alerting LLNL programs of exclusion zones around each nest site until the young had fledged and were independent. These mitigation measures were developed in conjunction with the U.S. Fish and Wildlife Service. There has been a steady increase in nesting activity at the Livermore Site over the last 4 years. In 1998, 6 nesting pairs of kites were successful in fledging 14 young. Additional information is provided in the LLNL SAERs.

Comment Code 3-50
Response:

See Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 3-51
Response:

DOE proposes that the existing administrative limit of 700 kg for plutonium at Buildings 332 and 334 be retained, primarily to accommodate the plutonium already on site, which cannot be relocated to other DOE facilities, as described in section 1.4.2 of the SA. There are various physical and chemical forms in the laboratory, as expected in a research environment. In 1994 several cans containing plutonium ash residue (oxides) were found to be bulging. This resulted from internal pressure from gases slowly created by the plutonium irradiating organic materials (such as plastic bags) also in the sealed cans. This pressurization would not cause them to explode, but rather was of concern because a sudden release of pressure could have caused a puff of airborne particles. Nonetheless, building confinement filters would have prevented an environmental release. The cans were punctured to release any pressure, and they were over-packed in cans having a carbon frit-filtered vent. A program is underway to stabilize this plutonium residue so that it can be stored in sealed containers for many decades.

Comment Code 3-52
Response:

See the response to comment 3-25, above.

Comment Code 3-53
Response:

See the response to comment 3-25, above.

Comment Code 3-54
Response:

The cumulative impacts for site operations from 1998 to 2002 are addressed in Section 9 of this SA.

See also the response to comment 3-24, above.

Comment Code 3-55
Response:

The issue of water use by the site has been added to Section 9 on cumulative impacts, section 2.10 and section 9. Recent investigations on the effects of buried capacitors on groundwater are discussed in Section 2.4.

See Common Issue 2.1, Supplement Analysis Process. See also the response to comments 1-7 and 3-24, above.

Comment Code 3-56
Response:

LLNL work to support the subcritical testing program involves routine operations that are within the scope of its continuing mission activities as assessed in the 1992 EIS/EIR.

Comment Code 3-57
Response:

Current AVLIS activities were evaluated in Chapter 4 of the 1996 USEC EA. It was indicated that there would be releases to the environment from AVLIS operations. However, as indicated in the EA, programs have been established to minimize the amount of hazardous materials released to the environment. Regular monitoring is done as required under the Bay Area Air Quality Management District and the National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations. Data are reported annually in LLNL's NESHAP report to the EPA. The AVLIS emissions are expected to be well below the threshold levels and are within conditions specified in permits.

See also the response to comment 3-25, above.

Comment Code 3-58
Response:

The AVLIS operations have been, and will continue to be, within the envelope described in the 1996 USEC EA, the 1990 DOE AVLIS EA, and the 1992 EIS/EIR.

See also the responses to comments 3-25 and 3-56, above.

Comment Code 3-59
Response:

See also the response to comment 3-29, above.

Comment Code 3-60
Response:

DOE does not believe that the level of tritium in the grapes in the local area have significantly higher levels of tritium than those used for wines in the Livermore Valley. The nature of atmospheric dispersion is such that higher concentrations are expected closer to the release point. However, four times a small number is still a small number, and it does not correlate to potential health impacts.

The information on tritium in Livermore Valley wine is discussed in the 1992 EIS/EIR. The amounts of tritium in wine are determined using highly sophisticated technology (helium-3 mass spectrometry). Such a sensitive technique allows one to detect differences between Livermore wines and others, but use of commercially available techniques would likely not be able to detect tritium in any samples, including those from Livermore. The tritium-in-wine data are published and placed in proper context each year in the SAER. That is, the data are evaluated using accepted and conservative dose models that indicate that while Livermore Valley wines do indeed contain more tritium than wines from other areas, the impacts are negligible. The dose to a consumer, assuming a relatively high 2-liter-per-day wine consumption at the highest tritium level detected in Livermore wines during 1997, would have been 0.0099 mrem. This dose is very small in comparison with the 10 mrem per year public exposure limit mandated in EPA regulations for the air pathway. That 10 mrem is conservative relative to the 100 mrem recognized internationally as providing adequate public protection from all pathways. And it is low compared to other radiological doses to persons in the vicinity of LLNL, including doses from naturally occurring radon, uranium, medical x-rays, cosmic rays, etc.

It is generally true that when tritium usage at LLNL is reduced, there are fewer operational emissions, and therefore smaller amounts detected in the environment. However, attempts to mathematically correlate annual tritium emissions with the measured concentrations of tritium in Livermore Valley wines have been unsuccessful. Although tritium rapidly diffuses in air and slowly permeates through most materials, the conversion rate of elemental gaseous tritium to a water form is relatively slow. Canadian field experiments show that the atmospheric conversion is on the order of 0.5% to 1% per hour (article by R. M. Brown, et al, in Health Physics 58:171-181, 1990).

While it is true that nearly a million curies of tritium have been released from LLNL over its history, it should be noted that over 700,000 of these curies were released in two events (1965 and 1970) in the form of elemental tritium gas. Tritium gas is known to have a significantly lower dose impact than tritiated water or water vapor; in fact, the dose is 25,000 times lower from exposure to tritium gas. Much of the remainder of the releases (about 50%) were also tritium gas releases. Therefore, the dose consequences of most of the tritium releases from LLNL have been negligible. In addition, LLNL's environmental monitoring program measures tritium impacts in all affected environmental media and reports those data annually in the SAER.

The potential for tritium to be released from routine NIF operations has been assessed in its project-specific environmental analysis at Appendix I of the DOE SSM PEIS. The amount of

incremental tritium emissions from NIF will be much smaller than present emissions from the Laboratory, and thus have no additional environmental or public health effect. Continuous stack monitoring will be installed at NIF.

See also, the response to comment 3-29, above.

Comment Code 3-61

Response:

See the response to comment 3-29, above.

Comment Code 3-62

Response:

The intent of the programmatic environmental document (such as the 1992 EIS/EIR) is to provide an impact analysis baseline that bounds the impacts from ongoing and future proposed projects. Most of the larger new facilities at LLNL that have been completed, are underway, or are proposed for construction by year 2002 were mentioned as proposed projects in the1992 EIS/EIR. Although these facilities were mentioned as proposed projects, their specific, detailed design and process information were not available to conduct an environmental analysis at the time of completion of the 1992 EIS/EIR. As their design information became available, project-specific NEPA analyses were completed as committed in the 1992 EIS/EIR. The potential impacts of those new project-specific NEPA analyses (as noted in Table 1.1 of the SA) were compared with the bounding accident impact projections contained in the programmatic 1992 EIS/EIR. Completion of these projects should yield no significant unmitigated environmental effects and the 1992 EIS/EIR still remains adequate.

Comment Code 3-63

Response:

The probability of one in one million per year is a generally accepted cut-off point used in determining when an event is considered credible (i.e., higher than one in one million per year) and subject to analysis, or is considered incredible (i.e., less than one in one million per year) and typically not analyzed.

4.4 RESPONSES TO COMMENTS FROM DOCUMENT 4: PUBLIC BRIEFING, LIVERMORE, FEBRUARY 11, 1999, 6:00 P.M.

Comment Code 4-1
Response:

Eighty tons of uranium is required for the AVLIS IPD series work outlined in the 1996 USEC EA. This quantity was also the administrative limit for the facility that was analyzed in the 1992 EIS/EIR.

Comment Code 4-2
Response:

See the response to comment 1-15, above.

Comment Code 4-3
Response:

DOE, in its NEPA reviews, must consider sites that are reasonable alternatives to perform the proposed action or work. Typically, only a few sites, such as LLNL, have the infrastructure and technical expertise to carry out the proposed work. DOE selects sites based on the lack of significant environmental impacts, as well as other factors such as costs, availability of facilities, technical expertise, etc.

Also, see Common Issue 2.3, Opposition to Nuclear Activities, and Common Issue 2.4, Concern with HEPA Filters.

Comment Code 4-4
Response:

See Common Issue 2.3, Opposition to Nuclear Activities. Also, see the response to comment 4-3, above.

Comment Code 4-5
Response:

See Common Issue 2.3, Opposition to Nuclear Activities. Also, see the response to comment 4-3, above.

Comment Code 4-6
Response:

See Common Issue 2.1, Supplement Analysis Process, and Common Issue 2.3, Opposition to Nuclear Activities.

Comment Code 4-7
Response:

See Common Issue 2.3, Opposition to Nuclear Activities. Also, see the response to comment 4-3, above.

Comment Code 4-8
Response:

See Common Issue 2.3, Opposition to Nuclear Activities. Also, see the response to comment 4-3, above.

Comment Code 4-9
Response:

See Common Issue 2.3, Opposition to Nuclear Activities. Also, see the response to comment 4-3, above.

Comment Code 4-10
Response:

This SA evaluates the increase in uranium limit for Buildings 332 and 334 from 300 kg (all types) to 3,500 kg (all types). Uranium is very dense (specific gravity about 19). About 7 cubic feet of uranium metals would weigh about 3200 kg. This is larger than a basketball: about the size of a microwave oven. Less than 1% enriched uranium metal is not highly radioactive and is used in a number of applications such as boat ballast, counterweights, and shielding for tanks and other military vehicles. See also the response to comment 1-15, above.

Also, see Common Issue 2.2, Proposed Changes in Administrative Limits.

Comment Code 4-11
Response:

The increased quantities of uranium would be stored locally at LLNL.

Comment Code 4-12
Response:

DOE analyzes all possible accident scenarios and screens out those considered incredible. For the vault, the series of events have a combined probability so low that it is considered incredible, that is, has a chance of less than one in one million per year of operations. In the case of the vault, the materials are in a sealed hardened source designed to withstand extreme events, such as a ground acceleration greater than 0.8g. There is no combustible material in the vault to feed a fire, and the vault is for all purposes impenetrable to external challenges. As a result of this, for a variety of scenarios, the probability of the material being released is calculated to be less than one in one million per year of operation. The possibility that an accident could release material from the vault to the environment is considered an incredible event or extremely improbable.

Comment Code 4-13
Response:

LLNL conducts a comprehensive environmental monitoring program that samples all parts of the environment to determine the impacts of LLNL operations on the environment and the public. The program includes direct monitoring of both Laboratory emissions (stacks and sewer) as well as surveillance monitoring of the environment surrounding the Laboratory. State-of-the-art monitoring equipment and analytical techniques are used to measure concentrations of potential pollutants at extremely low levels. The program has been evaluated by qualified peers and found be extremely robust and comparable to any in the country or world. The results of the environmental monitoring program are published every year in the SAER.

See the response to comments 1-2, 1-4, 1-7, 1-12, 3-31, and 3-60. Also, see Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 4-14
Response:

DOE does not believe that the continued operation of LLNL and SNL-L will pose a significant impact to the public or the environment.

See the response to comments 1-2, 1-3, 1-4, 1-5, 1-7, 1-8, and 1-12. Also, see Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 4-15
Response:

See the response to comment 4-3, above. Also, see Common Issue 2.3, Opposition to Nuclear Activities, above.

Comment Code 4-16
Response:

The units have been changed to be consistent; the correct unit is one chance in one million per year. DOE has decided to continue the use of curies in the SA and not include the equivalent units in becquerels or disintegrations per second for ease of presentation.

Comment Code 4-17
Response:

See Common Issue 2.1 Supplement Analysis Process.

Comment Code 4-18
Response:

DOE has several programs for reporting incidents and accidents. The CAIRS system collects the widest range of data. CAIRS is a database used to collect and analyze DOE and DOE contractor reports of injuries, illnesses, and other accidents that occur during DOE operations in accordance with DOE Order 231.1. CAIRS reporting is managed by the Office of Occupational Safety & Health Policy (EH-51). Access to the CAIRS system is available through the internet at "www.tis.eh.doe.gov."

Another level of reporting is covered under the Occurrence Reporting and Processing System (ORPS). DOE's ORPS Program provides timely notification to the DOE complex of events that could adversely affect: public or DOE worker health and safety, the environment, national security, DOE's safeguards and security interests, functioning of DOE facilities, etc. DOE analyzes aggregate occurrence information for general implications and operational improvements. The ORPS Program and its data system are described in DOE Order 232.1A and its associated Manual, DOE Manual 232.1-1A. DOE/OAK final occurrence reports are available to the public through the Energy Information Center or the Office of Public Affairs located at 1301 Clay Street, Oakland, California. These offices can be contacted for any information pertaining to injuries, illnesses or accidents involving LLNL.

Significant occurrences or accidents are analyzed in investigations termed Type "A" and Type "B". A report is done on each of these accidents and is available to the public through the internet at "www.tis.eh.doe.gov." Specific information pertaining to DOE/OAK accidents is available through the Energy Information Center or the Office of Public Affairs.

DOE is not aware of any releases or spills to the environment associated with a 5.5 earthquake in the recent past. There was a 5.5 seismic event in 1980 at Livermore. Several upgrades were made to the Laboratory's infrastructure as a result of that event. The analysis in the 1992 EIS/EIR incorporates data and changes to facilities from the 1980 earthquake.

Comment Code 4-19
Response:

DOE and LLNL would report any accidents with the potential to impact the public or the environment, even if it occurred as a result of classified activities.

See also the response to comment 4-18, above.

Comment Code 4-20
Response:

See the response to comment 4-18, above.

Comment Code 4-21
Response:

The only criticality incident in the last four decades at LLNL occurred on March 26, 1963, in Building 261, during a criticality experiment. The occurrence of an excursion of 4×10^{17} fissions was attributed to mechanical failure during the experiment. Exposure to personnel in or near the building was low and did not exceed 0.12 rem. Only small amounts of short-lived gaseous fission products were released from the experiment room.

Comment Code 4-22
Response:

DOE acknowledges that nearly a million curies of tritium have been released from LLNL over its history. However, it should be noted that over 700,000 of these curies were released in two events (1965 and 1970) in the form of elemental tritium gas. Tritium gas is known to have a significantly lower dose impact than tritiated water or water vapor. In fact, the dose is 25,000 times lower from exposure to tritium gas. Much of the remainder of the releases (about 50%) were also tritium gas releases.

The tritium in vegetation consists of that in “free water” and that which is in an organic molecules. In the 1997 SAER, LLNL included a discussion of organically-bound tritium doses, assuming that entire plants were made up of organically-bound tritium, and showed that the doses were negligible. Although the potential damage to human tissue of an organically-bound tritium molecule may be a factor of 3 to 5 higher than for a molecule in free water form, this organic portion is so small that that it is not considered a significant contributing factor. In the calculations of public dose, the assumptions as to intake of vegetation are very conservative (overestimated) that they outweigh any organically-bound tritium that could be separately measured. The direct monitoring of organically-bound tritium is difficult and expensive, and would not enhance public protection.

Comment Code 4-23
Response:

See the response to comment 1-15, above.

Comment Code 4-24
Response:

The SA (Section 6) notes that the methodology for assessing accidents used in the 1992 EIS/EIR employed a consequence assessment and not a risk assessment methodology. Consequence assessment approaches assume that the triggering event (e.g., earthquake) and resulting release of hazardous material have a 100% probability of occurring. Consequences (e.g., dose, exposure, and health effects) are therefore calculated as if the event and release occurred. The frequency of handling or use of a material would not factor into an approach employing a consequence assessment.

The probability of an accident that releases material to the environment is related to a limited extent to the number of operations with the material. Accidents also occur as a result of hardware failure (e.g., valves, fans) and building fires and natural phenomena (e.g., earthquakes). These accidents are independent of the operations, and the amount released and their consequences depend greatly on the amount of "material at risk" to the accident. The amount at risk is controlled by administrative limits for the amount of material in a container, glovebox, workstation, room, etc. Because of this, neither the probability, size of the release, nor the consequences increase proportionally with the increased inventory in the facility. In the 1992 EIS/EIR, and therefore in this SA, the consequences of "bounding accidents" are presented. Although the administrative limits are proposed to be raised, the bounding accidents in the 1992 EIS/EIS have been found by this SA to still apply.

Comment Code 4-25
Response:

There was one air plutonium release from the Plutonium Facility at LLNL in 1980 as a result of an incorrect changeout and sealing of HEPA filters. The amount released was monitored at the time. Ongoing, continuous monitoring of the plutonium facility, using methods sanctioned by the US Environmental Protection Agency, indicates that the HEPA filter systems are performing as intended.

DOE believes that worker safety and health monitoring is within established guidelines for exiting radioactive areas.

Also, see Common Issue 2.4, Concerns With HEPA Filters, above.

Comment Code 4-26

Response:

There was a release of plutonium to the sanitary sewer in 1967 at LLNL. Both the amounts of plutonium released and the resulting concentrations in the sludge at the Livermore Water Reclamation Plant (LWRP) have been estimated and discussed in the SAERs and the 1992 EIS/EIR. Although knowledge about where the affected sludge was ultimately utilized is uncertain, experiments using the contaminated sludge to grow a vegetable garden were conducted and the results published in the early 1970s; these experiments indicated there was no cause for health concern from the plutonium in the sludge. Furthermore, gardens of Laboratory employees who received contaminated sludge from the LWRP were sampled and these data also indicate no cause for public health concern. It is likely that the same is true regardless where this material was used. The nature and magnitude of the contamination does not warrant any cause for public health concern.

Also, see the response to comment 1-12, above.