DEMOLITION OF BUILDING 51 AND THE BEVATRON

Environmental Assessment
DOE/EA-1541

Prepared for:
Lawrence Berkeley National Laboratory

March 2008

PREFACE

The National Environmental Policy Act of 1969 (NEPA) requires that Federal agencies consider the environmental consequences of their proposed actions before decisions are made. In complying with NEPA, the U.S. Department of Energy (DOE) follows the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500 through 1508) and DOE's own NEPA implementing procedures (10 CFR 1021). The purpose of an Environmental Assessment (EA) is to provide Federal decision-makers with sufficient evidence and analysis to determine whether to prepare an Environmental Impact Statement (EIS) or issue a Finding of No Significant Impact (FONSI). This EA has been prepared to assess the environmental consequences resulting from the demolition of Building 51 and the Bevatron, located at the Lawrence Berkeley National Laboratory (LBNL; also referred to as "Berkeley Lab," "the Laboratory," or "the Lab" in this document), a DOE National Laboratory.

The objectives of this EA are to (1) describe the underlying purpose and need for DOE action; (2) describe the Proposed Action and identify and describe any reasonable alternatives that satisfy the purpose and need for DOE action; (3) describe baseline environmental conditions at LBNL; (4) analyze the potential impacts to the existing environment from implementation of the Proposed Action and other reasonable alternatives; and (5) compare the impacts of the Proposed Action with the No Action Alternative and other reasonable alternatives.

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CHAPTER 1.0
Executive Summary

1.1 Proposed Action

This Environmental Assessment (EA) describes a proposal by the U.S. Department of Energy (DOE) to demolish the Bevatron and the structure housing it, Building 51, at Berkeley Lab. During its operation from 1954 until 1993, the Bevatron was among the world's leading particle accelerators, and during the 1950s and 1960s, four Nobel Prizes were awarded for work conducted in whole or in part there. The Bevatron is approximately 180 feet in diameter. Building 51 is a large (approximately 126,500 gross square feet) shed-like structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, shop and office functions. Since the end of the Bevatron's operations in 1993, Building 51 has had limited use for equipment storage, office space, and dry laboratories.

The Bevatron and Building 51 are no longer needed by LBNL. The Bevatron has not operated since 1993 and is non-functional. The Building 51 structure housing the Bevatron is deteriorating, and consumes disproportionate maintenance resources. It does not meet current building codes, the roof leaks in several locations, and portions of the structure do not comply with current seismic design standards. In addition, removal of the building and its contents would free up the site for future development. However, while development of the site is likely at some point in the future, at this time, there are no firm plans for future development that have reached the level of a proposed or reasonably foreseeable action.

The project site is approximately four acres in size, including parking and staging areas. Of this total, approximately 2.25 acres would be converted from developed area (i.e., occupied by Building 51) to an undeveloped area for an indeterminate time, until another project is proposed, approved, and initiated. Under the proposed project, the concrete shielding blocks that surround the Bevatron would be removed, the Bevatron apparatus would be disassembled, Building 51 and the shallow foundation and tunnels underneath the building would be demolished, and the resulting debris and other materials would be removed. Minor soil remediation effort is expected as part of this action. The site would then be backfilled, and the fill compacted and leveled. The duration of the physical work for the project may vary from four to seven years, from early 2008 through 2011 or beyond, contingent upon funding and results of material sampling. For the purposes of conservative impact assessment, where impacts presumably are intensified in a shorter project timeframe, the project is assumed to take place over a four year period.[1]

Approximately half of the materials that would be removed would consist of non-hazardous debris and other items typical of building demolition projects. Hazardous waste, low-level radioactive waste, and mixed waste also would be shipped from the site. The project would seek to reuse or recycle materials (e.g., uncontaminated metals and concrete) where feasible. Items that could not be reused or recycled would be handled and disposed in accordance with applicable policies and regulations. An estimated maximum of about 4,700 one-way truck trips to ship items off-site, and to bring in such things as equipment and fill material for bringing the site back to a level condition, would be required over the course of the project. A maximum of about 50 temporary workers would be used by the project at any one time.

Depending upon funding, a project variant, under which project activities would be conducted in an alternative sequence, has been developed since publication of the Draft of this Environmental Assessment. The alternative-sequence project variant would begin with appropriate sampling and surveys for hazardous building construction materials and debris, followed by removal and abatement of all hazardous materials within Building 51. Prior to demolition of the building structures, systems and components, the project would set up additional stormwater drainage and collection systems. Once the building was demolished down to the grade level concrete slab, the Bevatron shielding blocks and equipment would be dismantled and removed with the use of two modern mobile cranes. Finally, the project would demolish and remove the building foundations, tunnels, trenches and slabs and backfill with suitable clean fill material. This alternative-sequence variant, if implemented, would not create a new significant impact, nor would it substantially increase the severity of a significant impact associated with the Project nor would it require new or altered mitigation measures.[2]

1.2 Alternatives

1.2.1 No Action

Under this alternative, the Bevatron would not be dismantled and Building 51 would not be demolished. Radioactive materials, as well as other hazardous materials such as lead dust, oils, and asbestos, would continue to remain in place.

[1] A variant of the project could reduce the minimum duration of the project from four years to three and a half years, but this reduction in schedule would have no resulting effect on project impacts, including traffic impacts. See revised page 76 and Appendix G.

[2] The alternative-sequence variant was analyzed in a Technical Memorandum dated July 3, 2007. The Memorandum was included in the Final EIR for the Demolition of Building 51 and the Bevatron, Appendix E. The Bevatron Final EIR was certified on July 19, 2007. The Memorandum is included in this Environmental Assessment as Appendix G. It determined that there would not be an increase in severity of impacts under the alternative-sequence or alternate duration.

1.2.2 Preservation

Under the Preservation Alternative, the entire site would be dedicated to non-LBNL uses and could be managed by another public agency, such as the National Park Service, with the intention of actively preserving Building 51 and the Bevatron equipment within it. The public agency would maintain and preserve the building in accordance with the *Secretary of the Interior's Standards for Preservation*, and would allow limited public access for interpretive/educational purposes. These Standards for Preservation define Preservation as "the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project." This alternative would also allow some level of abatement of hazardous materials, such as lead and asbestos removal, to the extent that abatement can be accomplished while maintaining the Bevatron equipment in place.

This alternative would not achieve most of the Laboratory's goals for the site. In addition, the facility would still require long-term maintenance and substantial financial investment for clean-up and refurbishment. This would include such things as significant reroofing and exterior waterproofing. Reinforcement would be required to strengthen the structure to make it seismically safe. New roll-up doors would also be required to replace those that were either removed or are inoperable. The facility would have to be patrolled periodically to prevent unauthorized uses, due to the continuing presence of hazardous materials, and, as would be the case for any unoccupied building, to ensure that it did not become occupied by unwanted animals or pests.

1.2.3 On-Site Rubbling

Under the On-Site Rubbling Alternative, activities called out in the Project Description would remain the same with the exception of activities related to concrete. In this alternative, a local "crushing plant" operation would be set up in the work zone outside of Building 51. Two large (approximately 35 feet [length] by 15 feet [width] by 10 feet [height]) diesel-powered concrete crushing machines would form the core of the operation. Concrete from shielding, the building walls and floor and foundation would be broken up using the crushing equipment. Following initial crushing, the material would require transfer by heavy equipment for processing through a second crusher to achieve the uniform sizing necessary to make the material attractive for reuse.

Under this alternative, most of the concrete from the building structure (i.e., walls and floors), foundation, and many of the concrete blocks shielding the Bevatron would be rubbled on-site. Metal (e.g., rebar) in the debris would be separated and disposed of separately. Only concrete containing no detectable added (i.e., non-naturally occurring) radioactivity and otherwise clear of contaminants would be rubbled. The rubbled material and segregated reinforcing steel would be recycled if public or private sector demand was available at the time of production. If not, it would be disposed of at a landfill. LBNL could use the rubble as aggregate or fill material if the need for such materials coincided with its production, although this is speculative at the present time.

This alternative would result in increased air quality and noise effects on-site, although these impacts would be negligible.

1.3 Impacts and Mitigation Measures

LBNL incorporates various mitigation measures on a Laboratory-wide basis, as required under its site-wide environmental documents prepared in accordance with the California Environmental Quality Act (CEQA) (see Appendix A of this EA). In addition, to reduce potential impacts to negligible levels in the areas of biological resources and transportation and circulation, the following project-specific mitigation measures are included in the CEQA Environmental Impact Report prepared for the Proposed Action:

Biological Resources

Impact: Noise and activities associated with demolition may indirectly disturb nesting special-status birds such that they abandon their nests or such that their reproductive efforts fail. To address potential indirect adverse effects on nesting special-status birds, the following mitigation measure would be adopted.

Mitigation Measure: Pre-Demolition Special-Status Avian Survey and Subsequent Actions. No more than two weeks in advance of any demolition activity involving concrete breaking or similarly noisy or intrusive activities commencing during the breeding season (February 1 through July 31), a qualified wildlife biologist shall conduct pre-demolition surveys of all potential special-status bird nesting habitat in the vicinity of the Building 51 project site and, depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on nesting special-status nesting birds:

1. If active nests of special-status birds are found during the surveys, a no-disturbance buffer zone will be created around active nests during the breeding season or until a qualified biologist determines that all young have fledged. The size of the buffer zones and types of construction activities restricted within them will be determined through consultation with the California Department of Fish and Game (CDFG), taking into account factors such as the following:
    a. Noise and human disturbance levels at the project site and the nesting site at the time of the survey and the noise and disturbance expected during the construction activity;
    b. Distance and amount of vegetation or other screening between the project site and the nest; and
    c. Sensitivity of individual nesting species and behaviors of the nesting birds.

2. If pre-demolition surveys indicate that no nests of special-status birds are present or that nests are inactive or potential habitat is unoccupied, no further mitigation is required.

3. Pre-demolition surveys are not required for demolition activities scheduled to occur during the non-breeding season (August 1 through January 31).

4. Noisy demolition activities as described above (or activities producing similar noise and activity levels in the vicinity) commencing during the non-breeding season and continuing into the breeding season do not require surveys (as it is assumed that any breeding birds taking up nests would be acclimated to project-related activities already under way). However, if trees and shrubs are to be removed during the breeding season, the trees and shrubs will be surveyed for nests prior to their removal, according to the survey and protective action guidelines 1a through 1c, above.

5. Nests initiated during demolition activities are presumed to be unaffected by the activity, and a buffer is not necessary.

6. Destruction of active nests of special-status birds and overt interference with nesting activities of special-status birds shall be prohibited.

7. The noise control procedures for maximum noise, equipment, and operations identified in Section 5.1.7 shall be implemented.

8. Shrubs that have been determined to be unoccupied by special-status birds may be removed as long as they are located outside of any buffer zones established for active nests.

Impact: Noise and activities associated with demolition may indirectly disturb nesting special-status bats such that they abandon their nests or such that their reproductive efforts fail. To address potential indirect adverse effects on roosting special-status bats, the following mitigation measure would be adopted.

Mitigation Measures: Pre-Demolition Special-Status Bat Survey and Subsequent Actions. No more than two weeks in advance of any demolition activity involving concrete breaking or similarly noisy or intrusive activities, commencing during the breeding season (March 1 through August 31), a qualified bat biologist, acceptable to the CDFG, shall conduct pre-demolition surveys, utilizing techniques acceptable to the CDFG, of all potential special-status bat breeding habitat in the vicinity of the Building 51 project site.

Under such surveys, potentially suitable habitat shall be located visually. Bat emergence counts shall be made at dusk as the bats depart from any suitable habitat. In addition, an acoustic detector shall be used to determine any areas of bat activity. At least four nighttime emergence counts shall be undertaken on nights that are warm enough for bats to be active, as determined by a qualified bat biologist.

Depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on breeding special-status bats:

1. If active roosts are identified during pre-demolition surveys, a no-disturbance buffer will be created, in consultation with the CDFG, around active roosts during the breeding season. The size of the buffer will take into account factors such as the following:

a. Noise and human disturbance levels at the project site and the roost site at the time of the survey and the noise and disturbance expected during the construction activity;

b. Distance and amount of vegetation or other screening between the project site and the roost; and

c. Sensitivity of individual nesting species and the behaviors of the bats.

2. If pre-demolition surveys indicate that no roosts of special-status bats are present, or that roosts are inactive or potential habitat is unoccupied, no further mitigation is required.

3. Pre-demolition surveys are not required for demolition activities scheduled to occur during the non-breeding season (September 1 through February 28).

4. Noisy demolition activities as described above (or activities producing similar noise and activity levels in the vicinity) commencing during the non-breeding season and continuing into the breeding season do not require surveys (as it is assumed that any bats taking up roosts would be acclimated to project-related activities already under way). However, if trees are to be removed during the breeding season, the trees would be surveyed for roosts prior to their removal, according to the survey and protective action guidelines 1a through 1c, above.

5. Bat roosts initiated during demolition activities are presumed to be unaffected by the activity, and a buffer is not necessary.

6. Destruction of roosts of special-status bats and overt interference with roosting activities of special-status bats shall be prohibited.

7. The noise control procedures for maximum noise, equipment, and operations identified in Section 5.1.7 shall be implemented.

8. Shrubs that have been determined to be unoccupied by special-status bats and that are located outside the no-disturbance buffer for active roosts may be removed.

Traffic and Circulation

Impact: The Proposed Action would temporarily and intermittently increase traffic volumes on roadways used by demolition-related vehicles. To address potential temporary and intermittent adverse effects to transportation and traffic, the following mitigation measure would be adopted.

Mitigation Measures: The frequency of truck trips (loaded or empty) shall be no greater than (a) one every 10 minutes (six truck trips per hour) during the a.m. and p.m. peak commute hours, and (b) one every five minutes (12 truck trips per hour) during periods other than the a.m. and p.m. peak commute hours.

Under this limitation, the projected level of truck traffic would have minimal effects on traffic flow, even if those trucks were to travel through the congested intersections on University Avenue at San Pablo Avenue and Sixth Street during the peak commute hours. Project-generated hourly truck trips would represent an increase of no more than about 0.9 percent above the a.m. and p.m. peak-hour traffic volumes, respectively, at the above-cited congested intersections.

Other Impacts

All other impacts identified in the analysis were determined to be unimportant for the reasons set forth in the EA. Regarding areas of relatively greater concern, minimal air quality impacts would be created by project-related emissions of construction dust, criteria air pollutants, diesel particulate matter, and asbestos, due to control measures that would be implemented as part of the project, and the nature or limited extent of the pollutants themselves. Similarly, impacts in the areas of water quality and noise would be negligible, due to control measures and the nature of the project site. The potential impacts of hazardous materials, hazardous waste, and other hazards would be reduced to negligible levels. In particular, it is expected that no detectable radioactivity would be contained in the dust generated by the project, and any exposures stemming from the off-site disposal of items containing radiological activity would be far below applicable regulatory limits.

Regarding cultural resources, a Memorandum of Agreement (MOA) has been signed among DOE, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding the demolition of Building 51. The stipulations of the MOA required that the building be documented in accordance with the National Park Service’s Historic American Engineering Record (HAER) requirements. In September 1997, LBNL staff prepared the HAER documentation which included a written historical and architectural description of the building and accelerator, and extensive photographic recordation in accordance with the MOA’s stipulations. The HAER documentation was submitted to and accepted by the US Department of Interior National Park Service (NPS) in March 1998.

With the acceptance of the HAER report by NPS, DOE may demolish Building 51 provided that DOE contacts the Historic American Building Survey (HABS) division of NPS to determine what level and kind of recordation is required for the buildings, and that such documentation is completed and accepted by HABS prior to demolition. LBNL has consulted with NPS. The latter determined that an addendum to the HAER report would meet HABS requirements. The HAER addendum has been completed and was accepted by NPS in August 2006. For NEPA purposes, with the signed MOA, completion of the HAER documentation, and approval of the HABS addendum by NPS, LBNL has adequately mitigated for the potential loss of Building 51, in accordance with the NHPA. As an additional measure, LBNL plans to commemorate the scientific achievements attributed to the Bevatron with a monument and/or display listing the historic discoveries that occurred there.

CHAPTER 2.0
Purpose and Need

The goal of the LBNL Building 51 and Bevatron Demolition Project is to eliminate existing potential hazards and make the building site available for eventual future use. By removing the structure and clearing the site, future site reuse could occur in a timely manner. For example, contaminated materials, equipment or environmental media, if any, would have been removed or otherwise managed as part of the proposed demolition project and would not impede future development. However, at this time, there are no existing plans for future development of the site. As future use is speculative, it is not described in this Environmental Assessment, nor are the impacts of such use evaluated. The proposed action would also reduce LBNL maintenance obligations and help off-set creation of new space.

The Laboratory's Long Range Development Plan (LRDP) is a planning document for development at LBNL. When the Draft of this Environmental Assessment was published in 2006, its analysis was completed in accordance with the 1987 LRDP Environmental Impact Report (EIR), as amended,[1] prepared pursuant to the California Environmental Quality Act (CEQA). Since publication of the Draft Environmental Assessment, two documents were prepared by Berkeley Lab that supersede the former LRDP and the 1987 LRDP EIR, as amended: the 2006 LBNL Long Range Development Plan and its accompanying LRDP EIR.[2] The analysis of this Environmental Assessment, is consistent with the 1987 LRDP EIR, as amended, is also consistent with the 2006 LBNL LRDP, as well as the 2006 LRDP EIR.[3] Project-level NEPA and CEQA environmental analysis will be conducted if and when necessary for any future development at the Building 51 site.

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[1] The 1987 LRDP EIR consists of the following documents:

- The *Lawrence Berkeley Laboratory Site Development Plan Environmental Impact Report,* August 1987 (State Clearinghouse No. [19]85112610);
- The *Supplemental Environmental Impact Report for the Proposed Renewal of the Contract between the United States Department of Energy and The Regents of the University of California for Operation and Management of the Lawrence Berkeley Laboratory,* September 1992 (State Clearinghouse No. [19]91093068); and
- The *Supplemental Environmental Impact Report Addendum for the Proposed Renewal of the Contract between the United States Department of Energy and The Regents of the University of California for Operation and Management of the Ernest Orlando Lawrence Berkeley National Laboratory,* September 1997 (State Clearinghouse No. [19]91093068).

These documents are referred to collectively as the "1987 Long Range Development Plan (LRDP) EIR, as amended."

[2] The draft LRDP and the LRDP EIR were circulated for public review on January 22, 2007. The EIR was certified on July 19, 2007. NEPA documentation is not required for a University of California LRDP.

[3] This Environmental Assessment includes references to the 1987 LRDP EIR, as amended, although the analysis is consistent with both the 1987 LRDP EIR and the 2006 LRDP EIR.

2.1 Project Objectives

The primary objectives of the Building 51 and the Bevatron demolition project are as follows:

- Eliminate potential hazards associated with Building 51;
- Reduce the burden on LBNL maintenance resources;
- Free space for potential future activities; and
- Help satisfy a DOE policy requiring that the square footage of new construction at a DOE facility be balanced by elimination of an equivalent amount of excess space.[4]

[4] This policy is set out in an August 9, 2002 memorandum from Bruce M. Carnes, Director, DOE Office of Management, Budget, and Evaluation. No specific proposed facility at LBNL is contingent or otherwise dependent upon this proposed demolition project.

CHAPTER 3.0
Description of Proposed Action and Alternatives

3.1 Proposed Action

3.1.1 Introduction

Lawrence Berkeley National Laboratory (LBNL; also referred to as "Berkeley Lab," "the Laboratory," or "the Lab" in this document) is an approximately 200-acre multi-program research laboratory operated and managed by the University of California (UC or the University) under a contract with the U.S. Department of Energy (DOE). This Environmental Assessment (EA) evaluates a proposal to demolish the Bevatron and the structure housing it, Building 51,[1] at Berkeley Lab.

The approximately 180-foot-diameter Bevatron was constructed as a proton synchrotron—a particle accelerator that accelerated protons within a beam pipe to near the speed of light. When the protons struck "targets" composed of various materials placed within a target chamber, the resulting interactions often produced new types of particles. Study of these interactions and the particles themselves led to important advances in the fields of particle and nuclear physics. Later modifications of the Bevatron enabled researchers to accelerate heavy ions and expand the facility's usefulness in additional areas, including medical research, cancer treatment, and cosmic ray experiments. During its operation from 1954 until 1993, the Bevatron was among the world's leading accelerators, and during the 1950s and 1960s four Nobel Prizes were awarded for work that utilized this apparatus.

Building 51 is a large, approximately 126,500-gross-square-foot steel-frame shed-like structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, shop, and office functions. Since the end of the Bevatron's operations in 1993, Building 51 has had limited use for equipment storage, office space, and dry laboratories (e.g., for computer repair). The building presently is largely unoccupied. The history of the facility is discussed in Section 4.3.3, Cultural Resources.

Under the Proposed Action, the Bevatron apparatus would be disassembled, Building 51 and the foundation underneath the building would be demolished, and the resulting debris and other materials would be removed. The site would then be backfilled, and the fill would be compacted

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1 Building 51 includes Building 51A, an integral addition to the main building.

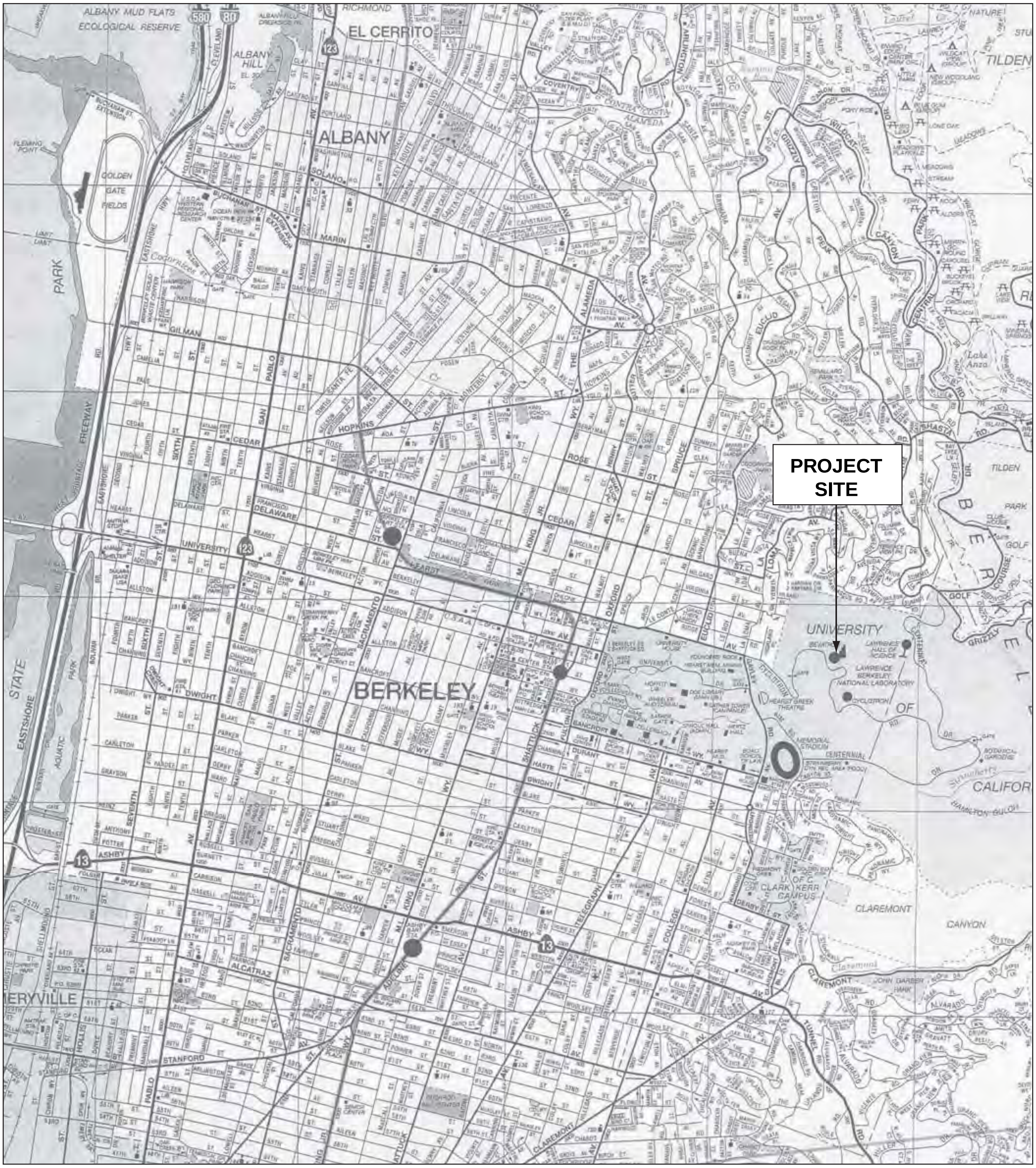
and leveled.[2] This would make future reuse of the site more feasible, although further preparatory site work outside of the scope of this project would be necessary. However, there are no firm plans for future development of the site at this time.

3.1.2 Location and Existing Conditions

LBNL is located in the cities of Berkeley and Oakland in Alameda County on land owned by the University of California. The project site comprises approximately four acres. Of this total, approximately 2.25 acres (the "demolition zone") would be converted from developed area (i.e., occupied by Building 51) to an undeveloped area for an indeterminate time, until another use for this area is proposed, approved, and initiated. The remaining acreage would be used for parking and staging. The site is located within the City of Berkeley portion of LBNL, in the west-central part of LBNL, and is located adjacent to Lawrence Road (from which vehicles enter and leave the site) and McMillan Road within Berkeley Lab. See **Figures 1** through **4**. Laboratory, office, engineering, and computing functions occupy the LBNL buildings immediately adjacent to Building 51. Open space or landscaped areas border the site immediately to the east and north. Surrounding land uses include residential areas to the north of the LBNL property line; LBNL buildings and UC Berkeley athletic fields to the south; LBNL buildings, non-UC Berkeley residences, and UC Berkeley student housing, amphitheater, and classrooms to the west; and additional LBNL buildings and the UC Berkeley Lawrence Hall of Science to the east. Building 51 is approximately 1,100 feet from the nearest residences to the west and north, and about 1,300 to 1,400 feet from the Lawrence Hall of Science to the east.

The project site is entirely developed with the exception of two small areas of ornamental landscaping at the entrance to Building 51. With the exception of two ornamental low-lying trees at this location, no trees would be removed as a result of the project. Small areas of the site are underlain by the edges of two groundwater plumes containing volatile organic compounds (VOCs). Soils underneath portions of the site were contaminated by VOCs, petroleum hydrocarbons, polychlorinated biphenyls (PCBs), and/or mercury that were released at unknown times during the period when the Bevatron was in operation. Starting in the early 1990s, investigation and cleanup actions have been undertaken. These actions are under the oversight of the California Department of Toxic Substances Control, which consults with such other agencies as the San Francisco Bay Regional Water Quality Control Board, DOE, and the City of Berkeley Toxics Management Division. As a result of the completion of interim corrective measures at two soil units at Building 51 under the Laboratory's Environmental Restoration Program, soil contaminants have been reduced to levels considered "protective of human health and the environment" under U.S. Environmental Protection Agency risk assessment guidelines. Groundwater contamination continues to be remediated under the Environmental Restoration Program. Contamination and remediation activities are discussed in more detail in Section 5.1.5, Hazards and Human Health. The site is not listed on the California Environmental Protection Agency (Cal/EPA) Hazardous Waste and Substances Sites List compiled pursuant to Government Code Section 65962.5, also known as the Cortese List.

2 A potential alternative-sequence project variant that would demolish the structure of Building 51 before disassembly and removal of the Bevatron is analyzed and addressed in Appendix G.



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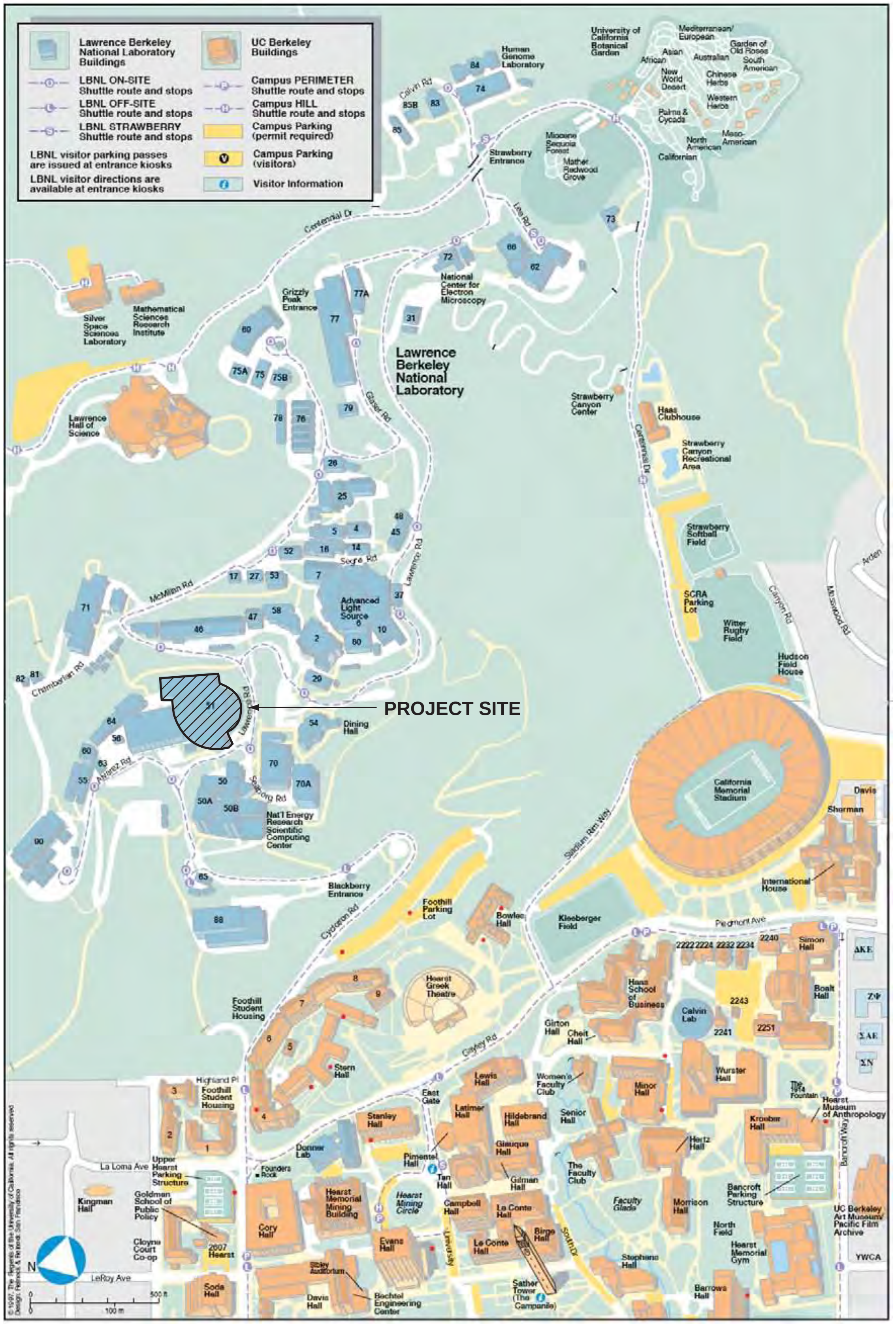
SOURCE: Environmental Science Associates

Demolition of Building 51 and the Bevatron / 204442 ■

Figure 1
Regional Map

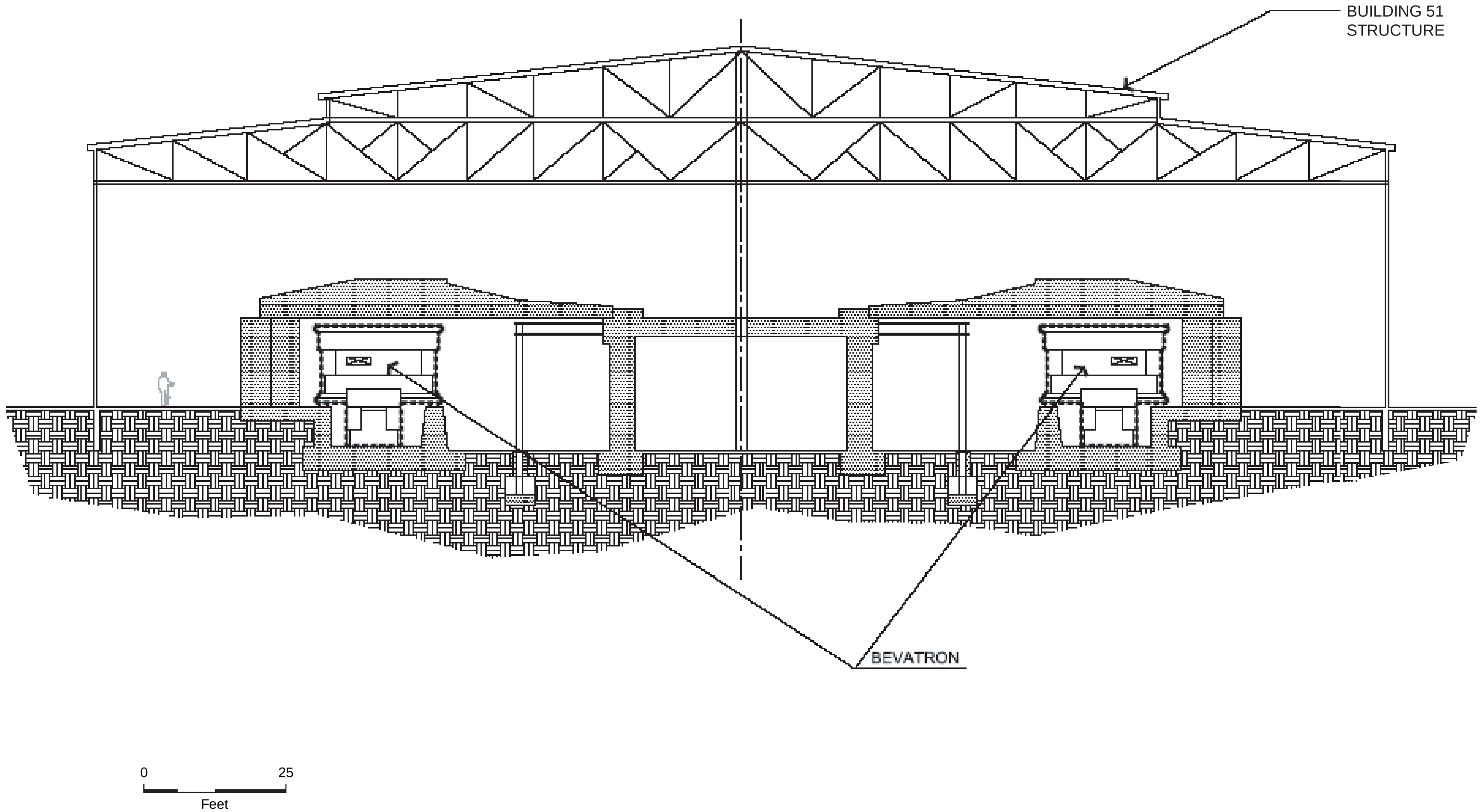


SOURCES: LBNL (2005) and ESA (2005)

FOOTNOTE: The removal of Building 51L and EPB Hall is not reflected on this map.

Demolition of Building 51 and the Bevatron / 204442 ■

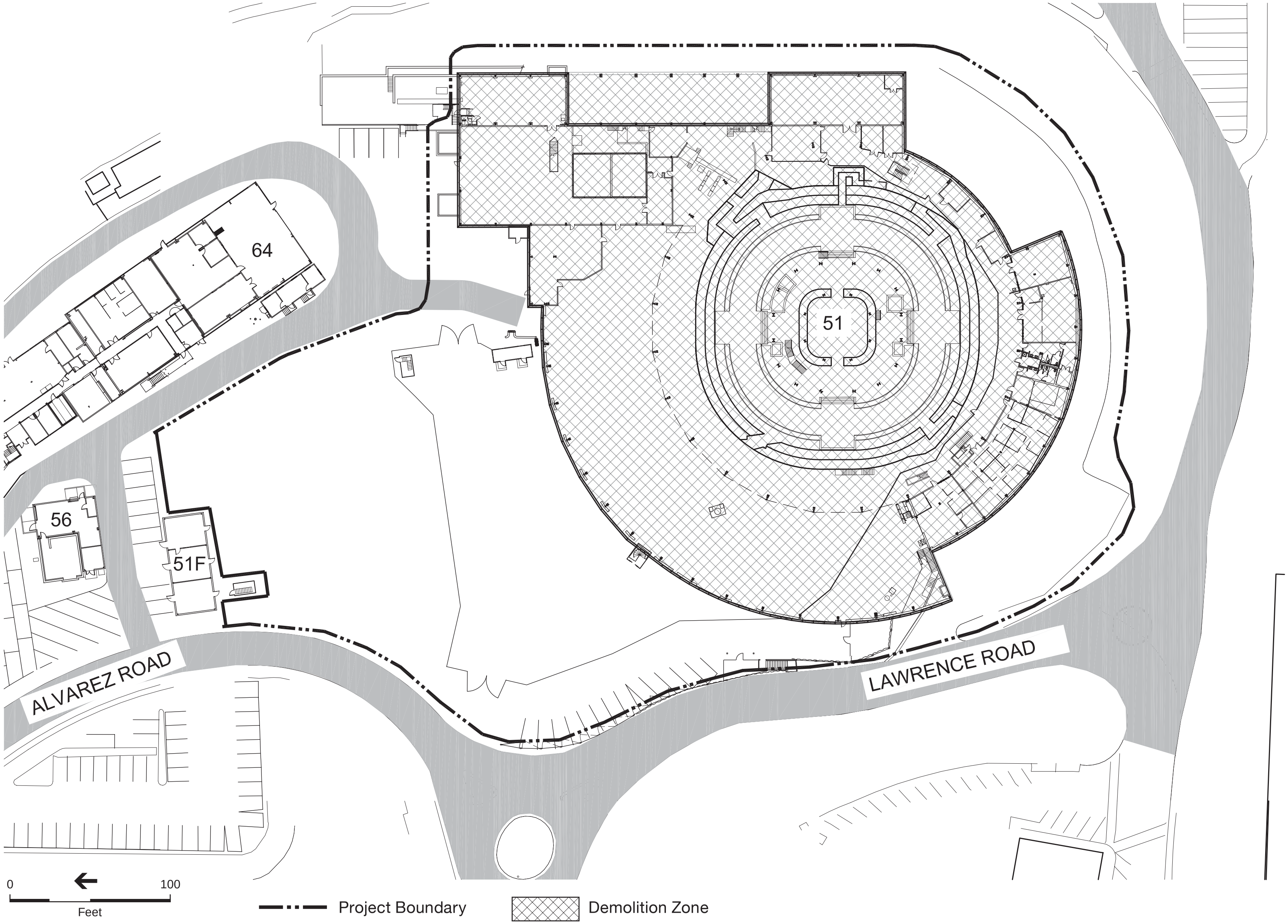
Figure 2
Project Site Location



SOURCE: LBNL (2005)

Demolition of Building 51 and the Bevatron / 204442 ■

Figure 4
Bevatron within Building 51 Section Diagram



SOURCE: LBNL (2005)

Demolition of Building 51 and the Bevatron / 204442 ■

Figure 3
Bevatron within Building 51 Project Area

3.1.3 Project Characteristics/Components

In brief, under the Proposed Action, the concrete block shielding surrounding the Bevatron would be removed, the Bevatron apparatus would be disassembled, Building 51 and the shallow foundation and tunnels underneath the building would be demolished, and the resulting debris and other materials would be removed. Minor site remediation effort would be included as part of this action. The site would then be backfilled, and the fill would be compacted to grade. This would make future reuse of the site more feasible, although further preparatory site work outside of the scope of this project would be necessary.

Depending upon funding, a project variant, under which project activities would be conducted in an alternative sequence, has been developed since publication of the Draft of this Environmental Assessment.[3] The alternative-sequence project variant would begin with appropriate sampling and surveys for hazardous building construction materials and debris, followed by removal and abatement of all hazardous materials within Building 51. Prior to demolition of the building structures, systems and components, the project would set up additional stormwater drainage and collection systems. Once the building was demolished down to the grade level concrete slab, the Bevatron shielding blocks and equipment would be dismantled and removed with the use of two modern mobile cranes. Finally, the project would demolish and remove the building foundations, tunnels, trenches and slabs and backfill with suitable clean fill material. This alternative-sequence variant, if implemented, would not create a new significant impact, nor would it substantially increase the severity of a significant impact associated with the Project or would it require new or altered mitigation measures.

3.1.4 Project Activities

The Proposed Action would entail the removal of approximately 22,000 to 26,000 tons of reinforced concrete, structural steel, siding, glass, and other building materials; 12,000 to 16,000 tons of reinforced concrete shielding blocks that enclose the Bevatron and protected personnel from penetrating radiation produced by the Bevatron when it was in operation; and 12,000 to 15,000 tons of Bevatron materials, mostly metals, such as yokes, support steel and equipment. Approximately half of the shipments of materials that would be generated by the project would consist of non-hazardous debris and other items typical of building demolition projects. The other half of these shipments would be of materials having some hazardous characteristics. Portions of the Bevatron apparatus, its concrete block shielding, and other items have low levels of induced radioactivity above naturally-occurring levels, due to their exposure to neutron and charged particle radiation produced by the Bevatron. Also, there may be small

[3] The alternative-sequence variant was analyzed in a Technical Memorandum dated July 3, 2007, which was included in the Final EIR for the Demolition of Building 51 and the Bevatron as Appendix E. The Bevatron Final EIR was certified on July 19, 2007. The Memorandum is included in this Environmental Assessment as Appendix G. It determined that there would not be an increase in severity of impacts under the alternative-sequence or alternate duration.

amounts of surface radioactivity on some pieces of equipment.[4] The concrete in a small number of shielding blocks contains concentrations of uranium slightly above background levels, and a small number of other shielding blocks are composed of depleted uranium encased in steel. Other types of hazardous materials also would be encountered. For example, the exterior siding of Building 51 is made of transite, an asbestos-containing material, and some surfaces were painted with lead-containing paint.

The duration of the physical work for the project may vary from four to seven years, from mid 2008 through 2011 or beyond, contingent upon funding and results of material sampling. For the purposes of conservative impact assessment, where impacts presumably are intensified in a shorter project timeframe, the project is assumed to take place over a four-year period.[5]

Apart from planning activities and actions to secure the site (e.g., locating and deactivating electrical lines as necessary), the main categories of project activities would be as follows:

Clean-out would remove equipment and materials that are not an integral part of the building structure. This includes the 750 to 800 concrete shielding blocks and the Bevatron itself. The shielding blocks would be removed in advance of the Bevatron components. The Bevatron itself, including steel yokes, magnets, and beamline pipes, would then be disassembled using such means as pneumatic impact tools, saw cutting, and possibly torch cutting. Other large mechanical equipment (e.g., fans and electrical panels) would also be removed, using similar methods.

Demolition would involve removal of the building structure and its shallow foundations. The general sequence of demolition activities would be (1) identification and isolation of building elements to be demolished; (2) abatement of all hazardous materials; (3) demolition of the building structure; and (4) segregation and disposal of the debris.

Manual removal of the external asbestos-containing siding materials, by unbolting fasteners, would be conducted prior to building demolition to prevent creation of airborne particles. Asbestos-containing materials in the roof membrane would be abated. The building superstructure would be dismantled and demolished to the grade level concrete slab. This slab would be surveyed, decontaminated if required, and removed along with the shallow foundation structures and tunnels. Those portions of the concrete slab that are not beneath the building would remain in place. In addition, a cooling tower adjacent to and surrounded on three sides by Building 51 that formerly provided chilled water for air conditioning has been demolished and removed. Deep underground concrete foundations would remain, as would most of the concrete retaining walls that support the hillside above the facility.

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4 Induced radioactivity was produced when energetic particles from the accelerator interacted with elements in items struck by the beam. Surface radioactivity resulted from the presence of radioactive targets that were used in some accelerator experiments. It is anticipated that very limited amounts of surface radioactivity, affecting a small volume of materials, would be encountered.

5 A variant of the project could reduce the minimum duration of the project from four years to three and a half years, but this reduction in schedule would have no resulting effect on project impacts, including traffic impacts. See revised page 76 and Appendix G.

The Building 51 outer wall forms a portion of the retaining walls. In order to keep the hillside in place during and after the building is demolished, approximately 170 feet of new concrete retaining wall would be constructed inside Building 51 prior to the demolition of that building, which would be kept in place after demolition. An alternative would be to reinforce existing walls to retain the hillside.

The particular demolition methods that would be employed have not been finalized. However, the most likely methods for the removal of the superstructure would involve the use of mobile cranes and other heavy equipment for superstructure dismantling, in conjunction with torch and mechanical cutting procedures. The concrete slab and foundations would be demolished using pneumatic, hydraulic, and/or chemical breaking techniques. For the latter, an expansive slurry would be poured into holes drilled into the concrete mass. Over several hours, this product expands through the process of hydration, generating cracks between holes and free faces in reinforced concrete. The slurry hardens into a non-hazardous solid that would be disposed of in the same manner as the concrete itself, and would not pose any contamination issues.

Materials disposition would occur at various stages of the project. About half of the demolition materials would consist of non-hazardous debris and other items typical of demolition projects. The project would seek to reuse or recycle such materials (e.g., uncontaminated metals and concrete) where feasible. Items that could not be salvaged would be sent to appropriate municipal landfills, such as the Altamont Landfill in Livermore, California.

Some materials are not suitable for salvage and cannot be sent to municipal landfills. For example, while it is known that there is no radioactivity above naturally-occurring levels in the outer structure of Building 51, portions of the Bevatron apparatus, the concrete block shielding, and other items have low levels of such radioactivity. Also, some non-radioactive hazardous materials would be encountered, including asbestos, lead, mercury, machine oils, and polychlorinated biphenyls. As part of Berkeley Lab’s Environment, Health and Safety program, sampling and instrument surveys are conducted at various facilities, including Building 51, to characterize the types, locations, and degree of chemical or radiological contamination. Such monitoring would be continued at Building 51 during the project. Potentially contaminated items would be screened and characterized based on their location and the associated degree of potential hazard.

In general, characterization of potentially radioactive materials would be accomplished by taking external radiation measurements using appropriate survey instrumentation and/or swipe samples according to DOE-approved protocols. The results of these surveys would determine the eventual destinations of the materials. For example, concrete shielding blocks that are found to have no detectable DOE-added radioactivity could be transferred to a third party for reuse, transferred to a third party for crushing and recycling, or transported to a landfill permitted to accept this type of waste.

Any items showing detectable DOE-added radioactivity would be sent to an approved disposal site, such as Envirocare in Clive, Utah (a licensed, privately operated facility), or the Nevada Test

Site (a DOE facility approximately 65 miles from Las Vegas). Also, other DOE facilities are permitted to receive and reuse such materials, for example, for their own accelerator operations. However, at this time, no DOE users for Bevatron components or shielding blocks have been found. Based on prior experience, the Laboratory anticipates that less than one-third of the shielding blocks would have detectable DOE-added radioactivity. It is expected that much of the Bevatron apparatus itself will have detectable radioactivity.

Items contaminated with non-radioactive hazardous materials would be sent to treatment and disposal facilities or landfills permitted to receive such items. Mixed waste (i.e., waste that is both hazardous and radioactive) would be handled in accordance with applicable regulations and DOE policies. In addition, the project would comply with the DOE Metals Recycling Moratorium, which restricts metals from radiological areas from being recycled.

Testing, fill replacement, and stabilization would be the final set of field activities. The area to be demolished extends to the exterior of Building 51. Soil under this area would be surveyed for contaminants under the auspices of the Laboratory's Environment, Health, and Safety (EH&S) Division. Residual chemical or radiological contamination, if any, would be addressed by the EH&S Division in consultation with the appropriate regulatory agency. Newly discovered environmental releases of hazardous constituents will meet the notification and corrective action requirements in LBNL's Hazardous Waste Facility Permit (EPA ID. no. CA 4890008986), section IV. B. "Newly Identified Releases". Cleanup standards and methods will be consistent with LBNL's Environmental Assessment and Corrective Measures Study Report for Remediating Contamination at LBNL Regulated under the Resources Conservation and Recovery Act (DOE/EA-1527).

The open area, or demolition zone, which would be approximately 2.25 acres, would then be backfilled with suitable clean fill material and compacted to grade in accordance with engineering requirements. The source of this material would be determined at the time of need, based upon local supply, and would be partially drawn from LBNL stockpiles. It is also likely that some clean residual rubble from the slab and foundations would be used as fill material. Although the Laboratory would use clean LBNL-derived fill material as much as possible, this EA conservatively assumes that half of the project's backfill requirements would be fill certified as clean by the provider and brought in from off-site. The demolition zone would be hydro-seeded with native grasses. Sampling wells for the Laboratory's Environmental Restoration Program would continue to function. The Proposed Action would not add any impervious surfaces to Berkeley Lab. In fact, it would decrease the amount of impervious surfaces. There are no longer any natural drainages on the site, and no streams or rivers would be altered.

Utility systems that traverse the project site and serve other areas would need to remain in continuous operation; thus, new segments would be built to re-route those services prior to disconnection at Building 51. No new utility connections would be required.

If it would be necessary to perform some work activity after sunset or before sunrise, such as truck loading and departure, or to complete a critical phase of work that would not cause important noise or other impacts, the Lab would install night shields on all outdoor fixtures used during demolition activities to minimize potential light and glare spillover impacts.

3.1.5 Related Traffic and Employment

An estimated maximum of about 4,700 one-way truck trips would be required over the four- to seven-year term of the Proposed Action. Most of the trips would be one of two types: (1) trips removing material (inbound trips with empty trucks and outbound trips removing material for appropriate disposal), or (2) trips delivering backfill (inbound trips delivering clean backfill and outbound empty trucks). Other truck trips would be for the delivery of project-related demolition equipment and miscellaneous supplies.

Demolition materials would be staged at or near the project site, inside the LBNL property line. Truck shipments from the site are planned to proceed west on Hearst Avenue, south on Oxford Street, and then west on University Avenue to Interstate 80. Shipments to the site would follow this route in reverse. Demolition work would be conducted approximately 40 hours per week, Monday through Friday. Normal work hours would be between 7:00 a.m. and 3:30 p.m. It is possible that some truck loading and departure would take place on Saturdays or Sundays, although this would be infrequent. No roads would be closed as a result of the action, and no new roads, road extensions, or improvements would be required. Similarly, project equipment (including excavators, front-end loaders, graders, hoe-rams, and mobile cranes) would be staged at or near the site, primarily at the parking lot north of Building 51.

Demolition activities would require temporary workers. Their number would vary over the multi-year demolition period, but is estimated to be about 20 to 25 workers on average per day, with a maximum of up to about 50 workers. For the purpose of calculating traffic impacts, this EA conservatively assumes that all would drive alone to the project site. Parking would be available near the site or elsewhere at LBNL.

3.1.6 Environmental and Workplace Controls

Agency-approved environmental protection measures would be employed as part of the proposed project, including dust and hazardous materials controls specified by Bay Area Air Quality Management District regulations and guidelines; hazardous waste handling in accordance with Cal/EPA, DOE, and other agency requirements; and stormwater pollution prevention measures as required by the San Francisco Bay Regional Water Quality Control Board. Further, as described in Section 3.1.7, below, applicable mitigation measures from Berkeley Lab's program EIR, the 1987 LRDP EIR, as amended (see Chapter 2, Purpose and Need), would be part of this present project. Also, as part of its normal operations, the Laboratory would implement other measures to address site-specific potential environmental impacts.

LBNL has an organizational structure and the technical expertise to self-monitor and control on-site safety and environmental conditions so that LBNL implements DOE and UC policies and procedures, complies with federal and state regulatory requirements, adheres to agreements with other parties, and carries out applicable mitigation measures.

A primary mechanism at LBNL for implementing these requirements and agreements into specific projects is to incorporate them into the general contract terms and conditions for the contractor that will be conducting the demolition work, and then to monitor the contractor's implementation steps and the efficacy of the measures. LBNL or independent technical staff would conduct project-related monitoring and/or oversight to assure that the requisite control measures implemented by the contractor are effective in controlling off-site emissions and on-site health and safety risks.

For the proposed demolition project, a series of reviews has been and continues to be performed by LBNL to identify potential adverse effects and to assess and develop the environmental monitoring and the structural and operational control measures needed to prevent project actions from exceeding relevant standards. LBNL has adapted existing procedures, or has prescribed new specific procedures or performance standards, to assure that the proposed project would be in regulatory compliance. Although not all of these specific procedures or performance standards for the proposed project have been completed, LBNL policy (as described, for example, in various sections of LBNL PUB-3000, Berkeley Lab's Health and Safety Manual; LBNL 2005c), requires that they be complete and in place before work may proceed.

3.1.7 Standard LBNL Project Features

LBNL has identified several environmentally proactive measures in its 1987 LRDP EIR, as amended, that are required in all LBNL projects and development to avoid or minimize potentially important environmental impacts. These mitigation measures have been adopted as part of the LRDP EIR by The Regents of the University of California, and thus are required of all LBNL activities pursuant to the California Environmental Quality Act, and are included as part of this NEPA analysis. Measures relevant to and incorporated into the project description of the Proposed Action are listed in Appendix A of this document.

3.2 Alternatives

3.2.1 No Action Alternative

Under this alternative, the Bevatron would not be dismantled and Building 51 would not be demolished. Radioactive materials, as well as other hazardous materials such as lead dust, oils, and asbestos, would continue to remain in place.

Under this alternative, the induced radioactivity contained in the concrete and other material of the Bevatron would remain on site and continue to decay over time.[6] The facility would remain a

[6] This alternative is also a decay-in-place alternative. The nuclei of radioactive atoms are unstable. Over time, the nuclei will eventually decay by emitting a particle and/or radiation, which transforms the nucleus into another nucleus, or into a lower energy state. The chain of decays continues until the resulting nucleus is stable. Decay for an interval of 10 half-lives would reduce the radioactivity to roughly 1/1000 of the original. Thus, for Co-60, which has a half-life of 5.2 years; decay for 52 years would reduce the Co-60 radioactivity to roughly 1/1000 of its present value.

long-term maintenance and financial drain on LBNL, and would not address the multiple legacy hazards on site. As indicated in the Project Description, the Bevatron has not operated since 1993 and is non-functional. The Building 51 structure housing the Bevatron does not meet current building codes or standards, including seismic design standards, and, as it is relatively old and deteriorating (e.g., roof leaks exist in several locations), it consumes disproportionate maintenance resources. Currently, the building and its contents are in fair to poor condition. Other hazards also exist, e.g. unabated hazards for lead dust, lead paint, and asbestos. Because of these problems, all present occupants are slated for relocation during 2005-2006. Further, under this alternative the deterioration of Building 51 and Bevatron would continue and eventually, the value of the historic resource would be lost. Lastly, this alternative would not include any hazard abatement or seismic upgrade activities, and therefore, long-term impacts to worker or public health could be greater than under the Proposed Action.

3.2.2 Preservation Alternative

Under the Preservation Alternative, the entire site would be dedicated to non-LBNL uses and could be managed by another public agency, such as the National Park Service, with the intention of actively preserving Building 51 and the Bevatron equipment within it. The public agency would maintain and preserve the building in accordance with the *Secretary of the Interior's Standards for Preservation*, and would allow limited public access for interpretive/educational purposes. These Standards for Preservation define Preservation as "the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project." This alternative would also allow some level of abatement of hazardous materials, such as lead and asbestos removal, to the extent that abatement can be accomplished while maintaining the Bevatron equipment in place.

This alternative would not achieve most of the Laboratory's goals for the site. Apart from the other disadvantages of the Preservation Alternative, the facility would still require long-term maintenance and substantial financial investment for clean-up and refurbishment. This would include such things as significant re-roofing and exterior waterproofing. Reinforcement may be required to strengthen the structure. New rollup doors would also be required to replace those that were either removed or are inoperable. The facility would have to be patrolled periodically to prevent unauthorized uses due to the continuing presence of hazardous materials, and, as would be the case for any unoccupied building, to ensure that it did not become occupied by unwanted animals or pests.

3.2.3 On-Site Rubbling Alternative

Under the On-Site Rubbling Alternative, the Proposed Action activities would remain the same with the exception of activities related to concrete. A local "crushing plant" operation would be set up in the work zone outside of Building 51. Two large (approximately 35 feet [length] by 15 feet [width] by 10 feet [height]) diesel-powered concrete crushing machines would form the core of the operation. Concrete from shielding, the building walls, and the floor and foundation would be broken up using the crushing equipment. Following initial crushing, the material would require transfer by heavy equipment for processing through a second crusher to achieve the uniform sizing necessary to make the material attractive for reuse.

Under this alternative, most of the concrete from the building structure (i.e., walls and floors), foundation, and many of the concrete blocks shielding the Bevatron would be rubbled on-site. Metal (e.g., rebar) in the debris would be separated and disposed of separately. Only concrete free of detectable added (i.e., non-naturally-occurring) radioactivity and otherwise clear of contaminants would be rubbled. The rubbled material and segregated reinforcing steel would be recycled if public or private sector demand was available at the time of production. If not, it would be disposed of at a landfill. LBNL could use the rubble as aggregate or fill material if the need for such materials coincided with their production, although this is speculative at the present time.

This alternative would share most of the advantages and disadvantages of the proposed project, although impacts would vary in some respects (e.g., this alternative would result in increased dust generation). However, sufficient space adjacent to Building 51 does not currently exist for this alternative to be feasible, and a site or sites would have to be made available elsewhere at LBNL, at a sufficient distance from off-site sensitive receptors to avoid nuisance impacts.

3.2.4 Alternatives Considered but Rejected as Infeasible

Adaptive Reuse Alternative

An Adaptive Reuse Alternative would keep as much of the Building 51 structure as practical, remove the Bevatron and other unused equipment, and construct new offices or laboratories inside the structure. Under this alternative, the building would be structurally upgraded. This would include extensive rebuilding to seismically update the building and to meet current building code requirements. The roof and exterior cladding and window systems would be removed and replaced with insulated and weather-tight roofing, glazing, and siding; mechanical and electrical systems would be removed and replaced with updated systems; and existing hazards such as lead dust, lead paint, and asbestos would be abated.

This alternative would also eliminate most of the existing potential hazards associated with Building 51, and reduce some of the burden on existing LBNL maintenance resources, although not to the extent achieved by the proposed project. Costs for hazard abatement and Bevatron and equipment removal would be similar. However, this alternative would be more costly, in terms of building and safety code compliance. The building does not meet modern fire/life safety regulatory codes or seismic requirements, and to upgrade it with fire proofing, fire separations, and structural enhancements would prove to be cost prohibitive. Compared with new construction, costs per square foot for building-wide renovation, including complete rebuilding of heating, ventilation, and air conditioning; electrical; communication; and plumbing systems would likely be greater, while the quality and configuration of the resulting space would be less desirable and inefficient for modern laboratory or office uses.

Finally, this alternative would not meet the other objectives of the proposed project, such as helping to meet the DOE policy requiring that the square footage of new construction at a DOE facility be balanced by elimination of an equivalent amount of excess space.

Encasing the Facility as a Central Courtyard Feature for Future Development at the Site

Under this alternative, which was suggested by members of the public, the Bevatron and Building 51 would be enclosed within a new building superstructure and utilized as a central design feature for any future development that may occur at the project site. This alternative is essentially another version of a preservation alternative, and would have similar advantages in avoiding impacts to cultural resources, and similar disadvantages in requiring major upgrades to the building and in not fulfilling the objectives of the proposed project. Also, this alternative would entail significant additional costs in creating the new building superstructure.

CHAPTER 4.0
Affected Environment

4.1 Regional and Local Setting

LBNL is located in the cities of Berkeley and Oakland in Alameda County on land owned by the University of California. The project site comprises approximately four acres. Of this total, approximately 2.25 acres (the “demolition zone”) would be converted from developed area (i.e., occupied by Building 51) to an undeveloped area for an indeterminate time, until another use for this area is proposed, approved, and initiated. The remaining acreage would be used for parking and staging. The site is located within the City of Berkeley portion of LBNL, in the west-central part of LBNL, and is located adjacent to Lawrence Road (from which vehicles enter and leave the site) and McMillan Road within Berkeley Lab. Laboratory, office, engineering, and computing functions occupy the LBNL buildings immediately adjacent to Building 51. Open space or landscaped areas border the site immediately to the east and north. Surrounding land uses include residential areas to the north of the LBNL property line; LBNL buildings and UC Berkeley athletic fields to the south; LBNL buildings, non-UC Berkeley residences, and UC Berkeley student housing, amphitheater, and classrooms to the west; and additional LBNL buildings and the UC Berkeley Lawrence Hall of Science to the east. Building 51 is approximately 1,100 feet from the nearest residences to the west and north, and about 1,300 to 1,400 feet from the Lawrence Hall of Science to the east.

4.2 Environmental Resources Potentially Affected

4.2.1 Air Quality

The project site is located in the city of Berkeley and is within the boundaries of the San Francisco Bay Area Air Basin (Bay Area). Storm tracks typically stay north of the Bay Area for much of the year. Berkeley’s proximity to the Pacific Ocean also contributes to its moderate climate. The annual temperature at Berkeley Lab averages in the mid 50s (degrees Fahrenheit). Low temperatures during winter months seldom drop below the mid 30s, while the warmest days of the summer infrequently see high temperatures that exceed 80 degrees Fahrenheit. Daily and seasonal oscillations of temperature are small because of the moderating effects of the nearby ocean. In contrast, rainfall generally tends to be confined to the period from early November through late April or early May. On average, Berkeley Lab receives about 30 inches of rainfall annually. The annual total can vary considerably, depending on climatic conditions, such as drought. Winds in the Berkeley area display several characteristic patterns. During the day, especially under fair weather conditions, winds are typically from the west and northwest as air comes in off the Pacific Ocean. At night, cooling of the land generates winds from the east and southeast. Southeast winds typically also precede weather systems passing through the region.

Criteria Air Pollutants

The federal Clean Air Act of 1970 and its amendments established maximum allowable concentration standards for six ambient air pollutants known as "criteria" pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter (respirable PM_{10} and fine $PM_{2.5}$), and lead.[1] Each of these standards was set to meet specific public health and welfare criteria. Individual states were given the option to adopt more stringent state standards for criteria pollutants and to include other pollutants. California has done so through the California Clean Air Act.

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with regulatory authority over stationary sources in the Bay Area, while the California Air Resources Board (CARB) has regulatory authority over mobile sources such as construction equipment, trucks, and automobiles throughout the state. The BAAQMD has the primary responsibility to meet and maintain the state and federal ambient air quality standards in the Bay Area.

Both the federal and state Clean Air Acts require that air basins, or portions thereof, be classified as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the federal and state standards have been achieved. The Bay Area Air Basin is currently designated nonattainment for the state ozone standards and the federal 8-hour ozone standard, though ozone levels measured at monitoring stations in Berkeley and Oakland[2] have not exceeded either standard in recent years. Ozone and ozone precursors such as reactive organic gases (ROG) and nitrogen oxides (NO_x) are the pollutants of greatest concern in the Bay Area. The Bay Area also is designated as nonattainment for the state PM_{10} standard and the state $PM_{2.5}$ standard. The Bay Area is designated as either attainment or unclassified with respect to all other pollutants.

There have been no exceedances of the state and the federal 1-hour ozone standards in the last five years at the monitoring sites nearest Berkeley Lab. There have been no exceedances of state and federal ambient carbon monoxide standards at the Alice Street station in Oakland in the last five years. Data from the monitoring station in Fremont indicate that there were two days over the state 24-hour PM_{10} standard in 2000, three in 2001, one in 2002, and none since. The standards for the other criteria pollutants (i.e., nitrogen dioxide [NO_2], sulfur dioxide [SO_2], and lead) are being met in the Bay Area, and the latest pollutant trends suggest that these standards will not be exceeded in the foreseeable future (CARB, 2005b).

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1 PM-10 and PM-2.5 consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. A micron is one-millionth of a meter, or less than one-25,000th of an inch. For comparison, human hair is 50 microns or larger in diameter. PM-10 and PM-2.5 represent particulate matter of sizes that can be inhaled into the air passages and deep into the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of aerosol-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles (PM-2.5) of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility.

2 The BAAQMD operates a regional monitoring network that measures the ambient concentrations of the six criteria pollutants. The station closest to the project site is the Alice Street station in Oakland, approximately six miles south of the project site. This station monitors ozone and carbon monoxide. The nearest station that monitors size-specific particulate matter (PM_{10} and $PM_{2.5}$) is located at Chapel Way in Fremont, approximately 30 miles southeast of the project site. The project site is considered typical of urban areas in the East Bay, so PM_{10} and $PM_{2.5}$ concentrations at the Fremont station provide some indication of likely concentrations at the project site.

Toxic Air Contaminants (Diesel Particulate Matter)

Toxic air contaminants (TACs) are air pollutants that may cause or contribute to an increase in mortality or an increase in serious illness, or may pose a present or potential hazard to human health. The CARB, California's air quality management agency, recognizes hundreds of substances as toxic air contaminants. CARB identified diesel particulates, referred to as diesel particulate matter or DPM, as a TAC in August 1998 (CARB, 2005a). While some other TACs could be expected to be present at the site or could be used in the proposed demolition, the potential hazard from these TACs would be much smaller than the potential hazard from the particulate emissions from diesel-fueled engines of the demolition equipment and haul trucks. For this reason, it is sufficient to consider DPM alone in determining impact.

The central issue of concern with DPM is the risk of chronic heath effects associated with long-term exposure to these particulates. To address this risk, CARB developed a risk management guidance document and risk reduction plan to reduce DPM and resultant health risk by 75 percent in 2010 and 85 percent by 2020. Since approval of these documents in September 2000, CARB has adopted a series of rules for stationary and portable diesel engines, solid waste collection vehicles, transport refrigeration units, and idling of diesel vehicles. Additional measures and specific regulations to reduce DPM emissions will be evaluated and developed over the next several years. In addition, in May 2004, the U.S. Environmental Protection Agency (EPA) adopted a comprehensive national program known as the Clean Air Nonroad Diesel Rule to reduce emissions from future nonroad diesel engines by more than 90 percent by integrating engine and fuel controls (EPA, 2004). As part of the Clean Air Nonroad Diesel Rule, EPA introduced sulfur content requirements for highway diesel fuel. The highway vehicle diesel fuel sulfur limit, which was originally 5,000 parts per million (ppm), was first revised to a limit of 500 ppm (low sulfur fuel), and then further reduced to 15 ppm (ultra-low sulfur fuel), beginning, for retail and wholesale consumers, on October 15, 2006. The 15 ppm sulfur limit is required to prevent the malfunction of catalyzed filtration systems that are needed to meet the future diesel engine emission standards. These federal limits on sulfur in fuel apply only to fuel for highway vehicles. CARB regulations mandate the same sulfur content for highway diesel fuel as do the EPA regulations, except that the effective date for retail and wholesale consumers is September 1, 2006.

Nonroad vehicle federal restrictions on sulfur content in diesel fuel follow a different schedule. The 2004 EPA Nonroad Diesel rule limits the sulfur in nonroad fuels to 500 ppm effective June 1, 2007, and 15 ppm effective June 1, 2010. Subsequent to these federal restrictions for nonroad engines, CARB moved up the dates for compliance with sulfur restrictions and on December 14, 2004, required that nonroad diesel fuel sold in California, except for diesel fuel used for locomotives or marine engines, must meet the same sulfur restrictions as fuel used for highway vehicles. In this case, the sulfur content in fuel for nonroad engines in California must not exceed 15 ppm as of September 1, 2006, rather than EPA date of June 2010.

Sensitive Receptors

Some land uses are known as “sensitive receptor areas” because people there are considered more sensitive to air pollutants than others for reasons that include pre-existing health problems, proximity to emissions source, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered relatively sensitive to air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are also considered sensitive to air quality because people such as children, elderly people, and the infirm (i.e., those most susceptible to air-quality related health problems) usually stay home for extended periods of time, with associated greater exposure to ambient air quality in residential areas. Recreational uses are also considered sensitive receptors because vigorous exercise associated with recreation places a high demand on the human respiratory system.

Sensitive receptor areas in the vicinity of the project site include residential areas and nearby dormitories associated with the University. The nearest sensitive receptors are the single- and multi-family residences to the southwest and single-family residences to the north of the project site. These areas are generally not downwind of the site, given that the predominant daytime winds are from the west and northwest, and those predominant winds would carry airborne emissions from the project site away from those sensitive receptors.

4.2.2 Biological Resources

LBNL is located on the western slopes of the Oakland-Berkeley Hills, where low- to moderate-density residential neighborhoods are mixed with open space containing a mosaic of vegetation types and wildlife habitats, including oak and mixed evergreen forests, native and non-native grasslands, chaparral, coastal scrub, marsh and wetland communities, and riparian scrubs and forests. The Lab is within a mile of several large tracts of relatively undeveloped open space and preserved land, including Tilden Park and Claremont Canyon Preserve, which are themselves contiguous with undeveloped East Bay Municipal Utility District (EBMUD) watershed lands. The Lab consists of a mix of built and undeveloped spaces, where activities range from industrial-scale operations and construction to minimally invasive vegetation management, often adjacent to one another. The Building 51 site is located in the northern portion of LBNL, an area that is approximately two-thirds developed and one-third open space. The site is thus surrounded by existing buildings and fragmented areas of open space. The site is part of a substantial plateau that was graded (cut and filled) for development into a northeast to southwest sloping hillside.

The Building 51 site itself is almost entirely developed, with the exception of two small areas of ornamental landscaping adjacent to the front entrance, although adjacent vegetated areas provide potential habitat for common and special-status wildlife species.[3] Vegetation types in the vicinity

3 The term “special-status species” includes species that are listed and receive specific protection defined in federal endangered species legislation. The term also includes other species that have not been formally listed as threatened or endangered but have been designated as species “of concern,” or as “rare” or “sensitive” on the basis of adopted policies and expertise of federal resource agencies or organizations with acknowledged expertise, including the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (now known as “NOAA Fisheries”). For purposes of this analysis, State of California designations are also included; that is, species

include annual grassland, coast live oak woodland, California bay woodland, oak-bay woodland, conifer stand, eucalyptus stand, and landscaped areas. Common wildlife observed at the proposed site, as well as in other similarly developed sites during field surveys throughout the LBNL hillside area (ESA, 2005; ESA, 2002a, 2002b, and 2002c; and ESA, 2003a, 2003b) includes species tolerant of human presence such as California mule deer (*Odocoileus hemionus californicus*), fox squirrel (*Scirius niger*), California towhee (*Pipilo crissalis*), chestnut-backed chickadee (*Poecile rufescens*), and western scrub jay (*Aphelocoma coerulescens*). No special-status plants or wildlife have been identified on the Building 51 project site or elsewhere at LBNL during field surveys (ESA, 2005; ESA, 2002a, 2002b, and 2002c; and ESA, 2003a, 2003b), although nine special-status animal species are judged to have at least a moderate potential to occur, based on habitat conditions. **Table 1** lists these species.[4]

Of these species, Cooper's hawk, sharp-shinned hawk, red-tailed hawk, American kestrel, great horned owl, and olive-sided flycatcher may all potentially make use of the oak, conifer, or eucalyptus trees in the vicinity of the Building 51 project site for nesting purposes. Bewick's wren may potentially use coast live oaks or landscaped areas adjacent to Building 51 for nesting. Long-eared and fringed myotis may potentially establish maternal roosts in trees with cavities, such as oaks, conifers, and eucalyptus that occur in the project vicinity.

Under Section 9 of the federal Endangered Species Act, a "take" is defined as an act to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect or to attempt to engage in any such conduct." Therefore, for special-status birds, this EA considers direct removal of nesting substrate or the destruction of nests and eggs, as well as indirect impacts such as noise generated by construction, which can result in disturbance of breeding birds, nest abandonment, and mortality of young, as "take" under the regulations protecting special-status species. For special-status bats, destruction of maternal roosts or indirect impacts resulting in maternal roost abandonment are considered as "take."

Generally, the potential for special-status plant species to occur at LBNL is low; none have been observed in past environmental studies prepared for LBNL (LBNL, 1992; LBNL, 1994; LBNL, 1997b; and SAIC, 1994), and none were observed during recent general biological resource

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identified by the California Department of Fish and Game (CDFG) and the California Native Plant Society,. Specifically, the following categories are included: federally listed endangered and threatened species; species proposed for listing as endangered or threatened; candidates for such listing; federally identified species of concern and species of local concern; state-listed endangered and threatened species, and rare (plants only) species; California Species of Special Concern; species designated "special animals" by the state; "fully protected" species (of which there are about 35, most of which are also listed as either endangered or threatened); and raptors (birds of prey), which are specifically protected by Fish & Game Code Section 3503.5, which prohibits the take, possession, or killing of raptors and owls, their nests, and their eggs. The inclusion of birds protected by Fish & Game Code Section 3503.5 is in recognition of the fact that these birds are substantially less common in California than most other birds, having lost much of their habitat to development, and the recognition that the populations of these species are therefore substantially more vulnerable to further loss of habitat and to interference with nesting and breeding than are most other birds. It is noted that a number of raptors and owls are already specifically listed as threatened or endangered by state and federal wildlife authorities.

4 Alameda whipsnake (*Masticophis lateralis euryxanthus*), federally listed as "threatened," has not been sighted at LBNL, although suitable habitat may be present on the Lab site. However, this would most likely be at the eastern corner of the Lab property, contiguous with open space to the north and east. Suitable habitat is not present at or near Building 51. Critical habitat for the species was re-proposed in October 2005 (USFWS, 2005d) and, as adopted in October 2006 (USFWS, 2006), includes the easternmost portion of the Lab site.

surveys (ESA 2002a, 2002b, 2002c and ESA, 2003a, 2002b). The LBNL hill site as a whole has been subject to ongoing disturbance, first in the form of grazing and then in the form of development, for the past 200 years. These types of disturbances, combined with the introduction of highly competitive non-native plant species, have resulted in the extirpation of a number of plant species that were documented in the Berkeley area in the late 1800s and early 1900s. In addition, the suppression of fire in the urbanized hills has resulted in mature stands of scrub and woodland with dense canopy cover and little understory, further reducing the likelihood for herbaceous species to be present. LBNL aggressively manages vegetation on virtually the entire

TABLE 1
SPECIAL-STATUS SPECIES POTENTIALLY PRESENT IN PROJECT AREA

Common Name *Scientific Name*	**Listing Status USFWS/ CDFG**	**General Habitat**	**Potential for Species Occurrence within the Project Area**	**Period of Identification**
Birds				
Cooper's hawk *Accipiter cooperi*	--/CSC	Nests in riparian growths of deciduous trees and live oak woodlands	**Moderate potential.** Nesting habitat is available adjacent to project site. Observed with kill upslope from Blackberry Canyon gate (ESA, 2003a).	March–July
Sharp-shinned hawk *Accipiter striatus*	--/CSC	Nests in riparian growths of deciduous trees and live oaks	**Moderate potential.** Potential nesting habitat is present on the north fork of Strawberry creek, low potential to forage in and around project site.	March–July
Olive-sided flycatcher *Contopus cooperi*	FSC/--	Inhabits open conifer or mixed woodlands; nests in large coniferous trees	**Moderate potential.** Suitable perching, foraging and nesting habitat is present adjacent to project site, but species is relatively rare in East Bay Hills.	May–August
Bewick's wren *Thryomanes bewickii*	FSC/--	Inhabits chaparral, scrub, and landscaped areas; may also be found in riparian and edges of woodland habitats	**Moderate potential.** Preferred habitat is present throughout LBNL. Species has potential to nest in landscape shrubs and oaks on and adjacent to project site.	Year-round
Great horned owl *Bubo virginianus*	--/3503.5	Often uses abandoned nests of corvids or squirrels; nests in large oaks, conifers, eucalyptus	**Moderate potential.** Suitable nesting habitat occurs in eucalyptus and conifer stands adjacent to project site.	Year-round
Red-tailed hawk *Buteo jamaicensis*	--/3503.5	Usually nests in large trees, often in woodland or riparian deciduous habitats	**Moderate potential.** Suitable nesting habitat is present in stands of large trees adjacent to site. Observed foraging at LBNL (ESA, 2002a).	Year-round
American kestrel *Falco sparverius*	--/3503.5	Frequents generally open grasslands, pastures, and fields; primarily a cavity nester	**Moderate potential.** Observed foraging at LBNL (ESA, 2003b). Potential nesting habitat available in cavities in mature oaks or pines adjacent to project site.	Year-round
Mammals				
Long-eared myotis *Myotis evotis*	FSC/--	Inhabits woodlands and forests up to approximately 8,200 feet in elevation; roosts in crevices and snags	**Moderate potential.** Suitable foraging and roosting habitat is present in project area.	March–August
Fringed myotis *Myotis thysanodes*	FSC/--	Inhabits a variety of woodland habitats, roosts in crevices or caves, and forages over water and open habitats	**Moderate potential.** Suitable foraging and roosting habitat is present in project area.	March–August

Status codes:

FEDERAL: (U.S. Fish and Wildlife Service [USFWS])
FSC = Federal species of concern; may be endangered or threatened, but not enough biological information has been gathered to support listing at this time

STATE: (California Department of Fish and Game [CDFG])
CSC = California Species of Special Concern
3503.5 = California Fish and Game Code Section 3503.5, Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls)

hill site for fire protection. Through the reintroduction of grazing, as well as fuel reduction by mechanical means, LBNL has converted both coastal scrub habitat and stands of eucalyptus and French broom to grassland in recent years. Although small areas of patchily distributed native grasses remain scattered throughout LBNL, the native herbaceous species observed in these areas are those that are commonly found throughout the Oakland-Berkeley Hills (ESA 2002a, 2002b, 2002c and ESA, 2003a, 2002b). Generally, less common species in the hills tend to be found on serpentine or other ultramafic soils or on thin soils, such as occur in roadcuts, where non-native species do not compete as readily. These types of soils were not observed at LBNL during ESA's field surveys. The Building 51 site itself is fully developed, precluding the establishment of plant cover; the grassy and wooded slopes directly adjacent upslope are not expected to support special-status plants for the reasons outlined above.

There are no wetlands or streams located on the Building 51 project site, and the site is located approximately 500 feet south of the head of the north fork of Strawberry Creek. Therefore, there is no potential for the Proposed Action to affect any streams or other "waters of the United States" that would fall under the jurisdiction of the U.S. Army Corps of Engineers, and this topic will not be discussed in the impacts analysis.

4.2.3 Cultural Resources

The entire lab property, including the project site, was surveyed in 2000 for the presence of potential archaeological and historical resources. No indications of historic or prehistoric archaeological resources eligible for listing on the National Register of Historic Places were encountered (Kielusiak, 2000). The Northwest Information Center has indicated there is a "low potential for Native American sites in the project area" and thus "a low possibility of identifying Native American or historic-period archaeological deposits in the project area" (Northwest Information Center, 2003). Native American archaeological sites in this portion of Alameda County tend to be situated on terraces along ridgetops, midslope terraces, alluvial flats, and near sources of water. As the project site is not located on these types of terrain and it is not adjacent to Strawberry Creek, historically the primary natural source of water in the area, there is a low potential for Native American sites to exist at the project site.

In terms of historic buildings, field surveys and historic research is being conducted at LBNL by a team of licensed cultural resource professionals to evaluate the potential for historically important buildings or structures. In coordination with LBNL, DOE, and the State Office of Historic Preservation (SHPO), this team is systematically investigating and reporting on all previously unsurveyed buildings and structures at the Lab. Upon completion, these reports will be submitted to SHPO for review and concurrence.

One historic resource eligible for listing in the National Register of Historic Places (NRHP) has been identified on the project site: Building 51 and the Bevatron equipment within it. Construction of Building 51 began in 1949, and the building was occupied in 1950. When the Bevatron began operating in 1954, it was the world's largest and highest energy accelerator, designed for the study of high-energy nuclear processes of cosmic energy range. Four Nobel Prizes were awarded for discoveries in the field of physics that were made at the Bevatron.

Additions and structural changes to Building 51 and modifications to the Bevatron continued until the facility was closed by the DOE in 1993.

The State Office of Historic Preservation assigned Building 51 a rating of “2S2,” which is defined as an “individual property determined eligible for the NRHP by consensus through Section 106 process. Listed in the California Register” (CSOHP, 2003; CSOHP, 2004).[5] As such, both the structure of Building 51 and the Bevatron accelerator equipment within it form a single historic resource, since Building 51 was purposefully designed and built to house the Bevatron.

In accordance with Section 106 of the National Historic Preservation Act (NHPA), LBNL has consulted with the SHPO and the Advisory Council on Historic Preservation (ACHP) regarding effects of the demolition of Building 51 and the Bevatron equipment within it, which are discussed in Section 5.1.3, Cultural Resources.

4.2.4 Geology and Soils

The project site is situated on the western slopes of the Oakland-Berkeley Hills, which are raised uplands of the Diablo Range located between the Hayward Fault on the west and the northern Calaveras Fault Zone to the east. Building 51 is underlain by what geologic mapping identifies as sandstone, siltstone, and mudstone bedrock of the Great Valley Complex (Graymer, 2000). Geologic mapping is consistent with bedrock observed in road-cut exposures along Cyclotron Road which consist mostly of sandstone, with some interbedded mudstone (Fugro West, Inc., 2002a, 2002b, and 2002c).

The steep sloping hillsides of the Oakland-Berkeley Hills characterize the general topography throughout the majority of the LBNL site. Building 51 is constructed on a series of graded level areas adjacent to vegetated natural or manmade slopes, some of which reach a steepness of up to 100 percent. Given the degree of grading on the LBNL site, many of the slopes are supported by retaining structures or have otherwise been engineered for stability. Level, graded areas are connected by sloping roads and pedestrian walkways. The Building 51 site is located on one of the larger graded, near-level areas on the LBNL site with elevations varying between approximately 720 and 760 feet above mean sea level. The northeast side of the project site is bound by an upsloped area with average gradients approaching 60 percent while to the west of Building 51, past the parking lot across Lawrence Road**,** the hillside slopes downward, in places at slopes approaching 100 percent (USGS, 1980).

The U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) (formerly known as the Soil Conservation Service) has characterized the majority of Building 51 site soils as Maymen loam, 30- to 75-percent slopes. Maymen loam is a shallow, moderately permeable soil that exhibits rapid to very rapid runoff and has a high to very high erosion hazard (USDA, 1981).

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5 Section 106 of the National Historic Preservation Act is a consultation process which requires federal agencies to consult with the Advisory Council on Historic Preservation on federal actions which may affect a building or structure listed in, or eligible for listing in, the National Register of Historic Places.

The San Francisco Bay Area contains both active and potentially active faults and is considered a region of high seismic activity.[6] The USGS Working Group on California Earthquake Probabilities has evaluated the probability of one or more earthquakes of Richter magnitude 6.7 or higher occurring in the San Francisco Bay Area within the next 30 years. The result of the evaluation indicated a 62-percent likelihood that such an earthquake event will occur in the Bay Area between 2003 and 2032 (USGS, 2003).

Ground movement during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material. The composition of underlying soils, even those relatively distant from faults, can intensify ground shaking. The Modified Mercalli (MM) intensity scale is commonly used to describe earthquake intensity and its effects on people or buildings due to ground shaking. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total); intensities ranging from IV to X could cause moderate to significant structural damage (CGS, 2002).[7] At LBNL, maximum ground shaking intensity resulting from an earthquake generated on the Hayward Fault, discussed below, is anticipated to be very violent with a Mercalli Intensity of X (ABAG, 2003).

The project site is immediately adjacent to the Hayward Fault Zone and approximately 19 miles northeast of the active San Andreas Fault Zone. Other principal faults capable of producing significant ground shaking at the project site are the San Gregorio-Hosgri, Calaveras, Concord–Green Valley, Marsh Creek–Greenville, and Rodgers Creek faults. The USGS Working Group on California Earthquake Probabilities estimates that there is a 27-percent chance that the Hayward–Rodgers Creek Fault System will experience an earthquake of magnitude 6.7 or greater in the next 30 years (USGS, 2003). Two active traces of the Hayward Fault are close to but not within the project site; the nearest ("Main Trace") is approximately 1,000 feet downslope, southwest of the project site, while the West Trace is located an additional 100 to 150 feet west (CGS, 1982). The USGS Working Group on California Earthquake Probabilities recently estimated that there is a 21-percent chance of the San Andreas Fault experiencing an earthquake of magnitude 6.7 or greater in the next 30 years (USGS, 2003).

4.2.5 Hazards and Human Health

Hazardous Materials and Waste

Hazardous materials are substances with certain physical and/or chemical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed of, or otherwise managed. Hazardous materials are grouped into the following

[6] An "active" fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years). A "potentially active" fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive. "Sufficiently active" is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (Hart, 1997).

[7] The damage level represents the estimated overall level of damage that will occur for various MM intensity levels. The damage, however, will not be uniform. Some buildings will experience substantially more damage than this overall level, and others will experience substantially less damage. Not all buildings perform identically in an earthquake. The age, material, type, method of construction, size, and shape of a building all affect its performance.

four categories, based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), and reactive (causes explosions or generates toxic gases).[8] Hazardous materials are commonly used in commercial, agricultural, and industrial applications, as well as in residential areas to a limited extent. A hazardous waste is any hazardous material that is discarded, abandoned, disposed, or in some cases is to be recycled. The same criteria that render a material hazardous also make a waste hazardous.[9]

Hazardous Materials Potentially at Building 51

A number of hazardous materials were used or generated at Building 51. Among these are asbestos-containing materials used in the construction of Building 51, polychlorinated biphenyls (PCBs) and mercury used in electrical or research equipment, lead used as shielding during operation of the Bevatron, lead-based paint used in the building, radioactivity in Bevatron components and shielding, and beryllium in Bevatron beamline targets, as well as other chemicals or radioactive materials.

Major examples of hazardous materials that may be encountered in the course of the proposed demolition project are described below, along with the LBNL approach to dealing with these materials. Estimates of the quantities and destinations of the hazardous and non-hazardous materials that would be sent off-site are presented in **Table 5** in Section 5.1.9, Public Utilities Impacts.

Radioactive Materials

While it is known from previous surveys that there is no radioactivity above naturally occurring levels in the outer structure of Building 51,[10] portions of the Bevatron apparatus, its concrete block shielding, and other items have low levels of radioactivity above naturally occurring levels. All of the radioactive waste that would be generated by the Proposed Action would be classified as low-level radioactive waste, or mixed waste containing low-level radioactive waste, as discussed below. Three main types of low-level radioactive waste would be sent off-site as a result of the Proposed Action:

- <u>Volume contamination</u>. Some concrete shielding blocks and concrete foundation, metal Bevatron components, and miscellaneous items (e.g., some tools) have volume contamination from induced radioactivity. For many years, the Bevatron accelerator beams produced thermal neutrons as a byproduct of normal operations for research experiments. These neutrons had the ability to penetrate into solid items to varying depths depending on the properties of the material. This process has resulted in low levels of induced radioactivity contained within the matrix of the present-day concrete and metals. This induced radioactivity is securely contained within the matrix of the concrete and metal and cannot be removed or transferred by simple contact with the surface of the concrete.

  There is little likelihood of induced activity in the majority of the concrete shielding blocks, as only the blocks closest to the beams produced by the Bevatron were exposed to thermal neutrons. Surveys to date of similar blocks found within the Building 51 complex confirm

8 Title 22 of the California Code of Regulations, Division 4.5, Chapter 11, Article 3.
9 California Health and Safety Code, Section 25151.
10 *Protocol for Survey and Release of Bevatron Materials* (June 30, 2005).

that most blocks have no detectable induced activity. Those that have induced activity have low levels of such activity. This low-level induced activity is of a magnitude similar to the natural radioactivity within the concrete, which typically ranges from 15 to 30 picocuries[11] per gram (pCi/g) total activity. This background radioactivity originates from the elements within crushed stone aggregate that is present in all concrete, and comes primarily from the decay of naturally-occurring radioisotopes of potassium, uranium and its decay series, and thorium and its decay series. The induced radioisotopes that are contained within the concrete shielding include cobalt-60, europium-152/154, barium-133, and cesium-137.

In the Bevatron accelerator apparatus itself, the most prevalent material is steel, with a substantial amount of copper and minor amounts of aluminum and other metals. Preliminary surveys indicate that while a greater proportion of the metals may be activated, the range of activity will be similar to that found in the concrete blocks. The primary isotopes in metals are cobalt-60, titanium-44, and iron-55.

- Surface contamination. A far smaller number of items may have surface contamination. Surface radioactivity resulted from the disintegration of radioactive targets that were used in some accelerator experiments. As a result of particle beam collisions with these targets, some interior surfaces of the beam tube were contaminated with low levels of various radioactive materials. It is anticipated that very limited amounts of surface radioactivity, affecting a small volume of materials, would be encountered.

- Uranium. Two types of shielding blocks contain uranium in excess of naturally occurring amounts. As a result of the materials or processes used in their manufacture to increase their density, a small number of blocks may have concentrations of uranium that cause the radioactivity of these blocks to be above background levels.[12] A small number of other blocks are composed of solid depleted uranium metal encased in steel.[13]

Materials that LBNL has reason to suspect might contain radioactivity would be characterized[14] by taking external radiation measurements using appropriate survey instrumentation and/or swipe samples according to DOE-approved protocols. Following characterization, the different categories of radioactive waste discussed above would be handled as follows:

- Volume contamination. DOE requires that waste items that have detectable DOE-added induced radioactivity (i.e., radioactivity above the background level that is added while the materials are at a DOE site or under DOE control) are to be managed as radioactive waste. For this Proposed Action, as set out in the LBNL EH&S Protocol for Survey and Release of Bevatron Materials (June 30, 2005), the DOE Berkeley Site Office has approved methods that can detect radioactivity down to 2 pCi/g of radioactivity above background.[15] The Laboratory anticipates that less than one-third of the shielding blocks, as well as some

[11] A picocurie is a combination of the Curie, a basic unit of measurement of the rate of radioactive decay, and the prefix pico, which modifies that unit to be 1/1,000,000,000,000 of its basic value. A picocurie is equal to 2.2 disintegrations per minute.

[12] A typical background concentration of U-238 in concrete is 0.5 - 1 pCi/g; the blocks with the elevated levels are typically 35 to 200 pCi/g.

[13] Depleted uranium blocks have activity levels of approximately 500,000 pCi/g.

[14] Characterization is the detailed documentation of the waste constituents such that the appropriate treatment, storage, and disposal decisions can be made. Characterization can include, for example, process knowledge, laboratory analysis, or written documentation (log books, formulas, etc.). LBNL's laboratory is accredited by the State of California Environmental Laboratory Accreditation Program for radionuclide analysis.

[15] This level is more conservative than the clearance screening level of 30 pCi/gram that is recommended in the national standard ANSI N13.12 “Surface and Volume Radioactivity Standards for Clearance” (ANSI, 1999). It is also comparable to the concentration of the natural radioactivity found in concrete.

other items, will have volume contamination. However, it is expected that much of the Bevatron apparatus itself will have detectable DOE-added radioactivity above naturally occurring levels.

Two main options exist for the disposition of items with detectable volume contamination. The first is to transfer the items to other DOE facilities for reuse. Other DOE facilities are permitted to receive and reuse such materials, e.g., for their own accelerator operations. At this time, however, no DOE users for Bevatron components or shielding blocks have been found. The second option, and the one expected to apply to all such items generated during the Proposed Action, is disposal as low-level radioactive waste at a DOE-authorized facility for, such as Envirocare in Clive, Utah, a licensed, privately operated facility; or the Nevada Test Site, a DOE facility approximately 65 miles from Las Vegas.

- Surface contamination. Different regulatory thresholds apply for surface contaminated items, varying with the nature and type of contamination involved. These are presented in DOE Order 5400.5. All material with surface contamination above these thresholds would be disposed as low-level radioactive waste at a DOE-authorized facility, as discussed above.

- Uranium. All blocks containing uranium above background levels, and all depleted uranium blocks, would also be sent to a DOE-authorized disposal facility.

It is anticipated that all Bevatron accelerator components would be disposed of at Envirocare. Regarding metals, the Proposed Action would comply with the July 2000 DOE Metals Release Suspension[16] and with an April 2005 agreement between LBNL and the DOE Berkeley Site Office regarding LBNL's implementation of this policy (*Agreement between LBNL and DOE Berkeley Site Office, LBNL Implementation of DOE Metal Release Suspension*; LBNL, 2005d). Applicable provisions include the following:

- Metals from radiation-controlled areas at accelerators where the metals may have become activated by exposure to beams would not be released for unrestricted recycling into commerce. Some areas within Building 51 contain such controlled areas. Metals covered by the suspension policy would be surveyed in accordance with the June 2005 *Protocol for Survey and Release of Bevatron Materials* referenced earlier. If the metal is contaminated, it would be held in a controlled area until disposed as radioactive waste. If there is no detectable activity, it would be disposed of at an appropriate landfill with a written agreement by the landfill that the metals would be prohibited from being recycled into commerce.

- The following are not within the scope of the DOE Metals Release Suspension: the release of property or equipment for reuse for their intended purpose, metals from locations other than former Radiological Areas, the recycle of non-metal materials, and rebar and other embedded metal materials in concrete that are not surface contaminated or volumetrically contaminated due to induced activity. Such metals, including Building 51 structural steel, are subject to unrestricted, "free" release, as long as there is no detectable DOE-added radioactivity above naturally occurring levels. For example, they could be reused, recycled, or sent to a landfill taking non-hazardous solid waste.

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[16] The DOE Metals Release Suspension suspended the unrestricted release of metals from Radiological Areas for recycling into commerce. There currently are no such Radiological Areas at Building 51. However, when the Bevatron was in operation, some of these areas did exist, due to the dose produced by Bevatron operations. Metals from former as well as current Radiological Areas are included in LBNL's implementation of this DOE policy.

Items contaminated with both radioactivity and non-radioactive hazardous waste (e.g., any lead shielding with induced radioactivity) would be managed as mixed waste and would be disposed at Envirocare or other authorized disposal facilities.

Asbestos

Asbestos is a naturally occurring fibrous material that was used as a fireproofing and insulating agent in building construction (e.g., in insulation, shingles, ceiling tiles, and floor tiles) before such uses were banned by EPA in the 1970s. The potential risk to human health is from inhalation of airborne asbestos when asbestos-containing materials (ACM) are disturbed during such activities as demolition and renovation. ACM can be divided into two general categories: friable and non-friable. Friable ACM products are those that can be readily crumbled or powdered by hand pressure, and are of more concern than non-friable ACM because of their greater potential for generating airborne fibers. Intact and sealed friable asbestos materials are considered non-friable and do not pose a health risk if they are undisturbed and undamaged. Non-friable ACMs generally possess a strong binder such as cement or vinyl, which stabilizes the asbestos, reducing the likelihood of generating airborne asbestos dust. However, actions such as sanding, grinding, cutting or drilling of non-friable asbestos can result in the release of asbestos fibers.

The exterior siding of Building 51 is composed of transite, a material typically containing approximately 20 percent non-friable chrysotile asbestos fibers. Building 51 is also known to contain non-friable ACMs in vinyl asbestos floor tiles, roofing felt, and insulation. In addition, due to the age of the building, friable asbestos might be encountered.

Federal regulations governing asbestos include EPA’s National Emission Standard for Hazardous Air Pollutants, the Asbestos Hazard Emergency Response Act, and Occupational Health and Safety Administration’s (OSHA) Asbestos Standard for the Construction Industry. On the state level, several laws mirror or exceed the federal requirements. Similar to federal laws, state laws and regulations also pertain to building materials containing asbestos. These regulations prohibit emissions of asbestos from asbestos-related manufacturing, demolition, or construction activities; require medical examinations and monitoring of employees engaged in activities that could disturb asbestos; specify precautions and safe work practices that must be followed to minimize the potential for release of asbestos fibers; and require notice to regulatory agencies prior to beginning renovation or demolition that could disturb asbestos.

Section 19827.5 of the California Health and Safety Code, adopted January 1, 1991, requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos. The California legislature has vested the BAAQMD with authority to regulate airborne pollutants, including asbestos, through both inspection and enforcement responsibilities. The BAAQMD is to be notified ten days in advance of any proposed demolition or abatement work.

LBNL has a comprehensive Asbestos Management Program to manage the presence of asbestos materials at the Laboratory. Prior to undertaking demolition activities, a screening survey is required to identify ACMs, along with sampling to assess and quantify ACMs for removal. Removal of ACMs would be conducted by a licensed and certified asbestos abatement contractor who would remove ACMs in accordance with the LBNL Asbestos Management Program. The ACM abatement would be conducted under the oversight of Lab personnel and subject to inspection by the BAAQMD. All of the abatement work must meet the requirements of OSHA, EPA, and BAAQMD regulations.

PCBs

Polychlorinated biphenyls (PCBs) are synthetic organic oils that formerly were used in many types of electrical equipment, including transformers and capacitors, primarily as electrical insulators. In 1979, the EPA banned the use of PCBs in most new electrical equipment and began a program to phase out certain existing PCB-containing equipment.

All transformers and capacitors known to contain PCBs have already been removed from Building 51 and properly disposed. The only remaining equipment that may contain PCBs are light ballasts. PCBs were found in soil and groundwater samples taken from under the foundation of the building. Soil cleanup measures were completed such that the PCB contaminants have been reduced to levels considered "protective of human health and the environment" under EPA risk assessment guidelines. Some groundwater contamination remains and continues to be remediated by LBNL under a program that is separate from this Proposed Action.

The use and management of PCBs in electrical equipment is regulated pursuant to the Toxic Substances Control Act (TSCA) and its implementing regulations. These regulations generally require labeling and periodic inspection of certain types of PCB equipment and set forth detailed procedures to be followed for disposal of these items and for responding to PCB spills. The TSCA regulations are administered by the EPA. Materials or equipment containing PCBs not regulated as hazardous under TSCA regulations may still be regulated as hazardous waste under Title 22 of the California Code of Regulations, depending on the concentration. PUB-3000, Berkeley Lab's Health and Safety Manual, contains LBNL EH&S Division policies and procedures for the handling of PCBs (LBNL, 2005c).

Lead

Lead-based paint was common until 1978, when the Consumer Product Safety Commission banned the use of paint containing lead at levels of over 600 parts per million for residential and toy purposes.[17] Some painted surfaces at Building 51, such as structural steel, drywall, ceilings, and exterior surfaces, could contain lead-based paint. In addition, lead dust contaminates some of the interior surfaces of Building 51. Sources of this dust include the operation of internal combustion engines using leaded gasoline and the handling of solid forms (blocks, sheets, bricks) of lead, which were used as radiation shielding during operation of the Bevatron. LBNL has a Lead Compliance Program that covers all facets of lead handling from the use of lead in experiments to disposal of lead-containing materials. In accordance with this program, lead-

[17] Lead in industrial-use paints is still permitted. However, most manufacturers have substantially reduced the amount of lead in such paints.

contaminated surfaces would be vacuumed using HEPA-filter-equipped[18] vacuums to remove surface deposits. Any such lead control measures would also be effective in controlling surface contamination by any other hazardous materials that may be present.

Mercury

Mercury was present in klystron tubes that were used for high energy physics research associated with the accelerator at Building 51, and some electrical switches, diffusion pumps, and gauges still at the facility may contain mercury. A mercury spill on the concrete floor of the facility was detected and cleaned up in the late 1990s. Similarly, mercury was found in plumbing and floors in another section of the building and cleaned up around this same time. It is possible that other mercury contamination may be discovered during the Proposed Action, e.g., in a location near the Motor Generator Room where components containing mercury were stored and handled. Mercury would be handled in accordance with PUB-3000 (LBNL, 2005c).

Beryllium

Small amounts of solid beryllium have been found inside portions of the shielded area within Building 51. Dust containing beryllium also was found in shelves where the solid beryllium was stored. In addition, beryllium may be present in beamline target areas inside the Bevatron. Beryllium found to date has been cleaned up in accordance with regulatory standards. If additional beryllium is found, contractors meeting DOE requirements (10 CFR 850) for beryllium cleanup operations would be engaged. All work would be performed in accordance with the LBNL *Integrated Worker Health and Safety Program for Beryllium Activities at the Berkeley Laboratory* (LBNL, 2000).

Chromium

The wooden and plastic parts of the cooling tower contain low concentrations of chromium, which was used in water treatment chemicals. Handling and disposal of the cooling tower would be performed in accordance with PUB-3000 (LBNL, 2005c).

Crystalline Silica Dust

The concrete slab and foundation that would be demolished contain crystalline silica.[19] Silica is a hazardous substance when it is inhaled, and the airborne dust particles that are formed when the concrete is broken, crushed, or sawn pose potential risks. The potential risks are to workers performing demolition activities or other activities adjacent to the demolition.

LBNL would require contractors to meet the Threshold Limit Values (TLVs) for crystalline silica in air set by the American Congress of Governmental Industrial Hygienists. Dust control measures, such as the use of water/fogger sprays, HEPA-filtered equipment, or other engineering controls,

[18] HEPA filters are high-efficiency filters that remove at least 99.97 percent of all particles that are greater than 0.3 microns in size.

[19] There are no plans to demolish the concrete shielding blocks; these would be removed intact.

would be implemented at the point of dust generation. If these controls cannot keep worker exposures below TLVs, workers would use respirators to limit their exposure to silica dust.

The levels of silica dust at neighboring buildings or off-site locations would be at non-hazardous levels in large part due to dust control measures. For any crystalline silica that would be released, dilution and dispersion would ensure that ambient dust levels at these locations would remain well below BAAQMD levels of concern.

Subsurface Contamination

The proposed site is not listed on the state Department of Toxic Substances Control (DTSC) Hazardous Waste and Substances Sites List, also known as the Cortese List. However, subsurface investigations have been conducted by Berkeley Lab in the vicinity of Building 51 since the early 1990's, and it is known that a portion of the demolition zone (the Building 51 footprint) is underlain by the edges of two groundwater plumes -- the Building 51/64 and the Building 51L Groundwater Solvent Plumes -- containing volatile organic compounds (VOCs).[20] These are shown in **Figures 5** and **6**.[21]

The Building 51/64 Groundwater Solvent Plume extends westward from the southeast corner of Building 64. The principal plume constituents are halogenated VOCs that were used as cleaning solvents, including 1,1,1-trichloroethane, trichloroethene (TCE), tetrachloroethene (PCE), and their associated degradation products (e.g., 1,1-dichloroethene (DCE), 1,1-dichloroethane, cis-1,2-DCE, and vinyl chloride). The Building 51L Groundwater Solvent Plume is centered near the southwest corner of the former Building 51L. The principal plume constituents are halogenated VOCs that were used as cleaning solvents, including TCE, PCE, and associated degradation products (e.g., cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride).

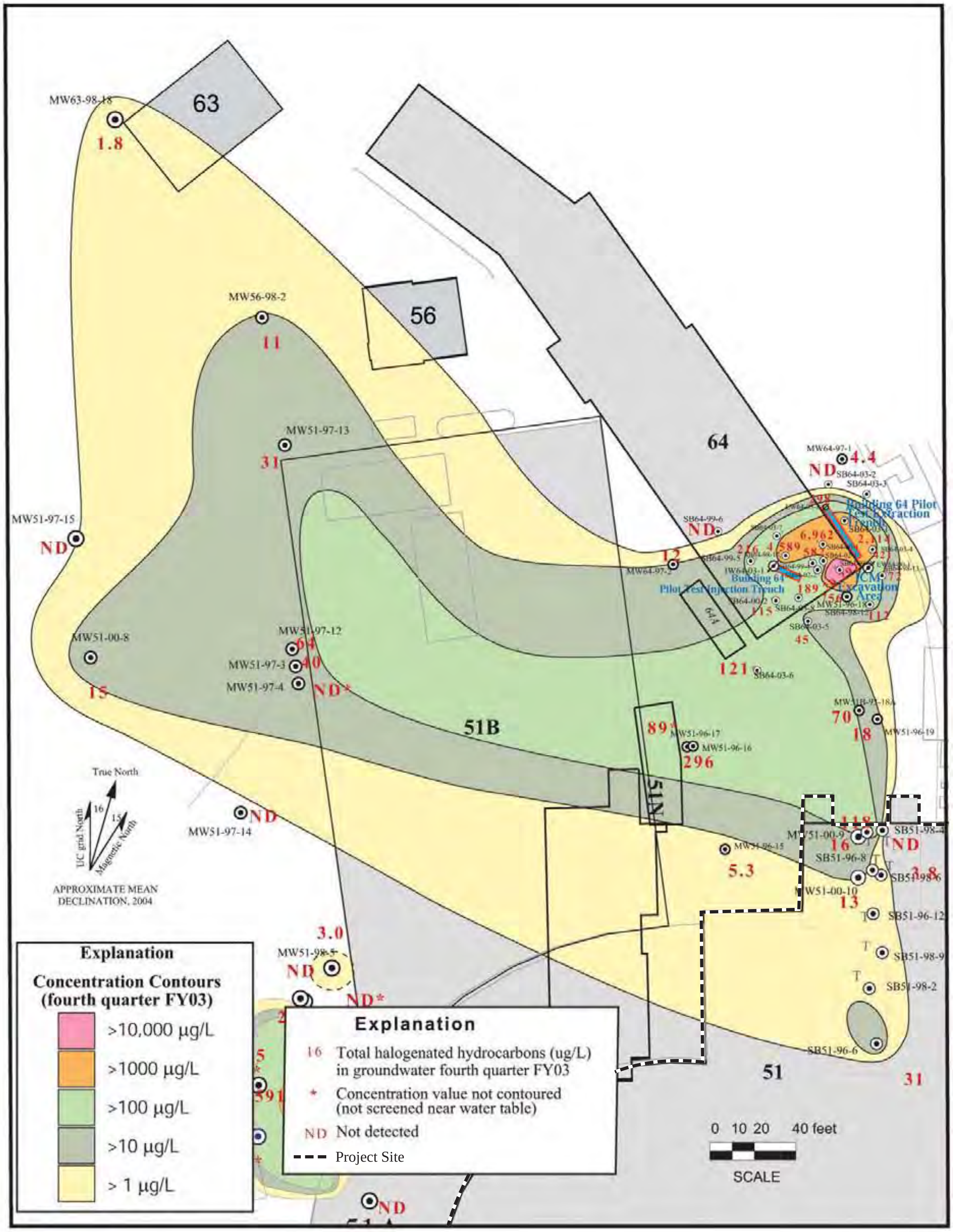
In addition, PCBs were detected in groundwater samples collected beneath the Building 51 foundation. Soils underneath portions of the site were contaminated by VOCs, petroleum hydrocarbons, PCBs, and mercury.

Remediation (i.e., cleanup) of the above contamination has proceeded as follows:

<u>General (LBNL-Wide)</u>

- Berkeley Lab’s Hazardous Waste Handling Facility (HWHF) operates under a Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Permit. Under RCRA, LBNL is required to undertake corrective action for all historical releases of hazardous wastes, including hazardous constituents from any Solid Waste Management Unit (SWMU).22 (Corrective action refers to the activities related to the investigation, characterization, and cleanup of releases of hazardous waste or

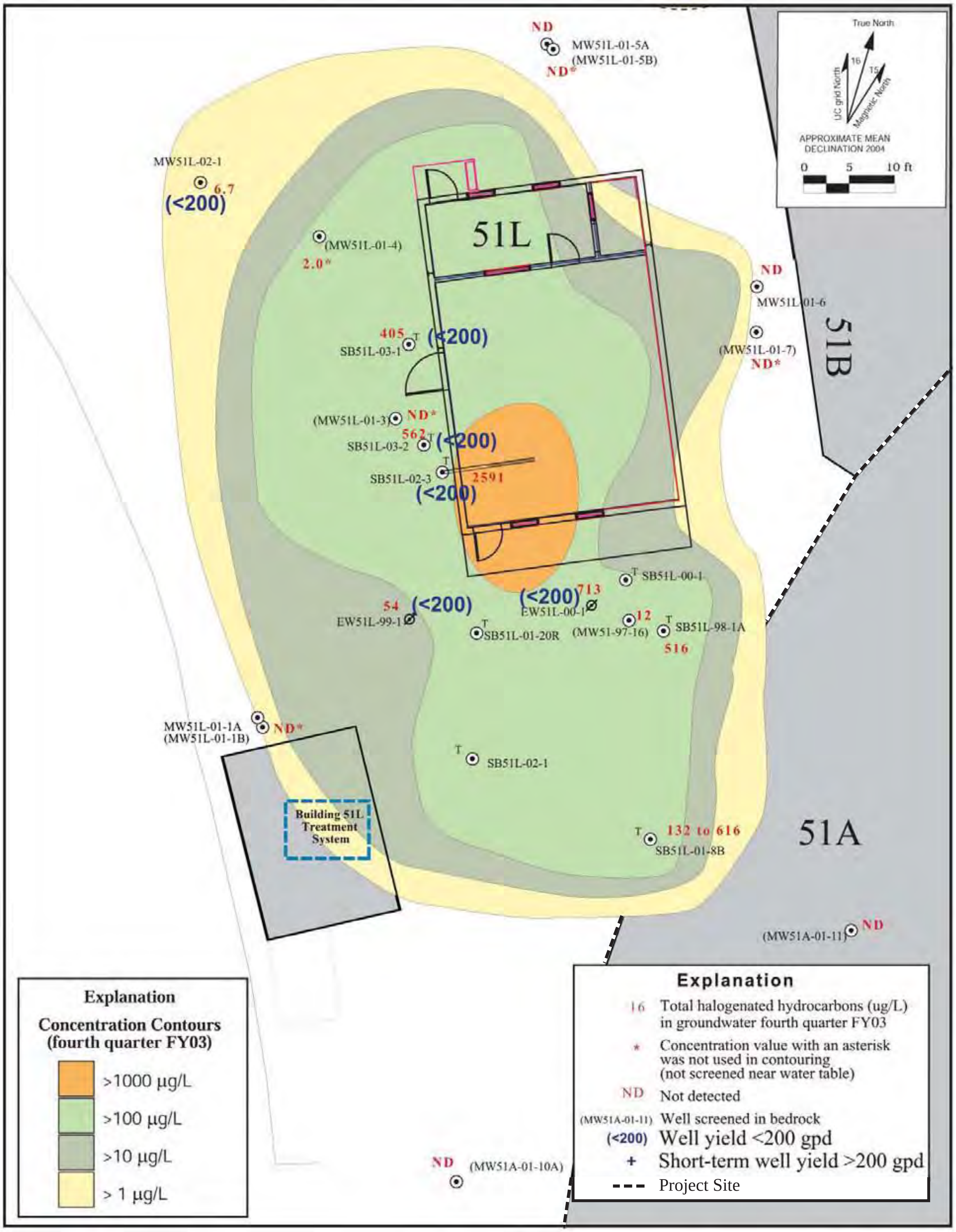
[20] Groundwater at the site varies from 10 to 90 feet below ground surface. Groundwater samples are analyzed at LBNL's own state-certified laboratory, while soil samples are sent to off-site state-certified laboratories.
[21] These figures show partial footprints of Building 51. For orientation purposes, see **Figure 2** in Chapter 3.0 (Project Description). It should also be noted that **Figures 5** and **6** include the former outlines of Building 51B and Building 51L, structures that were removed from LBNL in 2004.
[22] “Solid Waste Management Unit” means any unit at a hazardous waste facility from which hazardous constituents might migrate, irrespective of whether the units were intended for the management of wastes.



SOURCE: LBNL (2005)

Figure 5

Total Halogenated Hydrocarbons in Groundwater,
Building 51/64 Groundwater Solvent Plume



SOURCE: LBNL (2005)

Figure 6
Total Halogenated Hydrocarbons in Groundwater in the Fill, and Estimated Well Fields, Building 51L Groundwater Solvent Plume

> hazardous constituents under RCRA.) Therefore, the permit requires that Berkeley Lab investigate and address historic releases of hazardous waste and hazardous constituents that may have occurred both at the HWHF and at SWMUs throughout the Berkeley Lab site. The DTSC is the regulatory agency responsible for enforcing the provisions of Berkeley Lab's Hazardous Waste Facility Permit, including the activities required under the RCRA Corrective Action Plan (RCRA CAP) process. DTSC consults with such other agencies as the San Francisco Bay Regional Water Quality Control Board, DOE, and the City of Berkeley Toxics Management Division.

The RCRA CAP Process has several primary components:

- RCRA Facility Assessment (completed in 1992);
- RCRA Facility Investigation (completed in 2000);
- Interim Corrective Measures (ICMs; ongoing);
- Corrective Measures Study (CMS, completed in 2005; see below) and Corrective Measures Implementation (CMI; ongoing).

Berkeley Lab currently is in the CMI phase of the RCRA CAP process. In February 2005, a revised CMS Report was submitted by the Laboratory to DTSC (LBNL, 2005f). NEPA documentation is contained in Chapter 7 of this document. The purpose of the CMS Report was to recommend appropriate remedies that can eliminate or reduce potential risks to human health from chemicals of concern in soil and groundwater and that can protect groundwater and surface water quality. The components of the RCRA CAP process are described in detail in the CMS Report, and the reader is referred to that document for information beyond that provided in this EA.

A CEQA Initial Study/Negative Declaration was prepared for the CMS Report (DTSC, 2005). DTSC solicited public comments on the CMS Report and the Initial Study/Negative Declaration from April 25 through June 8, 2005, and held a public hearing on May 26, 2005. DTSC approved the CMS Report and final Remedy Selection, effective October 2005. DOE issued a NEPA Environmental Assessment/Corrective Measures Study Report in September 2005 (DOE, 2005). The EA has the same content as the CMS Report, but also includes a Finding of No Significant Impact under NEPA, and responses to comments by DTSC and DOE.

The IS/ND is available on the DTSC website at http://www.dtsc.ca.gov/HazardousWaste/Projects/upload/LBNL_CEQA_Initial-Study1.pdf. The approved CMS Report and the DOE EA/CMS Report are available on the Lab's Environmental Restoration Program website at http://www.lbl.gov/ehs/erp/html/documents. These documents also are available at the downtown Berkeley Public Library.

Corrective Action at Units Relevant to Building 51

The RCRA CAP process identified two SWMUs at Building 51. While corrective action measures have addressed and will continue to address subsurface contamination in the vicinity of Building 51, the RCRA CAP is a preexisting activity that is independent of the proposed Building 51 and Bevatron demolition project. The RCRA CAP would take place whether or not the Proposed Action proceeds. At the same time, the Proposed Action would be configured such that it would not interfere with the successful continuation of the RCRA CAP.

As part of interim corrective measures, cleanup activities have already been conducted in many areas of the Lab, including two soil units at Building 51, the Motor Generator Room and Vacuum Pump Room. The main contaminants of concern were PCBs, waste oil, and vacuum pump oil. After soils were excavated, contaminants were reduced to levels considered "protective of human health and the environment" under EPA risk assessment guidelines.

To remediate the Building 51/64 Groundwater Solvent Plume, contaminated source area soils located at the southeast corner of Building 64 were excavated as an ICM in August 2000 and a groundwater extraction system was installed in the backfilled excavation. In addition, an in situ soil flushing pilot test is being conducted in the source area to prevent further migration of contaminants in groundwater. To divert discharges away from the North Fork of Strawberry Creek, an ICM was also implemented that routes water from a portion of the Building 51 subdrain system to a groundwater treatment system using granular activated carbon. The treated groundwater is then discharged to the sanitary sewer under an EBMUD wastewater discharge permit.

As a result of these measures, the remaining soil contaminant concentrations in the source area are below cleanup standards, and groundwater contaminants have generally shown gradual long-term declines over most of the plume area. The CMS Report recommends that the following further corrective actions be undertaken in the CMI phase: continued in situ soil flushing combined with groundwater capture in the plume source area, monitored natural attenuation for the downgradient portion of the plume, and continued surface water (subdrain effluent) capture and treatment until groundwater discharge to surface water is shown to be below detectable levels.

To remediate the Building 51L Groundwater Solvent Plume, the groundwater level has been lowered, using pumping from two extraction wells, to stop any discharge of contaminated groundwater to surface water. The treated groundwater is then discharged to the sanitary sewer under EBMUD permit.

The CMS Report recommends that the following further corrective actions be undertaken in the vicinity of the project site in the CMI phase: excavation and off-site disposal of saturated and unsaturated zone soils in the plume source zone, monitored natural attenuation for the remaining plume area, and rerouting or lining of the storm drain to prevent migration of groundwater contaminants to surface water. For more complete descriptions of contamination and corrective action measures in the vicinity of Building 51, the reader is directed to the CMS Report.

Once Building 51 is demolished, further investigation for potential soil and groundwater contamination at portions of the site that were previously inaccessible would take place, and appropriate corrective measures would be undertaken. Newly discovered environmental releases of hazardous constituents will meet the notification and corrective action requirements in LBNL's Hazardous Waste Facility Permit (EPA ID. no. CA 4890008986), section IV. B. "Newly

Identified Releases." Cleanup standards and methods will be consistent with LBNL's Environmental Assessment and Corrective Measures Study Report for Remediating Contamination at LBNL Regulated under the Resources Conservation and Recovery Act (DOE/EA-1527).

Fire Hazards

LBNL is located near undeveloped land in the Oakland and Berkeley Hills. Portions of this land are wooded with native canyon stands of oak and California bay or with introduced plantations of eucalyptus or conifers. At the project site, extensive natural vegetation both within and surrounding LBNL creates the greatest potential for fire hazard. The Building 51 site itself is almost entirely developed and devoid of vegetation, with the exception of small landscaped areas. It is surrounded by a mosaic of other existing buildings, paved areas, and fragmented areas of open space.

Fire protection services for the project site are provided by Berkeley Lab through a contract with the Alameda County Fire Department, which maintains an on-site fire station. Fire personnel are also trained in emergency medical services and hazardous materials response. In addition, LBNL maintains an automatic aid agreement with the City of Berkeley to provide support during the summer fire season and in the event of a hillside wildfire.

4.2.6 Hydrology and Water Quality

The Berkeley Lab facility lies within the upper portion of the Strawberry Creek watershed; this upper portion consists of approximately 874 acres of land east of the UC Berkeley campus. The entire Strawberry Creek watershed occupies approximately 1,163 acres and includes other UC properties, public streets of both Oakland and Berkeley, and private property (LBNL, 2005e).

Approximately 35 percent of the LBNL site is covered with impervious surfaces such as buildings, roads, and paved surfaces. Compared to natural ground cover (pervious surfaces), impervious surfaces restrict natural infiltration of surface water and increase stormwater runoff rates and volumes. The remaining 65 percent surface area at the site is pervious surface area consisting of steep hillsides covered with natural grasses and other vegetation to minimize erosion (LBNL 2002).

Building 51 is located within Blackberry Canyon. Situated at an elevation of about 720 feet above mean sea level, the building complex is constructed on a series of graded level areas adjacent to vegetated natural or manmade slopes, some of which reach a steepness of up to 100 percent. A portion of the building has a second story that opens to another level, graded area. The two levels are connected by internal staircases or a sloping roadway. Building 51 is located on the largest graded area of the LBNL site. Surface water flows from the project site and the larger Strawberry Creek watershed are ultimately discharged into San Francisco Bay south of the Berkeley Marina at the terminus of the municipal storm drain system that conveys Strawberry Creek through the city of Berkeley (LBNL, 2005e).

The LBNL site is situated over bedrock, which is covered by a shallow soil surface. The flow and occurrence of groundwater at the LBNL site is controlled by the underlying complex geology, the presence of faults, and fractures in the bedrock (LBNL, 2002). Groundwater flows through the fractures in the bedrock and is therefore slow to recharge. Groundwater flow generally follows the surface topography either west or south toward the City of Berkeley or toward streams (Strawberry Creek and its tributaries).

Groundwater flows beneath Building 51 in a northwest direction through the artificial fill materials and appears to be influenced by the natural topography that underlies the graded cut and fill supporting Building 51 (LBNL, 2005e). Water level elevation mapping of the Bevalac area (between Buildings 51 and 71), which was generated from groundwater data collected in the fourth quarter of 2003 (when groundwater was at a seasonal high), indicates that groundwater depths can range between 15 feet and 50 feet below the ground surface, depending on location (LBNL, 2005e). Groundwater levels are deeper during the summer months or drought periods when the water table is not recharged by precipitation. Based on the water level map, shallower groundwater depths occur along the base of the slope on the east side of Building 51 (depths of 15 feet to 30 feet) and become deeper toward the northwest (depths of 30 feet to 60 feet). Groundwater elevations beneath the central portion of Building 51 are relatively level, reflecting the flat surface topography of the Building 51 site (LBNL, 2005e).

4.2.7 Noise

Transportation sources, such as automobiles, trucks, trains, and aircraft, are the principal sources of noise in the urban environment. Along major transportation corridors, noise levels can reach 80 DNL[23], while along arterial streets, noise levels typically range from 65 to 70 DNL. Industrial and commercial equipment and operations also contribute to the ambient noise environment in their vicinities.

The Building 51 project site is located on a large parcel of flat land along Lawrence Road and McMillan Road. The primary sources of noise at the project site are activities from the operation of the adjacent buildings and noise from the LBNL shuttle buses, trucks, and other vehicles.

Some land uses are considered more sensitive to ambient noise levels than others because of the duration of noise exposure as well as the types of activities that typically occur there. People in residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, natural areas, parks and outdoor recreation areas are generally more sensitive to noise than are people at commercial and industrial establishments. Housing, outdoor recreation, and similar land uses are therefore considered “sensitive receptor areas” for noise.

[23] DNL = day-night average sound level, which is the energy average of the A-weighted sound levels occurring during a 24-hour period, accounting for the greater sensitivity of most people to nighttime noise by weighting noise levels at night (“penalizing” nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted by adding 10 dBA to take into account the greater annoyance of nighttime noises.

Figure 7 shows the position of Building 51 in relation to other LBNL buildings as well as the nearest sensitive-receptor areas to the north, east, and west; there are no nearby sensitive receptor areas to the south. The noise-sensitive land uses are as follows:

- Area 1. This area to the west consists of the Nyingma Institute (Buddhist facility) and single- and multi-family residences. This area is approximately 1,100 to 1,400 feet west of Building 51 and approximately 160 to 250 feet lower in elevation. As a result of intervening hillside terrain and building structures, there is no direct line-of-sight between any of the residences or the Buddhist facility and Building 51.

- Area 2. This area to the north consists of single-family residences along Campus Drive, Olympus Avenue, and Summit Road. The nearest residences are located on Campus Drive approximately 1,100 feet north of Building 51 and are approximately 270 feet higher in elevation. A partial line-of-sight exists between some of these residences and Building 51, although none has a completely unobstructed view due to the intervening terrain and building structure.

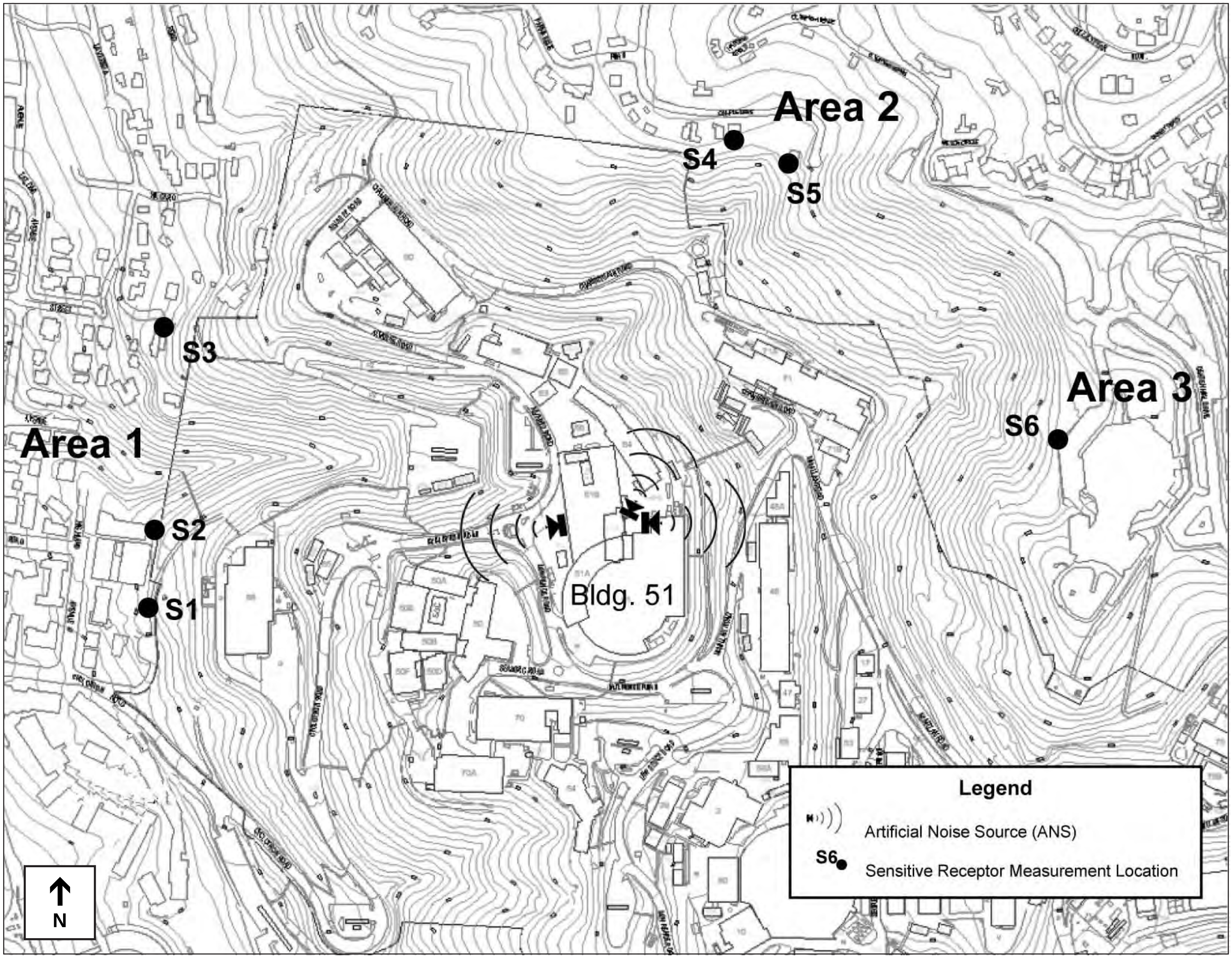
- Area 3. To the east is the UC Berkeley Lawrence Hall of Science Museum (LHS), which is located approximately 1,300 to 1,400 feet away from Building 51. The LHS rests on a hillside approximately 350 feet higher than Building 51. No line-of-sight exists between Building 51 and the buildings at LHS because LHS is offset from the edge of the hillside. However, a person standing directly in front of the 3.5-foot-tall boundary wall at the edge of the hillside where the LHS property faces Building 51 would have a partial line-of-sight. This wall is at the boundary of the LHS outdoor area where children often play on the outdoor fixtures. The play fixtures themselves do not have a line-of-sight to Building 51.

As shown in **Figure 7**, the average existing noise levels were measured at six sites in the three areas described above. **Table 2** lists the measured background noise levels.

TABLE 2
AVERAGE EXISTING BACKGROUND NOISE LEVELS AT SENSITIVE RECEPTOR LOCATIONS

Measurement Location (see Figure 7)	Average Existing Background Noise Level (dBA)	Noise Sources
Site 1	54	Distant roadway noise
Site 2	46	
Site 3	44	
Area 2		
Site 4	54	Intermittent distant construction noise
Site 5	52	
Area 3		
Site 6 (at wall)	54	Distant construction noise and children playing on Lawrence Hall of Science outdoor fixtures
Site 6 (15 ft. from wall)	53	

SOURCE: Parsons (2003)



SOURCE: Parsons (2003)

Demolition of Building 51 and the Bevatron / 204442 ■

Figure 7
Sensitive Noise Receptor Locations

Noise measurements taken in connection with the ongoing preparation of the LBNL LRDP EIR indicate that hourly average noise levels at locations measured nearest Building 51 range between 52 and 66 decibels (dBA, Leq[24]). Maximum noise levels measured were between 61 and 83 dBA, with the second highest reading (74 dBA) at Building 71, near the top of the McMillan Road grade. These levels likely were the result of shuttle bus traffic on the hill.[25]

A less frequent but regular noise source is a nearby 2-megawatt diesel emergency power generator, located approximately 200 feet northwest of Building 51 and abutting the tree line. This generator is tested monthly for a minimum of four hours, and it creates noise of up to 85 dB at a distance of 50 feet. In addition, regular vegetation management is performed in and around the area of trees under analysis. This management includes use of equipment such as weed-whackers, leaf blowers, chippers, and chain saws.

4.2.8 Public Services

LBNL secures firefighting services through a contract with the Alameda County Fire Department, which staffs a fire station located on the LBNL grounds. This station, which is Alameda County Station No. 19, is located at LBNL Building 48. Station 19 is staffed with four persons 24 hours a day, every day of the year: two firefighters, one engineer, and one officer. Three of these personnel are required to be trained in hazardous materials response, and one is a paramedic. Equipment at Station 19 includes one fire engine, one reserve fire engine, a hazardous materials vehicle, and a light-duty four-wheel drive “brush patrol unit” that can be used for wildland fires.

An Emergency Operations Center has been established at LBNL’s Station 19, which is equipped with fault-tolerant telecommunications. LBNL's Fire, Medical, Protective Services, Plant Engineering, Maintenance, and Environmental Health and Safety personnel are trained and equipped to respond to local emergencies. Each building, including Building 51, has an Emergency Team headed by the building manager.

Police services at LBNL are provided through a contract with the UC Berkeley Police Department (UCPD). UCPD handles all patrol, investigation, and related law enforcement duties for UC Berkeley and associated University-owned properties. UCPD operates 24 hours a day, seven days a week, coordinating closely with the City of Berkeley Police Department. UCPD includes 77 police officers, 45 full-time non-sworn personnel, and 60 student employees. Located at 1 Sproul Hall on the UC Berkeley campus, UCPD has primary law enforcement jurisdiction on the campus of the University of California and associated University properties, including LBNL UCPD, 2005).

LBNL also contracts with a private security firm, which is responsible for on-site security needs including Laboratory access, property protection, and traffic control. The on-site security staff at LBNL totals approximately 18 personnel, divided into approximately five to six personnel per

[24] Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements; Leq represents the constant sound level which would contain the same acoustic energy as the varying sound level.

[25] All noise readings were based on 15-minute measurements.

shift. Staffing and resources include an on-site manager, two roving patrols 24 hours per day, and gate access attendants 24 hours per day at the Blackberry Gate and fewer hours at the Strawberry and Grizzly Peak gates.

The City of Berkeley Public Works Department maintains public streets within the city limits of Berkeley. Caltrans maintains public highways in the project site vicinity.

4.2.9 Public Utilities

The LBNL Facilities Division collects non-hazardous solid waste from Berkeley Lab buildings. In calendar year (CY) 2004, the Lab generated 191.5 metric tons (about 423,000 pounds) of routine solid sanitary waste, which was disposed by the Richmond Sanitary Service. In addition, it generated 1,087.43 metric tons (about 2,396,000 pounds) of waste that was recycled. As a government-owned facility operated through contract by the University of California, LBNL complies with the waste minimization reporting requirements of DOE, the State of California, the University of California, and Berkeley Lab itself, and has achieved significant reductions in the amount of waste it generates. As of CY 2004, LBNL had reduced the amount of routine solid sanitary waste going to land disposal by almost 80 percent compared with the baseline year set by DOE of CY 1993. The reductions were achieved through waste segregation and recycling efforts and through a composting and mulching program.

4.2.10 Traffic and Circulation

LBNL is located close to two major highways: Interstate 80/580 (I-80/I-580) approximately three miles to the west, and State Route (SR) 24 approximately two miles to the south. Access from the Lab to I-80/I-580 is through the city of Berkeley via east-west arterial streets. Access to SR 24 is via Tunnel Road. The primary local access routes to the Berkeley Lab site are University Avenue-Hearst Avenue, Grizzly Peak Boulevard-Centennial Drive, and Piedmont Avenue-Gayley Road.

Vehicles can enter Berkeley Lab through three gates: Blackberry (main) Gate, Strawberry Gate, or Grizzly Peak Gate. Normally, Blackberry Gate is staffed continuously, Strawberry Gate is staffed for about 13 hours encompassing both the morning and evening commute hours, and Grizzly Peak Gate is staffed during morning commute hours only.

The Laboratory’s main vehicle routes are two-way, except for three sections where roadside parking reduces traffic lanes, permitting only one-way travel. Main routes within the boundaries of LBNL include Cyclotron Road and Lawrence Road. Vehicle access to the project site is from Lawrence Road. Cyclotron Road and Lawrence Road each have two lanes, and on-street parking is prohibited. As part of its standard practices, the Laboratory uses or requires subcontractors to use advance warning signs and flaggers to direct traffic as needed to maintain safe and efficient traffic flow during construction projects.

The Berkeley Lab site is served indirectly by Bay Area Rapid Transit (BART) and by Alameda–Contra Costa Transit (AC Transit) bus routes, and directly by two LBNL-operated shuttle service routes.

LBNL operates a free on-site shuttle bus and several shuttle buses that travel off-site. Two of the latter travel around some of the perimeter of the UC Berkeley campus, and one shuttle goes to downtown Berkeley, connecting with the Berkeley BART Station and AC Transit bus lines. A separate off-site shuttle provides express service to and from the Rockridge BART Station at selected commute hours. Off-site shuttle service starts at 6:20 a.m. from the main Laboratory shuttle bus hub located at Building 65 and continues until 6:50 p.m. Buses run every 10 minutes up to 6:10 p.m. Between the hours of 6:10 p.m. and 6:50 p.m., the shuttle runs at 20-minute intervals. The internal shuttle operates every 10 minutes from 6:40 a.m. until 5:20 p.m.; it then operates at 20-minute intervals until 6:50 p.m. The closest internal shuttle bus stop to the project site is below Building 70, across the street from the entrance to Building 51.

The UC Berkeley 2020 LRDP EIR assessed existing traffic level of service (LOS) conditions during weekday a.m. and p.m. peak traffic hours at the following intersections (UC Berkeley, 2004):

- Hearst Avenue and La Loma Avenue / Gayley Road – signalized
- Hearst Avenue and LeRoy Avenue – side-street stop-sign control
- Hearst Avenue and Euclid Avenue – signalized
- Hearst Avenue and Scenic Avenue – side-street stop-sign control
- Hearst Avenue and LeConte Avenue – side-street stop-sign control
- Hearst Avenue and Spruce Street – signalized
- Hearst Avenue and Oxford Street – signalized
- Hearst Avenue and Shattuck Avenue – signalized
- Oxford Street and Berkeley Way – signalized
- Oxford Street and University Avenue – signalized
- University Avenue and Shattuck Avenue (northbound) – signalized
- University Avenue and Shattuck Avenue (southbound) – signalized
- University Avenue and Milvia Street – signalized
- University Avenue and Martin Luther King, Jr. Way – signalized
- University Avenue and San Pablo Avenue – signalized
- University Avenue and Sixth Street – signalized
- Shattuck Avenue and Bancroft Avenue – signalized
- Shattuck Avenue and Durant Avenue – signalized
- Gayley Road and East Gate – side-street stop-sign control
- Gayley Road and Stadium Rim Way – all-way stop-sign control
- Stadium Rim Way and Centennial Drive – all-way stop-sign control
- Centennial Drive and Grizzly Peak Road – all-way stop-sign control

The LOS concept is a qualitative characterization of traffic conditions associated with varying levels of traffic, based on delay and congestion. Descriptions of conditions range from LOS A (free-flow condition) to LOS F (jammed condition). LOS C or better are generally considered to be satisfactory service levels, while LOS D is minimally acceptable, LOS E is undesirable, and LOS F conditions are unacceptable. The determination of LOS for signalized and all-way stop-sign-controlled intersections is based on the average delay (in seconds per vehicle) for the entire intersection. The LOS for intersections controlled by stop signs on side-street approaches only is presented for the worst movement at the intersection (i.e., the movement with the highest average delay in seconds per vehicle) that is controlled by stop signs.

Traffic counts were conducted at each of the above-cited intersections when UC Berkeley was in session.[26] Based on methodologies presented in the 2000 *Highway Capacity Manual*, all of these intersections operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, except for the signalized intersections of University Avenue / Sixth Street and University Avenue / San Pablo Avenue, which operate at LOS F during both peak hours.[27]

The Alameda County Congestion Management Agency’s 2002 level of service monitoring indicates that the segments of I-80 through Berkeley are congested (LOS E or F) in both directions during morning and afternoon peak commute periods, and frequently during off-peak periods as well (Abrams Associates, 2002). The portion of SR 24 within the Oakland city limits experiences LOS F in the eastbound direction from I-580 to the Caldecott Tunnel during the p.m. peak hour. The only Alameda County Congestion Management Program arterial roadway operating at LOS F within the city of Berkeley is SR 13 (Ashby Avenue).

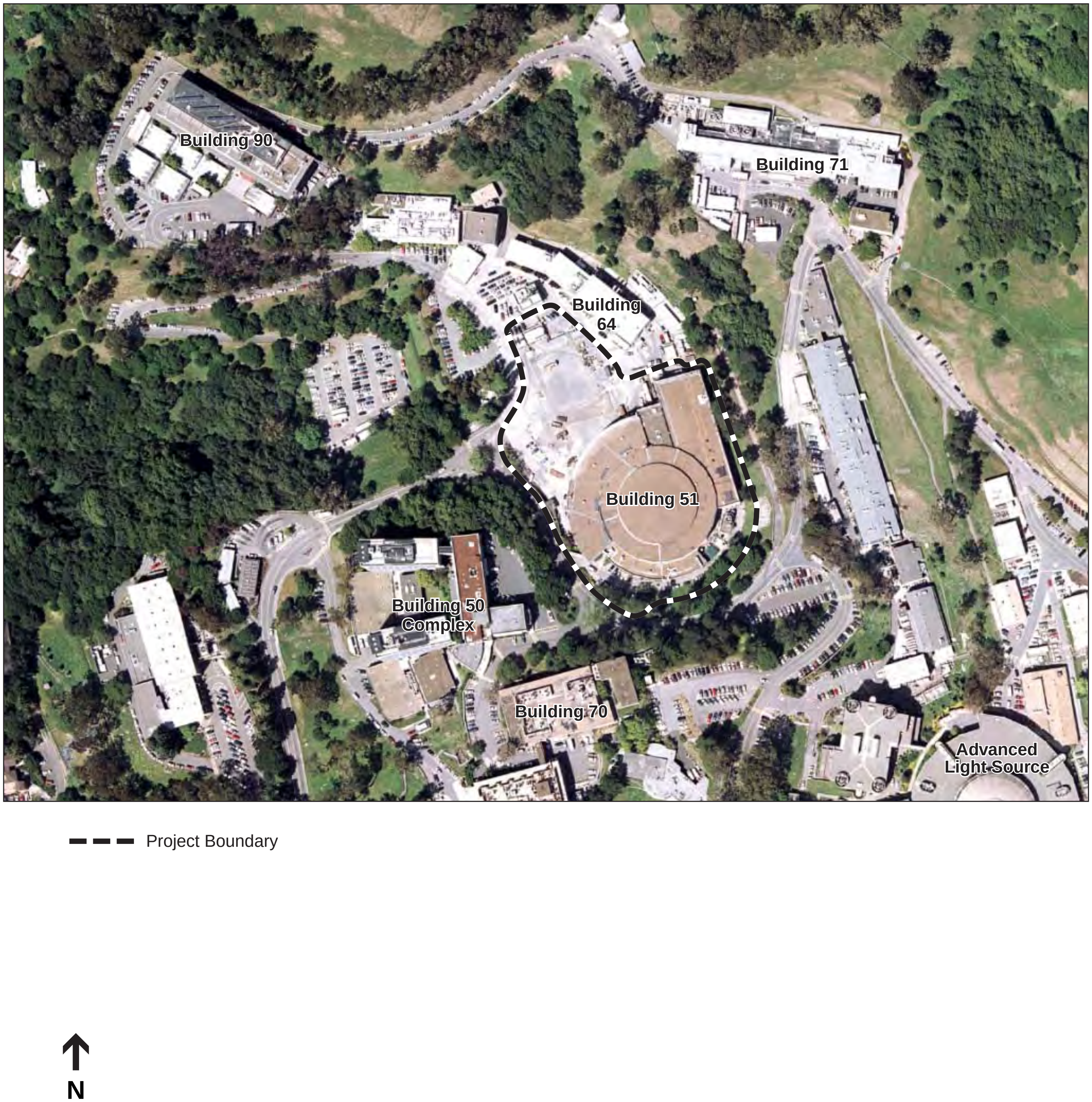
4.2.11 Visual Quality

LBNL is located on approximately 200 acres in the eastern hills of Berkeley and Oakland. It is surrounded by open space, institutional uses, and residential and neighborhood commercial areas. The project site is located entirely within the City of Berkeley. South and east of the Lab is the University of California, Berkeley campus, characterized by a variety of buildings, open space, student parking areas, and mature landscaping. The stadium and other University buildings are located farther southeast. To the west and north of the Lab are residential neighborhoods and a small commercial area located in the City of Berkeley. The residential neighborhoods are characteristically a mix of single- and multiple-family homes, some small retail uses, and a variety of local, landscaped roadways. Some of the homes closest to the Lab are tucked into the lower reaches of the hillside, while others are situated atop the higher ridges, and therefore have an unimpeded panoramic view of the Lab and its environs. Building 51 is approximately 1,100 feet from the nearest residences to the west and north, and about 1,300 to 1,400 feet from the Lawrence Hall of Science to the east. Farther away and to the northeast of the site are Tilden and Claremont Canyon Regional Parks. These large open space areas are heavily vegetated with eucalyptus, oak, and other herbaceous species, and include numerous paved and unpaved recreational trails, open field areas, and a variety of public amenities.

The project site is approximately four acres, including parking and staging areas. Approximately 2.25 acres of the project site (the "demolition zone") would be converted from developed area (i.e., occupied by Building 51) to an undeveloped area for an indeterminate time, until another use for the site is proposed, approved, and initiated. The site is located adjacent to Lawrence Road and McMillan Road within Berkeley Lab, and is generally flat. As shown in **Figure 8**, an aerial view of Building 51, the project site is surrounded by parking lots, other LBNL research

[26] Peak-period traffic counts were conducted at the study intersections during November and December 2002 for the UC Berkeley LRDP Update analysis.

[27] The *Highway Capacity Manual* is published by the Transportation Research Board. Characterization of existing levels of service is taken from the *UC Berkeley LRDP Final EIR* (April 2004).



SOURCE: LBNL (2005)

Figure 8
Aerial Photograph of the Project Site

structures, landscaping, and roadways. The character of the immediate area is highly urbanized and developed as an institutional facility. Parks and other open spaces are located beyond the perimeter of LBNL, but do not define the character of the site.

Views of the vicinity of the project site are available from long-, medium-, and short-range distances, although, due to topography, other buildings, and the presence of many large trees, Building 51 is generally not visible from publicly accessible long-range views of LBNL.

The existing sources of light and glare at the project site are generally limited to the interior and exterior lights of Building 51. Other sources of light include interior and exterior lighting associated with adjacent buildings, parking lots, and access roads. All on-site buildings and parking areas are currently equipped with outdoor, downward-directed light fixtures for nighttime lighting and security. In addition, the cars and trucks traveling to and from the site represent sources of glare. The project site is located near internal LBNL roadways such as Cyclotron Road, Alvarez Road, Lawrence Road, and McMillan Road, where street lighting results in light and glare during evening hours.

CHAPTER 5.0

Environmental Consequences

5.1 Environmental Consequences of the Proposed Action

5.1.1 Air Quality

Demolition activities could create a temporary adverse effect on the local air quality of the site and its surroundings. These activities have the potential to generate 1) dust (including PM_{10} and $PM_{2.5}$), primarily from "fugitive" sources (i.e., emissions released through means other than through a stack or tailpipe); and 2) lesser quantities of other criteria air pollutants, primarily from tailpipe emissions from haul trucks, heavy construction equipment, demolition machinery (primarily diesel-powered) and worker automobile trips (primarily gasoline-powered). The Proposed Action may also involve demolition and removal of asbestos-containing building materials.

The Bevatron apparatus would be disassembled and Building 51 and the foundation slabs and tunnels underneath the building would be demolished. All work related to disassembly and removal of the internal structures (i.e., the concrete shielding blocks and the Bevatron machine) would occur while the exterior building structure is in place, minimizing the release of dust and other emissions. Subsequently, this external building would be demolished.[1] After demolition of the building, the slab and foundation structure would be demolished. Later demolition steps would include the possible excavation of approximately 200 cubic yards of contaminated soils and backfill of the site with an estimated 20,000 cubic yards of clean fill.

Fugitive Dust

The two major fugitive dust sources would be 1) concrete breaking using a hoe-ram and loading of the broken concrete into trucks, and 2) general demolition[2] of the building and loading of structural debris. Because much of the concrete breaking and demolition of internal structures would occur while the external Building 51 structure is in place, fugitive dust emissions would tend to be largely contained within the volume of the structure, where they could be more easily controlled. For the remaining fugitive dust that would not be contained within the building, the

1 A potential alternative-sequence project variant that would demolish the structure of Building 51 before disassembly and removal of the Bevatron is analyzed and addressed in Appendix E of the Bevatron Final EIR, which was certified on July 19, 2007. The analysis is included in this document as Appendix G.

2 Removal and disposal of the asbestos-containing siding would be completed before the general demolition of the building would begin. Effective dust control measures would be a part of the asbestos abatement procedure.

majority of the particles would settle out of the atmosphere well within the boundaries of LBNL, due to the substantial distances from the project site to the LBNL boundaries.

The BAAQMD's approach to analyses and evaluation of construction impacts, including demolition activities, is to emphasize implementation of effective and comprehensive control measures, as detailed in the *BAAQMD CEQA Guidelines* (BAAQMD, 1999), rather than detailed quantification of emissions. These control measures are included as part of the Proposed Action. Measures that would be applied to control fugitive dust include the Basic Control Measures set out in the *BAAQMD CEQA Guidelines*. These are:

- Water all active construction areas at least twice daily;
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard;
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites;
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites; and
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.

Measures required by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) to control fugitive dust would also be applied. Concrete dust created by breaking or cutting of concrete shielding blocks and of slabs and foundation must be controlled by OSHA-required measures that limit worker exposure to crystalline silica dust. These control measures, to be implemented at the point at which the fugitive dust would be generated, require the use of water sprays or engineering controls. Such measures would be required during the demolition of the slab and foundation structure.

The BAAQMD considers a project's construction-related fugitive dust (including PM_{10} and $PM_{2.5}$) impacts to be less than significant if all of the required dust control measures, listed above, are implemented. Because the various dust control measures included in the project description and the standard LBNL procedures noted above incorporate all of the BAAQMD's basic required measures, construction dust impacts to both on-site and off-site receptors would be negligible.

Tailpipe Emissions

In addition to fugitive dust emissions, the operation of diesel- and gasoline-powered demolition equipment and demolition-related haul trucks, along with worker commute trips, would also generate ozone precursors, carbon monoxide, and diesel particulate matter (DPM) emissions. The diesel-powered demolition equipment that would be working on-site at various times during the span of the project could include heavy equipment such as boom cranes, fork-lift, front-end loader, back-hoe, ram impact hammer, grader, and compaction roller. The flat-bed and dirt haul trucks required to transport materials to and from the site would also be diesel-powered. Overall, an estimated maximum of about 4,700 one-way truck trips would be required over the lifetime of the project. Maximum frequency is expected to be no more than 34 daily one-way truck trips for hauling material into and out of the site. In addition, as described below in Section 5.1.10, Traffic and Circulation, worker trips are estimated at up to 124 daily individual trips during peak demolition activity periods.

Criteria Air Pollutant Emissions

Not all demolition equipment would be on-site or operating at the same time, thereby reducing the potential short-term impact of these tailpipe emission sources. Moreover, diesel- and gasoline-powered equipment operation would be limited to work hours, and LBNL contract provisions would place limits on equipment idling, require use of electric power in lieu of internal combustion engine power, require use of ultra low-sulfur diesel fuel, and require equipment maintenance to reduce gaseous emissions. As a result of these measures, emissions of criteria air pollutants would be reduced.

Likewise, as described in Section 5.1.10, Traffic and Circulation, haul truck and worker commute trips would occur over a limited period of time, and would represent negligible increases in auto and truck traffic on those streets and roads. Therefore, the resulting impact on local air quality from criteria pollutant emissions would be negligible.

Diesel Particulate Matter Emissions

In addition to criteria pollutants, the diesel-powered trucks and demolition equipment would also generate DPM. As noted previously, CARB identified DPM as a Toxic Air Contaminant in 1998. In addition, CARB implemented a diesel risk reduction plan.

The project activities involving diesel-operated equipment releasing DPM emissions would be temporary, occurring periodically over a more than four-year period, but the scheduled regulatory reductions of DPM emissions that begin in 2007 to lower the resultant health risk from DPM by 75 percent in 2010 would further lower emissions from these sources if newer equipment is used. Although the exact amount of the DPM emissions reduction is not known, substantially greater reductions in DPM emissions are expected to occur for large on-road trucks than for off-road equipment.

Even accounting for the source reductions, the exposure of the public to DPM emissions from haul trucks would be greater than the exposure to DPM emissions from on-site demolition equipment, primarily because the haul trucks would pass within approximately 30 feet of some residences in Berkeley, while the Building 51 work site, where the demolition equipment would operate, is 1,100 feet or more from the nearest residences. This very large difference in distances is sufficient to determine that the concentrations of project DPM in exhaust emissions that would reach any residence would be much less for on-site equipment than for haul trucks.[3] It is possible to make a conservative estimate of the health risk from DPM emissions from project-related truck

[3] Although the project's on-site demolition equipment would be additional sources of DPM, the DPM that would reach off-site residences would be reduced by dispersion, due to the distance of the project site from these residences. As a net result, DPM concentrations from on-site equipment would be roughly 1/100 to 1/10 of the annual DPM concentrations from hauling, based on the amount of demolition equipment assessed and results of modeling described below.

hauling for a resident along a truck route by considering that the exposure, and the related health risk, would be a function of the number of trucks, on a yearly basis, that would pass by a residence. The overall incremental risk from these truck emissions would also be a function of the specific years in which the activities would occur. As stated above, the total number of one-way truck trips that would occur over the multi-year duration of demolition activities is estimated to be approximately 4,700.

DPM emissions from the truck trips were estimated using the CARB model, EMFAC2002. This model relies on emission factors for heavy-duty diesel trucks, similar to those to be used for the project; these factors are derived from emission measurements of equivalent-sized trucks. The estimated DPM emissions for 2,000 annual truck trips[4] were then input into the EPA dispersion model SCREEN3 to calculate ambient air concentrations of DPM (exposure levels) at receptors near the haul truck route roadways. Distances as close as 30 feet from the roadway were assumed in the modeling. The model predicted the worst-case annual average concentration of DPM to be 0.0008 $\mu g/m^3$. Assuming that these project truck emissions would occur beginning in 2006, the total exposure of DPM at the maximum receptor would result in an incremental cancer risk of approximately 0.01 in a million.[5] This would be 1/1000th of the health risk significance criterion value of 10 in a million.

For the reasons stated above, the concentrations of project DPM that would reach any residence from on-site equipment would be much less than the concentrations of project DPM at residences near haul truck routes. Even with longer durations of exposure, the total of the exposures to DPM from on-site project equipment, and the associated health risk, at any residence would also be smaller than the DPM exposure and risk at residences near haul truck routes.

Because the DPM health risk from the on-site sources would be much less than the DPM health risk from haul trucks, the overall health risk from DPM from both sources would therefore be approximately 0.01 in a million.

This estimate of the Proposed Action's incremental cancer risk can be considered to be conservative for several reasons. First, the model SCREEN3 that was used in the analysis uses hypothetical worst-case meteorology to calculate ambient air concentrations. This includes very stable atmospheric conditions and low wind speeds over an entire year. In addition, the DPM emissions that were input into the model were estimated for the first year of expected activities (2006). By 2010, as shown by EMFAC2002, DPM emissions are expected to be reduced by about 30 percent because stricter state and federal emission regulations would come into effect. Lastly, the risk estimate assumes that residents are present during all exposure periods.

4 The 2,000 one-way truck trips per year for each of 3 years is an overestimate of the anticipated truck traffic, so it overestimates total DPM emissions and total risk.

5 Calculated using the carcinogenic risk factors published by the California Office of Environmental Health Hazard Assessment. The risk factors for DPM are based on a total dosage or exposure over a human lifetime of 70 years.

Thus, the health risk from the exposure to DPM from both on-site diesel-powered equipment and project haul trucks would be approximately 1/1000th of the health risk significance criterion value of 10 in a million; the impact of the public exposure to DPM would be minimal.

Asbestos

The exterior siding of Building 51 was constructed with transite, a material typically containing approximately 20 percent non-friable chrysotile asbestos fibers. Given the age of Building 51 and demolition characterization surveys of the facility, other parts of the building were also constructed using asbestos-containing materials. Since airborne asbestos poses a serious health threat, the demolition and removal of any potential asbestos-containing building materials would be handled according to LBNL's Asbestos Management Program, which is tailored to meet the requirements of BAAQMD Regulation 11, Rule 2: Hazardous Materials–Asbestos Demolition, Renovation and Manufacturing. This program includes standards of operation necessary to control asbestos emissions, and identifies any prior notification and permitting requirements. With adherence to this program, the exposure of the public and of the workers to airborne asbestos would be controlled and the impacts associated with exposure to airborne asbestos would be minimal.[6] An asbestos demolition notification to the BAAQMD would be required; if regulated asbestos is present, an asbestos renovation notification would also be needed.

5.1.2 Biological Resources

Since with the exception of the two small areas of ornamental landscaping at the entrance to Building 51, demolition activities would include no tree or shrub removal or damage to trees, and the ornamental landscaping to be removed does not represent appropriate habitat, there would be no potential for direct adverse effects on special-status nesting birds. However, there are a number of oak and conifer trees in close proximity to Building 51 on the slopes to the east and south of the building. These trees are located in a relatively narrow strip of vegetation between two developed areas and alongside Lawrence Road, which has regular daytime traffic flow, including heavy diesel trucks and buses moving up the grade to McMillan Road. The trees nevertheless may provide nesting habitat for special-status birds, as do other trees within a 500-foot radius of the Building 51 site, including oak, eucalyptus, and conifers. Some activities, most notably noise generated by demolition under the Proposed Action, would have the potential to disturb any nesting raptors or other special-status nesting birds present in these trees. Such activities could result in the abandonment of special-status bird nests, eggs, or fledglings.

Ambient noise in the area of Building 51 is generated most notably by vehicle traffic, especially diesel trucks and the Lab's shuttle bus fleet (also diesel-powered), which circulates the Lab at 10-minute intervals throughout the day, as well as automobiles and motorcycles. In particular, McMillan Road, which includes a steep incline at its closest proximity to Building 51 and thus promotes particularly loud vehicular engine noises, is closer to many of the trees of concern than most of the actual sources of demolition noise would be, as the roadway defines the border of the tree area. Stationary sources, including heating, ventilating, and air-conditioning equipment

6 Section 5.1.6, Hazards and Human Health, addresses impacts associated with demolition of radioactively-contaminated building material as well as building surfaces painted with lead-based paint.

associated with buildings, and other stationary equipment at the Lab, including pumps, generators, cooling towers, exhaust hoods, and machine shop equipment, also generate noise, as do current activities at the Building 51 site and immediate vicinity, which include laydown and vehicle storage space for LBNL's "riggers," crane operators, and construction crews for various projects at LBNL.

Noise measurements taken in July 2003 and January 2004 indicate that hourly average noise levels at locations measured nearest Building 51 range between 52 and 66 decibels (dBA, Leq[7]) (ESA, 2003c; ESA, 2004). Maximum noise levels measured were between 61 and 83 dBA, with the second highest reading (74 dBA) at Building 71, near the top of the McMillan Road grade, most likely the result of shuttle bus traffic on the hill.[8] Less frequent but more noisy activity includes operation of a nearby two-megawatt diesel emergency power generator, located approximately 200 feet northwest of Building 51 and abutting the tree line. This generator is tested monthly for intervals of four hours or more, at which time it creates noise of up to 85 decibels at a distance of 50 feet. In addition, regular vegetation management is conducted in and around the trees near Building 51. This vegetation management includes use of equipment such as weed-whackers, leaf blowers, chippers, and chain saws.

As stated in Section 5.1.7, Noise, noise levels associated with typical construction and demolition equipment, other than a hoe-ram impact hammer, range from 74 to 77 dBA. The noise levels associated with simultaneous operation of multiple pieces of equipment other than this hammer is expected to reach 80 dBA, as measured at a distance of 50 feet from the source. With use of the hoe-ram hammer, which would be employed only during the removal of the foundation and substructure (a period expected to last for nine or 10 months), construction noise levels could be as high as 96 dBA at 50 feet. While much of the available research on noise effects on wildlife focuses on longer-term effects related to disturbance from recreational users and military operations (e.g., snowmobiles in national parks, military aircraft overflights in wilderness areas), this analysis conservatively assumes that disturbances from construction and demolition noise could potentially result in the abandonment of special-status bird nests, eggs, or fledglings present in the trees adjacent to the site.[9] On one hand, one source reports, in terms of effects of continuous noise on bird communities, "An increase of 10 dBA above background noise is probably acceptable in most situations" (Nicholoff, 2003). On the other hand, a 10 dBA increase in noise level is perceived by the human ear as a doubling in loudness, potentially causing an adverse response. Wildlife perception of noise appears to be generally more sensitive than that of humans; therefore, it is assumed for the purposes of this EA that a 10 dBA increase in noise (a

7 Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements; Leq represents the constant sound level which would contain the same acoustic energy as the varying sound level.

8 All noise readings were based on measurements 15 minutes in duration.

9 In Ellis (1981), the observers recorded "noticeably alarmed" responses in raptors to sounds within the 82-114 dBA range. At comparable levels (72-89 dBA) seabirds flushed off nests (Jehl and Cooper 1980); at 115 dBA seabirds were absent for as long as 10 minutes (Stewart 1982). Though these studies did not always establish nest failure, the thresholds for a single stimulus event clearly had an effect. This information is indicative that nesting disruption may occur if the noises would persist over a longer period of time. More recent research has found certain types of unnatural noise to be disruptive to bird life at a much lower level. For example, Delaney et al. (1999) found that spotted owl flush rates in response to chain saws became undetectable only when noise levels dropped below 46 dBA.

doubling of loudness) over the existing maximum levels should be considered to be material for birds, as well as other wild animals. Therefore, even assuming that the 83 dBA noise level (generated just south of Building 51, atop the hill inside the LBNL Blackberry Canyon entrance) is representative of typical intermittent bus and truck noise on McMillan Road, demolition-generated noise generated at 96 dBA from use of the hoe-ram impact hammer would represent a material increase over the highest existing noise levels in the area of the Building 51 site, and might be sufficient to cause an impact on nesting special-status birds. However, assuming that simultaneous operation of multiple pieces of more standard equipment (trucks, backhoes, graders, cranes, and the like, and not including the hoe-ram impact hammer) would not exceed 80 dBA and would not be continuous (i.e., an individual piece of construction equipment frequently operates for several minutes to an hour or two before stopping while equipment is repositioned, haul trucks depart, and so forth), such activities would not be sufficient to cause a substantial impact on nesting special-status birds – that is, for most of the Proposed Action timeframe, these potential noise impacts would be negligible even without the incorporation of mitigation measures. Activities undertaken for the Proposed Action would have the potential to cause an important adverse noise or vibration impact to wildlife only during the demolition of the foundation and substructure stage, when the hoe-ram impact hammer would be used.

In addition to the above impacts, any removal or destruction of active nests and any killing of migratory birds would violate the federal Migratory Bird Treaty Act, which prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior.

Regardless of the noise and demolition activity levels on the Building 51 site, there would be no adverse effect, and therefore no substantial impact, if the Proposed Action would not interfere with the successful nesting of raptors and other special-status birds. Demolition activities, including ground clearing and grading that would occur during the non-breeding season (August 1 through January 31), would have no potential effect. For activities that would commence during the breeding season (February 1 through July 31), the conduct of the avian surveys and the subsequent preventive actions would eliminate the potential for adverse effects to nesting special-status birds, as identified in the following mitigation measure.

Mitigation: To address potential indirect adverse effects on nesting special-status birds, the following mitigation measure would be adopted:

Pre-Demolition Special-Status Avian Survey and Subsequent Actions. No more than two weeks in advance of any demolition activity involving concrete breaking or similarly noisy or intrusive activities that commencing during the breeding season (February 1 through July 31), a qualified wildlife biologist shall conduct pre-demolition surveys of all potential special-status bird nesting habitat in the vicinity of the Building 51 site and, depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on nesting special-status nesting birds:

1. If active nests of special-status birds are found during the surveys, a no-disturbance buffer zone will be created around active nests during the breeding season or until a qualified biologist determines that all young have fledged. The size of the buffer zones and types of construction activities restricted within them will be determined

through consultation with the CDFG, taking into account factors such as the following:

a. Noise and human disturbance levels at the Building 51 site and the nesting site at the time of the survey and the noise and disturbance expected during the construction activity;

b. Distance and amount of vegetation or other screening between the Building 51 site and the nest; and

c. Sensitivity of individual nesting species and behaviors of the nesting birds.

2. If pre-demolition surveys indicate that no nests of special-status birds are present or that nests are inactive or potential habitat is unoccupied, no further mitigation is required.

3. Pre-demolition surveys are not required for demolition activities scheduled to occur during the non-breeding season (August 1 through January 31).

4. Noisy demolition activities as described above (or activities producing similar noise and activity levels in the vicinity) commencing during the non-breeding season and continuing into the breeding season do not require surveys (as it is assumed that any breeding birds taking up nests would be acclimated to demolition-related activities already under way). However, if trees and shrubs are to be removed during the breeding season, the trees and shrubs will be surveyed for nests prior to their removal, according to the survey and protective action guidelines 1a through 1c, above.

5. Nests initiated during demolition activities are presumed to be unaffected by the activity, and a buffer is not necessary.

6. Destruction of active nests of special-status birds and overt interference with nesting activities of special-status birds shall be prohibited.

7. The noise control procedures for maximum noise, equipment, and operations identified in Section 5.1.7, Noise, of this EA shall be implemented.

8. Shrubs that have been determined to be unoccupied by special-status birds may be removed as long as they are located outside of any buffer zones established for active nests.

Special-status bats that may occur in the Building 51 vicinity include fringed myotis and long-eared myotis. Special-status bats may use crevices in exfoliating tree bark, as found in eucalyptus, and/or hollow cavities in trees, such the oaks and pines located in the vicinity of the proposed Building 51 site, as well as abandoned buildings. Myotis bats may use the oak woodland across Lawrence Road from the Building 51 site, the oak and bay woodlands at the head of the north fork of Strawberry Creek, or the various conifers, oaks, and eucalyptus located between Building 51 and McMillan and Lawrence roads. As discussed above for birds, particularly noisy activity associated with one stage of demolition could result in noise levels sufficiently high to cause adverse impacts on maternal roosts of special-status bat species. During other stages, assuming that simultaneous operation of multiple pieces of less noisy equipment would not exceed 80 dBA and would not be continuous, such activities would not be considered sufficient to cause a substantial impact on nesting special-status bats.

Regardless, there would be no adverse effect, if the Proposed Action would not interfere with the successful roosting of the bats. Demolition activities that would occur during the non-breeding season (September 1 through February 28) would have no potential effect. For those demolition activities that would commence during the breeding season (March l through August 31), the conduct of bat surveys and the subsequent preventive actions would eliminate the adverse effects of the Proposed Action.

Mitigation: To address potential indirect adverse effects on roosting special-status bats, the following mitigation measure would be adopted:

Pre-Demolition Special-Status Bat Survey and Subsequent Actions. No more than two weeks in advance of any demolition activity involving concrete breaking or similarly noisy or intrusive activities, commencing during the breeding season (March 1 through August 31), a qualified bat biologist, acceptable to the CDFG, shall conduct pre-demolition surveys, utilizing techniques acceptable to the CDFG, of all potential special-status bat breeding habitat in the vicinity of the Building 51 site.

Under such surveys, potentially suitable habitat shall be located visually. Bat emergence counts shall be made at dusk as the bats depart from any suitable habitat. In addition, an acoustic detector shall be used to determine any areas of bat activity. At least four nighttime emergence counts shall be undertaken on nights that are warm enough for bats to be active, as determined by a qualified bat biologist.

Depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on breeding special-status bats:

1. If active roosts are identified during pre-demolition surveys, a no-disturbance buffer will be created, in consultation with the CDFG, around active roosts during the breeding season. The size of the buffer will take into account factors such as the following:
    a. Noise and human disturbance levels at the Building 51 site and the roost site at the time of the survey and the noise and disturbance expected during the construction activity;
    b. Distance and amount of vegetation or other screening between the Building 51 site and the roost; and
    c. Sensitivity of individual nesting species and the behaviors of the bats.
2. If pre-demolition surveys indicate that no roosts of special-status bats are present, or that roosts are inactive or potential habitat is unoccupied, no further mitigation is required.
3. Pre-demolition surveys are not required for demolition activities scheduled to occur during the non-breeding season (September 1 through February 28).
4. Noisy demolition activities as described above (or activities producing similar noise and activity levels in the vicinity) commencing during the non-breeding season and

continuing into the breeding season do not require surveys (as it is assumed that any bats taking up roosts would be acclimated to demolition-related activities already under way). However, if trees are to be removed during the breeding season, the trees would be surveyed for roosts prior to their removal, according to the survey and protective action guidelines 1a through 1c, above.

5. Bat roosts initiated during demolition activities are presumed to be unaffected by the activity, and a buffer is not necessary.

6. Destruction of roosts of special-status bats and overt interference with roosting activities of special-status bats shall be prohibited.

7. The noise control procedures for maximum noise, equipment, and operations identified in Section 5.1.7, Noise, of this EA shall be implemented.

8. Shrubs that have been determined to be unoccupied by special-status bats and that are located outside the no-disturbance buffer for active roosts may be removed.

Activities undertaken for the Proposed Action could disturb common wildlife species that exist within the proposed Building 51 area, including black-tailed deer, raccoon, striped skunk, and gopher snakes. Animals within these habitats, such as small mammals and reptiles, could be subjected to noise and other human disturbances, as well as to direct mortality. However, mortality of common wildlife is not considered an important impact, nor is it expected to occur, particularly with regard to larger and more mobile species. It is expected that no habitat for common wildlife will be lost as a result of the Proposed Action. In fact, revegetation of the site after demolition will result in a short-term slight increase of open space and habitat for common wildlife. The Proposed Action would therefore result in a negligible impact on common wildlife species.

As noted in Section 4.4.2, Biological Resources Setting, the potential for special-status plant species to occur on the Building 51 site is considered low. Therefore, the Proposed Action would not result in an important impact on special-status plants.

5.1.3 Cultural Resources

Demolition and Excavation/Grading

Archival research, field work elsewhere at LBNL, and the nature of the Building 51 site itself all indicate that there is only a low potential for Native American sites to exist at the location of the proposed action. Similarly, there is no indication that the site has been used for burial purposes in the recent or distant past. Thus, encountering human remains at the site during demolition activities would be unlikely.

However, should cultural resources or human remains be encountered during the demolition and excavation phases of the proposed action, the LBNL Facilities Design and Construction Procedures Manual (Procedures Manual) specifies procedures to be followed. This document requires that if an archaeological artifact is discovered on site during construction, all activities within a 50 foot radius shall be halted and a qualified archaeologist shall be summoned within

24 hours to inspect the site. If the find is determined to be significant and to merit formal recording or data collection, adequate time and funding shall be devoted to salvage the material. Any archaeologically important data recovered during monitoring shall be cleaned, cataloged, and analyzed, with the results presented in a report of finding that meets professional standards.

The Procedures Manual also requires that in the event that human skeletal remains are uncovered during construction or ground-breaking activities, all work within a 50 foot radius shall immediately halt, and LBNL Security shall be contacted. LBNL Security shall contact the University of California Police Department to evaluate the remains to determine that no investigation of the cause of death is required. The Native American Heritage Commission (NAHC) will be contacted within 24 hours if it is determined that the remains are Native American. The NAHC will then identify the person or persons it believes to be the most likely descendant from the deceased Native American, who in turn would make recommendations to LBNL for the appropriate means of treating or disposing of the human remains and any grave goods. (LBNL, 2005a). Adherence to the Procedures Manual would mitigate any impacts associated with accidental discovery of cultural resources or human remains.

In accordance with 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act (NHPA), the DOE Oakland Operations Office (DOE-OAK) consulted with the California State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation (ACHP) in order to take into account the effect of demolition of Building 51.

As part of the Section 106 consultation process, a Memorandum of Agreement (MOA; Appendix C) was signed in 1997 among DOE, the California SHPO, and the ACHP regarding the demolition of Building 51. The MOA stated that the demolition of the Bevatron Building/Building 51 and Building 51A Complex will affect a property eligible for inclusion on the National Register of Historic Places. The stipulations of the MOA required that the building be documented in accordance with the National Park Service's Historic American Engineering Record (HAER) requirements. In September 1997, LBNL staff prepared the HAER documentation which included a written historical and architectural description of the building and accelerator, and extensive photographic recordation in accordance with the MOA's stipulations. The HAER documentation was submitted to and accepted by the US Department of Interior National Park Service (NPS) in March 1998.

With the acceptance of the HAER report by NPS, DOE may demolish Building 51 provided that DOE contacts the Historic American Building Survey (HABS) division of NPS to determine what level and kind of recordation is required for the buildings, and that such documentation is completed and accepted by HABS prior to demolition. LBNL has consulted with NPS. The latter determined that an addendum to the HAER report would meet HABS requirements. The HAER addendum has been completed and was accepted by NPS in August 2006. For NEPA purposes, with the signed MOA, completion of the HAER documentation, and approval of the HABS addendum by NPS, LBNL has adequately mitigated for the potential loss of Building 51. As an additional measure, LBNL plans to commemorate the scientific achievements attributed to the Bevatron with a monument and/or display listing the historic discoveries that occurred there.

5.1.4 Geology and Soils

Backfilling, grading, and other demolition activities associated with the project would require the removal of the shallow below-grade concrete foundation, and replacement of a portion of a retaining wall. In addition, there may be a need to excavate subsurface contaminated soil, although this quantity is anticipated to be small (approximately 200 cubic yards). The media cleanup standards and impact analysis would be consistent with those stated in the Environmental Assessment and Corrective Measures Study Report for Remediating Contamination at LBNL Regulated under the Resources Conservation and Recovery Act (DOE/EA-1527). This soil would be removed from the Laboratory, and hauled to an appropriate off-site location for disposal. Clean backfill would be used to restore the site to the current grade. The backfill would be compacted and hydro-seeded.

The Proposed Action proposes no excavation on sloped areas. If excavation is necessary, it would occur in localized areas and generate minimal quantities of soil, as noted above. A site- and project-specific erosion control plan would be included as part of the project design process and implemented as a condition for approval. This plan would include, as part of the proposed project, measures from the 1987 LRDP EIR, as amended (see Appendix A), and development of a site-specific Stormwater Pollution Prevention Plan (see Section 5.1.6, Hydrology and Water Quality). This Plan would include, as feasible, the covering of excavated materials, installation of silt traps, fencing, and use of filter fabric as measures to control erosion and sedimentation as required by the California Construction General Permit. Landscaping would then begin as soon as surface disturbances were finished for each relevant area.

The Proposed Action would therefore not have a substantial impact on geology and soils.

5.1.5 Hazards and Human Health

Project-related activities that include removal of lead dust or asbestos building materials, cutting or removal of equipment or structural materials, or the processing and removal of concrete shielding blocks or slabs would involve substances that could be a hazard to workers, the public or the environment. Various types of hazardous materials would be encountered during demolition activities. About half of the truck trips that would transport materials for disposal off-site would carry non-hazardous construction debris and solid waste, and about half would carry some type of hazardous waste, low-level radioactive waste, or mixed waste. As described in Section 5.1.9, Public Utilities, of the truckloads carrying radioactive waste, the great majority would be of low activity, volume-contaminated items.

The project would incorporate activities and programs to ensure compliance with regulatory and LBNL-specific requirements. Because some equipment and building surfaces in Building 51 are contaminated with hazardous materials at levels that could pose potential hazards to demolition workers, the project would include thorough surveys for all suspected materials, and, if necessary, cleanup of surface contamination on the equipment to be removed and building surfaces to be demolished. This process of removing and disposal of surface contamination from hazardous materials would follow standard LBNL policies and procedures, which are designed to remove or seal and dispose of these contaminants without hazard to workers, the public, or the environment in accordance with regulatory requirements. Once the surface contaminants have been properly abated, general demolition activities would proceed.

Asbestos abatement would be conducted under the LBNL Asbestos Management Program. Before demolition activities proceed, a screening survey would identify ACMs and a sampling program would be used to assess and quantify ACMs for removal. A licensed and certified asbestos abatement contractor would remove ACMs following regulatory requirements. Asbestos-Certified LBNL personnel would oversee the ACM abatement.

Levels of crystalline silica dust would be controlled at the emission source to limit worker exposure. These controls would also help maintain compliance with air quality emissions standards, keeping dust concentrations at off-site receptors to negligible levels.

Materials that LBNL has reason to suspect might contain radioactivity would be characterized according to DOE-approved protocols and disposed appropriately, as described above. Due to the low levels of radioactivity present in the concrete that would be subjected to jackhammering or otherwise broken up, as well as the protective measures (e.g., applying water for dust suppression), it is expected that no detectable radioactivity would be contained in the dust generated by the project.

The project would include off-site disposal of items containing low levels of radiological activity to a certified disposal facility. The low levels of such activity, coupled with the employment of appropriate safety measures in accordance with LBNL operational procedures (e.g., as set in LBNL PUB-3000; LBNL, 2005c), would ensure that any exposure resulting from the shipment of these items to LBNL employees and contractors (e.g., truck drivers), and to the general public (e.g., pedestrians, or passengers in a car idling in traffic next to a truck containing such items), would be far below applicable regulatory limits.[10] The shipments with the highest levels of radioactivity, and the only shipments that could create a measurable dose, would be two or three shipments of depleted uranium. The estimated dose to a hypothetical passenger sitting for one hour in a car positioned two meters (about six-and-a-half feet) from a truck carrying depleted

[10] For transport workers, the applicable DOT regulatory limit is 2 mrem per hour. (49 CFR 173.441(b)(4)). For LBNL employees, the annual occupational exposure to general employees at DOE facilities such as the Laboratory is not to exceed a total effective dose equivalent of 5 rem (1 rem = 1,000 mrem) (10 CFR 835.202(a)(1)). Lesser annual exposure limits are set for employees who are pregnant women (500 mrem to the embryo/fetus from the period of conception to birth), and for minors who are occupationally exposed to radiation and/or radioactive materials (100 mrem) (10 CFR 835.206, 207). The LBNL Radiation Protection Program, which implements 10 CFR 835 at the Laboratory, also sets two administrative levels that can be exceeded only with the approval of relevant authorities:

- A Department of Energy Administrative Control Level for workers of 2 rem whole body exposure per year per person is established for all DOE activities. Approval by the DOE Program Secretarial Official or designee is required prior to allowing a person to exceed this level.
- LBNL itself has set an Administrative Control Level of 1 rem per year for whole body exposure. Approval by the Deputy Laboratory Director is required prior to allowing a person to exceed this level.

  The exposure of members of the public to radiation sources as a consequence of all routine DOE activities shall not cause, in a year, an effective dose equivalent greater than 100 mrem (DOE Order 5400.5). This standard includes exposure to both airborne radionuclides and penetrating radiation. As mentioned earlier in the text, EPA established a limit of 10 mrem/year for airborne emissions for the general public (40 CFR 61).

uranium would be 0.2 mrem. For a hypothetical pedestrian standing for 15 minutes at a distance of two meters from such a shipment, the estimated dose would be 0.05 mrem. These are conservative assumptions, as it is unlikely that any individual member of the public would be within this distance of these shipments for these lengths of time. Even under these circumstances, the resulting exposures would be hundreds of times below the DOE regulatory limit applicable to members of the public, and below the standards set out earlier. Exposures would be less at greater distances and lesser durations.[11] For LBNL workers and contractors, the largest reasonably foreseeable exposure would be to truck drivers transporting depleted uranium blocks. A driver would receive a maximum dose of about 0.03 mrem per hour. This estimate, which does not factor in the likely lessening of the dose due to attenuation as radiation passes through the truck cab, also is far below the applicable regulatory limit and below the applicable standards. See Section 5.1.10, Traffic and Circulation, for a discussion of the potential for accidents during the transportation of materials that would be generated by the proposed project.

As a result of the above factors, the potential impacts of hazardous materials, hazardous waste, and other hazards discussed in this section would be reduced to negligible levels.

Grading, filling, and minor excavation to remove contaminated soil would occur during demolition of the building and foundations and tunnels. Since the concrete slab that surrounds Building 51 would remain in place, this grading, filling, and minor excavation would occur within the Building 51 footprint. Although substantial efforts have been made to locate and sample potentially contaminated environmental media under the building, additional areas of contamination could potentially be discovered during demolition activities, which could potentially result in exposures to demolition workers and/or the environment. Thus, in response to the discovery of conditions that indicate potential contamination, testing would be conducted in these areas prior to allowing work to proceed. Should contamination be present, LBNL would implement necessary measures to protect people and the environment from exposure, in accordance with the regulatory frameworks, and policies and procedures, described earlier in this section. These measures would be contained in a site-specific work plan and a site-specific safety plan, and would be consistent with those required under federal and state hazardous materials regulations and guidelines.

Dewatering may be necessary during project activities because groundwater can be as shallow as 15 feet below ground surface in the vicinity of the site. It is not yet known whether the excavation would intersect the existing groundwater plumes, which are located adjacent to the Building 51 site. As a prudent practice, however, the project would consider all soil and groundwater collected during these activities as potentially contaminated. In accordance with existing LBNL policies, any groundwater extracted during demolition activities would be appropriately contained and tested prior to determining the appropriate disposal option.

Prior to the start of excavation, the project management team would obtain information on known residual soil and groundwater contamination in the project area. The project management team

[11] For example, the exposure to an individual standing for an hour at three meters (about 10 feet) distance from a depleted uranium shipment would be 0.12 mrem. At six meters the dose would be one-fourth of that dose at three meters, and at 12 meters it would be one-fourth of the exposure at six meters.

would be responsible for ensuring that bid specifications disclose known locations and concentrations of hazardous chemicals in soil and groundwater that could be encountered by contractors. Any intrusive work in areas where contaminants are present would be performed by properly trained contractors with oversight by the project management team and assistance from the EH&S Division (e.g., for soil, water, or air monitoring or auditing). Residual chemical or radiological contamination, if any, would be addressed by the EH&S Division in consultation with the appropriate regulatory agency. Newly discovered environmental releases of hazardous constituents will meet the notification and corrective action requirements in LBNL's Hazardous Waste Facility Permit (EPA ID. no. CA 4890008986), section IV.B. "Newly Identified Releases." Cleanup standards and methods will be consistent with LBNL's Environmental Assessment and Corrective Measures Study Report for Remediating Contamination at LBNL Regulated under the Resources Conservation and Recovery Act (DOE/EA-1527).

Project activities would likely involve the use of hazardous materials such as solvents and petroleum products. The use of hazardous materials best management practices (BMPs) during demolition would be required as part of the proposed project under a project-specific Stormwater Pollution Prevention Plan, as described below in Section 5.1.6, Hydrology and Water Quality. Common BMPs include following manufacturers' instructions and securely storing hazardous materials at an appropriate distance from surface water bodies. In addition, as in all phases of the project, excavation and grading activities would comply with applicable state and federal regulations, as well as LBNL-specific policies, that govern hazardous materials exposure of workers, the public, and the environment. Potential exposure of workers, the public, and the environment to hazardous materials would be minimized through development of the site-specific work and safety plans in accordance with LBNL standard operating procedures, and proper handling, storage, and disposal of contaminated soil and groundwater. This would reduce impacts, including the potential for spills of hazardous materials, to negligible levels.

As it would remove a structure and persons associated with it, the project would decrease current exposure to wildland fire hazards. Areas currently occupied by the Building 51 structures would be replanted in accordance with LBNL's Integrated Landscape Management Program, using drought-tolerant native grasses. Landscaping details would include ground cover for erosion control. The proposed project would implement existing design guidelines, as described in the 1987 LRDP, and would be generally consistent with this document. The proposed project would not interfere with implementation of LBNL's emergency response or evacuation plans, because access roads would not be blocked.

5.1.6 Hydrology and Water Quality

As with many large construction projects, the Proposed Action would require the management of water generated from dust suppression activities, rainfall, and, because of the seasonally shallow groundwater, excavation dewatering. Management of the surface water is necessary to avoid entrainment of pollutants such as asbestos, lead, and silica in concrete dust. Also, construction equipment used on-site may release small quantities of petroleum products including diesel, gasoline, and grease that could be combined in the wastewater. The Proposed Action would also involve the management of some materials that have induced or surface radioactivity (see Section 5.1.5, Hazards and Human Health).

Water generated during the project that comes into contact with the site is referred to in this analysis as “demolition contact wastewater.” The actual quantity of demolition contact wastewater that would be generated by the proposed project activities is not known; however, for the purposes of this impact analysis, it is assumed that small quantities of wastewater would be generated at the site on each day of demolition activities. Amounts of groundwater that may be generated are difficult to estimate. However, LBNL estimates that approximately 350 gallons of groundwater per day flow beneath the project area during the September dry season and up to approximately 4,750 gallons of groundwater per day flow through the same area during the December wet season. The upper end of this range is conservatively doubled for planning purposes to a range of 350 to 9,500 gallons of groundwater per day on the site throughout the year. Some portion of this daily groundwater flow would be considered demolition contact wastewater.

The actual quantities of water generated would depend on such variables as the type of equipment used to break concrete, the amount of water discharged from excavations, the amount of rainfall, and the elevation of the groundwater levels. This analysis assumes that demolition activities would continue through the winter and that stormwater management techniques would be used to reduce the contact of stormwater with residual contaminants at the demolition site.

Stormwater that could be contaminated by construction activity would be controlled by LBNL’s Best Management Practices (BMPs). The BMPs used by LBNL are described in its 2006 sitewide Stormwater Pollution Prevention Plan (SWPPP). The specific details of the demolition process and the most effective BMPs for controlling surface runoff, preventing erosion, and maintaining adequate drainage at the Building 51 site will be developed by LBNL staff and contractors in project-specific SWPPPs as the specifics of the demolition activities are further defined. As required by the statewide General Construction Permit, the preparation and implementation of SWPPPs will ensure that pollutants would not enter the environment through uncontrolled runoff. On-going groundwater monitoring would not be disturbed.

The project-specific SWPPPs would address each aspect or phase of the demolition project and describe the BMPs necessary to remedy potential stormwater management issues. LBNL would require each subcontractor operating on the Building 51 site to develop and be accountable to a SWPPP, which would define procedures and BMPs necessary to manage and discharge wastewater generated during the phases of deconstruction. The subcontractor would be responsible for preparing and implementing the SWPPP, while LBNL would oversee acceptable implementation through regular inspection of the BMPs.

Each SWPPP would address in detail the particular wastewater management issues and procedures that are unique to the individual demolition phase or activity. For example, contractors involved in aboveground concrete demolition would develop the necessary BMPs for management of water used for concrete dust suppression; contractors working in subgrade areas or excavations would use BMPs designed to address seepage of groundwater or water accumulated on the subgrade floor of Building 51. The development of the specific procedures would rely on the fact that the building site and pad site are paved, so water on the site could be controlled in a relatively straightforward and reliable manner.

Examples of BMPs that LBNL could require as part of the project, all but the last from the LBNL 2006 facility-wide SWPPP, include the following:

- Any excavated soil that is stockpiled would be covered with weighted plastic during rain events.
- Storm drains would be protected from soil or other materials by placement of a cover, filter fabric, or other measure during demolition activities.
- Good housekeeping practices requiring orderly storage of materials and proper clean-up would be implemented throughout the demolition site.
- Hazardous materials would be stored in closed containers and away from storm drain locations.
- Water from concrete cutting activities or other concrete breaking or sawing would be contained and immediately vacuumed up.
- When new concrete is placed, specific on-site locations would be designated if necessary for concrete dust washing. Concrete residue would be allowed to harden and then would be disposed of as trash, avoiding discharge to storm drains.
- Site winterization would employ LBNL's BMPs and would include covering open tanks and lined ponds that hold demolition contact water, if these are present (such water usually would be stored in already-covered tanks); routing water away from areas that may contain residual construction waste material and petroleum; and inspecting storm drains to ensure that on-site flooding does not occur or waste materials are not flushed with clean stormwater.
- All demolition contact water generated during deconstruction operations would be contained in tanks or lined ponds and tested to determine final disposal method. Testing to determine disposal pathway would follow applicable state and federal guidelines for characterizing and profiling waste material.
- During mud-producing activities, a self-contained station would be set up where truck wheels would be cleaned to prevent dirt from leaving the site by this route. Water would be captured and recycled in this system. This station would use as little water as possible incorporating dry cleaning methods, high-pressure sprayers, and a positive shutoff valve. The station would be located away from storm drain inlets and drainages. Discharge water would be collected and disposed of in accordance with all applicable laws and regulations.

Enforcement of SWPPPs and the required BMPs would be the responsibility of LBNL site monitors who would be on-site during all demolition operations to ensure that contractors comply with the stormwater/wastewater management plans. These monitors would have the ability to authorize contractors to immediately correct non-compliant conditions or order work to stop until such conditions were corrected.

Demolition contact water would be managed by BMPs as specified in SWPPPs required by LBNL for each subcontractor. These SWPPPs and the BMPs they require would be in compliance with state and federal regulations and subject to regular inspection by LBNL staff. The management and disposal of all demolition contact wastewater and stormwater, and regular inspection of wastewater management procedures, would ensure that impacts from the generation of contact wastewater would be negligible. It is anticipated that groundwater determined to be clean can be discharged to the storm drain. Groundwater that is found to be contaminated would be treated to an acceptable level and discharged under permit to the sanitary sewer system.

Stormwater runoff from the proposed site is currently discharged to the North Fork of Strawberry Creek. This condition would not change under the post-Building 51 site configuration. Following the demolition and removal of Building 51 and its foundation, the demolition zone would be converted to vacant space and hydro-seeded with native grasses. This would allow varying amounts of surface water to percolate into the ground rather than flow along the surface, especially early in the rainy season when soil conditions are not yet saturated. The percolation of surface water into the ground would slightly reduce the overall quantity of surface water runoff. Because the Proposed Action would cause stormwater runoff on the subject site either to be slightly reduced or to remain the same as under existing conditions, the impact on runoff rates and volumes discharged to the North Fork of Strawberry Creek would be negligible. In addition, BMPs followed by the contractors would maintain the quality of re-water discharged to the North Fork of Strawberry Creek to acceptable levels.

5.1.7 Noise

All work related to disassembly and removal of the internal structures (i.e., the concrete shielding blocks and the Bevatron apparatus) would occur while the exterior structure of Building 51 is in place. The exterior structure would then be demolished. After demolition of the building, the slab and foundation structure would be demolished. Final tasks would include excavating contaminated soils, if necessary, followed by backfilling of the site. Demolition work would be performed approximately 40 hours per week, Monday through Friday; normal work hours would be between 7:00 a.m. and 3:30 p.m. It is possible that some truck loading and departure would take place on Saturdays and/or Sundays, although this would be infrequent.

The degree to which noise generated by the project would affect sensitive receptor areas depends upon the noise level generated by the equipment used, the distance between noise sources and the nearest noise-sensitive uses, and the existing noise levels at those locations. Demolition noise levels fluctuate depending on the particular type, number, and duration of use of various types of equipment.

To determine the potential noise impacts on sensitive receptors, noise tests and calculations were conducted to measure sound propagation from Building 51 to the nearest sensitive receptor areas. The tests used an artificial noise source producing a noise level of 95 dBA at 50 feet. This artificial noise source served as a surrogate for noise levels associated with the loudest stage of demolition described above (i.e., the second stage).[12] The noise level generated was measured at the six receptor locations described in Section 4.1.7, Noise Setting, to account for the acoustical effects of the terrain, building structures, and atmospheric conditions. The resulting noise levels, based on measured noise plus background noise, were then compared to the maximum noise levels set by the Berkeley Noise Ordinance as well as the average measured existing noise levels in each of these areas. These results are shown in **Table 3**.

[12] Noise levels associated with demolition of the foundation and substructure would be 1 dBA louder than the artificial noise source used in this analysis. As mentioned earlier, except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived. Therefore, for this analysis, it was assumed that the noise levels measured as part of the noise tests conducted using the artificial noise source would serve as a reasonable substitute for the noise levels generated by the loudest stage of demolition.

TABLE 3
MEASURED NOISE LEVELS AT SENSITIVE RECEPTOR LOCATIONS WITH DEMOLITION

Measurement Location (see Figure 7)	Demolition Noise Level at Sensitive Receptor Locations (dBA)	Maximum Allowable Noise Level (Weekday/Weekend) (dBA)	Average Background Noise Level (dBA)
Area 1			
Site 1 (zoned R4)	54	65/55	54
Site 2 (zoned R4)	46	65/55	46
Site 3 (zoned R1)	44	60/50	44
Area 2			
Site 4 (zoned R1)	up to 57	60/50	54
Site 5 (zoned R1)	up to 53	60/50	52
Area 3			
Site 6 (at wall) (zoned R5)	up to 60	65/55	54
Site 6 (15 ft. from wall) (zoned R5)	not audible	65/55	53

SOURCE: Parsons (2003)

As indicated in **Table 3**, the noise levels associated with the loudest phase of demolition would not be audible at most adjacent sensitive receptor locations, and would not exceed applicable weekday noise limits set by the Berkeley Noise Ordinance.[13] Weekend truck loading and departure activities would generate noise levels that would not exceed Berkeley's weekend noise standard at any sensitive receptor sites. At the same time, on-site receptors, such as occupants of LBNL buildings adjacent to the Building 51 site, would experience temporary noise increases during demolition. Although such receptors are not generally considered noise-sensitive, implementation of mitigation measures identified in the 1987 LRDP EIR, as amended, would lessen noise impact to a negligible level (see Appendix A). Moreover, as part of project contract specifications, LBNL would require its subcontractors to employ the following noise control procedures:

- Maximum noise: Contractors will use equipment and methods during the course of this work that minimize disruption to adjacent offices and residences. Noise levels for trenchers, graders, and trucks will not exceed 80 dBA at 50 feet as measured under the noisiest operating conditions.

[13] If demolition work were to occur on weekends, associated noise levels would exceed Berkeley's weekend noise standard (City of Berkeley, 2005) at Site 4 and at the wall at Site 6. At Site 4, the combination of background and demolition noise would result in a noise level of up to 57 dBA, which represents an approximately 3-dBA increase over background noise. A 3-dBA change is considered a just-perceivable difference in noise level. Therefore, this increase in noise level would result in a negligible impact. The majority of LHS activities occur away from the wall at Site 6, in areas where there is no line-of-sight to the Building 51 area (a partial line-of-sight is available at the wall, as well as at the north parking area). Given that most LHS visitors would remain in the area behind this wall and that LHS itself is well behind this wall, LHS activities and visitors would not be exposed to demolition noise levels in excess of the weekend standard.

- Equipment: Contractors will use jack hammers equipped with exhaust mufflers and steel muffling sleeves. Diesel equipment will have exhaust muffled. Air compressors will be of a quiet type such as a “whisperized” compressor.

- Operations: Machines will not be left idling. Electric power will be used in lieu of internal combustion engine power whenever possible. Equipment will be maintained to reduce noise from vibration, faulty mufflers, or other sources.

- Scheduling: Noisy operations will be identified in the project schedule. Such operations will be scheduled so as to minimize their impact on occupied areas and their duration at any given location.

Demolition-induced vibration attenuates more or less rapidly at distance from the source, depending largely on soil conditions. Given the distance between the demolition site and any off-site buildings and residences, it is reasonable to assume that there would be no off-site impacts from groundborne vibration regardless of soil conditions. People working in LBNL buildings in the immediate vicinity of Building 51 may notice groundborne vibrations associated with demolition of the building. This impact would be negligible because it would be temporary and intermittent and would not adversely affect any off-site receptors.

Lastly, truck traffic associated with the hauling of materials to and from the site could potentially elevate noise levels along haul routes for the duration of demolition activities. The project would result in a maximum of 34 daily one-way truck trips. Trucks would be directed to routes on roads and freeways that are already heavily traveled. Therefore, given the limited number of project trips and the volume of existing traffic on the affected roadways, the general increases in noise levels along haul routes would not be perceptible.

While the Proposed Action is consistent with the City of Berkeley’s Noise Ordinance, the additional measures incorporated as part of the Proposed Action would assure that the Proposed Action would not expose sensitive receptors to excessive noise levels.

5.1.8 Public Services

The Proposed Action would not introduce any additional long-term population or employment into the area. Thus, it would not result in any additional long-term demand for police or fire services or the need for new or altered facilities.

The demolition activities may require temporary roadway lane closures and detours, but these temporary changes would not substantially affect response times to the Building 51 site and its vicinity. No complete road closures are anticipated during the demolition period. Demolition activities would be overseen so as to comply with applicable safety requirements, including but not limited to LBNL-specific requirements and those of the DOE and the federal OSHA. Fire, emergency medical, and police services would be appropriately informed of relevant aspects of the project.

The Proposed Action would result in a maximum of approximately 34 one-way truck trips per day, and 4,700 total one-way truck trips on Berkeley city streets and public highways over a period of four to seven years. These project-related truck trips, along with other, non-project-related truck trips, would cause wear on those streets, roads, and highways. Large trucks are used routinely on local streets designated as truck routes within Berkeley and also used on public highways and freeways. Such public roadways are designed and constructed to sustain regular use by heavy trucks. While most of the project truck shipments are anticipated to fall within the normal truck weight limits, about five percent would be overweight, and therefore their routes would be specified to preclude damage to bridges along the way. All project-related trucks would use approved truck routes, and therefore no damage to roadways is expected beyond that which would be considered normal wear and tear.

5.1.9 Public Utilities

Project demolition activities would generate waste and debris. Some items would be contaminated with radioactivity or have other hazardous characteristics. These waste types and their disposition options are discussed in Section 5.1.5, Hazards and Human Health. About half of the materials that would be removed would consist of non-hazardous construction debris and other solid waste. Categories of the latter include reinforced concrete shielding blocks, concrete from the building slab and foundation, glass, wood and metals. In the Bevatron accelerator itself, the most prevalent material is steel, with significant amounts of copper, aluminum, and other metals also present. In addition, there would be incidental quantities of other materials in the Bevatron apparatus, such as rubber, epoxy, and plastic.

The Proposed Action would use contractors to remove the various types of construction debris that would be generated. The project would seek to reuse or recycle non-hazardous waste where feasible. For example, uncontaminated metals might go to scrap dealers. Items that could not be salvaged would be sent to appropriate municipal landfills, such as the Altamont Landfill in Livermore, California.

Metals not subject to the DOE Metals Release Suspension would be eligible for unrestricted (“free”) release. For concrete shielding blocks, reuse options include shielding at other accelerators, and soil stabilization. Prior to release for shipment off-site, these materials would be screened in accordance with the LBNL EH&S Protocol for Survey and Release of Bevatron Materials (LBNL, 2005b). Such materials can be sent off-site and reused or recycled by government agencies and private sector parties without restrictions. If reuse or recycling is not feasible, non-radioactive concrete blocks, concrete from the other sources, and other non-hazardous materials can be sent to landfills that accept these types of materials.

Another recycling option for concrete with no hazardous characteristics is to send it to commercially operated off-site locations that break concrete into rubble. The resulting rubble could be released for such uses as fill for construction projects and road building, or it could be sent to landfills.

It is assumed that approximately half of the clean fill needed for backfilling the foundation void would be purchased and brought on-site, and the other half would be supplied by clean fill from LBNL, possibly including a small amount of recovered rubble from the slab and foundations.

Table 4 provides a summary of the principal categories, amounts, and destinations of hazardous and non-hazardous waste that would be generated.

TABLE 4
DEMOLITION WASTE: ESTIMATED AMOUNTS AND DESTINATIONS

Material	Local Class 3[a] Landfill	Local Class 2[b] or Class 3 Hazardous Waste Facility	Reuse/ Recycle	Low Level Radioactive Waste Disposal Site[e]
Asbestos Containing Material		26 truckloads		
Concrete Shielding Blocks				
Volume contamination				3,200 tons
Eligible for unrestricted release	10,300 [c] tons			
Miscellaneous Radioactive Waste Items				250 tons
Bevatron Accelerator				12,360 tons[d]
Building Steel from Accelerator Zone	180 tons[d]			
Building Steel from Outside Accelerator Zone			900 tons	
California Hazardous Materials		40 tons		
Slab and Foundation Debris				
Hazardous materials-contaminated		800 cubic yards		200 cubic yards
Volume contamination				
Non-radioactive			10,500 cubic yards	
Contaminated Soil		200 cubic yards		
Beam Line Components with Internal Surface Contamination				80 tons
Lead				5 tons
Depleted Uranium Shielding				43 tons
Other Non-Hazardous Demolition Waste	750 tons[c]			
TOTALS	**11,230 tons**	**40 tons, 1,000 cubic yards, and 26 truckloads**	**900 tons and 10,500 cubic yards**	**15,938 tons and 200 cubic yards**

a A Class 3 Landfill is for disposal of ordinary municipal solid waste.

b A Class 2 Landfill is for "designated waste." Designated waste is defined by California Water Code Section 13173 as (a) Hazardous waste that has been granted a variance from hazardous waste management requirements pursuant to Section 25143 of the Health and Safety Code and (b) Nonhazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan. Designated wastes typically include such materials as non-friable asbestos, sewage sludge (biosolids), bag house waste, grit, street sweepings, petroleum contaminated soil, triple-rinsed pesticide containers, etc.

c Some of this waste may be reused or recycled, lowering the amount that would be sent to landfills.

d Subject to DOE Metals Suspension. If not radioactive, some of this waste may be sent to landfills subject to an agreement not to recycle (i.e., "free release").

e Envirocare, Nevada Test Site, or other authorized facility.

As part of its standard operating procedures, LBNL consults with landfills prior to the start of demolition activities to ensure that there is sufficient capacity to accept the amount of waste generated by such projects, and has done so for the proposed project. No problems are anticipated in disposing of the various types of waste that would be generated.

The Proposed Action would result in a negligible impact on public utilities.

5.1.10 Traffic and Circulation

The Proposed Action would result in temporary and intermittent increases in traffic volumes on area roadways. Those increases would be associated with commute trips by demolition workers and the movement of equipment used for demolishing Building 51 and the Bevatron, removing materials, and backfilling and grading the Building 51 site. The intensity and nature of these activities would vary over the multi-year period of the project, and the range of adverse impacts on traffic flow and parking conditions would similarly vary. Potential adverse project-related transportation impacts would primarily relate to temporary increases in traffic volumes on area roadways outside the Lab site, in the City of Berkeley.

Truck Destinations and Routes

The Proposed Action would generate truck trips for a variety of purposes, including equipment and material deliveries and removals, demolition, excavation, and backfilling. The Proposed Action would seek to reuse or recycle materials (e.g., uncontaminated metals and concrete) where feasible. Items contaminated with non-radioactive hazardous materials would be sent to treatment and disposal facilities or landfills permitted to receive such items.

Berkeley Laboratory routinely informs its construction subcontractors that truck routing be directed toward University Avenue, Oxford Street between Hearst and University Avenues, Hearst east of Shattuck Avenue, Shattuck Avenue, Adeline Street, and Ashby Avenue, and that trucks avoid the Warring/Derby/Belrose/Claremont corridor. As part of the Proposed Action, contract specifications would include requirements that truck shipments would follow a subset of these routes: in general, shipments from the site would proceed down Cyclotron Road to Hearst Avenue and then proceed west on Hearst Avenue, south on Oxford Street, and west on University Avenue to I-80. Shipments to the site would reverse these directions. This is also the route designated for radioactive and mixed waste in a 1996 agreement between LBNL and the City of Berkeley. The location of the receiving facilities would dictate what direction on I-80 the trucks would travel.

No roads would be permanently closed as a result of the Proposed Action, and no new roads, road extensions, or improvements would be required. As stated above, LBNL’s Facilities Master Specifications would require flaggers for all work that may affect the use of roads by the University and, in accordance with LBNL’s Health and Safety Manual, traffic disruptions and temporary road closures would be managed through the use of signs, cones, barricades, flaggers, and clearly identified traffic detours. Additionally, security and the local fire and police departments would be notified of any temporary road closures.

Number and Timing of Trips

An estimated maximum of about 4,700 one-way truck trips would be required over the four- to seven-year term of the Proposed Action.[14] Most of the trips would be one of two types: 1) inbound trips with empty trucks and outbound trips with trucks hauling away material for appropriate disposal, or 2) inbound trips delivering clean backfill and outbound empty trucks. Other trips would be for the delivery of demolition equipment and miscellaneous supplies.

Demolition work would be performed approximately 40 hours per week, Monday through Friday; normal work hours would be between 7:00 a.m. and 3:30 p.m.. It is possible that some work, including truck loading and departure, would take place on Saturdays and/or Sundays, although this would be infrequent.[15]

The highest level of truck travel would occur during the final months of the proposed activities, when backfilling is underway. It is estimated that the number of daily truck trips at that time would be about 18 to 34 one-way trips (i.e., up to 17 loaded trucks and 17 empty trucks); during the other periods of demolition activity, the number of truck trips per day would be no more than about 10 one-way trips.[16] Because these truck trips would be spread over the course of a work day, the up to 34 daily one-way trips would generate an average of about four one-way trips per hour (i.e., one truck every 15 minutes). However, the actual number of shipments could be greater at particular times.

The number of workers and associated trips would vary over the multi-year demolition period, but is estimated to be about 20 to 25 workers on average per day, with a maximum of up to about 50 workers. Contractor personnel not taking public transportation or LBNL-provided bus transit would park near the Building 51 site or elsewhere at LBNL. An estimate of the number of daily trips by workers is based upon a conservative assumption that all of the workers would be driving alone (i.e., no carpooling assumed) to and from the site during the peak hour, even though public transportation and Laboratory shuttles are available in the Building 51 area. In addition, it was assumed that because of the presence of an on-site cafeteria, no more than about 25 percent of the demolition workers would travel off-site during the lunch period. The number of trips generated by workers would therefore be up to 50 inbound trips in the morning, 24 mid-day trips (12 inbound, 12 outbound), and 50 outbound afternoon trips for a total of approximately 124 daily trips during the peak demolition activity periods. The worker-generated trips would be dispersed over the various roadways used between the Building 51 site and the worker's trip origin/destination.

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14 A schedule variant of the project could reduce the minimum duration of the project from four years to three and a half years, but for the reasons discussed here, this reduction in schedule would not increase the maximum haul truck traffic generation rates and therefore would not change the resulting traffic impacts and mitigation measures. See Appendix G.

15 An alternative-sequence project variant that would demolish Building 51 before the disassembly and removal of the Bevatron itself would, for the reasons discussed here, not increase the maximum haul truck traffic generation rates and therefore would not alter traffic and traffic-related impacts and their mitigation measures. Analysis of the alternative-sequence project variant is included in Appendix G.

16 For comparison, existing daily traffic entering and exiting LBNL is approximately 5,700 vehicles per weekday.

Effects on Roads and Intersections

The estimated increase in traffic volumes caused by haul truck traffic for the Proposed Action would not be substantial relative to background traffic conditions, and would fall within the daily fluctuations of traffic volumes for area roadways, which would not be noticeable to the average motorist. As noted in Section 4.1.10, Traffic and Circulation Setting, the intersections of University Avenue / Sixth Street and University Avenue / San Pablo Avenue operate at LOS F during both peak hours. The remaining 20 study intersections operate at LOS D or better. The Proposed Action's contribution to the two intersections operating at LOS F would represent an increase of no more than about 0.9 percent above the a.m. and p.m. peak hour traffic volumes. These truck trips would be spread over the course of a work day, therefore, the highest level of truck traffic would generate an average of about one truck every 15 minutes. This short-term increase in vehicle trips would not substantially affect level of service and traffic flow on roadways. The primary impacts from demolition truck traffic would include a temporary and intermittent reduction of roadway capacities due to the slower movements compared to passenger vehicles. As stated above, at particular times, the actual number of truck trips could be greater than the average estimated herein. However, with the incorporation of the mitigation measure described below, the number of demolition-generated vehicle trips would not result in any adverse change in traffic levels of service.

The Proposed Action would neither alter the physical configuration of the existing roadway network serving the area, nor introduce unsafe design features. The physical and traffic characteristics of area roadways (e.g., traffic signal and stop-sign control, pedestrian crosswalks and crossing signals) would safely accommodate traffic generated by the Proposed Action. The Proposed Action's effect on general and emergency access, pedestrians and bicyclists, and safety related to roadway design, would be negligible.

Transportation of equipment or demolition materials exceeding the load size and weight limits of any roadways would require special permits. There are established procedures and processes for obtaining such permits through agencies governing the use of the roadway and highway system. Compliance with applicable regulatory requirements is expected to result in negligible impacts.

> **Mitigation:** To address potential temporary and intermittent adverse effects to transportation and traffic, the following mitigation measure would be adopted:
>
> The frequency of truck trips (loaded or empty) shall be no greater than (a) one every 10 minutes (six truck trips per hour) during the a.m. and p.m. peak commute hours, and (b) one every five minutes (12 truck trips per hour) during periods other than the a.m. and p.m. peak commute hours.
>
> Under this limitation, the projected level of truck traffic would have minimal effects on traffic flow, even if those trucks were to travel through the congested intersections on University Avenue at San Pablo Avenue and Sixth Street during the peak commute hours. Hourly truck

trips would represent an increase of no more than about 0.9 percent above the a.m. and p.m. peak-hour traffic volumes, respectively, at the above-cited congested intersections.[17]

Demolition workers would require parking areas for their vehicles. Adequate parking is available in the Building 51 staging area to meet parking needs of the Proposed Action, and as part of the Proposed Action, demolition workers driving vehicles to LBNL would be directed to park within that area.

Transport of Demolition Materials

The Proposed Action would require the off-site shipment of hazardous waste, low-level radioactive waste, and mixed waste. Transport of hazardous and radioactive materials is addressed below, and additional information on the handling of these materials is provided in Section 5.1.5, Hazards and Human Health.

Transport of Radioactive Waste

Radioactive waste would consist of waste that contains induced and/or surface radioactivity, the presence of which would be determined by instrument surveys or swipe samples, depending on the items involved. While Berkeley Lab is subject to DOE requirements for the on-site management of radioactive waste, it is subject to a different set of requirements for the transport of such waste, mandated by the U.S. Department of Transportation (DOT), as follows:

- As described in Section 5.1.5, for volume contamination from induced radioactivity, the DOE-approved detection limit for radioactivity is 2 picoCuries/gram (pCi/g). The DOT definition of radioactive waste differs from that of DOE. Items with induced activity are not managed under DOT regulations as radioactive where the sum of the radioactivity of all of the isotopes in an item expected to be encountered during the Proposed Action is 270 pCi/g or less. Thus, items with radioactivity between 2 pCi/g and 270 pCi/g would be classified as "radioactive" by DOE, but not by DOT. Only items with an induced activity above DOT isotope-specific activity thresholds are required to be managed as a DOT hazardous material for shipment to a disposal facility.

- The number of surface contaminated items is expected to be small enough that one shipment would suffice. It is possible that these items would be grouped and shipped with other radioactive waste produced by other programs at LBNL. Shipments would be labeled and transported in accordance with DOT requirements.

- All or most of the concrete blocks containing uranium above background levels, and all of the depleted uranium blocks, would be transported as DOT radioactive material, and labeled and transported in accordance with DOT requirements. Some metals from the Bevatron may also be shipped as DOT radioactive material.

As stated in a 1996 agreement between LBNL and the City of Berkeley, the Laboratory:

[17] The maximum 0.9-percent increase was calculated using six one-way truck trips (one every 10 minutes), a passenger-car-equivalence of three cars per one truck, and existing a.m. peak-hour traffic volumes on University Avenue. The percent increase with any other combination of values (e.g., four one-way truck trips, or existing p.m. peak-hour volumes, or total intersection volumes, or cumulative volumes) would be less than 0.9 percent.

> "will target shipments [of radioactive and mixed waste] for the morning hours of 9 a.m. - 11 a.m. and pledge[s] to avoid where possible, shipments during peak 'rush hour' traffic (6 a.m. - 9 a.m. and 3 p.m. - 8 p.m.). However, we must state that when this target cannot be met, the Laboratory reserves the right to allow the transporter to depart at other times, confident that the standard we meet for packaging and shipping such waste provides every reasonable assurance for protection of the environment and public health."

As described earlier, radioactive waste would be sent to an approved disposal site. Prior to beginning shipments of items determined to be radioactive waste, LBNL would make a voluntary annual advance notification to designated City of Berkeley agencies. This notification would summarize the general types of waste being shipped, the typical radioisotope content of each waste type, and the anticipated shipping frequency.

Employees and contractors at Berkeley Lab who handle and transport radioactive materials must comply with the requirements of the Laboratory's DOE-approved Radiation Protection Program. Any shipments or transfers of radioactive materials from the Laboratory would be reviewed and approved by the Environment, Health and Safety (EH&S) Division to ensure that the materials would be properly contained for shipment pursuant to applicable DOT and DOE regulations and requirements, and would not present a hazard to the public during transport. As described in Section 5.1.5, any radiological dose to LBNL employees and contractors, or to the general public, would be far below applicable regulatory limits.

Transport of Hazardous Waste

The EH&S Division is responsible for ensuring compliance with hazardous waste regulations and for determining the Berkeley Lab Hazardous Waste Handling Facility's management requirements, selecting a disposal site, and manifesting and maintaining disposal records. Hazardous waste, and transite and other asbestos-containing material, would be packaged, labeled, and transported as per EPA and DOT regulatory requirements. Any residual soil or groundwater contamination that is encountered during demolition would be managed in accordance with applicable DOE and Berkeley Lab policies, and state and federal regulations regarding hazardous waste transport. These regulations are specifically designed to reduce the potential risk of any adverse affects to human health to negligible levels.

Transport of DOT Non-Regulated Materials

In general, due to the absence of hazardous characteristics, the DOT non-regulated materials that would be shipped off-site as a result of the Proposed Action would not require sealed containers. Items would have been vacuumed or otherwise cleaned prior to shipment, and the trucks would not release radioactive or hazardous dust products. However, some items likely would be shipped in sealed containers because of certain physical characteristics (e.g., small items that otherwise would be difficult to hold down or surface contaminated objects that may contain dispersible radioactivity).

Accident Potential

Accident data for collisions involving trucks over a three-year period (2002 through 2004) were obtained from the Department of California Highway Patrol for roadways that truck trips generated by the Proposed Action would likely use between the Building 51 site and the I-80 freeway (CHP, 2005). **Table 5** shows the name of the road, the length of the road segment in question, the total number of collisions involving trucks in the three-year period, the average number of accidents per year, and the number of accidents that were the fault of the truck driver in the opinion of the reporting officer. As shown in the table, the number of accidents per year involving trucks has not been high, and has been less so if one considers only those for which fault was assigned to the truck driver.

TABLE 5
COLLISIONS INVOLVING TRUCKS ON LIKELY TRUCK ROUTES (2002-2004)

Roadway	Length of Segment	All Accidents		Fault of Truck Driver	
		Total	Per Year	Total	Per Year
University Avenue (Oxford Street to I-80)	2.19 miles	17	5.7	10	3.3
Oxford Street (University Ave. to Hearst Ave.)	0.12 mile	1	0.3	1	0.3
Hearst Avenue (Shattuck Ave. to Highland Pl.)	0.72 mile	1	0.3	1	0.3
Shattuck Avenue (Hearst Ave. to Ashby Ave.)	1.31 mile	5	1.7	2	0.7
Adeline Street (Shattuck Ave. to Ashby Ave.)	0.39 mile	3	1.0	3	1.0
Ashby Avenue (Shattuck Avenue to I-880)	1.66 mile	9	3.0	4	1.3

SOURCE: CHP (2004)

The Proposed Action would neither change the physical characteristics of the street network serving the site, nor generate traffic that is incompatible with existing traffic patterns. It would be unlikely that the rate of motor vehicle accidents (i.e., accidents per number of vehicles) would increase as a result of the Proposed Action. There would be no reasonably foreseeable substantial risks to health and safety from transporting project demolition material.

The Proposed Action would result in a negligible impact on traffic, circulation, and parking at the Building 51 site and in the vicinity.

5.1.11 Visual Quality

Demolition activities would create a temporary adverse effect on the visual quality of the proposed site and its surroundings. The visual environment during the demolition project, which would last between four years and seven years, would include the presence of elements typical of a demolition site such as cranes, excavators, loaders, trucks, compactors, stockpiled materiel, and temporary fencing, as well as the truck trips necessary to bring materials to and from the site. After demolition activities have been completed, the site would be backfilled, compacted, and hydroseeded. While future reuse of the site is contemplated by LBNL, no specific project has been identified to date, and for the purpose of this analysis, no buildings would exist on the site after the demolition project is completed.

In accordance with 1987 LRDP EIR, as amended, disturbed areas would be revegetated using native shrubs, trees, and/or grasses (see Appendix A). All vegetation placed by the proposed project would be irrigated as necessary and would conform to the 1987 LRDP Design Guidelines.

Views of the site and of demolition activities would be primarily available from locations immediately surrounding the building, on LBNL property, with some portions of the site visible from the Lawrence Hall of Science when looking west. The visual environment created during demolition activities would be temporary and therefore its impact on views would be negligible. Further, no long-range views of the project site would be altered, as the site is generally not visible from longer distances within the City of Berkeley.

Removal of the Bevatron and Building 51 would alter the character of the site by replacing a large building complex with an open, revegetated area of about 2.25 acres in size; however, this alteration would not create an adverse aesthetic impact.

If nighttime demolition activities were to occur, temporary lighting would be required that could affect views by increasing the amount of light and glare emitted from the project site. Work would be performed approximately 40 hours per week, Monday through Friday. Normal work hours would be between 7:00 a.m. and 3:30 p.m. However, if it would be necessary to perform some work activity after sunset or before sunrise, such as truck loading and departure, or to complete a critical phase of work that would not cause high levels of noise or other impacts, the Lab would install night shields on all outdoor fixtures used during demolition activities to minimize potential light and glare spillover impacts. This nighttime lighting would not be a substantial new source of light or glare visible to off-site urban areas.

The Proposed Action would therefore not have an important impact on the visual quality of the site, or the visual quality of areas in the vicinity of the site.

5.1.12 Environmental Resources Not Affected

Environmental resource topics in which no impact would occur include the following:

- **Floodplains/ Wetlands.** The Proposed Action would not take place within a 100-year floodplain or in the vicinity of wetlands.

- **Seiche, Tsunami, and Mudflows.** Removal of the structures eliminates structural hazards associated with mudflows, seiches, and tsunamis.

- **Agriculture/Mineral Resources.** There are no agricultural land uses on or near the project site that would be affected by the demolition of Building 51. The California Department of

Conservation, Geological Survey (CGS, formerly Division of Mines and Geology) has mapped the project site as a MRZ-4, which is an area containing no known mineral occurrences where geologic information does not rule out either the presence or absence of significant mineral resources (Kohler, 1996). There are no mineral resource sites that would be affected by the demolition of Building 51.

- **Odors.** The demolition process would include no activities or sources capable of creating any objectionable odors.

- **Riparian/Sensitive Habitats.** The site is currently developed and does not contain riparian habitat or support sensitive natural communities. The demolition of the structures would not affect these habitats as they do not exist on the site. There are no marshes, vernal pools, or wetlands on the site. No impact would occur as these resources are not present.

- **Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP).** The site is not located within the boundaries of a HCP or NCCP area. Therefore, the Proposed Action would not conflict with a HCP or NCCP.

- **Air Traffic.** The site is not located within two miles of a public or private airstrip. Therefore, there are no potential impacts associated with safety and noise hazards related to air traffic. The demolition project would have no effect on air traffic patterns.

- **Permanent Noise.** The Proposed Action would not result in permanent increases in noise levels in the project vicinity. Once demolition is complete there would be no further noise generated.

- **Septic Systems.** No septic systems exist on the site. Existing wastewater disposal systems would remain intact.

- **Water and Wastewater.** No new wastewater would result from the demolition of Building 51. If water is needed to reduce dust during demolition, wastewater would not be generated as only enough water to moisten the active area would be used and no runoff would occur. With such small quantities, wastewater treatment would not be affected by dust suppression watering. Therefore, no impact to wastewater treatment would result.

  Water consumption would be maintained at roughly the current rate as a result of the demolition and relocation of employees on-site, and sufficient water supply is currently available. A limited amount of water would be required for demolition-related activities, such as dust suppression and site housekeeping; however, the amount required would not result in the need for additional water facilities or entitlements to serve the proposed demolition activities. The Proposed Action would not result in an increase in long-term demand, but would maintain existing demand levels. No new water or wastewater treatment facilities would be required.

- **Energy.** The Proposed Action would require short-term use of energy, including electrical power and fossil fuels to operate equipment. Long-term energy use would be maintained at the current rate as a result of the relocation of employees on-site. The Proposed Action would not result in a long-term increase in energy demand, and no new electricity-generating equipment or facilities would be required.

- **Community Division.** Demolition would not divide the community, as it would merely result in the removal of existing structures no longer used on the site.

- **Population Growth/Housing Displacement.** No new homes, employment, or infrastructure would be created as a result of the demolition of Building 51. As a result, no increases in population levels are anticipated. There are no existing housing structures associated with Building 51. No homes would be demolished as a result of this Proposed Action. No replacement housing is needed.

- **Recreation.** No population increase would occur as a result of the Proposed Action; therefore, the existing level of use of neighborhood parks and regional facilities would not increase or change. Since the use of such facilities would not increase, deterioration of recreational opportunities would not be accelerated. The same levels of use and wear that are currently experienced would continue under this Proposed Action. No recreational facilities would be constructed, nor would demand exceed the availability of recreational facilities. This Proposed Action would not construct or require the off-site construction of recreational facilities.

- **Land Use.** The Proposed Action would take place on an area that is adjacent to Lawrence Road (from which vehicles enter and leave the site) and McMillan Road within Berkeley Lab. Laboratory, office, engineering, and computing functions occupy the LBNL buildings immediately to the west of Building 51. Open space or landscaped areas border the site immediately to the east and north. The Proposed Action would not conflict with LBNL planning documents, including its Long Range Development Plan. The area has been previously identified as a location of a future laboratory building in LBNL planning documents. A brief, supporting analysis of Land Use is included in Appendix B.

- **Socioeconomics.** Federal funding for the Proposed Action would be from national sources and would not represent an important commitment of local resources. Employment for the demolition would draw upon local populations and would not be perceptible in any particular employment or housing market.

- **Environmental Justice.** Due to the low incidence of localized, off-site impacts from the Proposed Action, as well as to the demographics of populations living nearest the project site, there would be no disproportionately high or adverse human health or environmental effects on minority or low-income populations from the demolition.

5.2 Analysis of Abnormal Events and Accident Scenarios

Routine accidents and injuries (e.g., slips, trips, and falls) are common occurrences at demolition sites and are not considered abnormal events. Nevertheless, worker safety issues are addressed in this document and would be further minimized by implementation of applicable federal, state, OSHA, and LBNL regulations and practices, including those identified in Appendix A of this document.

Vehicle accidents related to trucking are discussed under Accident Potential in Section 5.1.10, Traffic and Circulation.

Abnormal accidents would include serious equipment malfunction or major structural or land stability failures due to faulty engineering or construction practices. Again, these issues have been addressed and would not be reasonably foreseeable given the inclusion of various precautionary elements of the Proposed Action, including those identified in Appendix A of this document.

5.3 Environmental Consequences of the Proposed Alternatives

5.3.1 No Action Alternative

Under the No Action Alternative, the induced radioactivity contained in the concrete and other material of the Bevatron would remain on site and continue to decay over time.[18] The facility would remain a long-term maintenance and financial drain on LBNL, and would not address the multiple legacy hazards on site. Because of the problems with the building, all present occupants are slated for relocation during 2005-2006.

The No Action Alternative would not achieve any of the goals of the Proposed Action.

Because the No Action Alternative would involve no on-site demolition activities or off-site removal of debris, the visual quality, air quality, biological resources, geology and soils, hazards and human health, hydrology and water quality, noise, public services, transportation, public utilities effects related to the demolition or to the transportation of debris would not occur.

However, the No Action Alternative would not avoid long-term cultural resources impacts, because the deterioration of Building 51 and the Bevatron would continue and eventually, the value of the historic physical resource would be lost. Lastly, the No Action Alternative would not include hazard abatement or seismic upgrade activities, and therefore, long-term on-site risks to worker or public health could be greater than under the Proposed Action.

5.3.2 Preservation

Under the Preservation Alternative, the entire site would be dedicated to non-LBNL uses and could be managed by another public agency, such as the National Park Service, with the intention of actively preserving Building 51 and the Bevatron equipment within it. The public agency would maintain and preserve the building in accordance with the *Secretary of the Interior's Standards for Preservation*, and would allow limited public access for interpretive/educational purposes.

The Preservation Action alternative would not achieve most of the goals of the Proposed Action.

[18] This alternative is also a decay-in-place alternative. The nuclei of radioactive atoms are unstable. Over time, the nuclei will eventually decay by emitting a particle and/or radiation, which transforms the nucleus into another nucleus, or into a lower energy state. The chain of decays continues until the resulting nucleus is stable. Decay for an interval of 10 half-lives would reduce the radioactivity to roughly 1/1000 of the original. Thus, for Co-60, which has a half-life of 5.2 years; decay for 52 years would reduce the Co-60 radioactivity to roughly 1/1000 of its present value.

Under the Preservation Action, the facility would still require long-term maintenance and a substantial financial investment for clean-up and refurbishment. This would include such things as re-roofing and exterior waterproofing. Reinforcement would be required to strengthen the structure to make it seismically safe. New roll-up doors would also be required to replace those that were either removed or are inoperable. The facility would have to be patrolled periodically to prevent unauthorized uses, due to the continuing presence of hazardous materials, and, as would be the case for any unoccupied building, to ensure that it did not become occupied by unwanted animals or pests.

The Preservation Alternative would involve on-site repair activities and related off-site trucking, as well as long term operations, that would result in aesthetics, air quality, biological resources, cultural resources, hazards and human health, noise, public services, transportation, and public utilities impacts that would be smaller than the Proposed Action's impacts.

The Preservation Alternative would result in substantially less site activity and demolition, so would have a lower potential for wastewater and runoff impacts than under the Proposed Action. Under this alternative, impervious surfaces would not be removed; therefore, the Proposed Action's beneficial impact to water quality would not occur, because impervious surfaces would remain in their existing condition at the site.

The Preservation Alternative could result in a potential seismic safety impact, because it would expose more people to potential injury as a result of seismic induced hazards. However, unless the building was occupied on a regular basis, this impact would likely be negligible.

5.3.3 On-Site Rubbling

Under the On-Site Rubbling Alternative, most of the Proposed Action's activities would remain the same with the exception of activities related to processing and disposal of concrete. Under this alternative, most of the concrete from the building structure (i.e., walls and floors), foundation, and many of the concrete blocks shielding the Bevatron would be rubbled on-site. Metal (e.g., rebar) in the debris would be separated and disposed of separately. Only concrete that contains no detectable added (i.e., non-naturally occurring) radioactivity and otherwise clear of contaminants would be rubbled. The rubbled material and segregated reinforcing steel would be recycled if public or private sector demand were available at the time of production. If not, it would be disposed of at a landfill. LBNL could use the rubble as aggregate or fill material if the need for such materials coincided with its production; however, this is speculative.

The On-Site Rubbling Alternative would achieve the goals of the Proposed Action.

On-Site Rubbling would require open areas for staging the broken but not yet rubbled concrete, maneuvering large heavy equipment to transfer broken concrete into the first crushing machine, and stockpiling the initially crushed material. In addition, a separate area would be required for the collection and consolidation of reinforcing steel. Sufficient space adjacent to Building 51 does not currently exist for such an operation, and a site or sites would have to be made available elsewhere at LBNL, at a sufficient distance from off-site sensitive receptors to avoid nuisance impacts. The On-Site Rubbling Alternative's requirement for such space could result in some minimal impacts to land use, whereas the Proposed Action would not affect land use.

Crushing of demolished materials for reuse as aggregate would greatly increase the amount of dust (PM_{10}) generated as compared to the proposed project. However, the amount of dust produced during crushing activities could be reduced by regularly watering the crushing operations to keep dust levels low. In addition, as compared with the proposed project, there would be additional heavy equipment, such as the concrete crushing machines themselves, which would produce additional diesel emissions. As would be the case for the proposed project, LBNL policies require subcontractors to comply with an array of federal and state requirements, including BAAQMD regulations and *BAAQMD CEQA Guidelines*, as well as OSHA regulations. These would ensure that impacts to air quality would be negligible. Long-term non-construction impacts would be the same as those of the proposed project.

Noise produced under this alternative would not exceed local noise limits. The noise generated would be greater than that under the proposed project if the concrete crushing equipment operated at the same time as other heavy demolition equipment. However, the incremental additional noise that would be created by this concrete crushing equipment would not be important. Noise created by the hoe ram hammer, which would be used during demolition for both the proposed project and this alternative, is greater than the noise created by other project equipment, to the extent that the combined noise level of the activity is based predominantly on the use of the hoe ram hammer. The noise produced by the concrete crusher operating together with the hoe ram hammer would not result in substantial noise increases over the level of the hoe ram hammer alone. Therefore, the noise levels would remain essentially the same for this alternative as for the proposed project.

Impacts to biological resources could be greater than under the Proposed Action because the on-site rubbling machinery and activities would have a larger potential to result in impacts to nesting raptors and other special-status nesting birds, special-status bats, and other biological resources, due to increased noise generated by the operation of the rubbling equipment.

The On-Site Rubbling Alternative's impacts to cultural resources, geology and soils, hazards and human health, hydrology and water quality, public services, traffic, and public utilities would be the same as would occur under the Proposed Action.

5.4 Cumulative Impacts

5.4.1 Projects in Vicinity of Proposed Action

Planned, pending, and/or reasonably foreseeable projects in the area of the Proposed Action include the following:

- The Rehabilitation of Buildings 77 and 77A project has already been approved to replace the roof of Building 77; upgrade various utility systems in both buildings; add an interior crane to Building 77A; and construct a small nearby building to house chillers, a cooling tower, boilers, and associated equipment.

- As described in Section 4.3.5, as a condition of the Hazardous Waste Facility Permit issued by the Department of Toxic Substances Control (DTSC), LBNL has been required to investigate and address historical releases of hazardous wastes and materials that may have occurred at the site. Cleanup activities have already been conducted in some areas as part of Interim Corrective Measures that were implemented to protect human health or the environment. The final step of the cleanup process is to determine the best way to clean the remaining contamination and to begin the final clean up. The document evaluating possible cleanup methods and recommending which cleanup methods to implement, called the Corrective Measures Study Report, or CMS Report, was made available to the public and other agencies for their review and comment, and was approved by DTSC effective October 2005. The selected cleanup measures of the CMS Report are being put in place as part of the Corrective Measures Implementation phase of the RCRA Corrective Action Plan process.

- User Support Building – This approved three-story, approximately 30,000-gross-square-foot building, would consist of assembly space, support laboratories, and offices in support of the Advanced Light Source user facility at LBNL. This building will be constructed on the site previously occupied by Building 10 which was demolished during the summer of 2007. Construction is scheduled from mid 2008 to mid-2010.

- The Animal Care Facility (ACF) is an approximately 5,005 gross square foot (gsf) one-story building located on the eastern side of Berkeley Lab, northwest of Building 83. The ACF will replace the nearby existing 8,500 gsf animal care unit in Building 74, which is nearing obsolescence due to aging and unreliable mechanical equipment, and potential seismic inadequacy. If seismic upgrades are made to Building 74, the vacated space in that building likely would be converted to wet and dry laboratories and used for the same types of research activities, some of which already take place at Building 74 and others of which take place at other buildings at LBNL. The new ACF building has been completed, and is anticipated to be occupied in early 2008.

- An approximately 140' x 20' section of Cyclotron Road, the main road leading into Berkeley Lab from Hearst Avenue in Berkeley, California, would be widened to provide a visitor processing lane. The action would also include removing the existing guard kiosk and installing up to three new guard kiosks. The project was completed in 2006.

- The University of California is in the planning stage for the construction and operation of a new Guest House to serve visiting scientists, faculty and students. Many of the visitors using the Lab’s facilities - the Advanced Light Source, National Center for Electron Microscopy, 88” Cyclotron, and the Molecular Foundry - are from outside the Bay Area and must obtain short-term housing. This proposed three-story, approximately 25,000-gross-square-foot building would hold up to 120 beds for visiting researchers and other guests of LBNL. An Initial Study/Negative Declaration was prepared and circulated in early 2007. The project was approved and construction will begin in 2008. The Guest House would be constructed near the Advanced Light Source, the Lab’s largest user facility. The site designated for the Guest House is near the center of the Laboratory, west and southwest of Building 2 and on the site of the demolished Building 29 and Trailer 29D, and existing Trailers 29A, 29B, and 29C. It would use existing utilities infrastructure in the vicinity.

- The UC Berkeley 2020 LRDP and LRDP EIR project population increases of up to 12 percent (approximately 5,320 “heads”) and built space increases of up to 18 percent (approximately 2.2 million gsf) by the year 2020. The Regents approved the UC Berkeley 2020 LRDP and certified the LRDP’s EIR on January 20, 2005.

- The Computational Research and Theory (CRT) Building would be a UC-funded, five-story, approximately 140,000 gross square foot computer and office building constructed near the Blackberry Gate entrance to the Lab’s main site. It would provide high-end computing floor space and accompanying office space to support the Lab’s National Energy Research Scientific Computing (NERSC) Center, which is currently operating within an off-site leased building. Construction would take place from approximately 2008 to 2011.

- The Helios Research Facility, a UCB project, would be a four-story, 160,000 gross square foot building constructed immediately south of LBNL buildings 66 and 62. The goal of the Helios Project is to accelerate the development of renewable and sustainable energy sources using sunlight. This would be achieved by developing fundamentally new and optimized materials for use in collectors, and by creating more efficient processing steps and energy handling. Construction would take place from approximately 2008 to 2011.

- The environmental analyses assumed no more than one million gsf of construction would be underway at any one time within the Campus Park, Adjacent Blocks, Southside and Hill Campus land use zones, which are approximately equal to the maximum level of construction that was underway at the time the Existing Setting data were collected in 2002 and 2003. Thus, the aggregate effects of the maximum level of construction foreseen under the UC Berkeley 2020 LRDP are already reflected in the existing setting.

  The UC Berkeley 2020 LRDP EIR also included a project-level analysis of the Chang-Lin Tien Center for East Asian Studies. The proposed Center includes two buildings: Phase 1, a four-story building of approximately 67,500 gsf, and Phase 2, a building planned to accommodate up to 43,000 gsf. At this point in time, Phase 1 is the only project that has received funding to proceed. Construction for Phase 1 is underway (Shaff, 2006).

- UC Berkeley plans to implement seven projects, referred to as the Southeast Campus Integrated Projects (SCIP). SCIP includes seismic and program improvements at the California Memorial Stadium, including a 158,000-gsf athletic training center and 102,000 gsf of additional new academic and support space at the stadium. The SCIP Final EIR, which was tiered from the UC Berkeley 2020 LRDP and LRDP EIR, was completed in October 2006. The SCIP EIR identified significant, unavoidable impacts in the areas of aesthetics (effects on the character of Gayley Road and on views from Panoramic Hill); cultural resources (changes to Memorial Stadium, demolition of several structures, and alterations to buildings and landscape along Piedmont Avenue); geology (earthquake risk); noise (due to construction and demolition and due to the potential for additional events at the stadium); traffic (effects at the Durant/Piedmont and Bancroft/Piedmont intersections[19]); and utilities and service systems (increased demand on wastewater facilities) (UC Berkeley, 2006). Project construction for all of the projects is not definite at this time, but is expected to begin in 2008 and be completed in 2012 (UC Berkeley, 2005c).

[19] These impacts could be mitigated with the implementation of mitigation measures from the UC Berkeley 2020 LRDP EIR but are identified as significant and unavoidable because they are outside the jurisdiction of The Regents and could only be implemented at the discretion of the City of Berkeley.

- UC Berkeley proposes to construct and operate an Early Childhood Education Center, serving up to 78 children, on the north side of Haste Street, mid-block between Dana and Ellsworth Streets, in Berkeley, California. The 17,880 square foot project site is adjacent to a large campus parking lot. The project site itself is presently used as a surface parking lot with 53 marked vehicle spaces (UC Berkeley, 2005a). Construction of this facility is underway. (Shaff, 2006).

- As part of UC Berkeley’s Northeast Quadrant Science and Safety (NEQSS) Projects, demolition of the former Stanley Hall took place in Spring 2003. The new Stanley Hall is currently under construction and was completed in 2007. The new facility is located at the East Gate of the campus next to the Hearst Memorial Mining Building and is eight stories above ground with three basement levels, and measures approximately 285,000 gsf (UC Berkeley, 2005b).

- The Center for Information Technology Research in the Interest of Society (CITRIS) Headquarters project is part of UC Berkeley's NEQSS projects. The demolition of Davis Hall North, located in the north east section of the Berkeley campus near the intersection of Hearst and LeRoy Avenues, began at the end of August 2004 to make way for a replacement facility that will provide the headquarters for CITRIS and is designed to contain about 79,420 assignable square feet within a total area of 142,000 gsf. Construction of the new CITRIS Headquarters facility is underway and scheduled to continue through 2009 (UC Berkeley, 2005b; UCOP, 2002; Shaff 2006).

- UC Berkeley plans to retrofit the Bancroft Library, which is located in the central portion of the campus to the north of Wheeler Hall between South Hall Road and Sather Road. The project will also include some program improvements. Construction for this project is underway and expected to continue through 2008 (Shaff, 2006).

- UC Berkeley plans to construct an Americans with Disabilities Act-compliant pedestrian bridge to connect the north and south components of the Foothill housing project. As currently proposed, the pedestrian bridge would be constructed over Hearst Avenue, just east of Gayley Road, connecting the two sides of the Foothill dormitories and would provide access between the dormitories and campus. The Foothill Bridge was completed in September 2007.

- Development in the surrounding area includes growth and development within the city of Berkeley as envisioned in the 2001 City of Berkeley General Plan (City of Berkeley, 2001) and EIR. The 2001 City of Berkeley General Plan allows for steady growth and development, but, given a lack of substantial undeveloped space in the City, this would take place at a relatively even pace with an emphasis on infill development. Projections include a population increase of approximately 7,000 people (a roughly six percent increase), approximately 3,300 new household units (a roughly eight percent increase), and approximately 3,700 new jobs (a roughly five percent increase) by the year 2020.

5.4.2 Cumulative Impact Areas

Areas where there would be no reasonably foreseeable substantial cumulative impacts include: Land Use; Socioeconomics; and Environmental Justice.

Development of the site is likely at some point in the future, although there are no firm plans for such development that have reached the level of a proposed or reasonably foreseeable action. Given the absence of a development proposal, and given that the new LBNL LRDP and LRDP

EIR now under preparation are not anticipated to include any specific development proposal for the Building 51 site, it would be speculative at this time to provide detailed analysis. However, it is anticipated that future development would be consistent with the 1987 LRDP and 1987 LRDP EIR, as amended, or, depending on when development would be proposed, with the new LRDP and LRDP EIR. Future development would be evaluated and documented in accordance with NEPA and CEQA requirements, and would incorporate applicable mitigation measures.[20] A future project also would comply with applicable governmental requirements that result in the avoidance or reduction of potential environmental impacts. Any such project would be required to be consistent with the governing LRDP absent an LRDP amendment. Similarly, development at UC Berkeley and other locations in the vicinity also is anticipated to comply with applicable requirements (e.g., in the case of UC Berkeley, with its own 2020 LRDP and LRDP EIR, issued in 2005). Thus, a future project at the Building 51 site would not be expected to contribute considerably to any cumulative impact.

Air Quality

The Proposed Action would generate air emissions only from temporary demolition-related activity and traffic. Given that the project-level air quality impacts would be negligible, the cumulative effect also can be based on a determination of the consistency of this project with the LRDP and the consistency of the LRDP with the regional CAP.

Because the Proposed Action is consistent with the LRDP and, in turn, because the LRDP has been determined to be consistent with the CAP, the contribution of these emissions to cumulative regional air quality would not be considered to be cumulatively considerable. The cumulative impact would be negligible.

Biological Resources

The Proposed Action would result in a minor net benefit for biological resources, although this benefit is not expected to be permanent. Project impacts on biological resources are expected to be relatively minor and all impacts would be mitigated to negligible levels. There are currently no specific projects planned for the site and the project calls for revegetation after demolition is complete. Thus the project would result in a small increase of open space and potential wildlife habitat at LBNL. Other projects considered at LBNL and the UC Berkeley campus, as well as development under the Berkeley and Oakland General Plans within the geographic context

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[20] For example, mitigation measures relevant to aesthetics in the 1987 LRDP EIR as amended, include:

III-F-1a: Buildings will occupy as limited a footprint as feasible. They will incorporate features that enhance flexibility and future versatility.

III-F-1b: Buildings will be planned to blend with their surroundings and be appropriately landscaped. Planning objectives will be for new buildings to retain and enhance long distance view corridors and not to compromise views from existing buildings. New buildings will generally be of low rise construction.

III-F-2: Any new facilities will not use reflective exterior wall materials or reflective glass, to mitigate the potential impacts of light and glare.

III-D-2a: Revegetation of disturbed areas, including slope stabilization sites, using native shrubs, trees, and grasses will be included as part of all new projects.

outlined above, and anticipated but uncertain future development that might occur at the project site, would cumulatively combine to reduce open space and available habitat. However, open space currently comprises a substantial portion of the geographic context described above and the fractional amount of vacant space developed would be relatively small.

The magnitude of cumulative effects of development on biological resources is in large part determined by the extent to which resources are protected in plans and during specific project implementation. The 1987 LBNL LRDP and the 2020 UC Berkeley LRDP, as well as the East Bay Regional Park District Master Plan (EBMUD, 1996) and the City of Berkeley General Plan, all contain policies and/or guidelines for protecting natural resources, including special-status species, sensitive natural communities, and jurisdictional waters. The Proposed Action and all development under the LBNL LRDP, the UC Berkeley LRDP and projects tiered from the UC Berkeley LRDP, the City of Berkeley General Plan, and the East Bay Regional Park District Master Plan would also take place in a regulatory context of federal, state, and local laws designed to avoid and minimize impacts to special-status species, sensitive natural communities, jurisdictional waters, and wildlife migratory corridors and nurseries. The cumulative impacts of all development anticipated under these plans would not result in a substantial reduction in open space or wildlife habitat. Similarly, the Proposed Action would not make a considerable contribution to that overall cumulative biological impact.

Cultural Resources

LBNL has retained Pacific Northwest National Laboratory (PNNL) to complete a series of reports to identify, survey, and evaluate approximately 245 buildings and structures at the LBNL site for potential eligibility for listing in the National Register. These studies have been undertaken pursuant to Section 110 of the National Historic Preservation Act, which requires that federal agencies such as DOE survey the lands under their control and evaluate all historic properties (including buildings and the equipment contained therein) for eligibility for listing in the National Register.

The PNNL series of reports is not yet complete, nor have the reports been submitted to the State Historic Preservation Officer for concurrence. Preliminary findings of the surveys and research conducted by PNNL suggest that Buildings 71 and 88 possibly are eligible for listing in the National Register (PNNL, no date). However, there are no current plans to alter Buildings 71 and 88. No other buildings or structures at LBNL have been identified as potentially eligible for listing in the National Register as part of this survey effort.

There are no projects planned as part of the UC Berkeley 2020 LRDP, or City of Berkeley projects that would damage or destroy known archaeological or historical resources. The proposed undertaking and all development under the LBNL and UC Berkeley LRDPs, and the City of Berkeley General Plan, would take place in a regulatory context of federal, state, and local laws designed to avoid and minimize impacts to cultural resources. As a result, these projects would not combine with the loss of Building 51 to create an important cumulative impact on cultural resources.

UC Berkeley's Final EIR for the Southeast Campus Integrated Projects (SCIP) (SCIP; see Chapter VI of the DEIR) identifies a number of historic resources that could be affected by that project. These include the Cheney House and Cheney Cottage at 2241 and 2243 College Avenue, the Piedmont Avenue Houses at 2222, 2224, 2232, 2234 and 2240 Piedmont Avenue, and California Memorial Stadium. A CEQA EIR was prepared to confirm the historic status of these buildings and to identify potential impacts to them resulting from the SCIP. The EIR identified significant impacts to these buildings and also identified mitigation measures to eliminate or reduce the severity of such impacts to the extent feasible. Impacts resulting from SCIP would not combine with the proposed undertaking to form a substantial cumulative impact to historic resources, due to the vastly different building types involved (i.e., residential structures and a sports stadium compared with a building that houses a particle accelerator), as well as differing architectural styles and dates of construction. To the extent they might adversely affect historic resources, the projects involved would not be "closely related" (CEQA Guidelines Sec. 15355(b)) enough to contribute to any cumulative impact, because of, by virtue of the substantially different historic resources involved, to contribute to any cumulative impact

While the Proposed Action would not combine with other nearby projects to result in a substantial cumulative impact on local historic resources, the buildings that house particle accelerators are of a rare type by virtue of their unique scientific requirements and construction expense. Particle accelerators of this size exist in only three locations in the state: LBNL, UC Davis, and the Stanford Linear Accelerator Center.

There are approximately 75 particle accelerators currently operating worldwide, of which 25 are located in North America (Bonn University, 2006). Aside from the 88-inch Cyclotron at LBNL (Building 88), there are two other operating particle accelerator facilities located in California. They are the Stanford Linear Accelerator Center (SLAC) at Stanford University in Palo Alto, California, and the Crocker Nuclear Laboratory at UC Davis in Davis, California. The architectural design and historical status of these particle accelerator facilities are discussed and compared with the Bevatron, below.

Stanford Linear Accelerator Center. SLAC was founded in 1962 on Stanford University land near Palo Alto, California. The facility began operating in 1966, with numerous additions in the 1970s and 1990s. SLAC is a collection of many structures housing many operating elements, including the Linac/NLC (Next Linear Collider), the Positron Electron Project (PEP), the asymmetric B Factory (PEP-II), the SLAC Linear Electron Positron Collider, the Stanford Positron Electron Asymmetric Ring (SPEAR), and the Stanford Synchrotron Radiation Laboratory (SSRL) (SLAC, 2006a). Three Nobel prizes in physics have been awarded to researchers at SLAC, one each in 1976, 1990, and 1995 (SLAC, 2006b). The buildings in which the accelerators are housed are of a modern/industrial architectural design, dictated by the basic linear form of the accelerator to be a sprawling, multi-structure facility housing many different pieces of equipment,

None of the SLAC facilities are listed (nor are they known to be eligible to be listed) on federal, state, or local registers of historical resources. In the future, if SLAC were to be determined to be a historic resource, measures to protect it from demolition or substantial alteration would include those required by CEQA and/or NEPA. However, SLAC is currently operational, and is not threatened with demolition or substantial alteration.

While both Building 51 and SLAC contain particle accelerators, the architectural design of SLAC is defined by the basic linear form of the accelerator to be a sprawling, multi-structure facility, whereas Building 51 is a smaller and more contained structure housing the single, circular-form Bevatron accelerator.

Crocker Nuclear Laboratory. The 76-inch Isochronous Cyclotron at Crocker Nuclear Laboratory began operating in 1966 at UC Davis. The accelerator is one of the few of this design remaining in productive operation, although another Isochronous Cyclotron is also in use at Oak Ridge National Laboratory (U.C. Davis, 2006). The building in which the accelerator is housed is of a mid-1960s modern architectural design, and is not listed on federal, state, or local registers of historical resources. In the future, if this facility were to be determined to be a historic resource, measures to protect it from demolition or substantial alteration would include those required by CEQA and/or NEPA.

Both the Bevatron and the Crocker facility accelerator are cyclotron accelerators, however, the Crocker accelerator is currently operational, and is not threatened with demolition or substantial alteration. Although the two share the same compact form, the Crocker ~~Nuclear Laboratory~~ accelerator is contained within a mid-1960s modern, four-story office/classroom/laboratory building which bears no architectural resemblance to Building 51, which has a more industrial aesthetic.

The Bevatron and the other particle accelerators in California do not physically exist together as a group, as do buildings in a historic district, where the architecture of each building contributes to the overall physical and historic entity. Rather, particle accelerators are related only in an abstract way. The historic importance of the Bevatron, a scientific research device, and Building 51, the building that houses it, lies in the contributions to physics and knowledge in general that were made using the Bevatron; the importance of these activities to LBNL in furthering its overall research programs; and the Bevatron as an important milestone in the on-going development of particle accelerators for basic research. The other known accelerators in the state are currently operational, do not appear to be slated for potential demolition, and will continue to exist in other forms across the state. As such, the demolition of Building 51 would not contribute to an important cumulative effect on historic resources.

Thus, the demolition of the Bevatron and Building 51 would not contribute to the loss of a physical historic group or entity, and therefore, the demolition would not result in a cumulatively considerable impact on historic resources.

Geology and Soils

The 1987 LRDP EIR, as amended, found that no significant adverse cumulative impacts upon people or property are anticipated in or in the vicinity of LBNL as a result of geologic and/or soils hazards. Compared with the existing population, greater numbers of people would be exposed to earthquake hazards as a result of growth anticipated in the 1987 LRDP EIR, as amended; growth anticipated in the LRDP EIR currently being prepared, including an unknown structure that may be built at the Building 51 site at some unknown future date; and other growth in the region. However, new structures would be built to current seismic design standards and would, in general, be safer than existing structures. The proposed demolition of Building 51 would therefore reduce overall potential cumulative earthquake hazard. The project does not contain a development component and the end result of the project would be an open area. As stated above, there would be no substantial impacts from this project and it would not contribute to a cumulative impact.

Hazards and Human Health

The Proposed Action, together with the implementation of RCRA corrective measures, would have a cumulative beneficial impact on soil and groundwater contamination at the Lab by removing hazardous materials and waste. The project would result in an overall decrease of hazardous materials at the project site through demolition, removal and off-site disposal in accordance with all applicable regulations. There were no important potential impacts identified for the handling, transportation, or disposal of the hazardous materials. Therefore, the project would not combine with the other projects listed in Section 6.1 to create a substantial cumulative increase in exposure to hazards or hazardous materials.

Hydrology and Water Quality

This cumulative impact analysis considers changes in drainage and water quality within the Strawberry Creek watershed and the impact that the Proposed Action would have on that watershed. Because Strawberry Creek and its tributaries drain through LBNL, UC Berkeley, and the city of Berkeley, the analysis considers development in those areas and not exclusively at LBNL. During project implementation, stormwater runoff and demolition contact water would be managed, controlled, and treated as outlined in the sitewide SWPPP and in SWPPPs prepared for each particular phase of the project to address stormwater management issues and assign BMPs. Through compliance with NPDES construction activity permit regulations, thorough implementation of SWPPPs, and regular monitoring of BMP efficiency by LBNL, the Proposed Action would not cause increased stormwater flows or discharges of polluted runoff that would be capable of altering drainage or degrading water quality within Strawberry Creek. Since the project would not alter natural hydrology or discharge pollutants to Strawberry Creek, the incremental contribution of the Proposed Action to cumulative hydrology and water quality impacts would not be cumulatively considerable.

Following project completion, the former Building 51 site would be converted to vacant space suitable for future, though undetermined, development. Such a conversion would result in no additional stormwater runoff from the site and could decrease flows under certain storm events. As with the short-term project conditions, since there would be no increase in runoff from the site under post-project conditions, the long-term effect would not be cumulatively important.

The project would not generate additional stormwater or pollution that would degrade water quality in Strawberry Creek. The 1987 LRDP EIR, as amended, considered the effects of stormwater quality and quantity resulting from constructing and operating all buildings in the entire LBNL site. The area occupied by the development considered in the 1987 LRDP EIR, as amended, would have greater square footage and more total impervious area than current conditions, or conditions after the completion of the Proposed Action. Therefore, the effects on the quantity and quality of stormwater from the Proposed Action are well within those considered in the 1987 LRDP EIR and have already been accounted for in LBNL's site-wide stormwater management planning.

Most other on-site LBNL development would have some water quality and stormwater drainage demand impacts that correspond to converting pervious surfaces into impervious surfaces. However, LBNL projects would be required to comply with LBNL's NPDES permit and associated SWPPP and SWMP, and this project will in general reduce impervious surfaces. Other projects occurring on the UC Berkeley campus and in the city of Berkeley would generally occur incrementally, and most often within already developed (and impervious) areas. Potential cumulative hydrology and water quality impacts associated with the Proposed Action would not result in an important cumulative impact.

Noise

The 1987 LRDP EIR, as amended, considered the intermittent and short-term effects of equipment and truck noise resulting from the construction of a larger facility than now exists at LBNL. Noise from all project demolition activities would fall well within the total construction noise levels that were considered in that EIR and for which the mitigation measures listed earlier were adopted. Moreover, as is evident from discussion under Section 5.1.5 regarding the limited effects of project noise on ambient noise at the nearest residences, new development on the UC Berkeley campus and in the city of Berkeley would be too distant and of insufficient noise energy to have a combined adverse effect on ambient noise at these sensitive receptor areas. For these reasons, the project's contribution to cumulative noise impacts from development in the surrounding area, including projects identified in the city of Berkeley and the UC Berkeley campus, would be considered unimportant.

Public Services

While the Proposed Action would employ workers for demolition activities, it would not result in any permanent new on-site employees. The approximately 50 people who worked at Building 51 have been relocated to other LBNL facilities, and do not add to future demand for public services. Any temporary increase in public services demand that would result from the demolition activities would be well within levels anticipated and accommodated in the existing LRDP and 1987 LRDP EIR, as amended. Although projected City of Berkeley and UC Berkeley campus projects would be expected to gradually increase demand for off-site services over time, the project-related demand for off-site services would be negligible and temporary, so the project's contribution to a cumulative public services impact would not be substantial.

Public Utilities

In the long term, the Proposed Action would result in reduced utility usage at LBNL, since Building 51 would no longer exist and would not continue to generate demand for utilities, and no new permanent employees would be added to LBNL as a result of the Proposed Action. Any project-specific demand for utilities from demolition activities would be within the anticipated demand expected and analyzed under the 1987 LRDP EIR, as amended. Although development at LBNL and in the surrounding area would be expected to increase demand for regional utilities and energy provision, the project's contribution to that combined demand would be negligible and would not cause any substantial increase in demand on regional providers. Moreover, regional utilities are managed to accommodate region-wide growth and demand increase; these projects would be expected to fit within this long-term planning. In addition, LBNL, UC Berkeley, and the City of Berkeley all encourage or mandate water and energy-saving devices and practices.

Traffic and Circulation

The Proposed Action would generate no new operational (long-term) vehicle trips and would have a negligible effect on long-term traffic conditions. Under cumulative conditions, traffic volumes would increase on area roadways and at study intersections due to the potential development cited above. Recent (2004) estimates of increases in roadway and intersection traffic volumes were presented in the University of California at Berkeley's *2020 Long Range Development Plan & Chang-Lin Tien Center for East Asian Studies Final EIR*.

The intersections in the project area cited under "Setting" above would continue to operate at acceptable levels of service (LOS D or better) during the a.m. and p.m. peak hours, except for the University Avenue/San Pablo Avenue, University Avenue/Sixth Street, and Gayley Road/Stadium Rim Way intersections, where delays within LOS F would increase. The project would generate a short-term increase in traffic volumes on area roadways that would fall within the daily fluctuation of traffic, which would not be noticeable to the average motorist. The trips generated by the Proposed Action would add negligible traffic to long-term cumulative conditions. Demolition traffic would be short-term and incremental, and, with the exception of the Lab's Guest House and projects in the SCIP, it is not likely that the Proposed Action's peak daily trip generation (trucks and worker vehicles), during the project's final phase, would coincide with the projects identified in this EA to the extent that a substantial disruption of traffic on surrounding streets would occur.

The approved User Support Building would not contribute to peak-hour AM and PM traffic conditions, as construction trips would be limited to off-peak hours. The latter 11 months of the proposed Guest House construction could coincide with the initial activity phase of the Bevatron project. This would not be cumulatively considerable, as the later construction phases of the moderately-sized Guest House would include relatively few truck trips, as most of the building material would be transported during the earlier phases. The CRT and Helios Buildings would likely coincide with the first two years of the Bevatron project, however it is not expected that new cumulatively considerable impacts would result. Those projects will be tiered from the new 2006 LRDP and EIR, which impose restrictions and management practices on new construction projects to avoid and minimize cumulative construction traffic from LBNL during peak commute hours.

It is anticipated that construction of the Guest House would overlap with the Proposed Action. Mitigation measures applicable to construction traffic included as part of the Proposed Action would also apply to construction of the Guest House, and would reduce the likelihood of important cumulative effects.

With respect to the potential cumulative traffic effects of UC Berkeley's proposed SCIP, construction and thus construction-related traffic from the SCIP Memorial Stadium renovation and the other six projects (including a parking structure, a new Law/Business school building, and renovations to existing law school, business school, and student residential buildings) would overlap with the Proposed Action. The projects would be within the growth envelope analyzed in UC Berkeley's 2020 LRDP EIR, and would result in space and population levels below levels anticipated in UC Berkeley's 2020 LRDP. The Final EIR for SCIP finds that cumulative transportation impacts would be consistent with the transportation impacts identified in the UC Berkeley 2020 LRDP EIR (UC Berkeley, 2006). Because those impacts are assumed as part of the cumulative development assumptions incorporated into this section, no additional cumulative transportation impacts would result from the proposed Building 51 project in combination with cumulative development.

In any case, the incorporation of mitigation included as part of the Proposed Action (please see the Executive Summary, page 6), would ensure that traffic-generating activities associated with concurrent projects would not have an important effect on traffic conditions. In addition, the potential impact of exposure to hazardous materials during transportation to off-site facilities would be negligible, and the Proposed Action would not result in a substantial cumulative impact, because the Proposed Action would not combine with other projects to create a substantial risk due to transport of hazardous materials.

Visual Quality

The temporary visual effects of the Proposed Action would make no cumulatively considerable contribution to adverse visual impacts at LBNL or in Berkeley. The project's temporary visual effects would be within the scope of the 1987 LRDP EIR, as amended, which concluded that the overall development of approximately two million gross square feet of facilities at LBNL would not adversely affect the visual quality of the area.

5.5 Summary of Alternatives and Consequences

The Proposed Action and Alternatives are summarized in **Table 6** on the following pages.

TABLE 6
SUMMARY OF PROPOSED ACTION ALTERNATIVES AND IMPACTS

	Proposed Action	**No Action**	**Preservation Alternative**	**On-Site Rubbling**
ACTION DESCRIPTION				
Site Location	West-central area of LBNL.	Same.	Same.	Same.
Site Size (approx)	2.25 acres (Building 51 footprint)	Same.	Same.	Larger work site required.
Number of Occupants	None	Same.	TBD, but more than 0.	Same.
Number of New Truck Trips	4,700 total truck trips.	None	Much fewer than 4,700 truck trips.	Same.
Number of New Auto Trips	No long-term auto increase.	Same.	Small long-term auto increase.	Same.
ACTION IMPACTS				
Geology, Soils, and Seismicity	Demolition including earthmoving activities could result in small amount of soil erosion or loss of topsoil.	No impact.	Increased impact. Exposure of persons to seismic induced hazards.	Same.
Hydrology and Water Quality	Minimal amount of wastewater and runoff could become contaminated and enter the stormwater system or the adjacent environment.	No impact.	Decreased impact. On-site repair activities could generate lesser construction runoff.	Same.
Biological Resources	Proposed Action may indirectly disturb nesting special-status birds, special-status bats. (Unlikely, but mitigation planned to make sure no disturbance occurs)	No impact.	Decreased impact. On-site repair activities would not impact biological resources.	Same. (Unlikely, but mitigation planned to make sure no disturbance occurs)
Historic and Archaeological Resources	Would demolish historic structure. (Mitigation includes documentation of site structure and installation of marker commemorating work performed there) Could disturb archaeological resources, though none are expected on this site.	No impact.	Decreased impact. On-site repair activities would maintain historic building.	Same. Same.
Visual Quality	Would have demolition equipment on the site and remove building.	No impact.	Decreased impact. On-site repair activities would maintain building.)	Same.
Traffic and Circulation	Would temporarily and intermittently increase traffic. Would generate truck trips carrying hazardous materials.	No impact.	Decreased impact. Alternative would generate vehicle trips from visitors and construction workers conducting on-site repairs.	Same.
Air Quality	Would create short-term emissions of criteria pollutants and possibly asbestos-containing materials.	No impact.	Decreased impact. On-site repair would create lesser short-term construction emissions.	Same.
Noise	Would create demolition noise.	No impact.	Decreased impact. Alternative would create noise associated with building improvements.	Slightly increased impact. Alternative would create demolition noise.

TABLE 6 (Continued)
SUMMARY OF PROPOSED ACTION ALTERNATIVES AND IMPACTS

	Proposed Action	No Action	Preservation Alternative	On-Site Rubbling
ACTION IMPACTS (cont.)				
Public Services	Could temporarily affect fire and police response times. Demolition truck trips would cause wear and tear on public roads and highways.	No impact.	Slightly increased impact. On-site repair would allow public use of the building and use police, fire, and emergency medical services.	Similar impact. Alternative could temporarily affect fire and police response times.
Public Utilities	Would generate demolition waste.	No impact.	Decreased impact. Alternative would use water and would generate waste and wastewater, but would not generate demolition waste.	Same.
Hazards and Human Health	Activities could include removal of hazardous materials. Could expose construction workers or the environment to hazardous materials.	No impact.	Decreased impact. Alternative would use small amounts of hazardous materials.	Same
Land Use	No impact.	No impact.	Alternative would increase development in area	Slightly increased impact. Alternative would have temporary on-site rubbling.
Environmental Justice	No impact.	No impact.	No impact.	No impact.
Cumulative Impacts	No substantial cumulative contributions. Small or negligible contribution to cumulative impacts.	No impact.	Same	Same

NOTES: "Same" denotes a characteristic or effect that is the same under the Proposed Action.
"gsf" is "gross square feet."

CHAPTER 6.0
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CHAPTER 7.0
Persons and Agencies Consulted

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Paul Franke, Facilities Planner, LBNL

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Jeff Philliber, Environmental Planning Coordinator, LBNL

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CHAPTER 8.0
Acronyms

ABAG	Association of Bay Area Governments
ACM	Asbestos-containing materials
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BMPs	Best Management Practices
Cal/EPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGS	California Department of Conservation, Geological Survey
CHP	California Highway Patrol
CMI	Corrective Measures Implementation
CNDDB	California Natural Diversity Database
CY	Calendar year
dB	Decibels
dBA	A-weighted decibels
DCE	1,1-dichloroethene
DOE	United States Department of Energy
DOT	United States Department of Transportation

DPM	Diesel particulate matter
DTSC	Department of Toxic Substances Control
EBMUD	East Bay Municipal Utility District
EH&S	Environment, Health, and Safety (Division)
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
gsf	Gross square feet
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HEPA filter	High Efficiency Particulate Air filters
HWHF	Hazardous Waste Handing Facility
ICM	Interim Corrective Measures
Leq	Energy-Equivalent Noise Level
LBL/LBNL	Lawrence Berkeley Laboratory/Lawrence Berkeley National Laboratory
LHS	UC Berkeley Lawrence Hall of Science Museum
LOS	Level of Service
LRDP	Long Range Development Plan
MM	Modified Mercalli
MOA	Memorandum of Agreement
MRZ	Mineral Resource Zones
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Airborne Pollutants
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NOP	Notice of Preparation

NOx	Nitrogen oxide
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
OSHA	Occupational Health and Safety Administration
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethene
$PM_{2.5}$	Particulate Matter – 2.5 microns or smaller
PM_{10}	Particulate Matter – 10 microns or smaller
PNNL	Pacific Northwest National Laboratory
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
ROG	Reactive Organic Gas
SHPO	State Historical Preservation Officer
SWMU	Solid Waste Management Unit
SWPPP	Storm Water Pollution Prevention Plan
TAC	Toxic Air Contaminant
TCE	Trichloroethene
TSCA	Toxic Substances Control Act
UC	University of California
UCPD	UC Berkeley Police Department
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	Volatile organic compound
$\mu g/m^3$	Micrograms per cubic meter

APPENDIX A

Standard (Required) LBNL Project Features

LBNL has identified several environmentally proactive measures in its 1987 Long Range Development Plan Environmental Impact Report (LRDP EIR; see Chapter 2, Purpose and Need), as amended, that Berkeley Lab implements in all of its projects and development to avoid or minimize potentially significant environmental impacts. These mitigation measures have been adopted as part of the LRDP EIR by The Regents of the University of California and thus are required of all LBNL activities, and are included as part of this NEPA analysis. Consequently, all such measures relevant to the Proposed Action are included in the project description as standard features of all such LBNL projects. These measures are pertinent to such environmental resource areas as visual quality; air quality; biological resources; cultural resources; geology and soils; hazards and hazardous materials; hydrology and water quality; noise; traffic; and utilities. Included among them are those listed below:

- Revegetation of disturbed areas, including slope stabilization sites, using native shrubs, trees, and grasses will be included as part of all new projects.

- Construction contract specifications would require that during construction exposed surfaces would be wetted twice daily or as needed to reduce dust emissions. In addition, contract specifications would require covering of excavated materials.

- Invasion of opportunistic colonizer trees and shrubs will be controlled. A maintenance program for controlling further establishment of eucalyptus, green wattle acacia, French broom, cotoneaster, and other opportunistic colonizer shrubs and trees in disturbed areas on-site will be undertaken. Herbicides will not be used for this purpose.

- Removal of native trees and shrubs will be minimized. (To the greatest extent possible, the removal of large coast live oak, California bay, and Monterey pine trees will be avoided.)

- A photographic record will be made of all structures demolished as part of future projects.

- An individual well-versed in the history of science in the twentieth century will evaluate the significance of specific pieces of equipment that may be replaced due to obsolescence or a change in the vector of research.

- Geologic and soils studies will be undertaken during the design phase of each LBNL building project. Recommendations contained in those studies will be followed to ensure that the effects of landsliding, lurching, and liquefaction potential will not represent a significant adverse impact during a seismic event.

- Excavation and earth moving will be designed for stability, and accomplished during the dry season when feasible. Drainage will be arranged to minimize silting, erosion, and landsliding. Upon completion, all land will be restored, covering exposed earth with planting.

- LBNL will prepare an annual self-assessment summary report. The report will summarize environment, health, and safety program activities, and identify any areas where LBNL is not in compliance with laws and regulations governing hazardous materials, hazardous waste, hazardous materials transportation, regulated building components, worker safety, emergency response, and remediation activities.

- Prior to shipping any hazardous materials to any hazardous waste treatment, storage or disposal facility, LBNL will confirm that the facility is licensed to receive the type of waste LBNL is proposing to ship to that facility.

- LBNL will continue its waste minimization programs and strive to identify new and innovative methods to minimize hazardous waste generated by LBNL activities.

- LBNL will require hazardous waste haulers to provide evidence that they are appropriately licensed to transport the type of wastes being shipped from LBNL.

- In addition to implementation of the numerous employee communication and training requirements included in regulatory programs, LBNL will undertake the following additional measures as ongoing reminders to workers of health and safety requirements:

  - Posting, in areas where hazardous materials are handled, of phone numbers of LBNL offices, which can assist in proper handling procedures and emergency response information.

  - Continuing to post “Emergency Response and Evacuation Plans” in all LBNL buildings.

  - Continuing to post all sinks in areas where hazardous materials are handled with signs reminding users that hazardous wastes cannot be poured down the drain.

  - Continuing to post dumpsters and central trash collection areas where hazardous materials are handled with signs reminding users that hazardous wastes cannot be disposed of as trash.

- LBNL will update its emergency preparedness and response program on an annual basis, and will provide copies of this program to local emergency response agencies and to members of the public upon request.

- Each individual project will continue to be designed and constructed with adequate storm drainage facilities to collect surface water from roofs, sidewalks, parking lots, and other surfaces and deliver it into existing channels which have adequate capacity to handle the flow.

- Summary: Potential adverse impacts to water quality can be reduced if LBNL adopts feasible mitigation measures to control surface water runoff, prevent erosion, and maintain adequate drainage facilities.

- Projected noise levels will be compared with ambient noise levels and the Berkeley Noise Ordinance limits, or other applicable regulations. Acoustical performance standards would be included in future contract documents. LBNL will continue to design, construct and operate buildings and building equipment taking into account measures to reduce the potential for excessive noise transmission.

- Noise-generating construction equipment will be located as far as possible from existing buildings. If necessary, windows of laboratories or offices will be temporarily covered to reduce interior noise levels on-site.

- LBNL's Facilities Master Specifications (Environment, Safety, and Health General Requirements) require subcontractors to furnish an adequate number of flaggers for all work that may affect the use of roads by the University. The following standards are required for traffic flaggers:

  – Flaggers shall be posted at the entrance and exit of access roads used for hauling material and at all other areas where normal traffic is subject to disruption.

  – Flaggers shall be equipped and instructed at Subcontractor's expense in accordance with current "Instructions to Flaggers" of the Department of Transportation, State of California.

- Prior to construction of any project which may add significant sewer load to the city sanitary sewer system, LBNL will investigate the potential impact of the project on the city system. LBNL will identify mitigation measures to accommodate the sewer load if the impact investigation indicates that the city system could not accommodate the additional sewage. LBNL will reimburse the City of Berkeley and/or EBMUD for its fair share of allowable and necessary sewer improvement capital costs which are needed to accommodate increased demand and mitigate sewer impacts resulting from implementation of the LBNL LRDP.

APPENDIX B

Memorandum of Agreement regarding the Demolition of the Bevatron Building among:

- **Department of Energy**
- **California State Historic Preservation Officer**
- **Advisory Council on Historic Preservation**

MEMORANDUM OF AGREEMENT AMONG THE DEPARTMENT OF ENERGY THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE DEMOLITION OF THE BEVATRON BUILDING, LAWRENCE BERKELEY NATIONAL LABORATORY, BERKELEY, ALAMEDA COUNTY CALIFORNIA

WHEREAS, the Department of Energy, Oakland Operations Office (DOE-OAK) has determined that the demolition of the Bevatron Building/Building 51 and 51A Complex, Lawrence Berkeley National Laboratory (Undertaking), will affect the Bevatron Building, a property eligible for inclusion on the National Register of Historic Places, and consulted with California State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) in accordance with 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act, (16 U.S.C. 470f) and Section 110 of the same Act, (16 U.S. C. 470h-2(f);

NOW, THEREFORE, DOE-OAK, the SHPO, and the Council agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

Stipulations

The DOE-OAK shall ensure that the following stipulations are carried out:

I. **Recordation**

A. DOE-OAK shall use, to the extent feasible, office and laboratory space in Building 51 to meet facility needs to achieve Lawrence Berkeley Laboratory's science and technology mission. This includes examining the use of Building 51 for accelerators and other large experimental apparatus, such as the equipment for the heavy-ion fusion program.

1. If the DOE determines that the re-use of Building 51 shall require the removal of the Bevatron apparatus from the building, the DOE-OAK shall contact the Historic American Engineering Record (HAER), National Park Service, 600 Harrison Street, Suite 600, San Francisco, 94107, to determine what level and kind of recordation is required for the apparatus. Unless otherwise agreed to by HAER, DOE-OAK shall ensure that all documentation is completed and accepted by HAER prior to the undertaking, and that copies of this documentation are made available to the SHPO and appropriate local archives designated by the SHPO.

2. If the DOE-OAK determines that the re-use of Building 51 is not feasible, or that the building can no longer contribute to the program goals of the facility, the DOE may demolish Building 51 provided that the measures included in Stipulation I.A.1 of this MOA have been completed and that the DOE-OAK contact the Historic American Building Survey (HABS), National Park Service, 600 Harrison Street, Suite 600, San Francisco, 94107, to determine what level and kind of recordation is required for the building. Unless otherwise agreed to by HABS, the DOE-OAK shall ensure that all documentation is completed and accepted by HABS prior to the undertaking, and that copies of this documentation are made available to the SHPO and an appropriate local archives designated by the SHPO.

II. Dispute Resolution Among Consulting Parties

Should the DOE-OAK or the SHPO object within 30 days to any action pursuant to this Agreement, the parties to the agreement shall consult to resolve the objections to the Agreement. If DOE-OAK determines that the objection cannot be resolved, DOE-OAK shall forward all documentation relevant to the dispute to the Council. Within 30 days after receipt of all pertinent documentation, the Council will either:

1. provide the DOE-OAK with recommendations, which the DOE-OAK will take into account in reaching a final decision regarding the dispute; or

2. notify DOE-OAK that it will comment pursuant to 36 CFR 800.6(b), and proceed to comment. Any Council comment provided in response to such a request will be taken into account by the DOE-OAK in accordance with 36 CFR 800.6(c) (2) with reference only to the subject of the dispute; the DOE-OAK's responsibility to carry out all actions under this Agreement that are not subjects of the dispute will remain unchanged.

III. Amendments

If any of the signatories determines that the terms of this Agreement cannot be carried out as written and that the Agreement should be amended, that signatory shall immediately consult the other signatories concerning such amendment. Amendments shall be considered and executed in accordance with 36 CFR 800.5(e)(5).

IV. Failure to Carry Out the Terms of This Agreement

Failure to carry out the terms of the Agreement require that DOE-OAK again request the Council's comments in accordance with 36 CFR 800. If DOE-OAK cannot carry out the terms of the Agreement, it will not take or sanction any action or make any irreversible commitment that would result in an adverse effect to a historic property or that could foreclose the Councils consideration of modifications or alternatives to the undertaking.

Execution of this Memorandum of Agreement and implementation of its terms evidence that the DOE-OAK has afforded the Council an opportunity to comment on the undertaking and its effects on historic properties, and that the DOE-OAK has taken into account the effects of the undertaking on historic properties.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

BY: John M. Fowler DATE: 6/13/97

John M. Fowler, Executive Director

DOE OAKLAND OPERATIONS OFFICE

BY: Martha J. Donnagele DATE: 10/7/97

for James M. Turner, Ph.D., Manager

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

BY: Cherilyn Widell DATE: 10/22/97

Cherilyn Widell

APPENDIX C
Socioeconomic Analysis

Setting and Impacts Summary

The Proposed Action would disassemble the Bevatron and demolish Building 51 and the foundation underneath the building. The site would be backfilled and the fill would be compacted and leveled. The Proposed Action would therefore not displace existing housing or residents. The Proposed Action would extend the existing roadway network adjacent to the project site. However, the new roadway segment would directly serve the project site, which would not include residential uses.

No new homes, employment, or infrastructure would be created as a result of the demolition of Building 51. As a result, no increases in population levels are anticipated. There are no existing housing structures associated with Building 51 and no homes would be demolished as a result of this Proposed Action. Therefore, no replacement housing is needed

Federal funding for the Proposed Action would be from national sources and would not represent an important commitment of local resources. Employment for the demolition would draw upon local populations and would not be perceptible in any particular employment or housing market.

The Proposed Action would therefore not directly or indirectly induce substantial growth in the area.

APPENDIX D
Environmental Justice Analysis

Setting

The LBNL complex is located in Alameda County, with a large portion located within the Berkeley city limits, and a smaller portion located within the Oakland city limits. The University of California, Berkeley, is adjacent to LBNL, and the nearest residential and commercial neighborhoods are located within the City of Berkeley. The nearest Oakland properties consist of designated open space areas. Unincorporated areas of Contra Costa County lie to the north and east, most of which are also designated open space areas.

Census 2000 revealed that Alameda County's population is approximately 51 percent non-white or more than one race: 15 percent black or African American alone, less than 1 percent American Indian and Alaska Native alone, 20 percent Asian alone, less than 1 percent Native Hawaiian and other Pacific Islander alone, 9 percent "some other race alone," and approximately 6 percent two or more races. In the City of Berkeley, the population is approximately 41 percent non-white or more than one race, and in the City of Oakland, the population is approximately 69 percent non-white or more than one race. Table D-1 below, compares the racial breakdown of Alameda County, Berkeley, Oakland, and census tracts located near LBNL in Berkeley.[1]

Census 2000 also identifies median[2] household incomes and family incomes. Table D-2, below, compares medial household incomes and family incomes in Alameda County, the cities of Berkeley and Oakland, and the residential and commercial census tracts nearest LBNL.

Impacts

The project site is located in Alameda County, within Oakland's city limits. Both Alameda County and Oakland have large non-white populations. In Alameda County, however, the largest single racial group is white (48.6%); in Oakland the largest single racial group is black or African American (35.7%). In residential and commercial areas located in the vicinity of LBNL, the single largest racial group is white (63.5% to 88.9%).

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1 Census tract 4216 is located northwest of LBNL and includes the neighborhoods north of the UC Berkeley campus; census tract 4227 is southwest of LBNL, and census tracts 4237 and 4238 are in the hilly areas further southwest of LBNL and south of the UC Berkeley campus.

2 Median income is the "middle" income: one half of all incomes are below the median and one half are above the median.

TABLE D-1
COMPARISON OF SELF-IDENTIFIED RACIAL IDENTITIES (PERCENTAGE)
ALAMEDA COUNTY, BERKELEY, OAKLAND, AND
CENSUS TRACTS 4216, 4227, 4237 AND 4238

	Percentage of Population						
Race	**Alameda County**	**City of Berkeley**	**City of Oakland**	**Census Tract 4216**	**Census Tract 4227**	**Census Tract 4237**	**Census Tract 4238**
White alone	48.6%	59.2%	31.3%	83.5%	63.5%	70.3%	88.9%
Black or African American alone	14.7%	13.6%	35.7%	1.9%	3.2%	2.6%	1.9%
American Indian and Alaska Native alone	0.6%	0.5%	0.7%	0.0%	0.2%	0.2%	0.3%
Asian alone	20.4%	16.4%	15.2%	9.0%	20.0%	19.4%	6.0%
Native Hawaiian alone and Other Pacific Islander alone	0.6%	0.1%	0.5%	0.2%	0.0%	0.0%	0.0%
Some other race alone	9.0%	4.6%	11.7%	0.2%	4.9%	2.1%	0.5%
Two or more races	6.0%	5.6%	5.0%	5.2%	8.2%	5.3%	2.4%
Total	99.9%*	100.0%	100.1%*	100.0%	100.0%	99.9%*	100.0%

***** Less than 100% due to rounding error.

SOURCE: Census 2000, ESA (2007)

TABLE D-2
COMPARISON OF FAMILY AND HOUSEHOLD MEDIAN INCOMES (1999)
ALAMEDA COUNTY, BERKELEY, OAKLAND AND
CENSUS TRACTS 4216, 4227, 4237 AND 4238

2000 Income	**Alameda County**	**City of Berkeley**	**City of Oakland**	**Census Tract 4216**	**Census Tract 4227**	**Census Tract 4237**	**Census Tract 4238**
Median Household Income	$55,946	$44,485	$40,055	$95,868	$25,625	$40,660	$105,011
Median Family Income	$65,857	$70,434	$44,384	$125,896	$48,846	$103,628	$149,802

SOURCE: Census 2000, ESA (2007)

Household and family median incomes are lower than County median incomes in both Oakland and in the City of Berkeley's census tract 4237, which has a high student population. Median household incomes alone are lower than the County median household income in Berkeley, Oakland, and City of Berkeley's census tracts 4227 and 4237. Median family incomes are higher than County median incomes for the City of Berkeley overall, as well as for the City of Berkeley census tracts 4216, 4237, and 4238.

As stated in Section 5.1.12, there would be no disproportionately high or adverse human health or environmental effects on minority or low-income populations from the demolition as a result of the Proposed Action, due to the low incidence of localized, off-site impacts from the Proposed Action, as well as to the demographics of populations living nearest the project site.

APPENDIX E

Revisions to the Draft Environmental Assessment

The following corrections and changes are made to the Draft Environmental Assessment and have been incorporated within the text. Revised or new language is underlined. Deleted language is indicated by ~~strikethrough~~ text.

Page 1:

> This Environmental Assessment (EA) describes a proposal by the U.S. Department of Energy (DOE) ~~and LBNL~~ to demolish the Bevatron and the structure housing it, Building 51, at Berkeley Lab. During its operation from 1954 until 1993, the Bevatron was among the world's leading particle accelerators, and during the 1950s and 1960s, four Nobel Prizes were awarded for work conducted in whole or in part there. The Bevatron is approximately 180 feet in diameter. Building 51 is a large (approximately 126,500 gross square feet) shed-like structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, shop and office functions. Since the end of the Bevatron's operations in 1993, Building 51 has had limited use for equipment storage, office space, and dry laboratories.

Page 1-2:

> The project site is approximately four acres in size, including parking and staging areas. Of this total, approximately 2.25 acres would be converted from developed area (i.e., occupied by Building 51) to an undeveloped area for an indeterminate time, until another project is proposed, approved, and initiated. Under the proposed project, the concrete shielding blocks that surround the Bevatron would be removed, the Bevatron apparatus would be disassembled, Building 51 and the shallow foundation and tunnels underneath the building would be demolished, and the resulting debris and other materials would be removed. Minor soil ~~site~~ remediation effort is expected ~~would be included~~ as part of this action. The site would then be backfilled, and the fill compacted and leveled. The duration of the physical work for the project may vary from four to seven years, from early ~~2006~~ 2008 through ~~2009 or~~ 2011 or beyond, contingent upon funding and results of material sampling. For the purposes of conservative impact assessment, where impacts presumably are intensified in a shorter project timeframe, the project is assumed to take place over a four year period. [Footnote added].

> A variant of the project could reduce the minimum duration of the project from four years to three and a half years, but this reduction in schedule would have no resulting effect on project impacts, including traffic impacts. See revised page 76 and Appendix G.

Page 2:

Depending upon funding, a project variant, under which project activities would be conducted in an alternative sequence, has been developed since publication of the Draft of this Environmental Assessment. The alternative-sequence project variant would begin with appropriate sampling and surveys for hazardous building construction materials and debris, followed by removal and abatement of all hazardous materials within Building 51. Prior to demolition of the building structures, systems and components, the project would set up additional stormwater drainage and collection systems. Once the building was demolished down to the grade level concrete slab, the Bevatron shielding blocks and equipment would be dismantled and removed with the use of two modern mobile cranes. Finally, the project would demolish and remove the building foundations, tunnels, trenches and slabs and backfill with suitable clean fill material. This alternative-sequence variant, if implemented, would not create a new significant impact, nor would it substantially increase the severity of a significant impact associated with the Project nor require new or altered mitigation measures. [Footnote added]

The alternative-sequence variant was analyzed in a Technical Memorandum dated July 3, 2007. The Memorandum was included in the Final EIR for the Demolition of Building 51 and the Bevatron as Appendix E. The Bevatron Final EIR was certified on July 19, 2007. The Memorandum is included in this Environmental Assessment as Appendix G. It determined that there would not be an increase in severity of impacts under the alternative-sequence or alternative duration.

Page 3-4:

Under this alternative, most of the concrete from the building structure (i.e., walls and floors), foundation, and many of the concrete blocks shielding the Bevatron would be rubbled on-site. Metal (e.g., rebar) in the debris would be separated and disposed of separately. Only concrete containing no detectable added (i.e., non-naturally occurring) radioactivity and otherwise clear of contaminants would be rubbled. The rubbled material and segregated reinforcing steel would be recycled if public or private sector demand was available at the time of production. If not, it would be disposed of at a landfill. LBNL could use the rubble as aggregate or fill material if the need for such materials coincided with its production, although this is speculative at the present time.

Page 7:

With the acceptance of the HAER report by NPS, DOE may demolish Building 51 provided that DOE contacts the Historic American Building Survey (HABS) division of NPS to determine what level and kind of recordation is required for the buildings, and that such documentation is completed and accepted by HABS prior to demolition. LBNL has consulted with NPS. The latter determined that an addendum to the HAER report would meet HABS requirements. The HAER addendum has been completed and was accepted ~~is currently being reviewed~~ by NPS in August 2006. ~~Demolition would not commence until NPS accepts the document.~~ For NEPA purposes, with the signed MOA, completion of the HAER documentation, and approval of the HABS addendum by NPS, LBNL ~~will have~~ has adequately mitigated for the potential loss of Building 51, in accordance with the NHPA.

As an additional measure, LBNL plans to commemorate the scientific achievements attributed to the Bevatron with a monument and/or display listing the historic discoveries that occurred there.

Page 9:

The goal of the LBNL Building 51 and Bevatron Demolition Project is to eliminate existing potential hazards and make the building site available for eventual future use. By removing the structure and clearing the site, future site reuse could occur in a timely manner. For example, contaminated materials, equipment or environmental media, if any, would have been removed or otherwise managed as part of the proposed demolition project and would not impede future development. However, at this time, there are no existing plans for future development of the site. As future use is speculative, it is not described in this Environmental Assessment, nor are the impacts of such use evaluated. The proposed action would also reduce LBNL maintenance obligations and help off-set creation of new space.

~~The primary planning document for development at LBNL is~~ The Laboratory's Long Range Development Plan (LRDP) is a planning document for development at LBNL. ~~adopted by the University of California in August 1987.~~ ~~All future development at LBNL will be consistent with this document and~~ When the Draft of this Environmental Assessment was published in 2006, its analysis was completed in accordance with the 1987 LRDP Environmental Impact Report (EIR), as amended, prepared pursuant to ~~in accordance with~~ the California Environmental Quality Act (CEQA).~~, or with~~ Since publication of the Draft Environmental Assessment, two documents ~~currently being~~ were prepared by Berkeley Lab that ~~will~~ supersede ~~these current documents: a~~ the former LRDP and the 1987 LRDP EIR, as amended: the 2006 LBNL Long Range Development Plan and its accompanying LRDP EIR. The analysis of this Environmental Assessment, is consistent with the 1987 LRDP EIR, as amended, is also consistent with the 2006 LBNL LRDP, as well as the 2006 LRDP EIR. [Footnote added]. Project-level NEPA and CEQA environmental analysis will be conducted if and when necessary for any future development at the Building 51 site.

This Environmental Assessment includes references to the 1987 LRDP EIR, as amended, although the analysis is consistent with both the 1987 LRDP EIR and the 2006 LRDP EIR.

Page 11-12:

Under the Proposed Action, the Bevatron apparatus would be disassembled, Building 51 and the foundation underneath the building would be demolished, and the resulting debris and other materials would be removed. The site would then be backfilled, and the fill would be compacted and leveled. [Footnote added] This would make future reuse of the site more feasible, although further preparatory site work outside of the scope of this project would be necessary. However, there are no firm plans for future development of the site at this time.

A potential alternative-sequence project variant that would demolish the structure of Building 51 before disassembly and removal of the Bevatron is analyzed and addressed in Appendix G.

Page 17:

In brief, under the Proposed Action, the concrete block shielding surrounding the Bevatron would be removed, the Bevatron apparatus would be disassembled, Building 51 and the shallow foundation and tunnels underneath the building would be demolished, and the resulting debris and other materials would be removed. Minor site remediation effort would be included as part of this action. The site would then be backfilled, and the fill would be compacted to grade. This would make future reuse of the site more feasible, although further preparatory site work outside of the scope of this project would be necessary.

Depending upon funding, a project variant, under which project activities would be conducted in an alternative sequence, has been developed since publication of the Draft of this Environmental Assessment. [Footnote added] The alternative-sequence project variant would begin with appropriate sampling and surveys for hazardous building construction materials and debris, followed by removal and abatement of all hazardous materials within Building 51. Prior to demolition of the building structures, systems and components, the project would set up additional stormwater drainage and collection systems. Once the building was demolished down to the grade level concrete slab, the Bevatron shielding blocks and equipment would be dismantled and removed with the use of two modern mobile cranes. Finally, the project would demolish and remove the building foundations, tunnels, trenches and slabs and backfill with suitable clean fill material. This alternative-sequence variant, if implemented, would not create a new significant impact, nor would it substantially increase the severity of a significant impact associated with the Project or would it require new or altered mitigation measures.

The alternative-sequence variant was analyzed in a Technical Memorandum dated July 3, 2007, which was included in the Final EIR for the Demolition of Building 51 and the Bevatron as Appendix E. The Bevatron Final EIR was certified on July 19, 2007. The Memorandum is included in this Environmental Assessment as Appendix G. It determined that there would not be an increase in severity of impacts under the alternative-sequence or alternate duration.

Page 18:

The duration of the physical work for the project may vary from four to seven years, from mid 2008 through 2011 or beyond, contingent upon funding and results of material sampling. For the purposes of conservative impact assessment, where impacts presumably are intensified in a shorter project timeframe, the project is assumed to take place over a four-year period. [Footnote added]

A variant of the project could reduce the minimum duration of the project from four years to three and a half years, but this reduction in schedule would have no resulting effect on project impacts, including traffic impacts. See revised Page 76 and Appendix G.

Page 18:

Demolition would involve removal of the building structure and its shallow foundations. The general sequence of demolition activities would be (1) identification and isolation of building elements to be demolished; (2) abatement of all hazardous materials ~~removal of non-structural materials~~; (3) demolition of the building structure ~~removal of non-load-bearing structural elements~~; and (4) segregation and disposal of the debris ~~removal of load-bearing structural elements~~.

Manual removal of the external asbestos-containing siding materials, by unbolting fasteners, would be conducted prior to building demolition to prevent creation of airborne particles. Asbestos-containing materials in the roof membrane would be abated. ~~The roof membrane and sections of the roof structure would be removed to permit the dismantling and removal of three cranes that are within the building.~~ The building superstructure would be dismantled and demolished to the grade level concrete slab. This slab would be surveyed, decontaminated if required, and removed along with the shallow foundation structures and tunnels. Those portions of the concrete slab that are not beneath the building would remain in place. In addition, a cooling tower adjacent to and surrounded on three sides by Building 51 that formerly provided chilled water for air conditioning ~~would be~~ has been demolished and removed. Deep underground concrete foundations would remain, as would most of the concrete retaining walls that support the hillside above the facility.

Page 19:

The Building 51 outer wall forms a portion of the retaining walls. In order to keep the hillside in place during and after the building is demolished, approximately 170 feet of new concrete retaining wall would be constructed inside Building 51 prior to the demolition of that building, which would be kept in place after demolition. An alternative would be to reinforce existing walls to retain the hillside.

Materials disposition would occur at various stages of the project. About half of the demolition materials would consist of non-hazardous debris and other items typical of demolition projects. The project would seek to reuse or recycle such materials (e.g., uncontaminated metals and concrete) where feasible. ~~For example, unrestricted, uncontaminated metals might go to scrap dealers.~~ Items that could not be salvaged would be sent to appropriate municipal landfills, such as the Altamont Landfill in Livermore, California.

Page 20:

Testing, fill replacement, and stabilization would be the final set of field activities. The area to be demolished extends to the exterior of Building 51. Soil under this area would be surveyed for contaminants under the auspices of the Laboratory's Environment, Health, and Safety (EH&S) Division. Residual chemical or radiological contamination, if any, would be addressed by the EH&S Division in consultation with the appropriate regulatory agency.

~~Radiological contamination of the soil is not anticipated, due to the shielding provided by the foundation of the building.~~ Newly discovered environmental releases of hazardous constituents will meet the notification and corrective action requirements in LBNL's Hazardous Waste Facility Permit (EPA ID. no. CA 4890008986), section IV. B. "Newly Identified Releases". Cleanup standards and methods will be consistent with LBNL's Environmental Assessment and Corrective Measures Study Report for Remediating Contamination at LBNL Regulated under the Resources Conservation and Recovery Act (DOE/EA-1527).

The open area, or demolition zone, which would be approximately 2.25 acres, would then be backfilled with suitable clean fill material and compacted to grade in accordance with engineering requirements. The source of this material would be determined at the time of need, based upon local supply, and would be partially drawn from LBNL stockpiles~~; e.g., from clean soil excavated for the Lab's Molecular Foundry or other projects~~. It is also likely that some clean residual rubble from the slab and foundations would be used as fill material. Although the Laboratory would use clean LBNL-derived fill material as much as possible, this EA conservatively assumes that half of the project's backfill requirements would be fill certified as clean by the provider and brought in from off-site. The demolition zone would be hydro-seeded with native grasses. Sampling wells for the Laboratory's Environmental Restoration Program would continue to function. The Proposed Action would not add any impervious surfaces to Berkeley Lab. In fact, it would decrease the amount of impervious surfaces. There are no longer any natural drainages on the site, and no streams or rivers would be altered.

Page 21:

Demolition materials would be staged at or near the project site, inside the LBNL property line. Truck shipments from the site are planned to proceed west on Hearst Avenue, south on Oxford Street, and then west on University Avenue to Interstate 80. Shipments to the site would follow this route in reverse. Demolition work would be conducted approximately 40 hours per week, Monday through Friday. Normal work hours would be between 7:00 a.m. and 3:30 p.m. It is possible that some truck loading and departure would take place on Saturdays ~~and/~~or Sundays, although this would be infrequent. No roads would be closed as a result of the action, and no new roads, road extensions, or improvements would be required. Similarly, project equipment (including excavators, front-end loaders, graders, hoe-rams, and mobile cranes) would be staged at or near the site, primarily at the parking lot north of Building 51.

Page 28:

The federal Clean Air Act of 1970 and its amendments established maximum allowable concentration standards for six ambient air pollutants known as "criteria" pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter (respirable PM_{10} and fine $PM_{2.5}$), and lead. [Footnote added]. Each of these standards was set to meet specific public health and welfare criteria. Individual states were given the option to adopt more stringent state standards for criteria pollutants and to include other pollutants. California has done so through the California Clean Air Act.

PM-10 and PM-2.5 consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. A micron is one-millionth of a meter, or less than one-25,000th of an inch. For comparison, human hair is 50 microns or larger in diameter. PM-10 and PM-2.5 represent particulate matter of sizes that can be inhaled into the air passages and deep into the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of aerosol-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles (PM-2.5) of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility.

Page 29:

The central issue of concern with DPM is the risk of chronic heath effects associated with long-term exposure to these particulates. To address this risk, CARB developed a risk management guidance document and risk reduction plan to reduce DPM and resultant health risk by 75 percent in 2010 and 85 percent by 2020. Since approval of these documents in September 2000, CARB has adopted a series of rules for stationary and portable diesel engines, solid waste collection vehicles, transport refrigeration units, and idling of diesel vehicles. Additional measures and specific regulations to reduce DPM emissions will be evaluated and developed over the next several years. In addition, in May 2004, the U.S. Environmental Protection Agency (EPA) adopted a comprehensive national program known as the Clean Air Nonroad Diesel Rule to reduce emissions from future nonroad diesel engines by more than 90 percent by integrating engine and fuel controls (EPA, 2004). ~~In parallel with emission standards for heavy-duty diesel engines, EPA introduced sulfur content requirements for highway diesel fuel.~~ As part of the Clean Air Nonroad Diesel Rule, EPA introduced sulfur content requirements for highway diesel fuel. The highway vehicle diesel fuel sulfur limit, which was originally 5,000 parts per million (ppm), was first revised to a limit of 500 ppm (low sulfur fuel), and then further reduced to 15 ppm (ultra-low sulfur fuel), beginning, for retail and wholesale consumers, on October 15, 2006. The 15 ppm sulfur limit is required to prevent the malfunction of catalyzed filtration systems that are needed to meet the ~~meet~~ future diesel engine emission standards. These federal limits on sulfur in fuel apply only to fuel for highway vehicles. CARB regulations mandate the same sulfur content for highway diesel fuel as do the EPA regulations, except that the effective date for retail and wholesale consumers is September 1, 2006.

Nonroad vehicle federal restrictions on sulfur content in diesel fuel ~~for nonroad engines~~ follow a different schedule. The 2004 EPA Nonroad Diesel rule limits the sulfur in nonroad fuels to 500 ppm effective June 1, 2007, and 15 ppm effective June 1, 2010. Subsequent to these federal restrictions for nonroad engines, CARB moved up the dates for compliance with sulfur restrictions and on December 14, 2004, required that nonroad diesel fuel sold in California, except for diesel fuel used for locomotives or marine engines, must meet the same sulfur restrictions as fuel used for highway vehicles. In this case, the sulfur content in fuel for nonroad engines in California must not exceed 15 ppm as of September 1, 2006, rather than EPA date of June 2010.

Page 31 (footnote 4):

Alameda whipsnake (Masticophis lateralis euryxanthus), threatened under both federal and state law, have not been sighted at LBNL, although suitable habitat may be present on the Lab site. However, this would most likely be at the eastern corner of the Lab property, contiguous with open space to the north and east. Suitable habitat is not present at or near Building 51. ~~On October 18, 2005, USFWS issued revised designations of Alameda whipsnake critical habitat, which do not include any portion of the project site (Federal Register, Volume 70, Number 200, pp. 60608 et seq.).~~ Critical habitat for the species was re-proposed in October 2005 (USFWS, 2005d) and, as adopted in October 2006 (USFWS, 2006), includes the easternmost portion of the Lab site.

Page 36:

The project site is immediately adjacent to the Hayward Fault Zone and approximately 19 miles northeast of the active San Andreas Fault Zone. Other principal faults capable of producing significant ground shaking at the project site are the San Gregorio-Hosgri, Calaveras, Concord–Green Valley, Marsh Creek–Greenville, and Rodgers Creek faults. The USGS Working Group on California Earthquake Probabilities estimates that there is a 27-percent chance that the Hayward–Rodgers Creek Fault System will experience an earthquake of ~~M~~ magnitude 6.7 or greater in the next 30 years (USGS, 2003). Two active traces of the Hayward Fault are close to but not within the project site; the nearest ("Main Trace") is approximately 1,000 feet downslope, southwest of the project site, while the West Trace is located an additional 100 to 150 feet west (CGS, 1982). The USGS Working Group on California Earthquake Probabilities recently estimated that there is a 21-percent chance of the San Andreas Fault experiencing an earthquake of ~~M~~ magnitude 6.7 or greater in the next 30 years (USGS, 2003).

Page 37:

Hazardous materials are commonly used in commercial, agricultural, and industrial applications, as well as in residential areas to a limited extent. A hazardous waste is any hazardous material that is discarded, abandoned, disposed, or in some cases, is to be recycled. The same criteria that render a material hazardous also make a waste hazardous.

Page 47:

To remediate the Building 51/64 Groundwater Solvent Plume, contaminated source area soils located at the southeast corner of Building 64 were excavated as an ICM in August 2000 and a groundwater extraction system was installed in the backfilled excavation. In addition, an in situ soil flushing pilot test is being conducted in the source area to prevent further migration of contaminants in groundwater. To divert discharges away from the North Fork of Strawberry Creek, an ICM was also implemented that routes water from a portion of the Building 51 subdrain system to a groundwater treatment system using granular activated carbon. The treated groundwater is then discharged to the sanitary sewer under an EBMUD wastewater discharge permit.

Page 47:

The CMS Report recommends that the following further corrective actions be undertaken in the vicinity of the project site in the CMI phase: excavation and off-site disposal of saturated and unsaturated zone soils in the plume source zone, monitored natural attenuation for the remaining plume area, and rerouting or lining of the storm drain to prevent migration of groundwater contaminants to surface water. For more complete descriptions of contamination and corrective action measures in the vicinity of Building 51, the reader is directed to the CMS Report.

Once Building 51 is demolished, further investigation for potential soil and groundwater contamination at portions of the site that were previously inaccessible would take place, and appropriate corrective measures would be undertaken ~~as required by DTSC, in consultation with the San Francisco Bay Regional Water Quality Control Board and the City of Berkeley Toxics Management Division~~. Newly discovered environmental releases of hazardous constituents will meet the notification and corrective action requirements in LBNL's Hazardous Waste Facility Permit (EPA ID. no. CA 4890008986), section IV. B. "Newly Identified Releases." Cleanup standards and methods will be consistent with LBNL's Environmental Assessment and Corrective Measures Study Report for Remediating Contamination at LBNL Regulated under the Resources Conservation and Recovery Act (DOE/EA-1527).

Page 52-53:

LBNL also contracts with a private security firm, which is responsible for on-site security needs including Laboratory access, property protection, and traffic control. The on-site security staff at LBNL totals approximately ~~25~~ 18 personnel, divided into approximately five to six personnel per shift. Staffing and resources include an on-site manager, two roving patrols 24 hours per day, and gate access attendants 24 hours per day at the Blackberry Gate and fewer hours at the Strawberry and Grizzly Peak gates.

Page 59:

Demolition activities could create a temporary adverse effect on the local air quality of the site and its surroundings. These activities have the potential to generate 1) dust (including PM_{10} and $PM_{2.5}$), primarily from “fugitive” sources (i.e., emissions released through means other than through a stack or tailpipe); and 2) lesser quantities of other criteria air pollutants, primarily from tailpipe emissions from haul trucks, ~~and~~ heavy construction equipment, ~~and~~ demolition machinery (primarily diesel-powered) and worker automobile trips (primarily gasoline-powered). The Proposed Action may also involve demolition and removal of asbestos-containing building materials.

The Bevatron apparatus would be disassembled and Building 51 and the foundation slabs and tunnels underneath the building would be demolished. All work related to disassembly and removal of the internal structures (i.e., the concrete shielding blocks and the Bevatron machine) would occur while the exterior building structure is in place, minimizing the release of dust and other emissions. Subsequently, this external building would be demolished. After demolition of the building, the slab and foundation structure would be demolished. [Footnote added:]

A potential alternative-sequence project variant that would demolish the structure of Building 51 before disassembly and removal of the Bevatron is analyzed and addressed in Appendix E of the Bevatron Final EIR, which was certified on July 19, 2007. The analysis is included in this document as Appendix G.

After demolition of the building, the slab and foundation structure would be demolished. Later demolition steps would include the possible excavation of approximately 200 cubic yards of contaminated soils and backfill of the site with an estimated 20,000 cubic yards of clean fill.

Page 61:

Not all demolition equipment would be on-site or operating at the same time, thereby reducing the potential short-term impact of these tailpipe emission sources. Moreover, diesel- and gasoline-powered equipment operation would be limited to work hours, and LBNL contract provisions would place limits on equipment idling, require use of electric power in lieu of internal combustion engine power, require use of ultra low-sulfur diesel fuel, and require equipment maintenance to reduce gaseous emissions. As a result of these measures, emissions of criteria air pollutants would be reduced.

Page 61:

The project activities involving diesel-operated equipment releasing DPM emissions would be temporary, occurring periodically over a more than four-year period, but the scheduled regulatory reductions of DPM emissions that begin in 2007 to lower the resultant health risk from DPM by 75 percent in 2010 would ~~may~~ further lower emissions from these sources if newer equipment is used. Although the exact amount of the DPM emissions reduction is not known, substantially greater reductions in DPM emissions are expected to occur for large on-road trucks than for off-road equipment.

Page 61 [Footnote 3]:

Although the project's on-site demolition equipment would be additional sources of DPM, the DPM that would reach off-site residences would be reduced by dispersion, due to the distance of the project site from these residences. As a net result, DPM concentrations from on-site equipment would be roughly 1/100 to 1/10 of the annual DPM concentrations from hauling, based on the amount of demolition equipment assessed and results of modeling described below.

Page 63:

> The exterior siding of Building 51 was constructed with transite, a material typically containing approximately 20 percent non-friable chrysotile asbestos fibers. Given the age of Building 51 and demolition characterization surveys of the facility, ~~it is likely that~~ other parts of the building were also constructed using asbestos-containing materials. Since airborne asbestos poses a serious health threat, the demolition and removal of any potential asbestos-containing building materials would be handled according to LBNL's Asbestos Management Program, which is tailored to meet the requirements of BAAQMD Regulation 11, Rule 2: Hazardous Materials–Asbestos Demolition, Renovation and Manufacturing. This program includes standards of operation necessary to control asbestos emissions, and identifies any prior notification and permitting requirements. With adherence to this program, the exposure of the public and of the workers to airborne asbestos would be controlled and the impacts associated with exposure to airborne asbestos would be minimal. An asbestos demolition notification to the BAAQMD would be required; if regulated asbestos is present, an asbestos renovation notification would also be needed.

Page 63:

> Since with the exception of the two small areas of ornamental landscaping at the entrance to Building 51, demolition activities would include no tree or shrub removal or damage to trees, and the ornamental landscaping to be removed does not represent appropriate habitat, there would be no potential for direct adverse effects on special-status nesting birds. However, there are a number of oak and conifer trees in close proximity to Building 51 on the slopes to the east and south of the building. These trees are located in a relatively narrow strip of vegetation between two developed areas and alongside Lawrence Road, which has regular daytime traffic flow, including heavy diesel trucks and buses moving up the grade to McMillan Road. The trees nevertheless may provide nesting habitat for special-status birds, as do other trees within a 500-foot radius of the Building 51 site, including oak, eucalyptus, and conifers. Some activities, most notably ~~and~~ noise generated by demolition under the Proposed Action, would have the potential to disturb any nesting raptors or other special-status nesting birds present in these trees. Such activities could result in the abandonment of special-status bird nests, eggs, or fledglings.

Page 69:

> With the acceptance of the HAER report by NPS, DOE may demolish Building 51 provided that DOE contacts the Historic American Building Survey (HABS) division of NPS to determine what level and kind of recordation is required for the buildings, and that such documentation is completed and accepted by HABS prior to demolition. LBNL has consulted with NPS. The latter determined that an addendum to the HAER report would meet HABS requirements. The HAER addendum has been completed and ~~is currently being reviewed~~ was accepted by NPS in August 2006. ~~Demolition would not commence until NPS accepts the document.~~ For NEPA purposes, with the signed MOA, completion of

the HAER documentation, and approval of the HABS addendum by NPS, LBNL ~~will have~~ has adequately mitigated for the potential loss of Building 51. As an additional measure, LBNL plans to commemorate the scientific achievements attributed to the Bevatron with a monument and/or display listing the historic discoveries that occurred there.

Page 70:

Backfilling, grading, and other demolition activities associated with the project would require the removal of the shallow below-grade concrete foundation, and replacement of a portion of a retaining wall. In addition, there may be a need to excavate subsurface contaminated soil, although this quantity is anticipated to be small (approximately 200 cubic yards). The media cleanup standards and impact analysis would be consistent with those stated in the Environmental Assessment and Corrective Measures Study Report for Remediating Contamination at LBNL Regulated under the Resources Conservation and Recovery Act (DOE/EA-1527). This soil would be removed from the Laboratory, and hauled to an appropriate off-site location for disposal. Clean backfill would be used to restore the site to the current grade. The backfill would be compacted and hydro-seeded.

Page 70:

Project-related activities that include removal of lead dust or asbestos building materials, cutting or removal of equipment or structural materials, or the processing and removal of concrete shielding blocks or slabs would involve substances that could be a hazard to workers, the public or the environment. Various types of hazardous materials would be encountered during demolition activities. About half of the truck trips that would transport materials for disposal off-site would carry non-hazardous construction debris and solid waste, and about half would carry some type of hazardous waste, low-level radioactive waste, or mixed waste. As described in Section 5.1.9, Public Utilities, of the truckloads carrying radioactive waste, the great majority would be of low activity, volume-contaminated items.

Page 72-73:

Prior to the start of excavation, the project management team would obtain information on known residual soil and groundwater contamination in the project area. The project management team would be responsible for ensuring that bid specifications disclose known locations and concentrations of hazardous chemicals in soil and groundwater that could be encountered by contractors. Any intrusive work in areas where contaminants are present would be performed by properly trained contractors with oversight by the project management team and assistance from the EH&S Division (e.g., for soil, water, or air monitoring or auditing). ~~If residual soil or groundwater contamination is encountered during demolition, it would be managed in accordance with applicable DOE and Berkeley Lab policies and state and federal regulations regarding hazardous material handling and hazardous waste management.~~ Residual chemical or radiological contamination, if any, would be addressed by the EH&S Division in consultation with the appropriate regulatory agency. Newly discovered environmental releases of hazardous constituents will meet the notification and corrective action requirements in LBNL's Hazardous Waste Facility Permit (EPA ID. no. CA 4890008986), section IV.B. "Newly Identified Releases." Cleanup standards and methods will be consistent with LBNL's Environmental Assessment and Corrective Measures Study Report for Remediating Contamination at LBNL Regulated under the Resources Conservation and Recovery Act (DOE/EA-1527).

Page 74:

The actual quantities of water generated would depend on such variables as the type of equipment used to break concrete, the amount of water discharged from excavations, the amount of rainfall, and the elevation of the groundwater levels. This analysis assumes that demolition activities would continue through the winter and that stormwater management techniques would be used to reduce the contact of stormwater with residual contaminants at the demolition site.

Stormwater that could be contaminated by construction activity would be controlled by LBNL’s Best Management Practices (BMPs). The BMPs used by LBNL are described in its ~~2002~~ 2006 sitewide Stormwater Pollution Prevention Plan (SWPPP). The specific details of the demolition process and the most effective BMPs for controlling surface runoff, preventing erosion, and maintaining adequate drainage at the Building 51 site will be developed by LBNL staff and contractors in project-specific SWPPPs as the specifics of the demolition activities are further defined. As required by the statewide General Construction Permit, the preparation and implementation of SWPPPs will ensure that pollutants would not enter the environment through uncontrolled runoff. On-going groundwater monitoring would not be disturbed.

Page 75:

Examples of BMPs that LBNL could require as part of the project, all but the last from the LBNL ~~2002~~ 2006 facility-wide SWPPP, include the following:

Page 76:

Stormwater runoff from the proposed site is currently discharged to the North Fork of Strawberry Creek. This condition would not change under the post-Building 51 site configuration. Following the demolition and removal of Building 51 and its foundation, the demolition zone would be converted to vacant space and hydro-seeded with native grasses. This would allow varying amounts of surface water to percolate into the ground rather than flow along the surface, especially early in the rainy season when soil conditions are not yet saturated. The percolation of surface water into the ground would slightly reduce the overall quantity of surface water runoff. Because the Proposed Action would cause stormwater runoff on the subject site either to be slightly reduced or to remain the same as under existing conditions, the impact on runoff rates and volumes discharged to the North Fork of Strawberry Creek would be negligible. In addition, BMPs followed by the contractors would maintain the quality of re-water discharged to the North Fork of Strawberry Creek to acceptable levels.

Page 83:

An estimated maximum of about 4,700 one-way truck trips would be required over the four- to seven-year term of the Proposed Action [Footnote added:]

A schedule variant of the project could reduce the minimum duration of the project from four years to three and a half years, but for the reasons discussed here, this reduction in schedule would not increase the maximum haul truck traffic generation rates and therefore would not change the resulting traffic impacts and mitigation measures. See Appendix G.

Demolition work would be performed approximately 40 hours per week, Monday through Friday; normal work hours would be between 7:00 a.m. and 3:30 p.m. It is possible that some work, including truck loading and departure, would take place on Saturdays and/or Sundays, although this would be infrequent. [Footnote added:]

An alternative-sequence project variant that would demolish Building 51 before the disassembly and removal of the Bevatron itself would, for the reasons discussed here, not increase the maximum haul truck traffic generation rates and therefore would not alter traffic and traffic-related impacts and their mitigation measures. Analysis of the alternative-sequence project variant is included in Appendix G.

Page 93:

- User Support Building – This approved three-story, approximately 30,000-gross-square-foot building will consist of assembly space, support laboratories, and offices in support of the Advanced Light Source user facility at LBNL. This building will be constructed on the site previously occupied by Building 10 which was demolished during the summer of 2007. Construction is scheduled from mid 2008 to mid-2010.

- The Animal Care Facility (ACF) ~~would be~~ is an approximately ~~7,100~~ 5,005 gross square foot (gsf) one-story building located on the eastern side of Berkeley Lab, northwest of Building 83. The ACF ~~would~~ will replace the nearby existing 8,500 gsf animal care unit in Building 74, which is nearing obsolescence due to aging and unreliable mechanical equipment, and potential seismic inadequacy. If seismic upgrades are made to Building 74, the vacated space in that building likely would be converted to wet and dry laboratories and used for the same types of research activities, some of which already take place at Building 74 and others of which take place at other buildings at LBNL. ~~Construction activities would take place for a roughly one-year period, forecast at this time to occur between April 2006 and April 2007~~. The new ACF building has been completed, and is anticipated to be occupied in early 2008.

- An approximately 140' x 20' section of Cyclotron Road, the main road leading into Berkeley Lab from Hearst Avenue in Berkeley, California, would be widened to provide a visitor processing lane. The action would also include removing the existing guard kiosk and installing up to three new guard kiosks. The project was completed in 2006~~likely would begin in January and last through August 2006~~.

- The University of California ~~Berkeley Lab~~ is in the planning stage for the construction and operation of a new Guest House to serve visiting scientists, faculty and students. Many of the visitors using the Lab's facilities - the Advanced Light Source, National Center for Electron Microscopy, 88" Cyclotron, and ~~in the future,~~ the Molecular Foundry - are from outside the Bay Area and must obtain short-term housing. ~~The Guest House would be a 25,000 gsf, three-story facility with approximately 60 guest rooms and would provide on-site, low-cost, short-term housing.~~ This proposed three-story, approximately 25,000-gross-square-foot building would hold up to 120 beds for visiting researchers and other guests of LBNL. An Initial Study/Negative Declaration was prepared and circulated in early 2007. The project was approved and construction will begin in 2008. The Guest House would be constructed near the Advanced Light Source, the Lab's largest user facility. The site designated for the Guest House is near the center of the Laboratory, west and southwest of Building 2 and on the site of the demolished Building 29 and Trailer 29D, and existing Trailers 29A, 29B, and 29C. ~~Construction activities would occur over a 17 month period, forecast at this time to occur between February 2007 and June 2008.~~ It would use existing utilities infrastructure in the vicinity.

Page 95-96:

- The Computational Research and Theory (CRT) Building would be a UC-funded, five-story, approximately 140,000 gross square foot computer and office building constructed near the Blackberry Gate entrance to the Lab's main site. It would provide high-end computing floor space and accompanying office space to support the Lab's National Energy Research Scientific Computing (NERSC) Center, which is currently operating within an off-site leased building. Construction would take place from approximately 2008 to 2011.

- The Helios Research Facility, a UCB project, would be a four-story, 160,000 gross square foot building constructed immediately south of LBNL buildings 66 and 62. The goal of the Helios Project is to accelerate the development of renewable and sustainable energy sources using sunlight. This would be achieved by developing fundamentally new and optimized materials for use in collectors, and by creating more efficient processing steps and energy handling. Construction would take place from approximately 2008 to 2011.

- The environmental analyses assumed no more than one million gsf of construction would be underway at any one time within the Campus Park, Adjacent Blocks, Southside and Hill Campus land use zones, which ~~is~~ are approximately equal to the maximum level of construction that was underway at the time the Existing Setting data were collected in 2002 and 2003. Thus, the aggregate effects of the maximum level of construction foreseen under the UC Berkeley 2020 LRDP are already reflected in the existing setting.

  The UC Berkeley 2020 LRDP EIR also included a project-level analysis of the Chang-Lin Tien Center for East Asian Studies. The proposed Center includes two buildings: Phase 1, a four-story building of approximately 67,500 gsf, and Phase 2, a building planned to accommodate up to 43,000 gsf. At this point in time, Phase 1 is the only project that has received funding to proceed. ~~Construction for Phase 1 is underway and scheduled to continue until Fall 2007 (Shaff, 2005).~~ Construction for Phase 1 is underway ~~and scheduled to continue until Fall 2007~~ (Shaff, 2006).

- UC Berkeley plans to implement seven projects, referred to as the Southeast Campus Integrated Projects (SCIP). SCIP includes seismic and program improvements at the California Memorial Stadium, including a 158,000-gsf athletic training center and 102,000 gsf of additional new academic and support space at the stadium. ~~The SCIP include seismic and program improvements at the California Memorial Stadium; construction of a parking structure and sports field at the current site of Maxwell Family~~

~~Field; construction of an 180,000 gsf building linking the Law and Business schools, landscape improvements at the Southeast Campus and Piedmont Avenue; interior improvements at selected buildings at the School of Law and the Haas Business School; and renovation and restoration of the Piedmont Avenue houses (five structures and site environs from 2222 to 2240 Piedmont Avenue). UC Berkeley has just begun the environmental analysis of the SCIP; the SCIP EIR will be tiered from the 2020 LRDP and LRDP EIR.~~ The SCIP Final EIR, which was tiered from the UC Berkeley 2020 LRDP and LRDP EIR, was completed in October 2006. The SCIP EIR identified significant, unavoidable impacts in the areas of aesthetics (effects on the character of Gayley Road and on views from Panoramic Hill); cultural resources (changes to Memorial Stadium, demolition of several structures, and alterations to buildings and landscape along Piedmont Avenue); geology (earthquake risk); noise (due to construction and demolition and due to the potential for additional events at the stadium); traffic (effects at the Durant/Piedmont and Bancroft/Piedmont intersections); and utilities and service systems (increased demand on wastewater facilities) (UC Berkeley, 2006). Project construction for all of the projects is not definite at this time, but is expected to begin in ~~winter 2006/~~2008 and be completed in 2012 (UC Berkeley, 2005c).

Page 96:

- UC Berkeley proposes to construct and operate an Early Childhood Education Center, serving up to 78 children, on the north side of Haste Street, mid-block between Dana and Ellsworth Streets, in Berkeley, California. The 17,880 square foot project site is adjacent to a large campus parking lot. The project site itself is presently used as a surface parking lot with 53 marked vehicle spaces (UC Berkeley, 2005a). Construction of this facility is underway ~~and is scheduled to end January 2007~~. (Shaff, 2006)

- As part of UC Berkeley's Northeast Quadrant Science and Safety (NEQSS) Projects, demolition of the former Stanley Hall took place in Spring 2003. The new Stanley Hall is currently under construction and ~~is~~ was completed in 2007 ~~scheduled to be completed in mid-2006~~. The new facility ~~will be~~ is located at the East Gate of the campus next to the Hearst Memorial Mining Building and ~~will be~~ is eight stories above ground with three basement levels, and ~~will~~ measures approximately 285,000 gsf (UC Berkeley, 2005b).

- The Center for Information Technology Research in the Interest of Society (CITRIS) Headquarters project is part of UC Berkeley's NEQSS projects. The demolition of Davis Hall North, located in the north east section of the Berkeley campus near the intersection of Hearst and LeRoy Avenues, began at the end of August 2004 to make way for a replacement facility that will provide the headquarters for CITRIS and is designed to contain about 79,420 assignable square feet within a total area of 142,000 gsf. Construction of the new CITRIS Headquarters facility is underway ~~expected to begin Spring 2006~~ and scheduled to continue through 2009 (UC Berkeley, 2005b; UCOP, 2002; Shaff 2006).

- UC Berkeley plans to retrofit the Bancroft Library, which is located in the central portion of the campus to the north of Wheeler Hall between South Hall Road and Sather Road. The project will also include some program improvements. Construction for this project is underway and expected to ~~begin in Spring 2006 and~~ continue ~~for approximately 18 months~~ through ~~September 2007~~ 2008 (Shaff, 2006).

- UC Berkeley plans to construct an Americans with Disabilities Act-compliant pedestrian bridge to connect the north and south components of the Foothill housing project. As currently proposed, the pedestrian bridge would be constructed over Hearst Avenue, just east of Gayley Road, connecting the two sides of the Foothill dormitories and would provide access between the dormitories and campus. The Foothill Bridge ~~should begin construction in December 2006 and be~~ was completed in ~~February~~ September 2007.

Page 99:

UC Berkeley's Final EIR for the Southeast Campus Integrated Projects (SCIP) (SCIP; see Chapter VI of the DEIR) ~~SCIP Initial Study/Notice of Preparation~~ identifies a number of historic resources that could be affected by that project. These include the Cheney House and Cheney Cottage at 2241 and 2243 College Avenue, the Piedmont Avenue Houses at 2222, 2224, 2232, 2234 and 2240 Piedmont Avenue, and California Memorial Stadium. A CEQA EIR ~~will be~~ was prepared to confirm the historic status of these buildings and to identify potential impacts to them resulting from the SCIP. ~~If significant impacts to these buildings are identified as a result of the EIR process for the SCIP, it is expected that, in consultation with the State Historic Preservation Officer, mitigation measures would be identified to eliminate or reduce the severity of such impacts to the extent feasible.~~ The EIR identified significant impacts to these buildings and also identified mitigation measures to eliminate or reduce the severity of such impacts to the extent feasible. ~~In addition, potential~~ Impacts resulting from ~~the~~ SCIP would not combine with the proposed undertaking to form a substantial cumulative impact to historic resources, due to the vastly different building types involved (i.e., residential structures and a sports stadium compared with a building that houses a particle accelerator), as well as differing architectural styles and dates of construction. To the extent they might adversely affect historic resources, the projects involved would not be "closely related" (CEQA Guidelines Sec. 15355(b)) enough to contribute to any cumulative impact, because of, by virtue of the substantially different historic resources involved, to contribute to any cumulative impact.

Page 100:

Both the Bevatron and the Crocker facility accelerator are cyclotron accelerators, however, the Crocker accelerator is currently operational, and is not threatened with demolition or substantial alteration. ~~While both the Bevatron and the Crocker facility accelerator are both cyclotron accelerators (one inoperable and the other operable) and therefore~~ Although the two share the same compact form, the Crocker ~~Nuclear Laboratory~~ accelerator is contained within a mid-1960s modern, four-story office/classroom/laboratory building which bears no architectural resemblance to Building 51, which has a more industrial aesthetic.

Page 103-104:

The approved User Support Building would not contribute to peak-hour AM and PM traffic conditions, as construction trips would be limited to off-peak hours. The latter 11 months of the proposed Guest House construction could coincide with the initial activity phase of the Bevatron project. This would not be cumulatively considerable, as the later construction phases of the moderately-sized Guest House would include relatively few truck trips, as most of the building material would be transported during the earlier phases. The CRT and Helios Buildings would likely coincide with the first two years of the Bevatron project, however it is not expected that new cumulatively considerable impacts would result. Those projects will be tiered from the new 2006 LRDP and EIR, which impose restrictions and management practices on new construction projects to avoid and minimize cumulative construction traffic from LBNL during peak commute hours.

Page 104:

~~Although still within the planning stage,~~ It is anticipated that construction of the Guest House would overlap with the Proposed Action. Mitigation measures applicable to construction traffic included as part of the Proposed Action would also apply to construction of the Guest House, and would reduce the likelihood of important cumulative effects.

With respect to the potential cumulative traffic effects of UC Berkeley's proposed SCIP, construction and thus construction-related traffic from the SCIP Memorial Stadium renovation and the other six projects (including a parking structure, a new Law/Business school building, and renovations to existing law school, business school, and student residential buildings) would overlap with the Proposed Action. ~~However, it is speculative to attempt to determine the nature and degree of the SCIP traffic impacts at this time; this information will be developed during the preparation of SCIP EIR.~~ The projects would be within the growth envelope analyzed in UC Berkeley's 2020 LRDP EIR, and would result in space and population levels below levels anticipated in UC Berkeley's 2020 LRDP. ~~Also, because the SCIP EIR will be tiered under UC Berkeley's 2020 EIR, it will incorporate all of the traffic mitigation measures of the 2020 LRDP EIR and incorporate any added measures necessary to mitigate, insofar as is feasible, the direct (and therefore, also the cumulative) traffic impacts of the SCIP.~~ The Final EIR for SCIP finds that cumulative transportation impacts would be consistent with the transportation impacts identified in the UC Berkeley 2020 LRDP EIR (UC Berkeley, 2006). Because those impacts are assumed as part of the cumulative development assumptions incorporated into this section, no additional cumulative transportation impacts would result from the proposed Building 51 project in combination with cumulative development.

In any case, the incorporation of mitigation included as part of the Proposed Action (please see the Executive Summary, page 6), would ensure that traffic-generating activities associated with concurrent projects would not have an important effect on traffic conditions. In addition, the potential impact of exposure to hazardous materials during transportation to off-site facilities would be negligible, and the Proposed Action would not result in a substantial cumulative impact, because the Proposed Action would not combine with other projects to create a substantial risk due to transport of hazardous materials.

Page 111:

~~University of California, Berkeley (UC Berkeley), *Southeast Campus Integrated Projects Notice of Preparation Tiered, Focused Environmental Impact Report*, November 14, 2005c.~~

University of California, Berkeley (UC Berkeley), *Southeast Campus Integrated Projects Tiered Focused Final Environmental Impact Report (SCH #2005112056)*; October 31, 2006. Available on the internet at: http://www.cp.berkeley.edu/SCIP/FEIR/SCIP_FEIR.html.

APPENDIX F

Comments on the Draft Environmental Assessment and Responses to Comments

A. Persons and Organizations Commenting in Writing

Comments are listed chronologically and comment identification numbers are in parentheses:

1. Jane Kelly, Director, California Office, Public Citizen, July 9, 2002 (JK-1 – JK-2)
2. Marylia Kelley, Executive Director, Tri-Valley CAREs, July 9, 2002 (MK-1 – MK-4)
3. Gene Bernardi, Committee to Minimize Toxic Waste, April 15, 2005 (GB-1 – GB-4)
4. L.A. Wood, January 9, 2006 (LAW-1 – LAW-3)
5. Richard C. Van Sluyters, March 19, 2006[1] (RC-1)
6. L.A. Wood, Berkeley Environmental Commission and Pamela Sihvola, Committee to Minimize Toxic Waste, March 19, 2006 (LWPS-1 – LWPS-8)
7. East Bay Municipal Utility District, April 10, 2006 (EBMUD-1 – EBMUD-2)
8. Peter Selz, April 10, 2006 (PS-1)
9. Arrietta Chakos, Assistant City Manager, City of Berkeley, April 11, 2006 (AC-1)
10. Janet Homrighausen, Senior Planner, City of Berkeley, April 12, 2006 (JH-1 – JH-2)
11. Phil Kamlarz, City Manager, City of Berkeley, April 12, 2006 (PK-1 – PK-5)
12. Daniella Thompson and James Sharp, April 21, 2006[2] (DT-1 – DT-4)
13. Hank Field, Environmental Specialist, UC Berkeley Office of Environment, Health and Safety, April 25, 2006[3] (HF-1 – HF-3)
14. PhoeBe ANNE (sorgen), Co-chair, Berkeley Fellowship of Unitarian Universalists' Social Justice Committee, May 1, 2006[4] (PBA-1)
15. City of Berkeley Landmarks Preservation Commission, May 4, 2006 (LPC-1 – LPC-8)
16. Environmental Health Subcommittee to the Community Health Commission, City of Berkeley, May 11, 2006 (EHS-1 – EHS-17)
17. Phil Kamlarz, City Manager, City of Berkeley, May 22, 2006 (K-1 – K-2)
18. Pamela Sihvola, Co-Chair, Committee to Minimize Toxic Waste, May 22, 2006 (CMTW-1 - CMTW-55)
19. Amado Y. Cabezas, May 22, 2006[5] (AYC-1 – AYC-2)
20. Wendy Cosin, Deputy Planning Director, City of Berkeley Planning and Development Department, June 21, 2006 (CBPDD-1 – CBPDD-15)
21. Jim Cunningham (JC-1 – JC-2)

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1 Email date.
2 Email date.
3 Email date.
4 The commenter also submitted duplicate comments via email on May 4, 2006.
5 Email date.

Note: No federal agency submitted comments on the Draft EA.

B. Comments and Responses on the Environmental Assessment

This section presents comments received on the EA (which are reproduced herein) and LBNL responses to the comments. Comments are numbered and keyed to the various communications. Unless otherwise specified, all references to chapters and page numbers pertain to this Environmental Assessment.

ATTACHMENT # 10 D
Comment Letter JK

Public Citizen 30 YEARS
Protecting Health, Safety & Democracy

Buyers Up • Congress Watch • Critical Mass • Global Trade Watch • Health Research Group • Litigation Group
Joan Claybrook, President

July 9, 2002

Members of the Berkeley City Council
2180 Milvia Street
Berkeley, CA 94704

RE: Support for Item # 32 on tonight's city council agenda

To the Honorable Members of the Berkeley City Council:

On behalf of Public Citizen, I am writing to urge your support for Item # 32 on tonight's city council agenda, a resolution calling for a halt to the demolition of the Bevatron facility and transport of all its radioactive and hazardous materials and waste.

Lawrence Berkeley National Laboratories began demolition and removal of Bevatron, a huge accelerator facility that has become radioactive during its 40 years of operation. This process, lasting at least 7 years and involving the removal of 40,000 tons of radioactive and hazardous waste, has and will continue pose public health risks to residents of Berkeley where the facility is located, as well as Livermore and Richmond, where the waste is being dumped. Much of the radioactive metals are being "recycled" into the national consumer metal goods stream, further threatening the health of an unknown number of people who may be exposed to these products.

Due to the nature of this process and the potential impacts on public health and safety, it is crucial that local residents be involved. Therefore, we are urging that this demolition be halted until an Environmental Impact Statement and Environmental Impact Report be submitted well in advance of a public hearing for review and comment.

Thank you in advance for your support of this important measure.

Sincerely,

Jane Kelly

Jane Kelly
Director, California Office

Ralph Nader, Founder
1615 Broadway, Ninth Floor • Oakland, CA 94612 • (510) 663-0888 • fax: (510) 663-8569 • www.citizen.org

<u>Jane Kelly, Director, California Office, Public Citizen, July 9, 2002 (Comments Identified as “JK-1 and JK-2”)</u>

Comments were received from Jane Kelly before the public review period on the Environmental Assessment. LBNL has chosen to respond because these comments are pertinent to the Proposed Action.

Response JK-1

The commenter urges a “halt to the demolition of the Bevatron facility.” Demolition of the Bevatron facility has not yet begun. As stated in this Environmental Assessment, the duration of the physical work for the project may vary from four to seven years, from early 2008 through 2012, contingent upon funding and results of material sampling. As stated on page 1, a variant of the Proposed Action could reduce the minimum duration of the project from four years to three and a half years, but this reduction in schedule would have no resulting effect on project impacts, including traffic impacts. See also revised page 80 and Appendix G.

Response JK-2

Approximately half of the materials to be removed would consist of non-hazardous debris and other items typical of building demolition projects. Hazardous waste, low-level radioactive waste, and mixed waste would also be shipped from the site. The Proposed Action would seek to reuse or recycle materials (e.g., uncontaminated metals and concrete) where feasible. Items that could not be reused or recycled would be handled and disposed in accordance with applicable policies and regulations.

Disposal of the materials that would be generated by the Proposed Action is discussed at various places in the EA, including Sections 5.1.5, Hazards and Human Health (e.g., pages 68-71), 5.1.10, Traffic and Circulation (e.g., pages 79-84), 5.1.8, Public Services (e.g., pages 76-77) and 5.1.9 Public Utilities (e.g., pages 77-79).

ATTACHMENT #10E

Comment Letter MK

Tri-Valley CAREs

Communities Against a Radioactive Environment

2582 Old First Street, Livermore, CA 94550 • (925) 443-7148 • Fax (925) 443-0177

Peace Justice Environment since 1983

July 9, 2002

The Honorable Shirley Dean, Mayor
and City Councilmembers
2180 Milvia Street
Berkeley, CA 94704

by fax to each office

Dear Mayor and Councilmembers:

I write in support of item 32 on tonight's Council Agenda. My organization has just been informed that a Livermore area landfill may become a recipient of non-radioactive wastes from the deconstruction of the Lawrence Berkeley National Laboratory's (LBNL) Bevatron.

We are concerned, in part, because we have not seen any Environmental Impact Statement, Environmental Assessment or other National Environmental Policy Act (NEPA) analysis performed on the Bevatron decontamination and decommissioning (D&D) project. Therefore, we have been ***unable*** to ascertain, for example, (1) what method(s) LBNL will employ to determine whether radioactivity is present in the debris, and (2) what the detection and release limits will be. We have similar questions regarding the potential for some of the debris to contain hazardous as well as radioactive contamination.

Further, we have not seen written documentation on final disposition of the debris.

I have seen LBNL materials that estimate the Bevatron and HILAC accelerators together contain more than 40,000 tons of concrete shielding blocks and metallic equipment. The sections of the document I have do not say how much of the 40,000 tons is associated with the Bevatron and how much the HILAC. However, it would seem that the D&D of the Bevatron will be a major federal project that could have an adverse environmental impact. Therefore, an Environmental Impact Statement appears to be needed.

Tri-Valley CAREs does not have a final position on the Bevatron removal. We do, however, urge you to ensure that LBNL goes through the proper NEPA process and solicits public input before going ahead with this massive project.

Thank you for your attention. Please inform me of your decision.

Sincerely,

Marylia Kelley

Marylia Kelley
Executive Director

<u>Marylia Kelley, Executive Director, Tri-Valley CAREs, July 9, 2002 (Comments Identified as "MK-1 through MK-4")</u>

Comments were received from Marylia Kelley before the public review period on the Draft EA. LBNL has chosen to respond because these comments are pertinent to the Proposed Action.

Response MK-1

This comment was submitted before the Draft Environmental Assessment was published and before the public comment period began.

The methods LBNL will employ to determine radioactivity present in debris (if any), as well as what the detection and release limits will be, are discussed in Section 5.1.5, Hazards and Human Health, pages 68-71.

Response MK-2

See response MK-1. As stated in response JK-2, disposal of the materials generated by the Proposed Action is discussed in the EA; see Sections 5.1.5, Hazards and Human Health (pages 68-71); 5.1.10, Traffic and Circulation (pages 79-84); 5.1.8, Public Services (pages 76-77); and 5.1.9 Public Utilities (pages 77-79).

Response MK-3

DOE Guidance for compliance with NEPA is contained in 10 CFR Part 1021. Appendix C to Subpart D to Part 1021 is entitled "Classes of Actions that Normally Require EAs But Not Necessarily EISs," the Proposed Action falls under item C11. "Siting/construction/operation/ decommissioning of low- or medium-energy particle acceleration facility with primary beam energy greater than approximately 100 MeV." This guidance indicates the level of NEPA review that DOE generally anticipates for such a facility is an EA, not an EIS.

Considering this guidance and the actions needed to deal with the historic aspects of the Proposed Action, the Department of Energy (DOE) has concluded that for NEPA purposes, preparation of an EA is appropriate for this action.

Response MK-4

Comment expresses respondent's position and is noted. See also responses MK-1 and MK-3.

ATTACHMENT #10A
(4 PAGES)

April 15, 2005.

Daniel Kevin
Environmental Planning Grp.
LBNL
One Cyclotron Rd. MS 90K0198
Berkeley, CA. 94720.

Re: Bevatron Demolition

Dear Mr. Kevin,

It is outrageous that the Lab is tiering the EIR for Bevatron Demolition off of an 18 year old Long Range Development Plan. And even more outrageous that the University of California, the current manager of the Lab is allowing this. It is very difficult for the public to exercise its right to know when it has to attempt to locate and assemble a 1987 EIR, a 1992 amendment and then juggle these with the Bevatron EIR next due. The big question is why has the continuation of the ~~the~~ LRDP started in 2000 been delayed? The 1987 EIR, as amended, does not cover the Molecular Foundry, the decommissioning of the National Tritium Facility, or the New Office building at Westgate. Since NO EIR's were done for the Molecular Foundry and the NTLF decommissioning, will the cumulative effects of all these projects be properly addressed? Consider the radioactive hazardous dust from Bevatron demolition mixed together with unfilterable nanoparticles, viruses and bacteria from the Molecular Foundry. Unfortunately, I live near this soup to be. However, I am especially concerned about those students and other residents who live close to the demolition site and the route for the thousands of

GB-1

GB-2

GB-3

Re: Bevatron Demolition

trucks that will transport the Bevatron debris - some radioactive, some with asbestos, lead, mercury, PC.B's, etc. Some of the debris contains Cobalt 60, and some Cesium 137. We already know X-rays are dangerous. That's why they finally stopped X-raying pregnant women. Cobalt 60, Now used on the Pacific Coast docks to inspect cargo containers, has 59 times the energy intensity of an X-ray. Cobalt 60 emits gamma rays. At the docks the gamma rays go from the source two plus feet from the container, passes through the 8' to 10' wide container and continues two plus feet to the detector on the other side. That's a minimum of 12'-14' or long enough that gamma rays from Cobalt 60 contaminated Bevatron debris in a truck in the right hand lane of the street (Hearst, Oxford, University Ave.) could expose people at a bus stop, on the sidewalk or in stores abutting the sidewalk. Also the gamma rays would travel left through two lanes of traffic. At a stop sign or in stalled traffic everyone surrounding the truck would get an unnecessary radiation dose. In case of accident, unretrieved debris and dust would contaminate the area for years if not decades. GB-3 cont.

Since the Bevatron is eligible for listing in the National Register of Historic Places, let's do that and allow the Bevatron and it's contamination to remain on site and the radioactivity to continue to decay in place as it has been doing since its inception 50 years ago. GB-4

Sincerely,

Gene Bernardi
9 Arden Rd. Berkeley, CA

(page 2 of 2 pages)

<u>Gene Bernardi, Committee to Minimize Toxic Waste, April 15, 2005 (Comments Identified as "GB-1 through GB-4")</u>

Comments were received from Gene Bernardi before the public review period on the Draft EA. LBNL has chosen to respond because these comments are pertinent to the Proposed Action.

Response GB-1

The primary planning document for development at LBNL is the Laboratory's Long Range Development Plan (LRDP). When the Draft of this Environmental Assessment was published in 2006, its analysis was completed in accordance with the 1987 LRDP Environmental Impact Report (EIR), as amended,[6] prepared pursuant to the California Environmental Quality Act (CEQA). Since publication of the Draft Environmental Assessment, two documents were prepared by Berkeley Lab that supersede the former LRDP and the 1987 LRDP EIR, as amended: the 2006 LBNL Long Range Development Plan and its accompanying LRDP EIR. The analysis of this Environmental Assessment, while in accordance with the 1987 LRDP EIR, as amended, is also consistent with the 2006 LBNL LRDP, as well as the 2006 LRDP EIR, which was certified on July 19, 2007.[7] NEPA documentation is not required for a University of California LRDP. Project-level NEPA and CEQA environmental analysis will be conducted if and when necessary for any future development at the Building 51 site.

Response GB-2

Cumulative impacts are discussed in Section 5.4, Cumulative Impacts, on pages 90-101, as modified by the text changes in Chapter II, Revisions to the Draft EA. The Molecular Foundry Building was not included in the Cumulative Impact Analysis because construction operations and attendant impacts were completed before any physical impacts from the Building 51 and Bevatron demolition project would occur. The Molecular Foundry Building was completed in 2006 and is now opened to the public. Any planned, pending, and/or reasonably foreseeable projects in the area of Building 51 and the Bevatron were included in the Cumulative Impact Analysis.

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6 The 1987 LRDP EIR consists of the following documents:

- The *Lawrence Berkeley Laboratory Site Development Plan Environmental Impact Report,* August 1987 (State Clearinghouse No. [19]85112610);
- The *Supplemental Environmental Impact Report for the Proposed Renewal of the Contract between the United States Department of Energy and The Regents of the University of California for Operation and Management of the Lawrence Berkeley Laboratory,* September 1992 (State Clearinghouse No. [19]91093068); and
- The *Supplemental Environmental Impact Report Addendum for the Proposed Renewal of the Contract between the United States Department of Energy and The Regents of the University of California for Operation and Management of the Ernest Orlando Lawrence Berkeley National Laboratory,* September 1997 (State Clearinghouse No. [19]91093068).

These documents are referred to collectively as the "1987 Long Range Development Plan (LRDP) EIR, as amended."

7 This Environmental Assessment includes references to the 1987 LRDP, as amended, although the analysis is also consistent with the 2006 LRDP EIR.

Response GB-3

The radiation exposure from Cobalt -60 and other radioactive contamination would be very low. The worst-case radiation exposure scenario was presented in the certified Bevatron EIR, Section F. Hazards and Hazardous Materials, page IV.F-23.

Response GB-4

The Bevatron's eligibility for listing in the National Register of Historic Places is discussed in Section 5.1.3, Cultural Resources (see pages 66-67).

With regard to radiological decay, radiological decay-in-place programs are designed for short-lived isotopes and allow the generator to hold these materials in storage until they have decayed to levels below detection limits, at which point they are managed as non-radioactive wastes. This is done for materials with isotopes that have much shorter half-lives than those present in the Bevatron. For example, regarding medical isotopes, the Nuclear Regulatory Commission authorizes "decay-in-storage" only for those isotopes that have half-lives shorter than 120 days (10 CFR 35.92). The predominant isotope in the Bevatron materials is Cobalt-60, which has a half-life of 5 years. It would be inappropriate to apply a program designed for short-lived isotopes to these materials.

In addition, radioactive materials typically are stored for 10 half-lives before they are released. This would result in storage times of 50 years or more for isotopes such as Cobalt -60. In effect, this would mean the postponement of the Proposed Action in favor of one of the alternatives examined in Section 3.2, Alternatives, e.g., the No Action alternative. The DEA concluded that this would not attain the goals of the project.

Lastly, decay in place would apply only to radioactive materials. Other hazardous materials that are or may be present at the facility, such as asbestos, lead, and chromium, are stable and do not decay.

Comment Letter LAW
ATTACHMENT 5
(13 PAGES)

Landmarks Preservation Commission
Planning & Development, City of Berkeley
Secretary Janet Homrighausen
2120 Milvia Street
Berkeley, CA 94704

January 9, 2006

Re: Bevalac Historic District & Building 51/51A, Lawrence Berkeley National Laboratory One Cyclotron Road, Berkeley, California

Dear Landmarks Preservation Commission

This is an addendum to my landmark application dated December 2, 2005, for Building 51/51A, Lawrence Berkeley National Laboratory (LBNL) One Cyclotron Road, Berkeley, California to include that of the Historic District.

The LBNL Bevalac district is eligible for the National Register of Historic Places at a national level of significance for a period 1949 to 1993. The eligibility of the Bevatron and Bevalac to the National Register is based on National Register Criteria A, B, and C. "Historic Architectural Evaluation Report" by Marjorie Dobkin and Micheal Corbett (1994) Lawrence Berkeley National Laboratory.

Under Criterion A, the Bevatron and Bevalac are associated with "significant contribution to the broader patterns of our history." They are also associated with significant contributions to the field of particle and nuclear physics and helped to establish American leadership in scientific research." LAW-1

Under Criterion B, the Bevatron and Bevalac are associated with many significant persons under National Register criterion i.e. persons associated to the historic property who are individually significant within a historic context. LAW-2

Under Criterion C, the Bevatron Building, the Accelerator Design Building (Building 64), and the HILAC Building (Building 71) are contributing elements of the Bevalac district. "Building 51 and 71 "embody the distinctive characteristics of a type" (National Register Bulletin 15:17) ; both are distinguished examples of a rare international building type, the accelerator building. Building 64 is a representative example of a research laboratory building." "The building of the Bevatron, and Bevalac possess a high degree of integrity of location, design, setting, materials, workmanship and association. Many of the changes made to the buildings themselves were all made during the period of significance, and do not constitute a loss of integrity." (See attached.) LAW-3

Respectfully,

L A Wood
1803 Bonita Avenue
Berkeley, CA 94709

BEVATRON AND BEVALAC
LAWRENCE BERKELEY LABORATORY

HISTORIC ARCHITECTURAL EVALUATION REPORT

PURCHASE ORDER NO. 4594410

PREPARED FOR:

LAWRENCE BERKELEY LABORATORY
And
THE U.S. DEPARTMENT OF ENERGY
One Cyclotron Road 8786706
Building 50A-4112
Berkeley, California 94720

PREPARED BY:

MARJORIE DOBKIN
MICHAEL CORBETT

MARJORIE DOBKIN
295 UNION STREET
SAN FRANCISCO, CALIFORNIA 94133

JULY, 1994

SUMMARY OF FINDINGS

In a historic architectural evaluation of the Bevatron/ Bevalac at Lawrence Berkeley Laboratory (LBL), undertaken in late 1993 and early 1994, the consultants found the facilities to be eligible as a district for the National Register of Historic Places at the national level of significance. Although less than fifty years old (normally a disqualifying factor) the Bevatron and Bevalac meet National Register Criteria Consideration G which grants an exception to the fifty year rule for properties of "exceptional importance." The elements which appear to be eligible as a district are the buildings and machines of the Bevatron and Bevalac, including the SuperHILAC (Building 71), the Bevatron (Building 51), and the Accelerator Design Building (Building 64).

The evaluation was conducted at the request of LBL, which is considering future plans for the facility as a result of its closure by the Department of Energy in February, 1993. The report highlights the scientific achievements and significant persons associated with the facility during its period of significance from 1949 (when construction of the facility got underway) to 1993, and describes the design of accelerator machines and buildings. The period of significance includes both the Bevatron period of operation from 1954 to 1974, and the Bevalac period of operation from 1974 to 1993. Documentation for the report was provided through archival research and field surveys.

The eligibility of the Bevatron and Bevalac to the National Register is based on three National Register Criteria: Criterion A, for association with events that have made a significant contribution to the broad patterns of our history; Criterion B, for association with significant persons; and Criterion C for Design/Construction in Architecture and Engineering. A property can be eligible under one or more criteria. The Bevatron/ Bevalac is eligible for the National Register because it meets the three criteria cited above (A,B,C) and it possesses most of the seven aspects of historic integrity required for the National Register -- location, design, setting, materials, workmanship, feeling and association. Most of the many modifications to the machines and buildings over the years were made within the period of significance -- 1949 to 1993 -- and do not constitute a loss of integrity. The guidelines for eligibility have been established by The Federal Code of Regulations (36 CFR Part 60), which is the code of implementing procedures of the National Historic Preservation Act of 1966, as well as National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation. A more detailed discussion of the National Register Criteria for Evaluation is presented in the Introduction portion of this report.

The report contains several sections: The **Introduction** outlines Section 106 of the National Historic Preservation Act -- the historic preservation process for federal agencies undertaking projects that may have an effect on historic properties. A **Methods** section describes the research methods used in preparing the report, and lists the libraries and archives consulted during the research process. An **Historical Overview** provides an historical context for the study of the Bevatron and Bevalac; presents highlights of scientific work at the facility from 1954 to 1993; identifies significant persons associated with the facility; and describes the design and operation of the accelerators at the Bevatron and Bevalac. A section on **Accelerator Buildings** provides a general discussion of the accelerator building as an international and industrial type. **History of the Bevatron and Bevalac Buildings** is a detailed and site-specific study of these accelerator buildings as they were originally designed and modified over the years. **Description: Buildings** provides a description of the Bevatron and Bevalac buildings as they exist today. The **Evaluation** discusses the eligibility of the Bevatron and Bevalac to the National Register of Historic Places according to the National Register Criteria for Evaluation. Finally, the **Bibliography** contains a complete list of sources consulted in the preparation of this report.

EVALUATION

The Bevatron and Bevalac appear to be eligible as a district for the National Register of Historic Places at the national level of significance for the period 1949 to 1993. The eligibility of the Bevatron and Bevalac to the National Register is based on National Register Criteria A, B, and C. Although less than fifty years old (normally a disqualifying factor) the Bevatron and Bevalac meet Criteria Consideration G which grants an exception to the fifty-year rule for properties of "exceptional importance." Those elements which appear to be eligible are the buildings and machines of the Bevatron and Bevalac, including the HILAC (Building 71), the Bevatron (Building 51), and the Accelerator Design Building (Building 64). This evaluation has been made following the guidelines in National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation and "Proposed Council Guidance: Consideration of Highly Technical and Scientific Facilities in the Section 106 Process," prepared in November, 1993 by the Advisory Council on Historic Preservation.

National Register Criterion A

Lawrence Berkeley Laboratory's Bevatron and Bevalac are associated with events that have made a "significant contribution to the broad patterns of our history" under Criterion A (National Register Bulletin 15:12). They were among the world's leading particle accelerators during a forty-year period from 1954 to 1993. The Bevatron and Bevalac are associated with significant contributions in the fields of particle and nuclear physics, and helped to establish American leadership in scientific research. Under Criterion A, a property is eligible if it is associated with "a pattern of events or a historic trend that made a significant contribution to the development of a community, a State, or the nation" (National Register Bulletin 15:12).

In the late 1950's and early 1960's four Nobel Prizes were awarded for particle physics research conducted in whole or in part at the Bevatron. The antiproton, the antiparticle of the proton (nucleus of the hydrogen atom), was discovered at the Bevatron in 1955 by a UCRL team led by Emilio Segre and Owen Chamberlain, who won the Nobel Prize in physics in 1959. Luis Alvarez won the Nobel Prize in physics in 1968 for his development of the bubble chamber as a particle detector and for his role in discovering 18 particle resonances through work with the bubble chambers at the Bevatron. Bevatron scientists made experimental observations of the subatomic particles K mesons that contributed significantly to the theory of parity nonconservation for which Tsung-Dao Lee and Chen Ning Yang won the Nobel prize in physics in 1957. UCRL emulsion experimental groups contributed to Murray Gell-Mann's identification of strange particles. and UCRL physicists discovered a new elementary particle that confirmed Gell-Mann's theory of the Eightfold Way. Gell-Mann won the Nobel Prize in physics for his work in 1969.

From 1974 through 1993 the Bevalac, a hybrid facility that linked the Bevatron to a linear accelerator known as the SuperHILAC, was associated with important scientific research in the fields of nuclear medicine, nuclear physics and cosmic ray experiments. The Bevalac was the only laboratory in the country capable of simulating the high energy heavy ion component of cosmic rays; it played an important part in the NASA space program, in studies of the effects of cosmic radiation upon astronauts and their equipment. In 1974 the Bevalac was established as a national accelerator facility for biomedical heavy-ion research funded by the U.S. Energy Research and Development Administration. Biomedical programs included basic cancer research as well as patient therapy. After the Bevalac was upgraded in 1981 it was the only accelerator in the world capable of accelerating all the naturally occurring elements of the periodic table, from hydrogen to uranium.

National Register Criterion B

The Bevatron and Bevalac are associated with many significant persons under National Register Criterion B. "Criterion B applies to properties associated with individuals whose specific contributions to history can be identified and documented. Persons 'significant in our past' refers to individuals whose activities are demonstrably important within a local, State or national historic context" (National Register Bulletin 15:14). The people identified below all made significant scientific contributions to the fields of particle and nuclear physics at the Bevatron or Bevalac, which were national research laboratories.

Properties associated with living persons are not usually eligible for the National Register under Criterion B (National Register Bulletin 15:16). However Tom McCulloch, of the Advisory Council on Historic Preservation in Washington, D.C., advised the consultants that this restriction would not apply in the case of the Bevatron and Bevalac because of the exceptional importance of the facility (McCulloch 1993).

Under Criterion B, persons associated with an historic property must be "*individually* significant within a historic context. A property is not eligible if its only justification for significance is that it was owned or used by a person who is a member of an identifiable professional class, or social or ethnic group. It must be shown that the person gained importance within his or her profession or group...Properties eligible under Criterion B are usually those associated with a person's *productive* life, reflecting the time period when he or she achieved significance" (National Register Bulletin 15:15). All of the people discussed under Criterion B worked at the Bevatron or Bevalac during the productive period of their lives; many of them spent their entire careers in association with the Bevatron or Bevalac, as graduate students, junior scientists, and senior scientists and administrators. All of people cited in this discussion under Criterion B had distinguished careers in physics, chemistry, medicine or engineering, and all are cited for specific achievements in association with the Bevatron or Bevalac during its period of significance from 1949 to 1993.

The following discussion classifies significant persons in two groups. In the first group are the Nobel Prize winning physicists whose work is associated with the Bevatron; the second group is comprised of the many scientists, engineers, and physicians who conducted important scientific work at the Bevatron and Bevalac, or who contributed significantly to the design and operation of the accelerator.

E.O. Lawrence and **Edwin McMillan** deserve a separate category of their own. Although their Nobel Prizes were not directly associated with the Bevatron or Bevalac, they played leading roles as laboratory directors in the creation of the facilities. Lawrence's invention of the cyclotron in 1929, and McMillan's idea of phase stability in 1945, were major scientific contributions that provided a foundation for development of the Bevatron.

All of the people on the following list are physicists unless otherwise noted. All of them were (and many still are) on the LBL staff. The Bevatron and Bevalac were international laboratories, drawing leading scientists from all over the world. But the list is already a long one, and a completely inclusive list would be overwhelming for the purposes of a National Register evaluation.

Nobel Prize Winners Directly Associated with the Bevatron

Emilio Segre and **Owen Chamberlain** won the Nobel Prize in 1959 for their discovery of the antiproton in an experiment at the Bevatron. This experiment is described briefly in the Historical Overview portion of the report.

Luis Alvarez won the Nobel Prize in 1968 for his development of the bubble chamber particle detector (originally invented by Donald Glaser) and for his role in finding 18 particle resonances with LBL bubble chambers used in conjunction with the Bevatron.

Other Significant Persons Directly Associated with the Bevatron/Bevalac

It is important to note that the following list is not necessarily exhaustive, and that other, equally qualified people may have inadvertently been omitted.

Jose Alonso: Nuclear physicist in Bevalac Biomedical Facility

Robert Birge: Experimental work with propane bubble chambers

William Brobeck: Engineer, Chief Designer of the Bevatron

Joseph Castro, M.D: In charge of clinical medical program at Bevalac

Bruce Cork: Member of team that discovered anti-neutron in 1956. Work both on machine and experiments from early period

Albert Ghiorso: Nuclear chemist at HILAC who first thought of Bevalac idea, and contributed to its early development

Gerson Goldhaber: Experimental work with nuclear emulsions

Donald Gow: Assisted Luis Alvarez in development of bubble chamber

Hermann Grunder: Helped plan Bevalac and was head of Accelerator Division at LBL after Edward Lofgren's retirement

Walter Hartsough: In charge of operations at Bevatron and Bevalac for many years

Glenn Lambertson: Member of team that discovered anti-neutron in 1956. Work both on machine and experiments from early period

Edward J. Lofgren: First director of Bevatron, leader of Bevalac development Director of Accelerator Division at LBL

Oreste Piccioni: Member of team that discovered anti-neutron in 1956

Wilson Powell: Experimental work with propane bubble chambers

Lynn Stevenson: Important member of Luis Alvarez' team in bubble chamber experiments.

Cornelius Tobias: Medical physicist involved in cancer therapy research at Bevalac

George Trilling: Experimental work with nuclear emulsions

William Wenzel: Member of team that discovered anti-neutron in 1956. Work both on machine and experiments from early period

Clyde Wiegand: Important member of the Segre /Chamberlain team that discovered anti-proton

<u>National Register Criterion C</u>

The Bevatron is eligible for the National Register under Criterion C both for the accelerator as a machine and for the building that housed the machine.

Bevatron and Bevalac Buildings

Under Criterion C, the Bevatron Building (Building 51), the Accelerator Design Building (Building 64), and the HILAC Building (Building 71), are contributing elements of the Bevalac district. Buildings 51 and 71 "embody the distinctive characteristics of a type" (National Register Bulletin 15: 17); both are distinguished examples of a rare international building type, the accelerator building. Building 64 is a representative example of a research laboratory building.

Accelerator buildings are characterized by the accommodation of accelerator magnets and machines, experiments, controls, and shielding; are realized through the modern approach to architectural design of industrial buildings; utilize modern structural systems and materials; and are built by national governments for advanced research in particle and nuclear physics by leading scientists and universities.

The Bevatron and HILAC possess these characteristics differently, for a proton synchrotron in the case of the Bevatron, and for a heavy ion linear accelerator in the case of the HILAC. In their own ways, each possesses the distinguishing characteristics of the type in a way that "can be expressed in terms such as form, proportion, structure, plan, style or materials" (National Register Bulletin 15:18). Each design is a reflection of the research process in forms, materials, structural systems, and plan. Magnet and accelerator rooms, craneways, experimental areas, mechanical and power rooms, and office and control rooms are reflected in the accretive forms and materials of the two buildings, both in their original designs and as they have been modified. Each of these buildings illustrates the patterns associated with all accelerator buildings, the individuality of their particular situation, and the evolution of the processes each was designed to accommodate (National Register Bulletin 15: 18).

As a district, the Bevatron and HILAC buildings linked together for the Bevalac, together with Building 64 as a support building, represent a unique and important effort among international accelerator facilities. While these parts represent the patterns associated with individual accelerator buildings, the district represents more powerfully the individuality of a complex and unique facility. Each building in the district is linked to the machines inside in a way that is inseparable from the machines. In this way the buildings are in effect part of the machines and their significance is inseparable from that of the machines.

Eligibility of the Bevatron and Bevalac must take into account Criteria Consideration G for "Properties that have achieved significance within the last fifty years" (National Register Bulletin 15: 41). Ordinarily, properties that have achieved significance within the past fifty years are not considered eligible for the National Register. However, under Criteria Consideration G "A property achieving significance within the past 50 years [can be eligible] if it is of exceptional importance" (36 CFR 60.4). As is discussed more fully above, both buildings and machines meet this standard. The Bevatron and Bevalac were leading international centers of research in particle and nuclear physics during their period of significance, from 1949 to 1993.

The Bevatron and Bevalac possess integrity in most of its seven aspects as required for the National Register: location, design, setting, materials, workmanship, feeling, and association (National Register Bulletin 15: 44). The interior of Building 64 is undergoing remodeling at the time of this writing and suffers a broader loss of integrity; the degree of change is not known, but in the context of the entire Bevalac, appears to be minor. Since the end of the period of significance is February, 1993, when the Bevalac was closed, many pieces of equipment have been removed from the facility. This has compromised its integrity but has not resulted in a loss of integrity.

The buildings of the Bevatron and Bevalac possess a high degree of integrity of location, design, setting, materials, workmanship, and association. The many changes made to the buildings themselves were all made within the period of significance, and do not constitute a loss of integrity. The removal of equipment has compromised the integrity of feeling.

Bevatron as a Machine

The Bevatron as a machine is eligible under Criterion C for Design/Construction in Engineering. This criterion applies to properties significant for their physical design or construction, and can include engineering, as well as architectural elements (National Register Bulletin 15:17). The Bevatron was a proton synchrotron designed from 1946 to 1954 under the overall direction of UCRL director, E.O. Lawrence, with the participation of UCRL physicists including Edward Lofgren. The engineering design was developed by a UCRL team led by William M. Brobeck, one of the world's leading pioneers of accelerator design. In addition to the Bevatron, he had also been the main designer of the 184-inch synchrocyclotron at UCRL.

The Bevatron was the largest, highest-energy accelerator in the world when it opened in 1954, and is eligible under Criterion C as "representing the work of a master" (National Register Bulletin 15:17). The design and operation of the Bevatron are described in some detail in the Historical Overview portion of the report.

The significant components of the Bevatron included a magnet with a diameter of approximately 120 feet, accelerating electrodes, injectors, a control system and motor generators. Upgrades included a new injection system, external proton beam facilities, concrete shielding, movable targets, and improvements in controls.

All of these main components would be eligible for the National Register if they had survived. However, because of the salvage program now underway at the Bevatron/Bevalac, much of the support equipment for the Bevatron has been removed, or is in the process of being removed.

The SuperHILAC, one of the two major components of the Bevalac (along with the Bevatron) is also eligible for the National Register under Criterion C for Design/Construction in Engineering. The SuperHILAC is eligible under Criterion C because it embodies the "distinctive characteristics of a type, period, or method of construction" (National Register Bulletin 15:17). The HILAC was one of the first of a type of accelerator developed in the late 1950's -- the heavy ion linear accelerator.

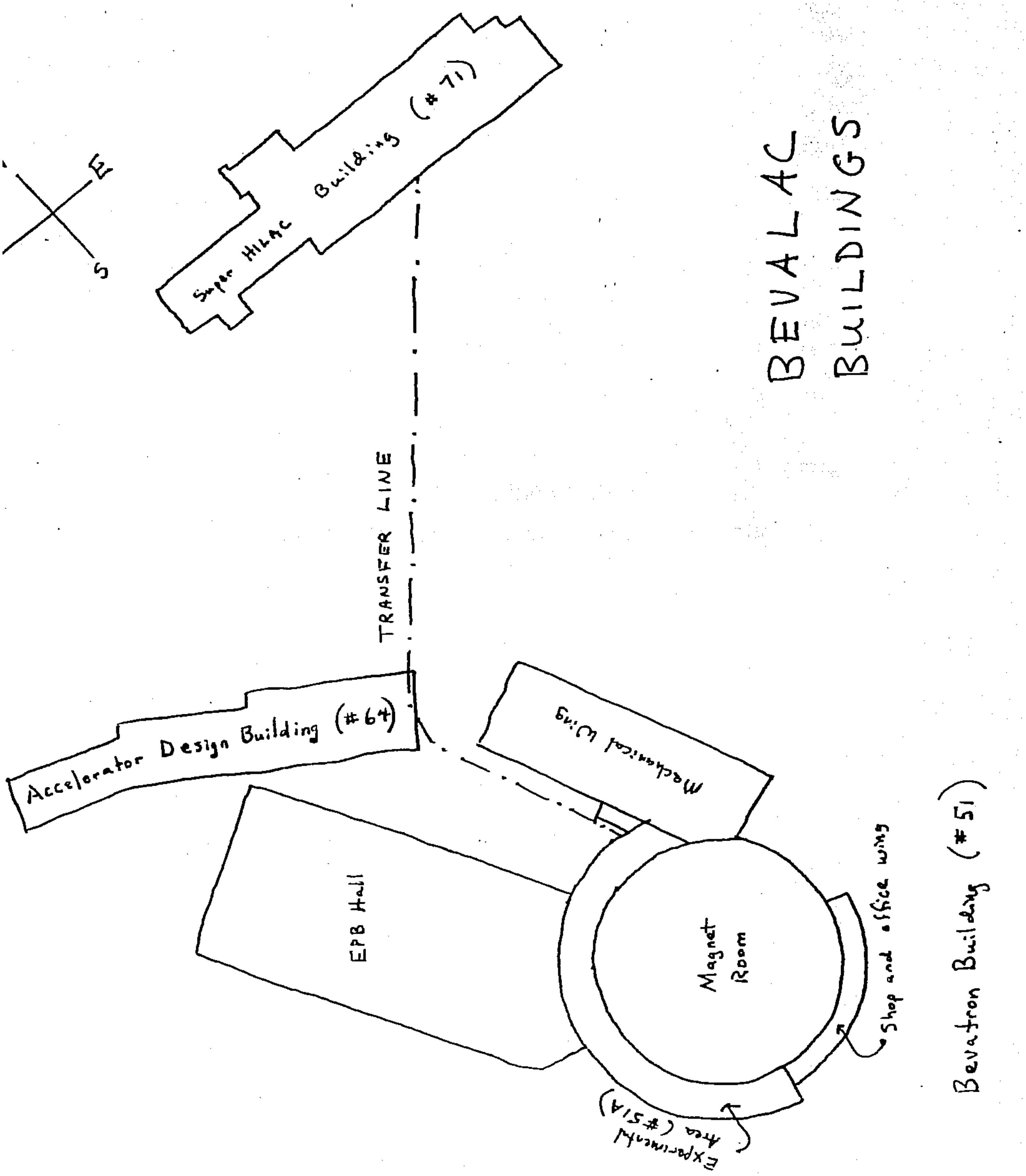
An earlier version of the SuperHILAC, the HILAC, or Heavy Ion Linear Accelerator, opened at the laboratory in 1957 to study heavy ions. The HILAC, and a sister machine at Yale University were the first accelerators built specifically for heavy ion research. The basic elements of the HILAC were a Cockroft-Walton generator and two Alvarez linacs separated by a narrow space. The upgrade of the HILAC to the SuperHILAC took place in 1971-1972.

The Bevatron and Bevalac as machines are eligible under Criterion C because in addition to their significance for design/construction in engineering they still retain integrity of location, design, setting, materials, workmanship, and association. All of the many upgrades of the machines over the years were made within the period of significance (1949-1993) and do not constitute a loss of integrity. The recent removal of equipment in the year since the facility was closed in February, 1993, has compromised the integrity of feeling.

In spite of the many upgrades of equipment that are inevitable in the life of a particle accelerator at a leading national research laboratory, it is important to note that in both the Bevatron and the Bevalac, much of the original structure remains intact. In the case of the Bevatron, the steel magnets, the copper coils and the cooling system are original, dating from 1954. In the SuperHILAC, both of the original linac injectors -- dubbed Adam and Eve, remain in the facility -- with the addition of the third injector, Abel, dating from 1981.

APPENDIX D

Sketch Map of Bevatron and Bevalac Buildings


BEVALAC BUILDINGS
Super HILAC Building (#71)
TRANSFER LINE
Accelerator Design Building (#64)
Mechanical Wing
EPB Hall
Magnet Room
Shop and office wing
Experimental area (#51A)
Bevatron Building (#51)
E
S

L.A. Wood, January 9, 2006 (Comments Identified "LAW")

Response LAW – 1, 2, 3

Comments noted. Section 4.2.3, Cultural Resources, states that Building 51 was determined eligible for listing in the National Register of Historic Places (NRHP) and has been listed in the California Register of Historical Resources; see, e.g., page 33-34.

In 1997, in accordance with 36 CFR 800, as part of the National Historic Preservation Act (NHPA) Section 106 consultation process, a Memorandum of Agreement (MOA; Appendix C) was signed among DOE, the California State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation (ACHP) regarding the demolition of Building 51. The MOA stated that the demolition of the Bevatron Building/Building 51 and Building 51A Complex would affect a property eligible for inclusion on the National Register of Historic Places. The stipulations of the MOA required that the building be documented in accordance with the National Park Service's Historic American Engineering Record (HAER) requirements. In September 1997, LBNL staff prepared and submitted HAER documentation to the US Department of Interior National Park Service (NPS) in March 1998. The documentation included a written historical and architectural description of the building and accelerator, and extensive photographic recordation in accordance with the MOA stipulations (see Section 5.1.3, Cultural Resources, pages 66-67).

As stated in Section 5.1.3, Cultural Resources, page 67:

> "With the acceptance of the HAER report by NPS, DOE may demolish Building 51 provided that DOE contacts the Historic American Building Survey (HABS) division of NPS to determine what level and kind of recordation is required for the buildings, and that such documentation is completed and accepted by HABS prior to demolition. LBNL has consulted with NPS. The latter determined that an addendum to the HAER report would meet HABS requirements. The HAER addendum has been completed and was accepted by NPS in August 2006. For NEPA purposes, with the signed MOA, completion of the HAER documentation, and approval of the HABS addendum by NPS, LBNL has adequately mitigated for the potential loss of Building 51. As an additional measure, LBNL plans to commemorate the scientific achievements attributed to the Bevatron with a monument and/or display listing the historic discoveries that occurred there." (Section 5.1.3, page 67)

--------- Original Message --------
Subject:FW: Draft EA for demolition of Bevatron and Bldg. 51
Date: Thu, 22 Jun 2006 09:54:19 -0500
From: Schwab, Carl <Carl.Schwab@bso.science.doe.gov>
To: Joseph P Harkins <JPHarkins@lbl.gov>

FYI

-----Original Message-----
From: Richard C. Van Sluyters [mailto:rcvs@berkeley.edu]
Sent: Sunday, March 19, 2006 9:42 PM
To: Carl Schwab
Subject: Draft EA for demolition of Bevatron and Bldg. 51

Dear Mr. Schwab,

I have read the draft EA for the demolition of the Bevatron and Building 51. As an LBNL neighbor, I am impressed by the thoroughness and care with which the EA was drafted. I have no criticisms or suggestions for improvement. Good luck with this project. RC-1

-RCVS
--
Richard C. Van Sluyters
1511 Campus Drive
Berkeley, CA 94708-2042
Home: (510) 486-1503
Cell: (510) 367-7031

Richard C. Van Sluyters, March 19, 2006[8] (Comment Identified "RC-1")

Response RC-1

Commenter states his position on the thoroughness of the Draft EA. Comment noted.

[8] Email date

ATTACHMENT #8B

Comment Letter LWPS

Mr. Don Klima, Director
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue, NW, Suite 809
Washington, D.C. 20004

March 19, 2006

Re: National Historic Preservation Act (NHPA), Section 106 review of case file DOE941104A and the Memorandum of Agreement (MOA) regarding the Demolition of the Bevatron and Building 51 at the Lawrence Berkeley National Laboratory, Berkeley, Alameda County, California, dated October 1997.

Dear Director Klima,

On March 17, 2006 we contacted your office expressing concern over the NHPA Section 106 process regarding the project referenced above. We now write to officially request that your office intervene on our behalf and investigate this urgent matter.

After speaking with the Office of Historic Preservation, California we forwarded a letter dated December 15, 2005 to the preservation officer Mr. Milford Wayne Donaldson. (See attachment 1.) In that correspondence we raised issue with the Memorandum of Agreement (MOA) and the fact that the Berkeley public was <u>not</u> included in the NHPA 106 process as consulting parties, prior to the finalization of the MOA in 1997. It appears also that your office never signed the 1997 MOA. (See attachment 2.)

Be advised that to date, Mr. Milford Wayne Donaldson, SHPO, has not responded to our letter. Moreover, DOE/LBNL has just released the National Environmental Policy Act (NEPA) documentation (Draft Environmental Assessment, EA) for the above referenced project that we believe is incomplete. Note, that the Historic American Building Survey (HABS) division of the National Park Service has <u>not</u> yet accepted the required addendum to the Historic American Engineering Record (HAER) report prepared for the Bevatron and Building 51. (p. 53) LBNL/DOE have refused to allow public access to this addendum, as well.

Again, we request your intervention in this matter because of the lack of response by Mr. Milford Wayne Donaldson and the Office of Historic Preservation. It is clear that the EA has not adequately addressed the Section 106 cultural resource issues of historical significance of the Bevatron. A full Environmental Impact Statement (EIS) should be required of the project.

Finally, the NHPA Section 106 process has not been completed so we ask that a new MOA be drafted with public participation.

Sincerely,
L A Wood
1803 Bonita Avenue
Berkeley, CA 94709-2117
email contact: la@berkeleycitizen.org

Pamela Sihvola
P. O. Box 9646
Berkeley, CA 94709
Committee To Minimize Toxic Waste

cc: Congresswoman Barbara Lee
Mr. Milford Wayne Donaldson, SHPO
F. J. Gofling, Chief Historian, Federal Preservation Officer, Department of Energy

L.A. Wood, Berkeley Environmental Commission and Pamela Sihvola, Committee to Minimize Toxic Waste, March 19, 2006 (Comments Identified as "LWPS")

Comment noted. While the comment does not directly address the accuracy or adequacy of the environmental analysis, for informational purposes, the DOE has completed the Section 106 National Historic Preservation Act process. Public notice of the Proposed Action, including the potential demolition of the Bevatron and the mitigation measures to reduce these effects, has been provided to all interested parties as part of the Environmental Assessment process under NEPA. As such, no further public notice under Section 106 or NEPA would be required.

The Advisory Council on Historic Preservation (ACHP) has found that DOE has met its responsibilities under Section 106 of the National Historic Preservation Act (please see Appendix H).

Community Health Commission

MAY 19, 2006

To: Honorable Mayor and
Members of the City Council

From: Community Health Commission

Submitted by: Thomas Kelly, Commission Chair, Community Health Commission

Subject: Recommendations on the Draft Environmental Assessment (DEA) for the Demolition of Building 51 and the Bevatron

INTRODUCTION

The Community Health Commission (CHC) was asked by community members to comment on the potential health impacts to Berkeley residents and others of the proposed demolition of Building 51 and the Bevatron located at the Lawrence Berkeley National Laboratory (LBNL).

The CHC was also asked by the community to consider making a recommendation that the buildings be left intact to avoid or minimize the health risks associated with their demolition and the transportation of the materials to an appropriate waste site.

CURRENT SITUATION AND ITS EFFECTS

The University of California and the Lawrence Berkeley National Laboratory are completing the required administrative process prior to demolishing Building 51 and the Bevatron. Both the demolition of these buildings and the alternative – maintaining the structures in place – have potential health and environmental impacts.

BACKGROUND

A. The CHC's Environmental Health Subcommittee met on several occasions to review the Draft Environmental Assessment. The Subcommittee made several recommendations to the CHC that were based on the following observations:

1. The scope of the project described in the DEA dated March 21, 2006 is substantial:
   - It is possible that the demolition and removal of the structures could take as long as 6 ½ years (depending on the availability of funding). The DEA assumes that the project will be concluded in 4 years.
   - The amount of debris that will be removed is between 46,000 and 57,000 tons, half of which is considered hazardous waste (23,000 – 28,500 tons). According to the DEA, the hazardous debris is likely to be shipped to Clive, Utah, approximately 60 miles from Salt Lake City.

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E-Mail: manager@ci.berkeley.ca.us Website: http://www.ci.berkeley.ca.us/manager

EAST BAY
MUNICIPAL UTILITY DISTRICT

April 10, 2006

Carl Schwab
U.S. Department of Energy, Berkeley Site Office
One Cyclotron Road, MS 90R1023
Berkeley, CA 94720

Dear Mr. Schwab:

Re: Draft Environmental Assessment – Building 51 and Bevatron Demolition, Berkeley

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the Draft Environmental Assessment (EA) for the Building 51 and Bevatron Demolition at the Lawrence Berkeley National Laboratory (LBNL) located in the City of Berkeley. EBMUD has the following comments.

WATER SERVICE

EBMUD provides water service to the LBNL through the Shasta Pressure Zone, with a service elevation between 900 and 1,050 feet, and the Berkeley View Pressure Zone, with a service elevation between 1,050 and 1,250 feet. The LBNL site receives its water supply via a 12-inch meter in Campus Drive in the Shasta Pressure Zone and via a 6-inch meter in Summit Road from the Berkeley View Pressure Zone. As stated on page 82 bullet 6 of the Draft EA, since the proposed action would not result in an increase in long-term water demand but would maintain existing demand levels, than no new water facilities would be required as a result of the proposed demolition and demolition activities. EBMUD-1

WASTEWATER

The demolition of a building should not generate any wastewater flows to EBMUD's Main Wastewater Treatment Plant. The project sponsor should notify EBMUD if wastewater flows are anticipated from the project.

Page 70, paragraph 1 states "[the proposed project] would allow varying amounts of surface water to percolate into the ground rather than flow along the surface." While there may not be concern for increased wastewater flow, there is concern about a possible increase in Infiltration/ Inflow (I/I). The project should address the replacement or rehabilitation of the existing sanitary sewer collection system to prevent an increase in I/I. A provision to control or reduce the amount of I/I should be included in the EA. The main concern is the increase in total wet weather flows, which could have an adverse impact if the flows are greater than the maximum allowable flows from this subbasin. EBMUD-2

If there will be increased wastewater flows, even if it is expected to be only a temporary increase, the project sponsor needs to confirm with the City of Berkeley's Public Works Department that there is available capacity within the subbasin flow allocation and that it has not been allocated to other developments. The City of Berkeley's I/I Correction Program set a maximum allowable peak wastewater flow from each subbasin within the City and EBMUD agreed to design and construct wet weather conveyance and treatment facilities to accommodate these flows. EBMUD prohibits discharge of wastewater flows above the allocated peak flow for a subbasin because conveyance and treatment capacity for wet weather flows may be adversely impacted by flows above this agreed limit. The projected peak wet weather wastewater flows from this project needs to be determined to assess the available capacity within the subbasin and confirmation from the City should be included in the EA. Suggested language to include in the EA is as follows: "The City of Berkeley Public Works Department has confirmed that there is available wastewater capacity within Subbasin *(insert subbasin number here)* that is reserved for this project." EBMUD-2

If you have any questions, please contact David Rehnstrom, Senior Civil Engineer, Water Service Planning at (510) 287-1365.

Sincerely,

John [signature], For

William R. Kirkpatrick
Manager of Water Distribution Planning

WRK:JAJ:sb
sb06_098.doc

East Bay Municipal Utility District, April 10, 2006 (Comments Identified as "EBMUD-1 and EBMUD-2")

Response EBMUD-1

Comment noted.

Response EBMUD-2

As stated in the EA, following demolition, the project site would be planted with native grasses, allowing for some potential increase in rainwater percolation, as noted in the comment. While the increase percolation could potentially result in a minor increase in infiltration/inflow to existing sanitary sewer lines, the project site is within the western portion of the Berkeley Lab site, where sanitary sewer flows are directed to City of Berkeley sub-basin 17-013. According to the recently completed EIR for Berkeley Lab's Long-Range Development Plan (LRDP), Sub-basin 17-013 is not currently constrained during peak wet weather flows, and it is expected to have future wet weather capacity to meet LBNL's growth needs during the term of the 2006 LRDP.

The commenter is requesting confirmation from the City of Berkeley that there is available wastewater capacity reserved for the project. This will not be included in the EA as the City of Berkeley has not confirmed this with LBNL in writing.

Comment Letter PS

UNIVERSITY OF CALIFORNIA, BERKELEY

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April 10 2006

Carl Schwab
U.S. Department of Energy
Berkeley Site Office
MS 90R 1023
One Cyclotron Road
Berkeley CA 94720

Dear Mr. Schwab:

It has come to my attention that the Bavatron in Building 51 is about to be dismantled. Considering the importance of this building to the history of science, I urge the Dept. of Energy to make sure that at least the core of the Bevatron will be preserved. PS-1

Sincerely,

Peter Selz
Professor Emeritus

Peter Selz, April 10, 2006 (Comment Identified as "PS-1")

Response PS-1

Preserving the Bevatron accelerator (the core) was considered in the Preservation Alternative, Section 3.2.2. As discussed in that section, this alternative would not achieve the objectives of the Proposed Action. Relocation of the Core for preservation was not considered because it would not be achievable: the 180'-diameter accelerator is far too heavy to be removed and would have to be destructively disassembled. Many of the massive core components were epoxied together and cannot be disassembled in a way that would preserve the core (i.e., it would have to be demolished for removal).

Comment Letter AC

Schwab, Carl

From: Chakos, Arrietta [AChakos@ci.berkeley.ca.us]

Sent: Tuesday, April 11, 2006 6:22 PM

To: Therese Powell (E-mail)

Cc: CESchwab@lbl.gov

Subject: Alert for you both on a City request coming to the LBNL staff for an extension of 30 days to comment on the Bevatron project Environmental Assessment

Terry Powell and Carl Schwab:

I am writing to alert that our City Council has asked the City Manager to request a comment period extension of 30 days on the Bevatron project environmental assessment.

AC-1

Council members are concerned, after hearing from community members, that the assessment does not speak to some potential development a the LBNL site and that the comments are due on April 21, 2006 before the Council returns on April 25 from its spring recess.

We will get the letter out to LBNL in the next day or two.

Thanks,
Arrietta Chakos

Arrietta Chakos
Assistant City Manager
MLK, Jr. Civic Center Building
2180 Milvia Street, 5th Floor
City of Berkeley, California 94704
510-981-7000

<u>Arrietta Chakos, Assistant City Manager, City of Berkeley, April 11, 2006 (Comment Identified as “AC-1”)</u>

Response AC-1

The draft environmental assessment was issued on March 21, 2006. A 30 day comment period was given, extending from March 21, 2006 to April 21, 2006. On April 18, 2006, DOE extended the comment period for another 30 days, from April 22, 2006 to May 22, 2006. In June 2006, the project was put on hold for approximately one year due to funding considerations.

Comment Letter JH

Planning and Development Department
Land Use Planning Division

RECEIVED 4-18-06

April 12, 2006

Terry Powell
Community Relations Officer
Lawrence Berkeley National Laboratory
1 Cyclotron Road Mail Stop 65
Berkeley, CA 94720

Dear Ms. Powell:

This letter is to inform you that at the April 6, 2006 meeting, the Landmarks Preservation Commission initiated the Cyclotron and Building 51 at the Lawrence Berkeley National Laboratory for consideration as a City of Berkeley Landmark or Structure of Merit. In addition, the Landmarks Preservation Commission will conduct a public hearing on this designation proposal at the May 4, 2006 meeting. You will receive a notice informing you of the public hearing in late April. JH-1

If this property is designated a City of Berkeley landmark or structure of merit, it is because the Landmarks Preservation Commission wishes to honor the property by recognizing its architectural and historical significance and its contribution to the urban character of Berkeley.

Please call me at (510) 981-7484 or jhomrighausen@ci.berkeley.ca.us if you have any questions regarding this initiation proposal. Thank you.

Sincerely,

Janet Homrighausen

Janet Homrighausen
Senior Planner

Cc LPC

2120 Milvia Street, Berkeley, CA 94704 Tel: 510-705-8111 TDD: 510-644-6915 Fax: 510-883-6543
E-mail: planning@ci.berkeley.ca.us

Janet Homrighausen, Senior Planner, City of Berkeley, April 12, 2006 (Comments Identified as "JH-1")

Response JH-1

Comment noted. The Landmarks Preservation Commission designated the Building 51/Bevatron site as a City of Berkeley Historical Landmark, without indicating any "features to be preserved," on August 3, 2006. On appeal, the City Council upheld the Landmarks Preservation Commission's decision on January 30, 2007.

CITY OF BERKELEY

Office of the City Manager

April 12, 2006

Dr. Steven Chu, Director
Lawrence Berkeley National Laboratory
One Cyclotron Road, Mail Stop 5230
Berkeley, CA 94720

Carl Schwab
U.S. Department of Energy
Berkeley Site Office
MS 90-1023
One Cyclotron Road
Berkeley, CA 94720

Re: Request for Extension of Public Comment Period on Draft Environmental Assessment for Demolition of LBNL Building 51/Bevatron

Dear Dr. Chu and Mr. Schwab:

I am writing, on behalf of the Berkeley City Council, to request that you extend the public comment period on the Draft Environmental Assessment (EA) for the demolition of Building 51 and the Bevatron at the Lawrence Berkeley National Laboratory (LBNL) to May 22, 2006 to allow the community and the City Council adequate time to provide input on the proposed project. PK-1

The City Council voted in 2003 to support decommissioning, deconstruction, and removal of the Bevatron. The Council's support was predicated on a process that was acceptable to the public, required preparation of an Environmental Impact Report (EIR) in compliance with State law, and included development of a long-term plan for future use of the site. Although LBNL did prepare an EIR, we have a number of concerns about the adequacy of that document. We were, in particular, troubled by the EIR's reliance on the EIR that UC Berkeley prepared for the 2020 Long Range Development Plan and its flawed analysis of the project's cumulative impacts on hydrology and water quality, traffic, and public facilities. I have attached a copy of that letter and request that it be included in the official record for the Draft EA. PK-2

Based on our preliminary review, the Draft Environmental Assessment does not allay our concerns about the adequacy of the CEQA document as a basis for analyzing and mitigating the impacts of the proposed demolition project. Because of the nature of the project, "construction period" impacts will be far more significant than its long-term effects. For this reason, it is critically important that the Environmental Assessment focus on the four to seven-year period when the demolition work will occur. The Assessment should also pay PK-3 special attention to projects on the eastern side of the Campus, including the proposed improvements to California Memorial Stadium and the proposed parking structure at Maxwell Family Field. Because of the amount of excavation required for the garage and the Stadium's Student Athletic Facility, both of these projects will generate an extraordinary amount of truck traffic that will be traveling along Gayley Road and Hearst Street, the same route trucks from the LBNL demolition project will use. The cumulative impact of the LBNL demolition project and other construction work in this vicinity will significantly exacerbate traffic and circulation problems in this part of the City and could severely impede the City's ability to provide emergency and public safety services to those who live and work in the area. PK-4

We ask you to postpone action on the assessment and extend the public comment period to May 22, 2006, to provide additional time for the City and members of the public to review the document. This will allow for a thorough scrutiny of the assessment continued good faith with our community. PK-5

We request your thoughtful consideration of this request and look forward to a favorable response.

Sincerely,

Phil Kamlarz
City Manager

cc: Honorable Mayor and Members of the City Council
City Clerk

Attachment

<u>Phil Kamlarz, City Manager, City of Berkeley, April 12, 2006 (Comments Identified as "PK-1 through PK-5")</u>

Response PK-1

The comment period on the Draft EA was extended to provide additional time to review and comment on the document. Please see Response AC-1.

Response PK-2

The Bevatron Final EIR included responses to the City of Berkeley's comments on the Draft EIR. The Final EIR was certified on July 19, 2007. The City's comment letter on the Draft EIR is hereby included in the official record for both the EIR and the EA.

Response PK-3

The Bevatron Final EIR was certified on July 19, 2007. The challenge period on the EIR has expired. The EA makes clear the timeframe under which any demolition impacts would occur. Please see Section 5, Environmental Consequences.

Response PK-4

Cumulative impacts of the Proposed Action on traffic and circulation were fully assessed in the EA. In addition, both projects mentioned by the commenter were considered as part of the cumulative impact analysis. Please see pages 100-101 of the EA.

Response PK-5

As stated above, the comment period on the Draft EA was extended. Please see response AC-1.

From: J M Sharp [mailto:ltsa@dnai.com]
Sent: Saturday, May 20, 2006 12:20 PM
To: Carl Schwab
Subject: bevdem comments

Mr Schwab, a hardcopy is in the mail. Meanwhile, here's an electronic version.

J

D Thompson / J Sharp - 2663 Le Conte Avenue Berkeley CA 94709 - 510/644-9344

21 April 2006

Mr Carl Schwab
US Department of Energy
Berkeley Site Office
One Cyclotron Road MS 90R1023
Berkeley CA 94720

Re: Building 51 and Bevatron Demolition DEA

Dear Mr Schwab:

We strongly feel that DOE/EA-1541--*Draft Environmental Assessment (DEA) for Demolition of Building 51 and the Bevatron*--released 21 March 2006, is a premature document. DT-1

For three reasons, we think the *DEA* should be withdrawn and re-circulated *after* the Lawrence Berkeley National Laboratory (LBNL) releases its new Long Range Development Plan (LRDP), first announced in a Notice of Preparation over five (!) years ago. DT-2

1. The Bevatron Demolition project involves the removal and transportation of a significant volume of hazardous and radioactive materials. It will involve thousands of truck trips along heavily populated City of Berkeley streets over a four-to-seven year period, if we can believe the estimates.

2. Though it is not articulated in the *DEA,* demolition of the Bevatron and Building 51 looks to us like the first stage of new major construction on that site. Indeed, LBNL now appears poised to enter the *hotel business* with the planned construction of a three-story, 25,000 gsf "Guest House" less than 500 feet from B DT-1 g 51 (*DEA,* p 87). DT-3

3. Because of the project's hazardous nature and long time horizon, we believe it is in the best interest of both the Department of Energy and the University of California to tier the project off a fresh LRDP with the most up-to-date mitigations possible. In our judgment, DT-4

it is not reasonable for a project which may not be completed until 2013 (and likely followed by another long construction period) to use a twice-amended 1987 LRDP as its framework. DT-4 cont.

Please withdraw the *DEA* and re-circulate it after the new LRDP is available.

Sincerely,

Daniella Thompson James M Sharp

Daniella Thompson and James Sharp, April 21, 2006[9] (Comments Identified as "DT-1 through DT-4")

Response DT-1

Please see Response GB-1.

Response DT-2

Please see Response GB-1.

Although NEPA documentation is not required for a University of California LRDP, LBNL believes that the currently applicable 1987 LRDP provides sufficient guidance for the Proposed Action. In addition, the analysis of the Environmental Assessment is consistent with the 2006 LRDP EIR, which was certified on July 19, 2007.

Risks from the transport of waste materials that would be generated by the Proposed Action are addressed in Section 5.1.5, Hazards and Human Health (see pages 68-71), and Section 5.1.10, Traffic and Circulation (see pages 79-84).

Response DT-3

Comment noted. As stated in Chapter 3, Description of Proposed Action and Alternatives, while development of the Building 51 site is likely at some point in the future, at this time, there are no firm plans for future development that have reached the level of a proposed or reasonably foreseeable action.

The commenter is correct in noting the planned construction of a Berkeley Lab Guest House; however, the Guest House will not be located on the Building 51 site. As stated in Chapter 5 of the EA, Berkeley Lab is in the planning stage for the construction and operation of a new Guest House to serve visiting scientists, faculty and students. Many of the visitors using the Lab's facilities—the Advanced Light Source, National Center for Electron Microscopy, 88" Cyclotron, and the Molecular Foundry—are from outside the Bay Area and must obtain short-term housing. The Guest House would be a 25,000 gsf, three-story facility with approximately 60 guest rooms and would provide on-site, low-cost, short-term housing. The site designated for the Guest House is near the center of the Laboratory, west and southwest of Building 2 and on the site of the demolished Building 29 and Trailer 29D, and existing Trailers 29A, 29B, and 29C. An Initial Study/Negative Declaration was prepared and circulated in early 2007. If approved, construction activities would occur over a 17 month period, forecast at this time to occur between 2008 and 2009.

Response DT-4

See response DT-2.

9 Email date

Comment Letter HF

Schwab, Carl

From: Hank Field [hfield@uclink.berkeley.edu]
Sent: Tuesday, April 25, 2006 11:54 AM
To: CESchwab@lbl.gov
Subject: Bldg. 51 Demolition Comment

Dear Mr. Schwab,

HF-1

Please ensure that the project will have stormwater pollution prevention controls in place so that the North Fork of Strawberry Creek and downstream reaches will not be impacted by potential pollutants. Potential pollutants or impacts include but are not limited to:

HF-2

Concrete dust-suppression water run-off
Soil sediment run-off due to erosion or mud-tracking.
Oil from machinery maintenance or broken hydraulic lines Debris bin run-off Increased run-off intensity to the creek if impervious space will be increased as a result of the project.

If you have any questions or would like to discuss my comments, please contact me.

Sincerely,

Hank

--

Hank Field
Environmental Specialist
University of California, Berkeley
Office of Environment, Health and Safety University Hall, 3rd Floor Berkeley, CA 94720-1150

(510) 642-0359 ph.
(510) 643-7595 fax
hfield@berkeley.edu

Comment Letter HF

Schwab, Carl

From: Steve Maranzana [stevemar@berkeley.edu]
Sent: Tuesday, April 25, 2006 5:09 PM
To: CESchwab@lbl.gov
Cc: Hank Field; Greg Haet; Karl Hans; Steve Maranzana; Tim Pine; PAThorson@lbl.gov
Subject: Re: Bldg. 51 Demolition Comment

Dear Mr. Schwab,

Hank Field is out the office for the next couple days but he wanted me to add "broken water supply lines" to the list of potential pollutant sources to consider. HF-3

Thank you,
Steve

At 11:53 AM -0700 4/25/06, Hank Field wrote:
>Dear Mr. Schwab,
>
>Please ensure that the project will have stormwater pollution
>prevention controls in place so that the North Fork of Strawberry Creek
>and downstream reaches will not be impacted by potential pollutants.
>Potential pollutants or impacts include but are not limited to:
>
>Concrete dust-suppression water run-off Soil sediment run-off due to
>erosion or mud-tracking.
>Oil from machinery maintenance or broken hydraulic lines Debris bin
>run-off Increased run-off intensity to the creek if impervious space
>will be increased as a result of the project.
>
>If you have any questions or would like to discuss my comments, please
>contact me.
>
>Sincerely,
>
>Hank
>
>
>--
>____
>________
>
>Hank Field
>Environmental Specialist
>University of California, Berkeley
>Office of Environment, Health and Safety University Hall, 3rd Floor
>Berkeley, CA 94720-1150
>
>(510) 642-0359 ph.
>(510) 643-7595 fax
>hfield@berkeley.edu

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~~~~~~
Steve Maranzana, EH&S Specialist
UC Berkeley - Office of Environment, Health & Safety Environmental Protection
317 University Hall
Berkeley, CA 94720-1150
(510) 642-6568 (voice)
(510) 643-7595 (FAX)
web site: http://www.ehs.berkeley.edu
~~~~~~

<u>Hank Field, Environmental Specialist, UC Berkeley Office of Environment, Health and Safety, April 25, 2006[10] (Comments Identified as "HF-1 through HF-3")</u>

Response HF-1

As described in Section 5.1.6, Hydrology and Water Quality, pages 71-74, the Proposed Action, being greater than one acre, will require coverage under the statewide General Construction Permit, and various protective mechanisms (i.e., developing and implementing a project-specific Stormwater Pollution Prevention Plan which specifies Best Management Practices (BMPs) that will prevent all construction pollutants, including dirt and silt from erosion and sedimentation, from contacting storm water and entering receiving waters) will be put in place. Sampling is not required as part of this permit, since this site does not discharge into impacted waters.

The specific details of the demolition process and the most effective BMPs for controlling surface runoff, preventing erosion, and maintaining adequate drainage at the Building 51 site will be developed by LBNL staff and contractors in project-specific SWPPPs as the specifics of the demolition activities are further defined. As required by the statewide General Construction Permit, the preparation and implementation of SWPPPs will ensure that pollutants would not enter the environment through uncontrolled runoff. On-going groundwater monitoring would not be disturbed.

Stormwater runoff from the proposed site is currently discharged to the North Fork of Strawberry Creek. Because the Proposed Action would cause stormwater runoff on the subject site either to be slightly reduced or to remain the same as under existing conditions, the impact on runoff rates and volumes discharged to the North Fork of Strawberry Creek would be negligible (see Section 5.1.6, pages 71-74).

Response HF-2

Section 5.1.6 of this Environmental Assessment states that the Proposed Action would require the management of water generated from dust suppression activities, rainfall, and, because of the seasonally shallow groundwater, excavation dewatering. Management of the surface water is necessary to avoid entrainment of pollutants such as asbestos, lead, and silica in concrete dust. Also, construction equipment used on-site may release small quantities of petroleum products including diesel, gasoline, and grease that could be combined in the wastewater. The Proposed Action would also involve the management of some materials that have induced or surface radioactivity (see Section 5.1.5, Hazards and Human Health)

Quantitative descriptions of water quality conditions, including results from the Lab's stormwater monitoring and surface water programs, are presented in LBNL's annual Site Environmental Report. Recent reports are available on the web at http://www.lbl.gov/ehs/esg/tableforreports/tableforreports.htm. The Laboratory is not required to and does not monitor the Building 51 area individually, as the Lab's stormwater permit covers the entire Lab. Data from Lab outfalls includes the Building 51 area.

10 Email Date

Response HF-3

LBNL maintenance technicians are on duty 24 hours a day and are trained to respond to any utility emergency such as a broken water main. They are trained (and have an operating procedure) to isolate the broken pipe and quickly set up dechlorination treatment that neutralizes any chlorine in the supply water prior to it reaching any downstream storm drain inlet.

Schwab, Carl

From: PhoeBe ANNE [phoebeso@earthlink.net]
Sent: Thursday, May 04, 2006 11:29 AM
To: JHomrighausen@ci.berkeley.ca.us; CESchwab@lbl.gov
Subject: to the Landmarks Preserv. Commission

Dear Landmarks Preservation Commissioners:
May 1, 2006

The Berkeley Fellowship of Unitarian Universalists' Social Justice Committee has voted to request that you landmark the Bevatron building.
It should be listed on the National Register of Historic Places because important research was done there, which resulted in four Nobel prizes. We like the idea of an "adaptive reuse alternative" with the site used to teach living history. Thank you for considering this creative option.

PBA-1

Sincerely,

PhoeBe ANNE (sorgen), co-chair
Berkeley Fellowship of Unitarian Universalists' Social Justice Committee
1606 Bonita Ave.
Berkeley, CA 94709

PhoeBe ANNE (sorgen), Co-chair, Berkeley Fellowship of Unitarian Universalists' Social Justice Committee, May 1, 2006 (Comment Identified "PBA-1")

Response PBA-1

As described in Section 3.2.4, Description of Proposed Action and Alternatives, the Adaptive Reuse alternative was considered but rejected as infeasible: it would not avoid the significant impacts to historic resources associated with the Proposed Action and it would be more costly, in terms of building and safety code compliance. The building does not meet modern fire/life safety regulatory codes or seismic requirements, and to upgrade it with fire proofing, fire separations, and structural enhancements would prove to be cost prohibitive.

Planning and Development Department
Land Use Planning Division

Carl Schwab
U.S. Department of Energy
Berkeley Site Office
1 Cyclotron Road, MS 90R1023
Berkeley, CA 94720

May 5, 2006

Dear Mr. Schwab,

The City of Berkeley Landmarks Preservation Commission (LPC) is responsible for the preservation and protection of Berkeley's cultural and historic landmarks. Please find enclosed comments from the LPC regarding the Draft Environmental Assessment for the demolition of the Bevatron and Building 51 at Lawrence Berkeley National Laboratory.

Please contact me at (510) 981-7484 or jhomrighausen@ci.berkeley.ca.us if you have any questions.

Sincerely,

Janet Homrighausen

Janet Homrighausen
Secretary, Landmarks Preservation Commission

Cc:
Terry Powell
Officer, Community Relations
One Cyclotron Road, MS 65A0101
Berkeley, CA 94720

Carl Schwab
U.S. Department of Energy
Berkeley Site Office
1 Cyclotron Road, MS 90R1023
Berkeley, CA 94720

May 4, 2006

Subject: Comments on the Demolition of Building 51 and the Bevatron Draft Environmental Assessment (DOE/EA-1541).

Dear Mr. Schwab,

Thank you for the opportunity to comment on the Demolition of Building 51 and the Bevatron Draft Environmental Assessment (DEA), dated March 21, 2006. The City of Berkeley Landmarks Preservation Commission (LPC) has reviewed the document with respect to cultural resources and has the following comments:

- 40 CFR §1508.9 states that an Environmental Assessment (EA), as prepared by the federal agency, serves to 1) Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact, 2) Aid an agency's compliance with the Act when no environmental impact statement is necessary, and 3) Facilitate preparation of a statement when one is necessary. LBNL does not cite any of these as reasons for the preparation of this DEA (see last paragraph of Preface). LBNL needs to clearly state its position as to whether an environmental impact statement will be prepared or a finding of no significant impact will be made, based upon the findings presented in the EA. Because the proposed project is a demolition of a structure eligible for the National Register, a significant impact in itself, the LPC believes that an environmental impact statement (EIS) must be prepared. LPC-1

- The draft EA references Lawrence Berkeley National Laboratory's (LBNL) Long Range Development Plan (LRDP) of 1987 as the current planning document. However, the DEA states that a new LRDP is expected to be released in 2006. The LPC questions the appropriateness of referencing an 18-year old document and believes the issuance of this DEA and a subsequent draft environmental impact statement (DEIS) may be premature. The updated LRDP will result in the best assessment of the goals and objectives of this project, in the context of the LBNL's most current evaluation of its future needs, its planned projects, and its overall scientific mission. By working with the outdated LRDP, LBNL is unable to reasonably anticipate future actions that, in combination with the proposed project, may result in cumulative or indirect impacts. An updated LDRP can also best inform potential project alternatives. LPC-2

- The Memorandum of Agreement among the Department of Energy, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding the demolition of the Bevatron Building was signed in 1997, over eight years before the draft environmental compliance documents were made available for public review. All parties should consider new public and agency comment and new documentation that arises during the environmental review process to ensure that the federal government's final decision is based on all the relevant factors. LPC-3

- The adaptive reuse alternative was dismissed as infeasible in the DEA without any real analysis. An adaptive reuse alternative should be analyzed in the EIS with the rigorous detail that will be afforded other alternatives. Alternatives should be evaluated and compared using the same type and detail of information. LPC-4

Given the LPC's recent review of the Draft Environmental Impact Report (DEIR) prepared under CEQA, the LPC offers the following suggestions for preparation of the draft Environmental Impact Statement (DEIS) under NEPA:

- The environmental impact statement should fully discuss the National Register Criteria under which Building 51 and the Bevatron are eligible for listing. Although applications to the National Register often focus on one of the eligibility criteria, the DEIS should discuss all criteria that effectively contribute to the eligibility of Building 51 and the Bevatron for the Register. This will aid in determining potential adaptive reuse projects and appropriate mitigations for any loss of integrity. LPC-5

- The environmental impact statement should discuss the findings of the Historic American Building Survey (HABS) report and the Dobkins and Corbett *Historic Architectural Evaluation Report*, and the architectural importance of Building 51 and the Bevatron from a historical perspective. The EIS should also provide information on the architectural firm of Masten and Hurd and the architect Milton T. Pflueger, a discussion of the architects' significance, and the importance of the Bevatron within the architects' body of work. LPC-6

- With respect to cumulative impacts, the EIS should include discussion and comparison of the existing particle accelerators of similar size in terms of architectural design. The EIS should also discuss and compare historic status and existing protections for the other particle accelerators of similar size. LPC-7

This concludes the LPC comments on the DEA.

As you may already be aware, Building 51 and the Bevatron were recently initiated by citizen petition for designation as a City of Berkeley landmark. (The LPC earlier withdrew, without prejudice, its initiation of Building 51 and the Bevatron.) We will keep you informed as to the outcome of the LPC proceedings. LPC-8

Again, the LPC appreciates the opportunity to comment on the draft EA.

Sincerely,

City of Berkeley Landmarks Preservation Commission

City of Berkeley Landmarks Preservation Commission, May 4, 2006 (Comments Identified as "LPC-1 through LPC-8")

Response LPC – 1

The commenter is correct regarding the Bevatron's eligibility for the National Register. Building 51 and the Bevatron were determined eligible for listing in the National Register of Historic Places (NRHP) and have been listed in the California Register of Historical Resources. Under NEPA, LBNL has adequately mitigated for the potential loss of Building 51 with a signed Memorandum of Agreement (MOA), completion of the National Park Service's Historic American Engineering Record (HAER) documentation, and approval of the Historic American Building Survey (HABS) addendum by NPS. As an additional measure, LBNL plans to commemorate the scientific achievements attributed to the Bevatron with a monument and/or display listing the historic discoveries that occurred there. For NEPA purposes, because DOE has mitigated potential impacts to cultural resources by complying with the terms of the MOA, the demolition of Building 51 and the Bevatron is not a significant impact. Therefore, it is not expected that preparation of an environmental impact statement (EIS) will be necessary, and pending issuance of a Finding of No Significant Impact, an EA is the appropriate document.

Response LPC – 2

Please see responses GB-1 and DT-2.

Response LPC – 3

The Memorandum of Agreement (MOA; Appendix C) was signed in 1997 among DOE, the California SHPO, and the ACHP regarding the demolition of Building 51. The stipulations of the MOA required that the building be documented in accordance with the National Park Service's Historic American Engineering Record (HAER) requirements. In September 1997, LBNL staff prepared the HAER documentation which included a written historical and architectural description of the building and accelerator, and extensive photographic recordation in accordance with the MOA's stipulations. The HAER documentation was submitted to and accepted by the US Department of Interior National Park Service (NPS) in March 1998.

With the acceptance of the HAER report by NPS, DOE may demolish Building 51 provided that DOE contacts the Historic American Building Survey (HABS) division of NPS to determine what level and kind of recordation is required for the buildings, and that such documentation is completed and accepted by HABS prior to demolition. LBNL has consulted with NPS. The latter determined that an addendum to the HAER report would meet HABS requirements. The HAER addendum has been completed and was accepted by NPS in August 2006. For NEPA purposes, with the signed MOA, completion of the HAER documentation, and approval of the HABS addendum by NPS, LBNL has adequately mitigated for the potential loss of Building 51.

Although the MOA was signed eight years prior to the Draft environmental document and federal decision, no new impacts have been identified since publication of the Draft EA. In addition, the Advisory Council on Historic Preservation (ACHP) sent a letter in September 2007 (included as

Appendix H) stating that “DOE has met its responsibilities under Section 106 of the National Historic Preservation Act for this undertaking.”

Response LPC – 4

The Adaptive Reuse alternative was considered but rejected as infeasible because it would not avoid the potential impacts to historic resources associated with the Proposed Action, it would be much more costly than the Proposed Action, and it would not meet project objectives.

Response LPC – 5

According to the California State Office of Historic Preservation, Building 51/51A is eligible for inclusion on the National Register of Historic Places under Criteria A and B, with Criterion Consideration G.

Response LPC – 6

The EA identified Building 51 and the Bevatron as an historic resource under National and State criteria. Because the Lab has satisfied NEPA requirements in mitigating the impact to this historic resource, no information about the architectural firm of Masten and Hurd is required beyond what was provided in the EA.

The following information about Masten and Hurd is taken from the landmark application for Building 51 and the Bevatron, City of Berkeley, Landmarks Preservation Commission, and is included for informational purposes. Charles F. Masten designed Kezar Stadium in 1922. He and Lester W. Hurd began their partnership in 1924, becoming well known for institutional buildings. After WW II, they specialized in large-scale institutional projects, such as Hastings College of Law in San Francisco and Warren Hall at UC Berkeley. Later, in collaboration with Ernest J. Kump & Associates, they designed three community colleges: Foothill College in Los Altos, Cabrillo College in Santa Cruz and De Anza College in Cupertino.

Response LPC – 7

The EA included extensive cumulative impact discussion comparing existing particle accelerators of similar size in terms of architectural design, as well as historic status of these particle accelerators. Please see Section 5.4.2, Cumulative Impacts, Cultural Resources, pages 95-97.

Response LPC – 8

Comment noted. The Lab acknowledges the Landmarks Preservation Commission decision, designating the Building 51/Bevatron site as a City of Berkeley Historical Landmark, without indicating any “features to be preserved,” on August 3, 2006. On appeal, the City Council upheld the Landmarks Preservation Commission’s decision on January 30, 2007.

ATTACHMENT #4A B
(4 PAGES AND 4 NEWS-CLIPPINGS)

Comment Letter EHS

To: The Community Health Commission
From: The Environmental Health Subcommittee
Date: May 11, 2006
Re: Recommendations from the Environmental Health Subcommittee to the Community Health Commission on the Draft Environmental Assessment (DEA) for Demolition of Building 51 and the Bevatron

The Community Health Commission (CHC) has been asked by community members to comment on the potential health impacts to Berkeley residents and others of the proposed demolition of Building 51 and the Bevatron located at the Lawrence Berkeley National Laboratory (LBNL).

We have also been asked by the community to consider making a recommendation to the full CHC that the buildings be left intact to avoid or minimize the health risks associated with their demolition and the transport of materials.

Commissioner Kahn has reviewed the section of the Draft Environmental Impact Report (DEIR) issued earlier this year by LBNL that discusses the Air Quality issues described in the DEIR. His memorandum is attached.

A. I have reviewed the DEA and wish to offer the following observations for your consideration.

1. The project described in the DEA is substantial:
   - It is possible that the demolition and removal of the structures could take as long as 6 ½ years (depending on the availability of funding). The DEA assumes that the project will be concluded in 4 years.
   - The amount of debris that will be removed is between 46,000 and 57,000 tons, half of which is considered hazardous waste (23,000 – 28,500 tons). According to the DEA, the hazardous debris is likely to be shipped to Clive, Utah, approximately 60 miles from Salt Lake City.
   - Approximately 4,700 truck trips will occur during this demolition. A single route (Hearst – Shattuck – University Ave.) for the round-trips will be used. During that period, it is possible that major construction will take place at the Ashby interchange at I-80. It raises the question as to whether any similar construction is anticipated

EHS-1

Other construction that is planned or on-going at LBNL, UC Berkeley, and the City of Berkeley (DEA, pp 86-89) are described, but their impacts are not aggregated.

2. The DEA states that the "future use of the site is speculative, it is not described in this Environmental Assessment, nor are the impacts of such use evaluated" (DEA, p. 7), however, the 2006 LBNL Long Range Development Plan (LRDP) and its accompanying LRDP EIR will be circulated later this year for review and may described a possible future use for the site"(DEA, p. 7)

EHS-2

3. The DEA acknowledges that the demolition activities are subject to Federal and State regulation. Federal regulations, especially over the past 6 years, have been consistently

EHS-3

relaxed and frequently unenforced. Not surprisingly, the community may not feel confident that reliance on federal regulation will do much to ensure that their health is protected.

The City of Berkeley has recently passed a Precautionary Principle Ordinance which requires that the City, when confronted with an issue that might cause harm, consider taking no action, or at least a response likely to cause the least harm.

B. The Environmental Health Subcommittee makes the following recommendations to the Community Health Commission. Approved recommendations will be forwarded to the City Council for inclusion in its response to the Draft Environmental Assessment for Demolition of Building 51 and the Bevatron:

1. Request that plans for the demolition not be finalized until the public has the opportunity to review and comment on LBNL's Long Range Development Plan due out later this year. EHS-4
2. Establish air monitoring equipment along the travel routes that can be accessed in real time by the community. Elements to monitor include criteria pollutants (the federal Clean Air Act, and the EPA identify and set standards to protect human health and welfare for six pollutants: ozone, carbon monoxide, particulate matter (PM10), sulfur dioxide, lead, and nitrogen oxide) as well as PM2.5 and asbestos. Doing so will assure the community that they are not being exposed to harmful contaminants and can also be used by researchers looking at air quality issues. Water quality and noise levels should be similarly monitored and reported. EHS-5
3. Determine if CalTrans plans any major work on the I-80 between Powell and Buchanan Streets over the next 7 years that might exacerbate the projected traffic and air quality conditions. EHS-6
4. Request assurance that, should the demolition go forward, it be concluded in four years or less reducing the impacts on the neighborhoods close to the demolition site and reducing the possibility that the unfinished demolition will increase exposures to hazardous materials. EHS-7
5. Should the demolition go forward, all trucks that are used for the transportation of rubble should be spot checked for safety and its diesel fuel for adherence to the latest regulations. EHS-8
6. There has been some community opposition to the Clive, Utah waste disposal site by people living in the area. Berkeley should let the Clive community know of the proposed disposal of hazardous material and be certain that we are not shipping hazardous waste to a community that is opposed to it. EHS-9

Air Quality and the Demolition of the Bevatron

Extensive discussion of the above topic has been made available by UC Berkeley in a Draft EIR (Environmental Impact Report) in a sixteen page document. I have read it over several times, and find it very difficult to summarize in a few sentences.

There are, however, a number of points to be made.

1. The demolition of Building 51 will require removal of the waste material resulting from the demolition by Diesel powered truck transport, through the City of Berkeley, over major thoroughfares, over an estimated time period of at least fours years or more. EHS-10

2. In addition to the potential pollution of the ambient air in Berkeley, both at the demolition site as well as in the vicinity of the truck route, by asbestos particles, particulate matter of various sizes, and chemical pollutants of a wide variety, a major consideration is also tailpipe pollution from Diesel powered trucks. Indeed, the EIR appears to regard this as a more important source of pollution than that of the material carried in the trucks. Furthermore, it is well known that carbon monoxide is a deadly gas produced by automotive exhaust. CO poisons the Hemoglobin carrying of Oxygen to the tissues. EHS-11

3. Insofar as measurement of the impact of the demolition process and truck transport is concerned, current facilities for potential measurement of air quality are totally inadequate. **The nearest air pollution measuring facility is the Alice Street Facility, in Oakland, six miles south of the project.** Ozone and carbon monoxide are the primary pollutants measured there. However, **the nearest specific particulate measuring facility is in Fremont, 30 miles southeast of the project site!** EHS-12

4. Insofar as demolition site protection is concerned, the sides of the building will not be demolished until all the material inside the building has been removed as a protective measure. Although a variety of "mitigation measures" are proposed by the Berkeley Lab, including frequent wetting down of the demolition site, protection of the aggregate material on trucks by a six-inch freeboard or covering of the cargo, **there is no plan to measure the impact of the entire process by any new special monitoring facilities!** EHS-13

5. The draft document discusses at great length the various Federal and State Rules and Regulations, including, of course those of the EPA. There are apparently none existent for the City of Berkeley. The fact that the San Francisco Bay Area Basin, as I interpret the EIR, is a non-attainment area at least for ozone, is a source of concern. The Laboratory evidently plans to keep well within those regulations. EHS-14

6. Particulate matter, which is classified in two different sizes, appears to be a major hazard of Diesel tailpipe exhaust. Inhalation of these particles is potentially injurious to humans, especially those with chronic lung and cardiac disorders. I need not emphasize the dangers of inhaled asbestos as a potential carcinogen. EHS-15

7. It would appear to me, as a resident of Berkeley, that the demolition project should be very carefully reviewed by the City Council, that an impartial expert in industrial Toxicology be consulted by the Council for third party advice in order to minimize the potential dangers this Demolition project might impact on our citizenry, as well as recommendations for careful monitoring of ambient air in the vicinity of the truck route. EHS-16

8. It is not clear to me from the EIR whether there is any possibility of pollution by radioactive material, either at the demolition site or along the truck route. EHS-17

<u>Environmental Health Subcommittee to the Community Health Commission, City of Berkeley, May 11, 2006 (Comments Identified "EHS-1 through EHS-17")</u>

Response EHS-1

Comment noted. As stated in this Environmental Assessment on page 1, the duration of the physical work may vary from four to seven years, although a variant of the project could reduce the minimum duration of the project from four years to three and a half years. Please see Appendix G.

Specific disposal sites for the Proposed Action have not yet been selected. The EA states "any items showing detectable DOE-added radioactivity would be sent to an approved disposal site, *such as* Envirocare in Clive, Utah" (Section 3.1.4, Proposed Action Activities, page 19).

For a discussion of traffic related to the Proposed Action, see Section 5.1.10, Traffic and Circulation (pages 79-84).

Response EHS-2

As stated in response GB-1**,** the LRDP EIR was certified on July 19, 2007. NEPA documentation is not required for a University of California LRDP. The commenter quotes language from this Environmental Assessment, page 9, which also states that "Project-level NEPA and CEQA environmental analysis will be conducted if and when necessary for any future development at the Building 51 site."

Response EHS-3

Respondent states position concerning confidence in reliance on federal regulation. Comment noted.

Response EHS-4

Comment noted. Please see responses DT-1 and DT-2.

Response EHS-5

The EA presents substantial evidence that air impacts from the Proposed Action, including diesel emissions, would be minimal; see Section 5.1.1, Air Quality, on pages 87-61. Based on the findings of the EA Air Quality analysis, the Proposed Action presents no significant Air Quality impacts. Therefore, no additional monitoring is deemed necessary and is outside the scope of the Proposed Action.

For a discussion of the Proposed Action's impact on water quality, see Section 5.1.6, Hydrology and Water Quality, pages 71-74 of the EA. See also responses HF-1 and HF-2 above.

Noise levels are described in Section 5.1.7 of the EA, pages 74-76. As indicated in **Table 3** of the EA (Section 5.1.7, page 75), the noise levels associated with the loudest phase of demolition would not be audible at most adjacent sensitive receptor locations, and would not exceed applicable weekday noise limits set by the Berkeley Noise Ordinance.[11] Weekend truck loading and departure activities would generate noise levels that would not exceed Berkeley's weekend noise standard at any sensitive receptor sites. At the same time, on-site receptors, such as occupants of LBNL buildings adjacent to the Building 51 site, would experience temporary noise increases during demolition. Although such receptors are not generally considered noise-sensitive, implementation of mitigation measures identified in the 1987 LRDP EIR, as amended, would lessen noise impact to a negligible level (see Appendix A). Moreover, as part of project contract specifications, LBNL would require its subcontractors to employ specific noise control procedures.

Truck traffic associated with the hauling of materials to and from the site could potentially elevate noise levels along haul routes for the duration of demolition activities. The Proposed Action would result in a maximum of 34 daily one-way truck trips. Trucks would be directed to routes on roads and freeways that are already heavily traveled. Therefore, given the limited number of project trips and the volume of existing traffic on the affected roadways, the general increases in noise levels along haul routes would not be perceptible.

While the Proposed Action is consistent with the City of Berkeley's Noise Ordinance, the additional measures incorporated as part of the project would assure that the project would not expose sensitive receptors to excessive noise levels.

Response EHS-6

Based on currently available information, CalTrans has no major work planned on the I-80 between Powell and Buchanan Streets over the next 7 years.

Response EHS-7

Comment noted. As stated in the EA, Section 3.1.4, Project Activities, page 17, the schedule for the project has been estimated to last 4 to 7 years…"contingent upon funding and results of material sampling." Materials disposition will be based on on-site sampling, the results of which will not be known until the Proposed Action is underway. Therefore, a more definitive schedule can not be determined in advance.

As stated on page 1, a variant of the project could reduce the minimum duration of the project from four years to three and a half years, but this reduction in schedule would have no resulting effect on project impacts, including traffic impacts. See also revised page 80 and Appendix G.

11 If demolition work were to occur on weekends, associated noise levels would exceed Berkeley's weekend noise standard (City of Berkeley, 2005) at Site 4 and at the wall at Site 6. At Site 4, the combination of background and demolition noise would result in a noise level of up to 57 dBA, which represents an approximately 3-dBA increase over background noise. A 3-dBA change is considered a just-perceivable difference in noise level. Therefore, this increase in noise level would result in a negligible impact. The majority of LHS activities occur away from the wall at Site 6, in areas where there is no line-of-sight to the Building 51 area (a partial line-of-sight is available at the wall, as well as at the north parking area). Given that most LHS visitors would remain in the area behind this wall and that LHS itself is well behind this wall, LHS activities and visitors would not be exposed to demolition noise levels in excess of the weekend standard.

Response EHS-8

Comment noted. There are numerous U.S. Department of Transportation (DOT) regulations concerning the dispersion of hazardous and radioactive constituents during transportation, including requirements to verify that removable radioactive contamination is below specified limits. In addition, DOE Orders specify requirements which govern the release of materials with DOE-added radioactivity; these orders are generally much more stringent than DOT requirements for both surface and volumetric radioactive contamination. As with all aspects of transportation, LBNL will comply with all applicable regulatory requirements.

The plastic tarps that would cover many truck loads are not intended to provide the primary protection against fugitive dust emissions. As stated on page 83, "In general, due to the absence of hazardous characteristics, the DOT non-regulated materials that would be shipped off-site as a result of the Proposed Action would not require sealed containers. Items would have been vacuumed or otherwise cleaned prior to shipment, and the trucks would not release radioactive or hazardous dust products. However, some items likely would be shipped in sealed containers because of certain physical characteristics (e.g., small items that otherwise would be difficult to hold down or surface contaminated objects that may contain dispersible radioactivity)."

Regarding diesel fuel adherence, the EA presents substantial evidence that air impacts from the Proposed Action, including diesel emissions, would be negligible; see Section 5.1.1, Air Quality, at pages 57-61. See page 29 for a detailed discussion on the revised diesel requirements. In brief, under California Air Resources Board regulations (13 California Code of Regulations section 2281), diesel-fueled trucks and equipment in California have been required to use ultra-low sulfur fuel (15 parts per million [ppm] of sulfur). Thus, ultra-low sulfur fuel would be used for trucks and most off-road engines during the entire life of the Proposed Action. Current CARB diesel regulations can be found at: http://www.arb.ca.gov/fuels/diesel/081404dslregs.pdf.

Response EHS-9

Comment noted. See response EHS-1 above. As part of its standard operating procedures, LBNL consults with landfills prior to the start of demolition activities to ensure that there is sufficient capacity to accept the amount of waste generated by such projects, and has done so for the Proposed Action. No problems are anticipated in disposing of the various types of waste that would be generated, as stated in Section 5.1.9, Public Utilities, page 77.

Response EHS-10

Comment noted. Section 5.1.5, Hazards and Human Health (pages 68-71), and Section 5.1.10, Traffic and Circulation (pages 79-84) addresses risks from the transport of waste materials that would be generated by the Proposed Action.

Response EHS-11

The EA presents substantial evidence that air impacts from the Proposed Action, including diesel emissions, would be negligible; see Section 5.1.1, Air Quality, at pages 57-61.

Response EHS-12

Comment noted. See response EHS-11.

Response EHS-13

Comment noted. See responses EHS-11 and EHS-12.

Response EHS-14

Comment noted.

Response EHS-15

Section 5.1.1, Air Quality, pages 57-61, discusses particulate matter and asbestos with regard to the Proposed Action.

Response EHS-16

Comment noted.

Response EHS-17

Section 5.1.5 of the EA, Hazards and Human Health (pages 68-71), describes any radioactive material arising from the Proposed Action, both on site and along truck routes. The potential hazard to persons living along the truck routes, as well as LBNL employees, contractors and the general public would be far below regulatory limits and any standards of significance.

Materials that LBNL has reason to suspect might contain radioactivity would be characterized according to DOE-approved protocols and disposed appropriately, as described above. Due to the low levels of radioactivity present in the concrete that would be subjected to jackhammering or otherwise broken up, as well as the protective measures (e.g., applying water for dust suppression), it is expected that no detectable radioactivity would be contained in the dust generated by the Proposed Action.

The Proposed Action would include off-site disposal of items containing low levels of radiological activity. The low levels of such activity, coupled with the employment of appropriate safety measures in accordance with LBNL operational procedures (e.g., as set in LBNL PUB-3000; LBNL, 2005c), would ensure that any exposure resulting from the shipment of these items to LBNL employees and contractors (e.g., truck drivers), and to the general public (e.g., pedestrians, or passengers in a car idling in traffic next to a truck containing such items), would be far below applicable regulatory limits.[12]

[12] For transport workers, the applicable DOT regulatory limit is 2 mrem per hour. (49 CFR 173.441(b)(4)). For LBNL employees, the annual occupational exposure to general employees at DOE facilities such as the Laboratory is not to exceed a total effective dose equivalent of 5 rem (1 rem = 1,000 mrem) (10 CFR 835.202(a)(1)). Lesser annual exposure limits are set for employees who are pregnant women (500 mrem to the embryo/fetus from the period of conception to birth), and for minors who are occupationally exposed to radiation and/or radioactive materials

As a result of the above factors, the potential impacts of hazardous materials, hazardous waste, and other hazards discussed in this section would be reduced to negligible levels.

(100 mrem) (10 CFR 835.206, 207). The LBNL Radiation Protection Program, which implements 10 CFR 835 at the Laboratory, also sets two administrative levels that can be exceeded only with the approval of relevant authorities:

- A Department of Energy Administrative Control Level for workers of 2 rem whole body exposure per year per person is established for all DOE activities. Approval by the DOE Program Secretarial Official or designee is required prior to allowing a person to exceed this level.
- LBNL itself has set an Administrative Control Level of 1 rem per year for whole body exposure. Approval by the Deputy Laboratory Director is required prior to allowing a person to exceed this level.

  The exposure of members of the public to radiation sources as a consequence of all routine DOE activities shall not cause, in a year, an effective dose equivalent greater than 100 mrem (DOE Order 5400.5). This standard includes exposure to both airborne radionuclides and penetrating radiation. As mentioned earlier in the text, EPA established a limit of 10 mrem/year for airborne emissions for the general public (40 CFR 61).

Office of the City Manager

May 22, 2006

Mr. Carl Schwab
U.S. Department of Energy, Berkeley Site Office
MS 90R 1023
One Cyclontron Road
Berkeley, CA 94720

Dear Mr. Schwab:

Thank you for providing an extended public comment period to respond to the Draft Environmental Assessment (DEA) for the demolition of the Bevatron and Building 51 at Lawrence Berkeley National Laboratory (LBNL). The City of Berkeley sent the attached comments on the Draft Environmental Impact Report (DEIR) for the same project to LBNL on December 5, 2005. LBNL has not yet issued a Final EIR that responds to the City's comments about the DEIR's inadequacies, nor does the DEA respond to the significant concerns raised.

K-1

The purpose of preparing an Environmental Assessment is to determine whether an Environmental Impact Statement (EIS) is necessary and, if so, to facilitate its preparation. Given the lack of response to the issues the City raised about the DEIR, we have no evidence that the project will not have a significant impact on the environment and must, therefore, conclude that the project would require preparation of an EIS per NEPA.

The City is particularly concerned that the Department of Energy has failed to make the Historic American Engineering Record (HAER) addendum available for public review. Without such documentation, neither the City nor the public can comment on the adequacy of the documentation that is proposed to mitigate the loss of a structure deemed eligible for listing on the National Register. K-2

Please refer to the attached letter for more detail about the areas where the City believes more information is needed prior to a determination of whether an EA or an EIS is the appropriate level of environmental review. Thank you for your consideration of these comments.

Sincerely,

Phil Kamlarz
City Manager

Cc: The Honorable Mayor and Members of the City Council
Dan Marks, Planning and Development Director; Wendy Cosin, Deputy Planning Director
Maneula Albuquerque, City Attorney
Arrietta Chakos, Assistant City Manager

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CITY OF BERKELEY

Office of the City Manager

December 7, 2005

Mr. Daniel Kevin
LBNL NEPA/CEQA Program
Lawrence Berkeley National Laboratory, 90K0198
One Cyclotron Road
Berkeley, CA 94720

Re: Comments on Draft Environmental Impact Report for Demolition of LBNL Building 51/Bevatron

Dear Mr. Kevin:

This letter is the City of Berkeley's response to the Draft Environmental Impact Report (EIR) for the demolition of Building 51 and the Bevatron at the Lawrence Berkeley National Laboratory (LBNL).

On March 11, 2003, the Berkeley City Council supported decommissioning, deconstruction, and removal of the Bevatron in a manner acceptable to the public, requested that an EIR be prepared, and requested that LBNL develop a long-term plan for future uses for the site. The City is pleased that LBNL agreed with our conclusion that a full EIR would be needed to analyze the potential significant environmental impacts of this project. We have some concerns, however, about the adequacy of the Draft EIR that LBNL issued on October 21, 2005.

The DEIR is "tiered" off three Environmental Impact Reports prepared between 1987 and 1997 that comprise the EIR for the LBNL's 1987 Long Range Development Plan (LRDP) as amended. The DEIR states that it relies on the 1987 EIR in several areas including environmental setting, overall growth-related issues, long-term cumulative impacts, and mitigation measures applicable to this project. The CEQA Guidelines (Sec. 15168 (d)) specify the circumstances under which a previously certified EIR can be incorporated by reference to deal with these and other factors. Because of significant impacts associated with implementation of the UC Berkeley 2020 Long Range Development Plan, which UC approved after adoption of the amended 1987 LRDP for LBNL, the current project's cumulative impacts on hydrology and water quality, traffic, and public facilities are of special concern.

The cumulative impact analysis includes consideration of the gross impacts associated with implementation of the UC Berkeley 2020 LRDP, but fails to include more specific project-level information that has become available during the past year. The specific impacts of several of these critical projects will be the subject of the upcoming Southeast Campus Integrated Projects (SCIP) EIR. Even though the SCIP DEIR will not be complete until sometime next year, it is clear that UC already has considerable information available about the timing, location, and magnitude of these projects. The Bevatron DEIR must include this information when evaluating the project's cumulative impacts.

In particular, we believe that the DEIR is seriously flawed because the cumulative impacts analysis

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specifically excludes the UC Berkeley Memorial Stadium Upgrade Project. The DEIR explains away this omission with the statement that "no detailed information about this project is available". This is not correct. Consultants to the University of California (the Lead Agency for both the Building 51/Bevatron Project and the Memorial Stadium upgrade) have been working on plans for the Stadium for at least a year. On November 10, Chancellor Robert Birgeneau announced highlights of a master plan for the Stadium that begins with construction of a new 132,500 square-foot student athletic center adjacent to the west wall of the Stadium as well as a new law and business building on the west side of Gayley Road. Construction of the first phase of the stadium plan — the student athlete high-performance center — is scheduled to begin in December 2006, pending environmental review and approval by the UC Board of Regents, in order to be ready for the 2008 football season. This means that the Stadium construction would likely coincide with the LBNL Building 51/Bevatron project.

The Council previously requested that LBNL develop a long-term plan for future uses of the site. According to LBNL Staff, the DEIR for the new LBNL Long Range Development Plan will not be available until 2006. If demolition of Bevatron were delayed to allow the new Long Range Development Plan to specify future uses for the property, the DEIR would have to also analyze such future uses. However, two of the stated objectives of the demolition project (eliminate potential hazards associated with the building, reduce the burden on LBNL maintenance resources - DEIR, p. III-2) support moving ahead at this time.

While the City supports timely removal of hazardous materials and does not recommend that the demolition be delayed until LBNL can prepare a new LRDP, we believe that the project should not go forward until the DEIR is revised to include additional information about the project's effects. To ensure that LBNL carries out the proposed activities "in a manner acceptable to the public" as the Council requested in 2003, the DEIR should be revised to respond to concerns that Staff and members of the public have identified including the following:

1. The City understands that because LBNL is a Federal facility, project approval requires compliance with both State (CEQA) and Federal (NEPA) environmental review requirements. We are aware that the Federal Department of Energy (DOE) is preparing an Environmental Assessment (EA) for the project in compliance with the National Environmental Policy Act (NEPA). The Department of Energy expects to issue the Draft EA later this year. It will have a 30-day review and comment period. The DEIR does not indicate whether the LBNL Director, to whom the Board of Regents has delegated authority for certifying this EIR and approving the project, can approve the project before the NEPA environmental assessment is completed and approved by the Department of Energy. Moreover, the DEIR does not explain why LBNL and DOE did not prepare a single environmental document intended to meet both State and Federal requirements as the CEQA Guidelines (Section 15220 et. seq.) suggest. Aside from avoiding a time-consuming duplicative review process, it seems prudent for the CEQA document to incorporate any information included in the NEPA environmental document. On the other hand, if the NEPA assessment document does not include any new information there is no apparent reason for delaying its release or for preparing a single environmental review document as the Guidelines suggest.

2. The transportation analysis in the DEIR is flawed because of reliance on inappropriate thresholds for determining which traffic impacts will be significant. The DEIR presents nine criteria for identifying significant impacts to the transportation system, two of which refer to roadway or

intersection capacity. The other five criteria are important but are not considered in this discussion.

Under the Bevatron DEIR, a traffic impact becomes significant when it causes levels of service at an intersection to degrade below LOS D; or causes an increase in total volume of greater than 5 percent at an intersection operating at LOS E or worse. On roadway segments designated in the Congestion Management Plan, the impact is not considered significant unless the projected peak hour volume would increase by at least 5 percent regardless of whether the segment is projected to exceed the CMP standard without the project (p IV.K-7). The DEIR states that the 5 percent threshold is based on the fact that day-to-day traffic volumes can fluctuate by as much as 10 percent and, therefore, the average motorist is unlikely to perceive a 5 percent variation. Whether the average motorist will notice an increase in traffic is not an appropriate criterion for determining whether an impact is significant. Various references to this threshold, such as those on page IV.K-11 are, therefore, misleading and irrelevant.

3. On page IV.K-5, the DEIR lists 22 intersections that UCB 2020 LRDP EIR evaluated and concludes, "All of these intersections operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, except [two]." The DEIR needs to provide more information about the project's traffic impacts on the 20 intersections that are projected to operate at an acceptable LOS without the project to determine whether the project will degrade operations to worse than LOS D at any of these intersections and, if it will, what measures will be taken to mitigate any significant impacts.

   Similarly, the cumulative analysis needs to provide additional technical documentation. Using the same list of intersections from the UCB 2020 LRDP EIR, the discussion of Cumulative Impacts (p. IV.K-16), concludes that all but three of the 22 intersections listed "would continue to operate at acceptable levels of service (LOS D or better) during the a.m. and p.m. peak hours...". This is a vague statement, and no documentation is provided to document the impacts on levels of service. Moreover, as noted above, the DEIR did not consider the additional impact of traffic that will be generated by work on the Memorial Stadium.

   The DEIR's analysis of cumulative impacts needs to focus on the four to seven-year period when LBNL will carry out the Bevatron demolition including assessing impacts on levels of service and proposing mitigations for any intersections that would exceed the DEIR's significance criterion. The DEIR acknowledges that the intersections at University Avenue/San Pablo Avenue, University Avenue/Sixth Street, and Gayley Road/Stadium Rim Way are already operating at LOS F and that the project in combination with planned, pending, or other reasonably foreseeable projects, including implementation of the UC Berkeley 2020 Long Range Development Plan and construction of the Tien Center would further degrade conditions. As indicated above, to simply say "[t]he project-generated trips would add negligible traffic to long-term cumulative conditions", suggesting that the traffic increases would not be noticeable to the average motorist, is not an acceptable technical explanation.

   In regard to the Gayley Road at Stadium Rim Way intersection, "where delays within LOS F would increase", we recognize that project traffic at this intersection should not include large trucks, because the truck route is clearly defined elsewhere. However, because the DEIR does identify this intersection, it needs to assess the project's impacts in a technical and complete manner.

Although the intersection of Gayley Road and Stadium Rim Way (Rim Road) is within the UC campus, the DEIR needs to assess the effect that traffic operations at this location would have on other locations in the City. For instance, will the queuing for northbound Gayley extend back to affect the City street intersection of Piedmont at Bancroft? Will congestion on Rim Road result in traffic taking alternate routes through residential neighborhoods south of the Stadium such as Panoramic, Prospect, Channing Way and other streets? Combined with the impact of construction at the Memorial Stadium, the project's cumulative impacts on the Gayley-Rim Road intersection could have spillover effects on intersections along the Piedmont-Warring corridor in addition to an adverse impact on the residential neighborhoods south of the campus.

4. The DEIR acknowledges that the proposed project would have a significant unavoidable impact on a historical resource as defined by the CEQA Guidelines. An addendum to the existing Historic American Engineering Record (HAER) to document the site's historic significance has been prepared for the Historic American Building Survey (HABS) and is being reviewed, but this information is not included in the DEIR or otherwise available for public review. Even though such documentation cannot reduce the impact of the proposed demolition of an historic resource to less than significant levels, the LBNL should make all of this documentation available for public review prior certification of the EIR. In addition to preparing a written and photographic record, LBNL should identify other ways to recognize the site's significance.

5. The DEIR concludes that the project individually and together with other proposed LBNL and UC Berkeley projects would have no impact or a less than significant impact on hydrology and water quality. This conclusion is based, in part, on information that the impacts of implementing the UC Berkeley 2020 Long Range Development Plan will have less than significant impacts on the Strawberry Creek watershed. The DEIR also relies on continuing implementation of best management practices (BMPs) and other measures from the LBNL's facility-wide Storm Water Pollution Prevention Plan (SWPPP) and Storm Water Management Plan (SWMP). Enforcement of these plans and implementation of the required BMPs would be the responsibility of LBNL monitors who would be on-site during all demolition operations to ensure that contractors comply with the stormwater/wastewater management plans (p. IV.G-11)

   As noted below, the DEIR does not include information showing how well these measures have mitigated water quality impacts to date. Moreover, aside from the information provided in the discussion of hazards and hazardous materials (Chapter IV), the DEIR does not include a quantitative description of existing water quality conditions. Since the project will continue for some years, the only way to ensure the efficacy of BMPs is to take runoff samples before the project commences and as it goes forward to evaluate the effectiveness of stormwater pollution prevention measures and make adjustments as needed. Sampling and analyses should be for sediment content as well as known pollutants such as lead, oil and grease, asbestos, etc. Annual reports should be made available for public review as well as to the Regional Water Quality Control Board.

6. The DEIR indicates that electrical and low sulfur diesel power will be used on site for equipment associated with demolition. The City recommends that "ultra-low sulfur" be used, not low sulfur.

7. The DEIR states that project will generate about 34 one-way truck trips per day and 4,700 one-way truck trips over the 4 to 7 years it will take to complete the job. These will be heavy trucks including flatbed and soil-haul trucks. About 5 percent may be overweight, the rest within "normal truck weight limits." The DEIR concludes that, even when considered together with other construction projects, the impact on City streets will be less than significant, and that no mitigation is required. The DEIR states that no damage to roadways is expected "beyond that which would be considered normal wear and tear" because the City's designated truck routes are designed and constructed to sustain regular use by heavy trucks.

   The DEIR includes a mitigation measure stating that UC will reimburse the City for its fair share of costs associated with damage to City streets from University construction activities "provided that the City adopts a policy for such reimbursements applicable to all development projects within Berkeley". The DEIR is correct that the City does not at this time have a specific program for recouping the cost of damage to city streets from construction projects. The City does, however, require private applicants to pay for improvements as a condition of approving projects that are subject to discretionary review under the Municipal Code. The fact that UC is not subject to the City's land use regulations, does not, however, eliminate its responsibility for mitigating the significant environmental impacts of its projects pursuant to the California Environmental Quality Act. Therefore, the DEIR should include a mitigation measure to reimburse the City for damage to streets that will occur as a result of up to seven years of on-going heavy truck traffic. The specifics of the mitigation should be negotiated with the City prior to release of the FEIR.

8. According to the DEIR, about a third of the shielding blocks and other items will have detectable radioactivity above the DOE limit and, therefore, will need to be sent to an approved disposal site, probably in Utah or Nevada. The DEIR states that about half of the truck trips would carry some type of hazardous waste, including low-level radioactive waste. The shipments with the highest levels of radioactivity would be two or three shipments of depleted uranium (p. IV.F-22-23). The DEIR provides information about the potential hazard posed to workers involved in transport and to members of the general public (e.g. pedestrians or passengers in cars along the route) but does not provide information about the potential hazard to those who live along truck routes. Also, even though the DEIR includes data on accident potential on routes within the City, it doesn't discuss potential hazards during transport once the trucks reach Interstate 80. This information is particularly important because of the congested conditions on I-80. The DEIR should also include information about the capacity of the receiving sites.

9. The DEIR states that the 4,700 flatbed and dirt-haul trucks required to transport materials to and from the site would be diesel-powered, and that the exposure to the public of diesel particulate matter emissions would be greater than on-site exposure during demolition because the trucks would pass within approximately 30 feet of residences.

   While Bay Area Air Quality Management District (BAAQMD) considers construction-related impacts to be less than significant if required dust-control measures are implemented, the proposed number of diesel-powered truck trips that will be routed though the City is extremely high. In addition, there are significant adverse public health impacts from particulate matter beyond those modeled for cancer risk. Since the science is not yet available to calculate the additional asthma attacks or death of sickly or elderly people along the transportation corridor, it would be prudent to take protective measures, similar to the ones identified for on-site diesel smoke generating activities. The DEIR should propose a mitigation measure that requires all haulers to use only ultra-low sulfur or biodiesel for the trips to and from LBNL.

10. The DEIR relies on a number of mitigation measures from the amended 1987 LRDP EIR but does not include information to show that these measures have successfully mitigated the impacts they were intended to reduce. Such information should be available from the CEQA-mandated monitoring that LBNL is required to conduct.

11. The DEIR incorporates a mitigation measure from the 1987 LRDP EIR regarding preparation of an annual self-assessment that summarizes environment, health, and safety program activities, and identifies any areas where LBNL is not in compliance with laws and regulations governing hazardous materials, hazardous waste, hazardous materials transportation, regulated building components, worker safety, emergency response, and remediation activities. Without oversight from the City or another outside agency and in the absence of State regulators, it is questionable whether such analysis would be as vigilant as the City and its residents desire. Given the impacts identified in the DEIR, the City recommends that a mitigation measure be added that LBNL provide regular reports during the Bevatron demolition project. Ideally, the reports would be posted on LBNL's web site and sent to all regulatory agencies and the City for information.

12. The DEIR provides little information about how the site will be used between completion of the demolition project and approval of a longer-term plan for development. It states that future development would have to be consistent with the 1987 LBNL LRDP as amended or the pending 2006 LBNL LRDP. At a minimum, the DEIR should indicate what use of the roughly four acre site would be consistent with the 1987 LBNL LRDP, which will be applicable to LBNL until such time it is amended or replaced. The DEIR suggests that about 2.25 acres would not be used for any purpose while the remaining area would be used for parking and staging. It is not clear whether these uses would cease following demolition or if the remaining area of about 1.75 acres would be used for parking for LBNL employees and/or visitors. It should be noted that at the Scoping Meeting it was stated that the 2.25 acres would be returned to open space use. The DEIR needs to provide more information about possible near-term uses of the property and assess any potential environmental impacts. This is particularly important if LBNL intends to use the site for parking.

Please contact Wendy Cosin, Deputy Planning Director, if you have any questions. She can be reached at 981-7402 or wcosin@ci.berkeley.ca.us. Thank you again for the opportunity to comment.

Sincerely,

Phil Kamlarz
City Manager

cc: The Honorable Mayor and Members of the City Council
Dan Marks, Planning and Development Director
Manuela Albuquerque, City Attorney
Arrietta Chakos, Assistant City Manager

<u>Phil Kamlarz, City Manager, City of Berkeley, May 22, 2006 (Comments Identified as "K-1 and K-2")</u>

Response K-1

The EA is being used to evaluate the significance of the impacts of the proposed project and determine if a FONSI can be issued or an EIS will be required. Additional time has been taken to complete the EA, in part, to incorporate and analyze information about potential new projects, such as the Berkeley Lab Guest House and the UCB Southeast Campus Integrated Projects (SCIP), which became available after the issuance of the Draft of this EA. The CEQA FEIR has also incorporated and analyzed this new information, and has provided the responses requested by the commenter.

Response K-2

The Historic American Engineering Record (HAER) report has been placed in the Main Branch of the Berkeley Public Library. The Historic American Building Survey (HABS) addendum to the HAER report has been completed and was accepted by NPS in August 2006 (please see Appendix I). For NEPA purposes, with the signed MOA, completion of the HAER documentation, and approval of the HABS addendum by NPS, LBNL has adequately mitigated for the potential loss of Building 51. In addition, the Advisory Council on Historic Preservation (ACHP) has found that DOE has met its responsibilities under Section 106 of the National Historic Preservation Act (please see Appendix H).

In addition to the HAER/HABS documentation, LBNL plans to commemorate the scientific achievements attributed to the Bevatron with a monument and/or display listing the historic discoveries that occurred there.

Committee to Minimize Toxic Waste

P.O. Box 9646, Berkeley, CA 94709

Mr. Carl Schwab
U. S. Department of Energy
Berkeley Site Office, MS 90R1023
One Cyclotron Road,
Berkeley, CA 94720

May 22, 2006

Subject: Comments on The Lawrence Berkeley National Laboratory's (LBNL) Draft Environmental Assessment (DEA) for the Demolition of the Bevatron Particle Accelerator, Building 51 and 51A.

Dear Mr. Schwab,

PRESERVATION OF THE BEVATRON IS THE MOST PROTECTIVE ALTERNATIVE FOR BERKELEY NEIGHBORHOODS, OUR HISTORY, CULTURE, HEALTH AND THE ENVIRONMENT CMTW-1

- Preserve the Bevatron/Building 51 in commemoration of Nobel Laureate Owen Chamberlain (1920-2006) who was involved in the discovery of the antiproton at the Bevatron and worked on the Manhattan Project during the Second World War. Chamberlain was present in Los Alamos at the testing of the first atomic bomb. Shortly after, he became an outspoken activist for arms control and other issues of social concern. Owen Chamberlain recommended the conversion of the Bevatron facility to a historical and educational resource. CMTW-2

- Preserve the Bevatron/Building 51 in celebration of LBNL's 75th anniversary in Berkeley scheduled for Founders Day, August 26, 2006. CMTW-3

- Preserve the Bevatron/Building 51 to provide the greatest protection for the health and safety of employees, nearby residents and wildlife (i.e. threatened Alameda Whipsnake) and those pedestrians exposed along routes for trucking out radioactive and hazardous waste which will result if the Bevatron is demolished. CMTW-4

In December of 1995, the California State Office of Historic Preservation, Department of Parks and Recreation listed the Bevatron, Building 51 and 51A as California Historic Resources with the following statement:

> *"Building 51 and 51A are eligible for inclusion on the National Register of Historic Places under Criterion Consideration G, as defined in 36 CF 60.4. The Building has strong associations with historic developments in the field of particle physics and was the site of a number of significant breakthroughs.*
>
> *The Bevatron is also noted for its associations with three Nobel Prize-winning physicists (Louis Alvarez, Owen Chamberlain, and Emilio Segre). The breakthroughs developed by these three men were the result of the technology provided by the Bevatron, and its position as the premier facility of its type in the 1950s."* (Attachment 1.)

For the reasons noted in this statement, we consider it mandatory that LBNL and the Department of Energy (DOE) preserve the Bevatron , Building 51/51A Complex, as a living science history site, a museum and education center for the benefit of future generations interested in science, history, architecture and engineering. CMTW-5

However, there are other reasons that preservation of the Bevatron must be the alternative chosen, and not the demolition of the building. These reasons have to do with the environmental impacts which will be miniscule with the Bevatron preserved in place, compared to the environmental impacts arising from the demolition of the facility. Preservation, therefore, provides the greater protection of the health and safety to employees, nearby residents and wildlife (i.e. threatened Alameda Whipsnake) and those exposed along routes for trucking out radioactive and hazardous waste. Some of the potential environmental impacts from the Bevatron demolition are as follows: CMTW-6

- radioactive, lead and asbestos dust permeating the atmosphere of the Berkeley Lab, surrounding neighborhoods, UC dormitories,
- radioactive and toxic dusts being washed down to further contaminate Berkeley's groundwater which should be of potential beneficial use as drinking water in case of disasters or severe drought, CMTW-7
- exposure of pedestrians, shoppers, vehicle drivers and passengers to radioactivity as radioactive Bevatron concrete and metal debris is trucked on City of Berkeley streets (i.e. Hearst, Oxford, University Avenue, Shattuck Avenue, Adeline, and Ashby Avenue) to the freeway, CMTW-8
- severe and extended exposure would occur if any of the trucks hauling radioactive debris were involved in an accident. This is quite probable in view of the twelve accidents per year involving truck collisions along the project truck routes, that occurred between 2002-2004. (p. IVK-15 Table IVK-1 Draft EIR 10/21/05), CMTW-9
- exposing other communities to radioactive and hazardous waste by dumping it in nearby landfills, i.e. Altamont, Richmond, Nevada Test Site, Clive,Utah, etc. CMTW-10
- continuing to speak of "low level" radioactive waste vs. "high level" radioactive waste as though the former were safe, despite the recent National Academy of CMTW-11

Sciences Panel BEIR VII (Committee on Biological Effects of Ionizing Radiation) Report that there is no safe of dose of radioactivity (Attachment 2.), CMTW-11

• Department of Energy treating materials and waste with 2pCi/g of radioactivity and the Department of Transportation treating materials and waste with 270pCi/g of radioactivity as non-radioactive, which requires less safety precautions during transportation and allows the dumping of these materials in ordinary landfills and, therefore, their potential recycling/reuse in household goods and commercial medical equipment, CMTW-12

• a health disaster to project workers, lab employees, students and downwind neighbors should precautionary measures fail during the demolition of the transite exterior siding of Building 51, which contains 20% asbestos fibers. CMTW-13

The DEA is deficient in many respects. Because the Bevatron is eligible to be listed on the National Register of Historic Places, a thorough investigation of all the potential environmental and historic resource impacts of the demolition must be addressed in an Environmental Impact Statement (EIS), including the following: CMTW-14

Hydrology and Water Quality

The EA/EIS must provide: a geologic cross section of the three groundwater plumes which converge at the Bevatron site, i.e. Building 51/64 VOC plume, Building 7 Freon/VOC plume and the old town VOC/Building 7 Diesel plume, to show the depth and concentration of groundwater contamination in the four acre Bevatron site and vicinity. CMTW-15

In addition to the Bevatron core area, more monitoring wells should be located laterally along the Cyclotron Fault and New Fault because they could act as conduits for the contaminated groundwater. CMTW-16

Additional groundwater monitoring wells are needed (a) west of the northern lobe of the Building 51/64 plume as well as (b) west of the western lobe of Building 71 solvent plume to show whether the two plumes converge into a topographic swale and (c) west of the old town plume, specifically in the area between Buildings 46 and 51. All of these plumes are in the Blackberry Creek Watershed and drain west toward the city of Berkeley and San Francisco Bay. (Attachment 3.) CMTW-17

A sampling strategy must be developed and implemented prior to the circulation of the EA/EIS to characterize and provide comprehensive data on the extent of the potential groundwater contamination plume under the Building 5 1/Bevatron. Soil boring(s) and testing should be part of this investigation. CMTW-18

The EA/EIS should show a map of the groundwater plumes in 1995 and in 2005, as they expanded during the RCRA investigations under LBNL's Environmental Restoration Program, so as to illustrate the direction and rate of their movement. CMTW-19

According to the Environmental Checklist's Project Description: "Soil and groundwater contamination are known to be present in some areas beneath Building 51 /Bevatron." The primary known chemicals of concern are chlorinated volatile organic compounds (VOCs) in soil and groundwater. In addition, PCBs have been detected in some groundwater CMTW-20 samples. Contamination in soil, outside the plume source areas, has included primarily chlorinated VOCs, petroleum, aromatic hydrocarbons, polycyclic aromatic hydrocarbons, PCBs and Mercury. CMTW-20

It appears that the location of the groundwater monitoring wells in the general Bevatron site is insufficient to characterize the full extent of these plumes. Are the contamination plumes interrelated? It appears that there are no groundwater sampling wells located in the basement of the Bevatron core area. CMTW-21

If the Bevatron structure is removed, what are the potential effects of the increased rainfall on the now pervious site? What protections will be put in place in the future site design to protect further impact of rainwater on existing groundwater plumes? How will the increased groundwater influence slope stability? CMTW-22

Pulling the concrete plug: How will the removal of the Bevatron and its subterranean structures impact the movement and current hydraulic controls of these groundwater contamination plumes? This factor alone is reason for additional groundwater evaluation and monitoring wells. How is LBNL preparing to prevent any contamination from entering the creeks and ending up in downtown Berkeley where Strawberry Creek flows day-lighted through many public and private properties? For this reason, all site clean-up must be done to residential standards. CMTW-23

Biological Resources and Hazards and Hazardous Materials

The EA/EIS must answer the following questions and provide specified information as follows:

1. Tables showing the specific quantities of activated (containing induced radioactivity) material (e.g., electromagnets, scrap metal, steel, copper, lead, concrete blocks, etc.) and by which of the following radionuclide and by what amount of radioactivity (expressed in Curies) they are activated: Ar-42, Ba-133, Co-60, Cs-137, Eu-152, Eu-154, Fe-55, Ti-44, etc. CMTW-24

2. What is the level of "natural" and/or "background" radioactivity LBNL assigns to and/or deducts from each specific material before shipping? CMTW-25

3. What is the actual activation level of each material to be shipped, particularly for every material referred to as being "slightly radioactive" and "slightly activated"? (DOE 2pCi/g vs. DOT 270pCi/g?) CMTW-26

4. Swipe sampling protocols, e.g. the criteria for selecting items "thought to pose reasonably foreseeable risks" from surface contamination: the portion of the surface to be swiped. CMTW-27

5. The quantities of "non-activated" metals and concrete shielding blocks that are scheduled for shipment to government and private sector parties, with certification by non-DOE parties that the metal within the blocks would not be recycled. CMTW-28

6. The quantities of "non-activated" concrete blocks to be broken into rubble and released for construction projects and road building (again the metal contained within the blocks to be certified non-recyclable as above (see #5) CMTW-29

7. A description of the air monitoring system LBNL has in place to determine any changes in air quality during the deconstruction process, if it proceeds. CMTW-30

8. The capacity of first responders to deal with potential accidents or spills. CMTW-31

9. The detection limits of the surveying instrumentation. CMTW-32

10. Name and location of the specific municipal landfills to which "non-activated" materials will be sent where the landfill operator must certify that the metals will not be recycled. CMTW-33

11. Specifically what is to be shipped to the Nevada Test Site and Yucca Mountain, Nevada, Altamont landfill in Alameda County and Richmond landfills in Contra Costa County, CA, a private landfill in Clive, Utah, Hanford, WA, or other DOE facilities/sites? CMTW-34

12. The effects on the potential beneficial uses of Berkeley's large aquifer, the Lennart Aquifer) i.e. availability in times of drought. Please describe LBNL's request to the Office of the U. C. President to declare groundwater at LBNL non-potable, i.e. initiating the process of declaring LBNL site (Strawberry Creek watershed) as **Brownfields** . CMTW-35

13. Potential effects upon the endangered Alameda Whip snake for which LBNL is critical habitat. CMTW-36

14. What are the cumulatively significant effects, on the human (and endangered Alameda Whip snake) environment, of the Bevatron demolition concurrent with the decommissioning and decontamination of the National Tritium Labeling Facility and the construction and operation of the Molecular Foundry. CMTW-37

15. How radioactive and hazardous materials will be packaged for shipping. How will the trucks transporting hazardous site debris be externally identified as they move through our city and beyond Berkeley. CMTW-38

16. How will radioactive materials, those considered to be "non-radioactive", be packaged for shipping. What are the various criteria used by LBNL to determine materials to be "non-radioactive"? CMTW-39

17. A consideration of alternatives to the demolition and shipping of unpackaged radioactive materials, which are considered non-radioactive, e.g. allowing radioactive materials to decay in place, without further demolition until fully decayed. CMTW-40

18. A comprehensive description of the various beam targets (including the magnet gap) and the beam dump areas during the Bevatron's forty-year history, and a sampling strategy to determine where the highest concentrations and types of radioactivity are located. CMTW-41

The U. S. Environmental Protection Agency's (US EPA) current recommendation is to manage asbestos in place, i.e. leave it alone. For abatement, to encapsulate, enclose, encase asbestos at the Bevatron in areas where needed to prevent exposure to the public. Same abatement strategy should apply for lead. CMTW-42

Further, if the proposed Bevatron demolition proceeds, DOE must obtain COMMUNITY ACCEPTANCE from Clive, Utah residents and other communities who might be the recipients of LBNL's hazardous and radioactive waste. (See Item 11 above.) CMTW-43

Air Quality and Transportation and Traffic

1. If LBNL ends up proceeding with the shipping of the Bevatron debris, all trucks involved must have hazardous materials warning placards in accord with the opinion of the National Transportation Safety Board and the Executive Director of the International Association of Fire Chiefs (West County Times, April 9, 2005). The hazardous materials signs on trucks help firefighters and health officials respond to accidents in the event that hazardous contents are exposed. If the trucks are not properly marked, community safety and emergency responders safety will decrease significantly. CMTW-44

Note: In the past month, there were two deaths in Berkeley associated with construction trucks involved in traffic accidents, within blocks of the UC Berkeley campus. (See attachment 4.)

2. All debris trucks should be fully enclosed van-type vehicles. CMTW-45

3. The air quality along the truck route should be monitored from the Bevatron to 1-80 with a stationary air monitoring protocol. CMTW-46

4. DOE must allow the inclusion of the City of Berkeley Transportation Commission's comments to the DEA/DEIS transportation, traffic and circulation issues as they will not be able to respond until they meet in June 2006. CMTW-47

Geology and Soils

The Bevatron is located on a four-acre site in the western portion of LBNL within the Blackberry Creek (a.k.a. the North Fork of Strawberry Creek) Watershed. The site is in the Hayward/East Canyon/Wildcat Canyon Earthquake Fault Zone, surrounded by two cross faults: the Cyclotron Fault to the south and the New Fault to the north.

The Final EA/EIS must include:

1. A most comprehensive earthquake fault map that would include all the faults in the entire Strawberry Creek Watershed, whether active or not, and an interpretation of the significance of the presences of these faults regarding the transport of surface and groundwater within the area of LBNL, where the Bevatron is located. CMTW-48

2. Watershed map for the LBNL hill site showing the various watershed and sub-watershed divides with a detail of the Blackberry Creek watershed and the four-acre Bevatron site. CMTW-49

3. A Seismic Hazard Zone Map which would show areas in the Strawberry and Blackberry Creek Watersheds where previous landslides had occurred, as well as all topographic, geological, geotechnical, and subsurface water conditions which indicate a potential for permanent ground displacement. CMTW-50

According to a 1949 geologist (C. Marliave) report on the bedrock conditions at the Bevatron site "...the area at the Bevatron is to be excavated and leveled off to elevation 710. The bedrock heneath this beveled surface will be comprised of poorly consolidated Orinda sediments... The Orinda formation absorbs water freely and the lava flows and breccia that are associated with it are also quite pervious so that the whole mass becomes readily saturated... There appears to have been considerable land sliding in the amphitheatre in which the Bevatron is to be located - and during periods of heavy rainfall, the underlying Orinda sediments become quite soft from absorbed water... seeps come out of the ground in many places.. .there are two known permanent springs in the area where tunnels have been driven into the hillside and pipes leading out from the caved entrances have been flowing water for many years."

Even though landside deposits may have been modified or have fill placed over them, their subsurface characteristics/failure planes may exert controls on groundwater flow patterns and thus on the movement contaminant plumes at the hill site. Mapping of the historic landside distribution in the EA/EIS is extremely important for understanding/interpreting how the contaminant plumes may be distributed on the hill. CMTW-51

4. What is the current configuration and condition of the engineered drainage around the Bevatron site? How is groundwater from the seeps and springs intercepted and captured? Where are water sources diverted? Do creek beds of the historic creeks function as conduits for these waters? According to the 1875 F. Soule Map titled: Strawberry Valley and Vicinity showing the natural sources of the water supply of the University of California, at least two of the branches of the North Fork of Strawberry Creek were located directly under the Bevatron Complex. Please provide a historic map of the site showing these watercourses and their current state. CMTW-52

Cultural Resources

The EA/EIS must carefully consider alternatives to demolition and removal that would allow the Bevatron and its contamination to remain on site in relative containment. On site containment will allow the radioactivity to decay in place and not be hauled away to impact other communities. This would also preserve the historic aspects of the Bevatron as it is eligible for listing in the National Register of Historic Places for the research in particle physics that resulted in four Nobel prizes. In December 1995 the California State Office of Historic Preservation listed the Bevatron, Buildings 51 and 51A, as California Historic Resources, as stated earlier.

Bevatron complex, known as the Bevalac District is also eligible for the National Register of Historic Places at a national level of significance for the period 1949-1993. The EA/EIS must address the historic resource impacts of the proposed Bevatron demolition on the Bevalac Historic District. (See attachment 5.) CMTW-53

An application requesting Landmark status for the Bevatron is pending before the City of Berkeley Landmarks Preservation Commission, LPC (See attachment 6). The LPC opened the public hearing May 4, 2006 and continued the hearing to June 1st at the applicant's request, to provide time to obtain document not yet released by the DOE, the Historic American Engineering Record (HAER) Addendum.

<u>We therefore request that DOE complete the HAER Addendum, incorporate it into the EA/EIS, and extend the public comment period to receive public comment on the information in the HAER Addendum. This would allow greater understanding of what is actually proposed to be demolished.</u>

There has been broad support to "Save the Bevatron and Building 51". Over 100 individuals have signed petitions to preserve the Bevatron as a City of Berkeley and National Landmark. (See attachment 7.)

We believe that according to the National Historic Preservation Act, Section 106, the use of Federal funds is prohibited in the demolition of a site that is eligible for listing in the National Register of Historic Places, such as the Bevatron.

In addition, the Memorandum of Agreement (MOA) signed by DOE, California State Historic Preservation Officer and the Advisory Council on Historic Preservation regarding the demolition of the Bevatron building was ratified over eight years ago without any public notice or citizen participation and prior to the release of any environmental review documents for public inspection and comment. We ask that a new MOA be drafted with public participation prior to the completion of EA/EIS. (See attachment 8.) CMTW-54

The projected cost of 85 million dollars for the Bevatron demolition and removal is truly appalling taking into consideration the enormous initial cost of the construction of the facility in the early 1950s, which was approximately 10 million dollars. Therefore we propose that LBNL, in celebration of its 75th Anniversary in 2006, declare an International Architectural Competition for the design and restoration of the Bevatron, and designate it as a historic and educational resource/landmark, as proposed by Nobel Laureate Owen Chamberlain. (Attachment 9). CMTW-55

The shape of the Bevatron and its steel construction lends itself magnificently to the possibility of it being a center courtyard feature for future development at the site. This option would save taxpayers over 80 million dollars and save many communities from the serious potential pollution which the demolition, transportation, and waste dumping would bring about.

Please respond to the comments above in the final EA/EIS as well as to the enclosed letters of concern from Gene Bernardi, James Cunningham, Social Justice Committee of the Berkeley Fellowship of Unitarian Universalists, Public Citizen, Tri-Valley Cares, and BLUE. (See attachment 10.)

Sincerely,

Pamela Sihvola

Pamela Sihvola, Co Chair CMTW

P. O. Box 9646, Berkeley CA 94709

In support and signing onto concerns as stated above

L A Wood

L A Wood, www.berkeleycitizen.org

1803 Bonita Avenue, Berkeley CA 94709

Pamela Sihvola, Co-Chair, Committee to Minimize Toxic Waste, May 22, 2006 (Comments Identified as "CMTW-1 through CMTW-55")

Introductory note: Many of the comments from the Committee to Minimize Toxic Waste (CMTW) are either identical or very similar to comments submitted in May and June 2005 by this same organization or one of its members (Pamela Sihvola) regarding two documents cited on pages 42-45 of the EA, the *Draft RCRA Corrective Measures Study Report for the Lawrence Berkeley National Laboratory* ("CMS Report"), February 2005, and the *Initial Study and Tiered Negative Declaration for the RCRA Corrective Measures – Remedy Selection Project, Lawrence Berkeley National Laboratory*, April 2005 (draft) and August 2005 (final). the *Environmental Assessment and Corrective Measures Study Report for Remediating Contamination at Lawrence Berkeley National Laboratory Regulated under the Resource Conservation and Recovery Act* ("DOE EA/CMS"), DOE/EA-1527, September 2005.

These CMTW comments and DTSC responses to comments are contained in Appendix K to the DOE EA/CMS, *Department of Toxic Substances Control (DTSC) Response To Comments, Lawrence Berkeley National Laboratory on Proposed Cleanup Remedies in the Corrective Measures Study Report and CEQA Negative Declaration,* August 31, 2005.[13]

As they are directly relevant to CMTW's comments on the EA, some of the CMTW comments and DTSC responses from Appendix K to the DOE EA/CMS are reproduced below. As evidenced in the DTSC responses, many of the materials requested by CMTW in their comments on the Draft EA have already been made available to the public via the CMS Report itself and a Berkeley Lab publication referenced by the CMS Report, the *Draft Final RCRA Facility Investigation Report for the Lawrence Berkeley National Laboratory Environmental Restoration Program* ("RFI Report"), September 2000.[14] The EA for the Bevatron and Building 51 Demolition is not intended nor required to duplicate the CMS Report and its supporting environmental documentation, nor the multi-volume RFI Report.

Response CMTW-1

Comment noted. See Section 3.1.1, Introduction, page 11, for discussion regarding Bevatron awards and achievements (see also Section 4.2.3, Cultural Resources, page 33-34).

Response CMTW-2

The respondent's opinions are noted.

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[13] part from being available as part of the DOE EA/CMS Report, this document also is available on DTSC's website at http://www.dtsc.ca.gov/HazardousWaste/Projects/upload/LBNL_CEQA_Response.pdf. See also http://www.dtsc.ca.gov/HazardousWaste/Projects/LBNL.cfm to locate copies of the original CMTW comment letter and attachments.

[14] RCRA is the Resource Conservation and Recovery Act; see the DEIR at pages IV.F-2 - 4. The RFI Report is available at the main branch of the Berkeley Public Library. As stated on the cover page of the RFI Report, "The draft final RCRA Facility Investigation Report (RFI) Report, for the Lawrence Berkeley National Laboratory Environmental Restoration Program, dated September 2000, was approved by the Department of Toxic Substances Control (DTSC) as final. The final RCRA Facility Investigation Report (RFI) Report contained herein consists of the draft final document accompanied by the DTSC approval letter dated July 27, 2001."

Response CMTW-3

The respondent's opinions are noted.

Response CMTW-4

Comment noted. Section 4.2.2, Biological Resources, on page 31, states that Alameda whipsnake (*Masticophis lateralis euryxanthus*), federally listed as "threatened," has not been sighted at LBNL, although suitable habitat may be present on the Lab site.

As stated in response DT-2 above, risks from the transport of waste materials that would be generated by the Proposed Action are addressed in Section 5.1.5, Hazards and Human Health (see pages 68-71), and Section 5.1.10, Traffic and Circulation (see pages 79-84).

Response CMTW-5

The purpose and need for the Bevatron and Building 51 Demolition is described in Section 3.0, Description of Proposed Action and Alternatives. As described in Section 3.0, the facility does not meet current building codes, the roof leaks in several locations, and portions of the structure do not comply with current seismic design standards. In addition, as described in Section 5.1.5, Hazards and Human Health, various types of hazardous materials are present in Building 51. In particular, portions of the facility are radiation controlled areas, and are inaccessible to the general public.

Response CMTW-6

See Section 3.2.2, Preservation Alternative. As discussed in that section, this alternative would not achieve the objectives of the Proposed Action.

Response CMTW-7

Comment noted. Section 5.1.6 discusses Hydrology and Water Quality. See also Section 5.1.5, Hazards and Human Health.

Response CMTW-8

Disposal of the materials that would be generated by the Proposed Action is discussed at various places in the EA, including Sections 5.1.5, Hazards and Human Health (e.g., pages 68-71), 5.1.10, Traffic and Circulation (e.g., pages 79-84), 5.1.8, Public Services (e.g., pages 76-77) and 5.1.9 Public Utilities (e.g., pages 77-79).

Response CMTW-9

See response CMTW-8. Accident data for trucks are presented in Section 5.1.10, Traffic and Circulation; see pages 79-84.

Response CMTW-10

See response CMTW-8.

Response CMTW-11

Comment noted. The respondent referenced an outside report which employs a different methodology for measuring a "safe dose of radioactivity."

Response CMTW-12

Comment noted. As stated in Section 5.1.5, Hazards and Human Health, (page 68) the "process of removing surface contamination from hazardous materials would follow standard LBNL policies and procedures, which are designed to remove or seal and dispose of the contaminants without hazard to workers, the public, or the environmental in accordance with regulatory requirements." Furthermore, standard measures are typically used by the DOE and the DOT in measuring the radioactivity of a material and would be applied to the Proposed Action as well. Disposal of any radioactive material would occur in an approved landfill.

Response CMTW-13

Comment noted. The policies and procedures that would be applied to the Proposed Action are standard LBNL and statewide policies and procedures and would be performed by individuals with sufficient experience and certification. Speculating that these measures would fail is unsubstantiated. Also see Response CMTW-12.

Response CMTW-14

An Environmental Assessment is the appropriate document for the Proposed Action. See response MK-3 above.

Response CMTW-15

Groundwater contamination in the Proposed Action area, including maps showing contaminant contours, is discussed in Section 5.1.5, Hazards and Human Health. The comment does not specify why the description and analysis in Section 5.1.5 is deficient, or why the additional information requested is necessary, nor provide substantial evidence regarding a significant impact that would result from the Proposed Action.

A similar comment (16-21) was made by CMTW in regard to the CMS Report ("The Final CMS Report must include a geologic cross section of each plume to show the depth and concentration of groundwater contamination in the four-acre Bevatron site and vicinity"). A portion of the DTSC response to that comment is applicable here:

> **RESPONSE 16-21** Geologic cross sections showing depth and contaminant concentrations in each of the groundwater contaminant plumes in the Bevatron site are presented in the RFI

Report, with the exception of the Building 51L plume, which was still being characterized at the time. Geologic cross sections illustrating key relationships for the major plume are also presented in Appendix I of the CMS Report, which includes a cross section through the Building 51L plume area.

The relation of the RFI Report to the CMS was explained in DTSC response 16-7:

RESPONSE 16-7 The CMS Report is a complementary report to, and relies on the data presented in the LBNL RFI report, which is the principal site characterization document. For this reason, the CMS only presents a brief summary of the geologic characterization data presented in the RFI Report and cites the RFI report for detailed information. The RFI Report was released for public review on November 15, 2000 and public hearings were held on December 6, 2000 and January 24, 2001.

The RFI report presents site-wide maps of bedrock geologic units, faults, surficial geologic units, stream courses, storm water drainage systems, and landslides. In addition, the site was divided into module areas for which more detailed geologic maps, geologic cross sections, and hydrauger locations were presented. These maps and cross sections were based on the highly detailed synthesis of geologic data presented in the Converse Consultants 1984 Hill Area Dewatering and Stabilization report (Converse, 1984), and supplemented by additional geologic mapping and subsurface drilling data obtained by Environmental Restoration Program (ERP) scientists during the RFI. The Converse Consultants synthesis included a thorough review and analysis of all known previously existing geologic studies at and adjacent to LBNL, and presents a detailed geologic map of LBNL and the surrounding regions as Plate 2 of that report.

Response CMTW-16

LBNL does not agree that there is either a "Cyclotron Fault" or a "New Fault" in the vicinity of the project site. A similar comment (16-22) was made by CMTW in regard to the CMS report ("In addition to the Bevatron core area, more monitoring wells should be located laterally along the Cyclotron Fault and New Fault because they could act as conduits for the contaminated groundwater"). A portion of the DTSC response to that comment is applicable here:

RESPONSE 16-22 There is no geologic evidence for the presence of the New Fault, which was proposed by Lennert and Associates. The reference to the Cyclotron Fault is not known. If this refers to Great Valley Group/Orinda Formation fault contact, then more monitoring wells are not required, since the fault contact is oriented approximately perpendicular to the groundwater flow direction. Several monitoring wells are located close to this contact near Building 51, and groundwater sampling or water level data from those wells do not show any evidence that the contact acts as a preferential conduit for contaminated groundwater flow. It should be noted that the depiction of geologic faults as conduits for groundwater flow is not correct. Although the ability of earth materials to transmit water can in some cases be higher in fault zones, in many cases faults have little or no effect on flow and the fine-grained materials formed by fault movement often serve to impede flow.

Also relevant is a portion of DTSC Response 16-14:

> The RFI and Draft CMS Report do evaluate potential seismic hazards. The Alquist-Priolo Earthquake Fault Zone near LBNL is shown on Figure 4.2-6 in the RFI Report. The zone represents an area within approximately 1/8 of a mile of the surface trace of an active fault where surface rupture might be expected to occur during an earthquake. All areas of soil and groundwater contamination [at LBNL] are outside this area, except for a small area of soil contamination under Building 88 that has been cleaned up to an unrestricted land use-level.

See also responses CMTW-18 and CMTW-21 below.

Response CMTW-17

Berkeley Lab does not agree that additional monitoring wells are necessary in the vicinity. A similar comment (16-23) was made by CMTW in regard to the CMS report ("Additional groundwater monitoring wells are needed (a) west of the northern lobe of the Building 51/64 plume as well as (b) west of the western lobe of Building 71 solvent plume to show whether the two plumes converge into a topographic swale and (c) west of the old town plume, specifically in the area between Building 46 and 51. All of these plumes are in the Blackberry Creek Watershed and drain west toward the city of Berkeley and San Francisco Bay (“Attachment 13"). A portion of the DTSC response to that comment is applicable here:

> **RESPONSE 16-23** There is no technical basis for the additional groundwater monitoring wells suggested. Two groundwater monitoring wells are located down-gradient (west) of the Building 51/64 plume along the former drainage to North Fork Strawberry Creek. Groundwater flow from the “northern lobe” of the Building 51/64 plume would converge on these wells. Contaminants have not been detected in either of these wells and therefore additional monitoring wells are not needed.
>
> Two monitoring wells are located along the former drainage to North Fork Strawberry Creek at the down-gradient edge of the “western lobe” of the Building 71 solvent plume (assumed to refer to the Building 71 Solvent/Freon plume in the vicinity of Buildings 71C through 71K). Concentrations of groundwater contaminants in these wells have either been below the detection limit or well below MCLs for the past 10 years. Groundwater contaminants were generally not detected in a third well that was located in this area. Based on the extensive data available, the Building 51/64 and Building 71 plumes do not converge; however, even if they did converge, there would be no change in the proposed corrective measures.
>
> Several monitoring wells are located between Building 46 and Building 51. Groundwater contaminants have generally not been detected in these wells. In addition, there is a slope stability well SSW19.63 located between Buildings 51 and 46 in the area of potential concern indicated on Attachment 13. SSW19.63 has been sampled approximately annually for VOCs since 1994 to ensure that the Building 46 subdrain adequately captured the down-gradient edge of the Building 52 Lobe. Except for trace concentrations of chloroform (approximately 1 μg/L or less), contaminants have not been detected in this well.

> Note that Attachment 13 [LBNL note: Attachment 3A to the CMTW comments on the Bevatron and Building 51 DEIR is identical to a portion of this earlier Attachment 13] of the comments does not accurately reflect current geologic conditions at LBNL.
>
> The attachment shows “earthquake faults”, “historic landslides” and “unsampled areas which could contain contaminated plume(s)” superimposed on a facility map of the known groundwater chemical plumes and the Building 75 tritium plume. The “earthquake faults” shown on the map are primarily those shown on Plate 3 (i.e. compilation of prior work) of the Converse Consultants 1984 geologic synthesis. As described above, the presence of most of these faults was based solely on conjecture; extensive analysis of field data by Converse Consultants indicated that there was no evidence for their existence. The feature labeled “earthquake fault lineation (sic) undetermined interpreted from 1939 photos” is not based on any known field observations. The areas labeled “historic landslides” do not reflect the current distribution of landslide deposits, which is illustrated in Figure 4.2.7 and 4.2.8 of the RFI Report. The “historic landslides” shown on Attachment 13 are apparently derived from studies that predate cut-and-fill operations, slope stability engineering, and most recent geotechnical studies conducted during development of the facility. In addition to the areas addressed in the preceding paragraph, several other “unsampled areas which could contain contaminated plume(s)” are shown on Attachment 13. These areas are either monitored by existing wells that are part of the groundwater sampling program (and are shown on the map), or are located in undeveloped areas of the facility where contaminants would not be present.

Response CMTW-18

As stated on page 46, “Once Building 51 is demolished, further investigation for potential soil and groundwater contamination at portions of the site that were previously inaccessible would take place, and appropriate corrective measures would be undertaken. Newly discovered environmental releases of hazardous constituents will meet the notification and corrective action requirements in LBNL's Hazardous Waste Facility Permit (EPA ID. no. CA 4890008986), section IV. B. "Newly Identified Releases." Cleanup standards and methods will be consistent with LBNL's Environmental Assessment and Corrective Measures Study Report for Remediating Contamination at LBNL Regulated under the Resources Conservation and Recovery Act (DOE/EA-1527).” Some areas are inaccessible until demolition takes place.

A similar comment (16-21) was made by CMTW in regard to the CMS report ("A sampling strategy must be developed and implemented prior to the publication of the Final CMS Report to characterize and comprehensive data on the extent of the potential groundwater contamination plume under the Building 51/Bevatron. Soil boring(s) and testing should be part of this investigation."). The DTSC response to comment 16-21 is given in CMTW-15, above, and CMTW-21, below.

Response CMTW-19

A comment (9-3) on the CMS Report made by a member of CMTW (Pamela Sihvola) concerned the shape of groundwater plumes at LBNL ("You can see that the plumes have odd shapes. This is a plume here, it is flowing in an old creek bed of Chicken Creek, and I can't really -- I understand that anyone by looking at the shape of this one or this one or this one or this one, can you say that these plumes are contained? They clearly have moved. The source of contamination that sweeps forth right here and all of these that you see here is moving downstream, downstream along the old creek bed, and the canyon wall is here."). A portion of the DTSC response to that comment is applicable here:

> **RESPONSE 9-3** Groundwater contaminants at LBNL initially moved down-gradient from the locations where the original chemical spills or leaks occurred, thereby forming groundwater contaminant plumes. These plumes eventually reached equilibrium and further down-gradient movement of the plumes stopped. The shape of a plume cannot be used to determine whether or not it is currently moving, but is the result of the combined effects of several factors including: a) the locations of the original spills; b) the chemical properties of the contaminants, c) the groundwater gradient (direction of flow) and velocity; d) the time since the initial contaminant release; and, e) the action of natural and artificial mechanisms (diffusion, dilution, degradation, pumping etc.) that attenuate (reduce concentrations of) contaminants. The plumes stabilized after attenuation processes reached equilibrium with the factors that caused them to move. The groundwater contaminant plumes at LBNL are not currently moving, and there is no evidence of recent movement, based on data collected over the past 13 years.
>
> The degree of containment of a plume cannot be determined from its shape, but, must be assessed by viewing variations in contaminant concentrations with time in key monitoring wells. Such data are presented in detail in both the RFI and CMS Reports, and show that the groundwater contaminant plumes are contained; that is, the concentrations of contaminants remain relatively static or are have been decreasing in key wells monitoring the down-gradient edges of the plumes.

Response CMTW-20

A similar comment (16-21) was made by CMTW in regard to the CMS report ("It appears that the location of the groundwater monitoring wells in the general Bevatron site is insufficient to characterize the full extent of these plumes. Are the contamination plumes interrelated? It appears that there are no groundwater sampling wells located in the basement of the Bevatron core area."). A portion of the DTSC response to that comment is applicable here:

> **RESPONSE 16-21** The number and locations of groundwater monitoring wells are sufficient to characterize the magnitude and extent of the groundwater plumes in the Bevatron area and no additional wells are needed to characterize the extent of the plumes. For each of the plumes in the Bevatron area, groundwater monitoring wells have been installed at the contaminant source location, within the plume bodies, cross-gradient from the plumes, and down-gradient from the plumes, thereby defining the extent of the plumes. In addition, a number of wells have been installed in multilevel clusters to assess the depth distribution of contaminants in key areas of the plumes.

> As described in the RFI Report [referenced in the CMS report], the three contaminant plumes described in the comment are not interrelated. These plumes are each derived from distinct sources, have distinct chemical compositions, and are not contiguous.

No groundwater monitoring wells have been installed beneath the Bevatron core area because of logistical constraints on installing wells in that area. In addition, no Solid Waste Management Units (SWMUs) or Areas of Concern (AOCs) that might constitute potential sources of contamination have been identified in the core area. Wells down-gradient from the core area do not show results indicative of a source of chemical contaminants in groundwater beneath that area. Therefore, there is no basis for installing wells or collecting soil samples. If there are any indications of contamination beneath the core area when the Bevatron is demolished, additional investigation will be conducted.

Response CMTW-21

See response CMTW-20 above.

Response CMTW-22

A similar comment (16-22) was made by CMTW in regard to the CMS report ("The Final CMS Report must include the potential effects of the increased rainfall on the now pervious site, if the Bevatron structure is removed. What protections will be put in place in the future site design to protect further impact of rainwater on existing groundwater plumes? How will the increased groundwater influence slope stability?"). A portion of the DTSC response to that comment is applicable here:

> **RESPONSE 16-22** [Regarding future site design] Factors such as slope stability, potential soil and groundwater contamination beneath the building, and the effect on corrective measures proposed for adjacent areas of groundwater contamination would be considered in any redevelopment of the site.
>
> Based on results from the numerous groundwater monitoring wells surrounding the Building 51 complex footprint, there is no evidence from significant groundwater contamination beneath the Bevatron core area. Potential groundwater contamination will be evaluated during demolition and redevelopment of the site, and additional monitoring wells will be installed if necessary.

Stormwater runoff would continue to be discharged into the existing storm drain system that surrounds the complex. This drainage system has the proven capacity to contain surface water runoff. This drainage system is also designed to capture and drain water present in the subsurface. This factor would limit any rise in groundwater levels following completion of the project, either from increased percolation into the now pervious surface or from the pervious slopes immediately uphill from the site. The nearest downhill slopes are a relatively significant distance away and are constructed with an engineered reinforced fill. Thus, the affect on uphill and downhill slope stability would remain largely the same as current conditions.

As stated on page 74 in Section 5.1.6, Hydrology and Water Quality:

“Stormwater runoff from the proposed project is currently discharged to the North Fork of Strawberry Creek. This condition would not change under the post-Building site configuration. Following the demolition and removal of Building 51 and its foundation, the demolition zone would be converted to vacant space and hydro-seeded with native grasses. This would allow varying amounts of surface water to percolate into the ground rather than flow along the surface, especially early in the rainy season when soil conditions are not yet saturated. The percolation of surface water into the ground would slightly reduce the overall quantity of surface water runoff. Because the Proposed Action would cause stormwater runoff on the subject site either to be slightly reduced or to remain the same as under existing conditions, the impact on runoff rates and volumes discharge to the North Fork of Strawberry Creek would be negligible.”

The present storm drain system would be augmented with an additional drainage line that extends into the center portion of the project site. This line will capture a small fraction of the stormwater runoff. The remaining stormwater would percolate into engineered backfill soil with some amount potentially reaching the contaminated groundwater plumes in the area. These plumes have been relatively stable in their movement and are predominantly found outside the footprint of the Building 51 complex under impervious surfaces that will remain after completion of the project. The Lab’s Environmental Restoration Program has numerous wells down-gradient from the project site. It is not anticipated that any stormwater that might potentially reach contaminated groundwater would cause the groundwater plumes to move or significantly affect current hydraulic controls. With clean up efforts of these plumes closely regulated by the state’s Department of Toxic Substances Control, the Lab will closely monitor chemical concentrations and water levels in these down-gradient wells and initiate any corrective actions should movement of either plume occur.

Response CMTW-23

Measures to prevent contamination from entering creeks are discussed in Section 5.1.6, Hydrology and Water Quality, generally; see e.g., pages 71-74. A similar comment (16-24) was made by CMTW in regard to the CMS report ("The Final CMS Report must include how the removal of the Bevatron (a concrete plug) and its subterranean structures impact the movement and current hydraulic controls of these groundwater contamination plumes. This factor alone is reason for additional groundwater evaluation and monitoring wells. How is LBNL preparing to prevent any contamination form entering the creeks and ending up in downtown Berkeley where Strawberry Creek flows day lighted through many public and private properties? For this reason, all site clean-up must be done to residential standards."). The DTSC response to that comment is applicable here:

> **RESPONSE 16-24** The removal of the Bevatron is not anticipated to have a significant effect on the movement or current hydraulic controls of groundwater contamination plumes. Chemical concentrations and water levels in numerous wells down-gradient from the Bevatron will be monitored and corrective action will be taken if it is determined that contaminated water might enter the creek.

Response CMTW-24

The types of radioactive materials that would be encountered, the way they would be handled, and their potential impacts are discussed in Section 5.1.5, Hazards and Human Health. Quantities and destinations of the different categories of materials that would be encountered are presented in Table 4 in Section 5.1.9, Public Utilities. The comment does not specify why the description or analysis in the Draft EA is deficient, or why the information requested is necessary, nor provide substantial evidence regarding a significant impact that would result from the Proposed Action.

Response CMTW-25

Background radioactivity levels are described on pages 36-38.

> "There is little likelihood of induced activity in the majority of the concrete shielding blocks, as only the blocks closest to the beams produced by the Bevatron were exposed to thermal neutrons. Surveys to date of similar blocks found within the Building 51 complex confirm that most blocks have no detectable induced activity. Those that have induced activity have low levels of such activity. This low-level induced activity is of a magnitude similar to the natural radioactivity within the concrete, which typically ranges from 15 to 30 picocuries per gram (pCi/g) total activity. This background radioactivity originates from the elements within crushed stone aggregate that is present in all concrete, and comes primarily from the decay of naturally-occurring radioisotopes of potassium, uranium and its decay series, and thorium and its decay series. The induced radioisotopes that are contained within the concrete shielding include cobalt-60, europium-152/154, barium-133, and cesium-137.
>
> In the Bevatron accelerator apparatus itself, the most prevalent material is steel, with a substantial amount of copper and minor amounts of aluminum and other metals. Preliminary surveys indicate that while a greater proportion of the metals may be activated, the range of activity will be similar to that found in the concrete blocks. The primary isotopes in metals are cobalt-60, titanium-44, and iron-55.
>
> ...Materials that LBNL has reason to suspect might contain radioactivity would be characterized by taking external radiation measurements using appropriate survey instrumentation and/or swipe samples according to DOE-approved protocols."

The only radioactivity included in waste manifests is that added as a result of LBNL operations. Background activity is subtracted at the measurement level.

Response CMTW-26

The activation level of each material to be shipped cannot be specified in advance of the actual surveys of such materials. Section 5.1.5 discusses the range of activation levels that are expected based on past experience; see pages 68-71.

Response CMTW-27

The language quoted in the comment does not appear in the Draft EA. As stated on pages 36-38, materials that LBNL has reason to suspect might contain radioactivity would be characterized by taking external radiation measurements using appropriate survey instrumentation and/or swipe samples according to DOE-approved protocols.

The only portions of the facility suspected to contain radioactivity are located within the inner area of the facility containing the Bevatron apparatus, which is bordered by the concrete shielding blocks. In addition, portions of some of the blocks themselves may be activated. This inner area has been designated a controlled area. Some items from this area have been stored temporarily in other controlled areas. All items from controlled areas would be surveyed before being sent offsite. The type of surveys that would be used would depend upon the items involved.

In the case of the potentially surface contaminated items mentioned in the comment, only a subset of the items located in the controlled areas are liable to have surface contamination. As stated on page 37,

> "As a result of particle beam collisions with these targets, some interior surfaces of the beam tube were contaminated with low levels of various radioactive materials. It is anticipated that very limited amounts of surface radioactivity, affecting a small volume of materials, would be encountered."

To be conservative, all items from controlled areas that might be subject to release, either unrestricted or subject to the DOE Metals Suspension, would be surveyed for surface contamination, even though most are unlikely to be surface contaminated. Swiping would be carried out using protocols consistent with the requirements of DOE Order 5400.5. Items showing any DOE-added activity would be sent to a low level radioactive waste disposal site.

Response CMTW-28

No materials are "scheduled for shipment," as the Proposed Action has not yet been approved. Estimated quantities of the materials listed in the comment are presented in Table 4 in Section 5.1.9, Public Utilities. As stated in the *Agreement between LBNL and DOE Berkeley Site Office, LBNL Implementation of DOE Metal Release Suspension* (April 22, 2005), the DOE Metals Release Suspension does not apply to rebar and other embedded metal materials in concrete that are not surface or volumetrically contaminated due to induced activity; thus, the certification mentioned in the comment would not apply to such metals. It is expected that less than 1 percent of the 12,360 tons of Bevatron accelerator metals listed in Table 4 would be eligible for shipment to landfills, subject to an agreement not to recycle. None would be eligible for unrestricted release.

Response CMTW-29

10,300 tons of concrete shielding blocks are listed in Table 4 as the estimated quantity that would be eligible for unrestricted release. Any portion of this could be broken into rubble and released. However, no commitments have been made to break any blocks into rubble, for any purpose.

Response CMTW-30

Air monitoring at LBNL is described in the Laboratory's annual Site Environmental Report. Regarding radionuclides in particular, as stated in the Air Quality chapter (Chapter 4) in the 2004 edition of that Report:

> Lawrence Berkeley National Laboratory's air monitoring program is primarily designed to measure the impacts from radiological air emissions. The program is designed to meet the requirements established by the United States Environmental Protection Agency (US/EPA) and the United States Department of Energy (DOE) that are contained in the following references:
>
> - 40 CFR Part 61, Subpart H (*National Emission Standards for Hazardous Air Pollutants*, or NESHAPs)
> - DOE Order 5400.5 *(Radiation Protection of the Public and the Environment)*.

The main means by which LBNL would monitor the impact from any air emissions resulting from the Proposed Action would be through the Laboratory's network of ambient air monitoring stations, which are strategically located around the Laboratory and collect particulate samples for measurement of gross alpha and gross beta levels. Please refer to the Air Quality chapter of the Laboratory's Site Environmental Report for further details on these stations, including a figure showing their locations.

Response CMTW-31

Police, fire, and other emergency services are discussed in Section 5.1.8, Public Services.

Response CMTW-32

As described on page 37, the detection limit for volume contamination is 2 picoCuries/gram, while detection limits for surface contamination depend upon the radionuclides being surveyed. Instrumentation is calibrated to achieve these detection limits.

Response CMTW-33

Specific landfills have not yet been selected. As stated on page 79, "As part of its standard operating procedures, LBNL consults with landfills prior to the start of demolition activities to ensure that there is sufficient capacity to accept the amount of waste generated by such projects, and has done so for the proposed project. No problems are anticipated in disposing of the various types of waste that would be generated." Table 4 shows the types of destinations where hazardous and non-hazardous waste generated by the Proposed Action would be sent.

Response CMTW-34

See response CMTW-33.

Response CMTW-35

A similar comment (16-26) was made by CMTW in regard to the CMS report ("The Final CMS Report must include the effects on the potential beneficial uses of Berkeley's large aquifer, e.g., availability in times of drought. Of special concern is the Lennert aquifer, currently pumped by the Shively well #1"). A portion of the DTSC response to that comment is applicable here:

> **RESPONSE 16-26** The Lennert Aquifer is up-gradient from areas of groundwater contamination at LBNL; and therefore, there is no effect on the potential beneficial uses of this "aquifer" from LBNL groundwater contaminants.

LBNL has not made the purported request to the Office of the U.C. President described by the commenter, and has no plans to do so.

Response CMTW-36

Section 5.1.2, Biological Resources, discusses the potential impacts of the Proposed Action on threatened and endangered species. As stated in footnote 3, page 31, suitable whipsnake habitat is not present at or near Building 51.

Response CMTW-37

Cumulative impacts are addressed in Chapter 5, Environmental Consequences. The Molecular Foundry was not included in the cumulative impacts analysis because its date of completion was set to occur before the start of the Proposed Action. The Molecular Foundry construction was completed in early 2006. Closure of the National Tritium Labeling Facility, which was completed in 2002, is not concurrent with this Proposed Action. See also response CMTW-36.

Response CMTW-38

Packaging and labeling of hazardous and radioactive materials is discussed in Section 5.1.10, Traffic and Circulation, e.g., at pages 82-83, and in Section 5.1.5, Hazards and Human Health on pages 68-71. DOT requirements for the transportation of these materials in commerce are specified in Title 49 of the Code of Federal Regulations (CFR), Subchapter C. Where any material meets the DOT definition of hazardous or radioactive, it will be transported in compliance with these requirements. This may or may not require the use of specified packaging, depending on the potential for dispersion of the material during transit. Materials that are not defined as hazardous or radioactive in accordance with DOT regulations have no specified packaging requirements. There are numerous other basic transportation requirements that govern the transportation of all materials in commerce. For example, loads must be secured using DOT-approved hold down devices which will ensure that materials do not fall from a vehicle during transportation. Where small objects or debris which cannot themselves be adequately secured to a vehicle are transported, such materials will be packaged in a "strong, tight" package which is designed to contain materials during all conditions incident to normal transportation. Examples of such containers include metal boxes or covered roll-off containers. General non-hazardous construction debris or soil which would be transported in a dump truck must conform to requirements for a cover on the load to prevent release of materials to the roadway or otherwise endanger other vehicles while in transit. Transportation of Building 51 demolition debris would be conducted in compliance with all applicable Federal, State, and local regulations. LBNL intends to use only transportation companies that are fully licensed and registered for commercial transportation activities.

Regarding the identification of trucks, DOT regulations specify the criteria used to define a material as hazardous or radioactive in transportation and include the requirements for marking and labeling of such materials and placarding of their shipments while in transit. All transportation vehicles are marked with the company name and DOT/Interstate Commerce Commission registration number in addition to other company specific vehicle identification numbers.

Response CMTW-39

See response CMTW-38.

Response CMTW-40

Radiological decay in place programs are designed for short-lived isotopes and allow the generator to hold these materials in storage until they have decayed to levels below detection limits, at which point they are managed as non-radioactive wastes. This is done for materials with isotopes that have much shorter half-lives than those present in the Bevatron. For example, regarding medical isotopes, the Nuclear Regulatory Commission authorizes "decay-in-storage" only for those isotopes that have half-lives shorter than 120 days (10 CFR 35.92). The predominant isotope in the Bevatron materials is Cobalt-60, which has a half-life of 5 years. It would be inappropriate to apply a program designed for short-lived isotopes to these materials.

In addition, radioactive materials typically are stored for 10 half-lives before they are released. This would result in storage times of 50 years or more for isotopes such as Cobalt-60. In effect, this would mean the postponement of the Proposed Action in favor of one of the alternatives examined in Section 3.2, Alternatives, e.g., the No Action Alternative. The EA concluded that this would not attain the goals of the Proposed Action.

Lastly, decay in place would apply only to radioactive materials. Other hazardous materials that are or may be present at the facility, such as asbestos, lead, and chromium, are stable and do not decay.

Response CMTW-41

See response CMTW-15. Regarding a "sampling strategy," see response CMTW-18.

Response CMTW-42

Respondent's comment that US EPA's recommendation that asbestos be managed in place be also applied to lead are noted. As described in Section 5.1.5, Hazards and Human Health (pages

68-71), the project would incorporate activities and programs to ensure compliance with regulatory and LBNL-specific requirements. This includes lead abatement.

Response CMTW-43

Comment noted. Specific disposal sites have not yet been selected.

Response CMTW-44

See response CMTW-38. The commenter did not attach a copy of the newspaper article cited in this comment, and it is unknown whether the opinions cited concern regarding the Proposed Action in particular. 49 CFR 171.2(f)(2) states that "No person shall, by marking or otherwise, represent that - ... A hazardous material is present in a package, container, motor vehicle, rail car, aircraft, or vessel, if the hazardous material is not present." LBNL follows all DOT requirements for the marking, labeling and placarding of hazardous materials in transportation, and would not intentionally violate the provisions of the Federal regulations governing hazardous materials by representing a shipment as hazardous if such shipment did not meet the definition of a hazardous material as specified in 49 CFR. DOT regulations have been promulgated with due consideration to public safety as well as the safety of emergency responders.

Accident data is presented in Section 5.1.10, Traffic and Circulation; see page 84.

Response CMTW-45

Where necessary for containment, debris will be transported in a container designed to contain all material during conditions incident to normal transportation. For large debris such as concrete blocks, large pieces of steel, or large magnets, the typical size and weight of these items preclude safe loading and unloading if a fully enclosed van-type vehicle is used. Covered van-type vehicles are not designed with the necessary tie down devices to adequately restrain a load such as a large concrete block during transportation. Also, both LBNL and the various receiving facilities must use a crane or large fork-lift for unloading at the destination site, which could not be practically or safely used if an enclosed, van-type vehicle was used. Since the majority of debris from the Proposed Action does not contain dispersible radioactivity or hazardous constituents, transportation of all debris in an enclosed vehicle is not warranted. See also response EHS-8 and response CMTW-38.

Response CMTW-46

Section 5.1.1, Air Quality, which addresses air quality impacts from the Proposed Action, found that no reasonably foreseeable significant air impacts would result. The comment does not specify why the description or analysis is deficient or why air quality along the truck route should be monitored, nor provide substantial evidence regarding a significant impact that would result from the Proposed Action.

Response CMTW-47

Comment noted. LBNL has responded to comments received both before and after the public comment period. To date, the City of Berkeley Transportation Commission has not submitted any written comments.

Response CMTW-48

Section 4.2.4, Geology and Soils, discusses active faults in the vicinity, while hydrology in the vicinity is discussed in Section 4.2.6, Hydrology and Water Quality. The only active fault near the Proposed Action site is the Hayward Fault. The comment does not specify why the description or analysis is deficient, why showing all faults (including inactive faults) in the entire watershed is necessary, why it is necessary to discuss the relation of these faults to surface and groundwater transport, or otherwise nor provide substantial evidence regarding a significant impact that would result from the Proposed Action. See also response CMTW-15.

A similar comment (16-16) was made by CMTW in regard to the CMS report ("The Final CMS Report must include a comprehensive earthquake fault map that would include all the faults in the entire Strawberry Creek Watershed, whether active or not, and an interpretation of the significance of the presences of these faults regarding the transport of surface, soil and groundwater within the LBNL site"). A portion of the DTSC response to that comment is applicable here:

> **RESPONSE 16-16** A fault map of the entire Strawberry Creek watershed would cover large areas outside the LBNL site and is outside the scope of the CMS. LBNL provided earthquake fault maps in the RFI Report that include faults that could potentially play a role in the migration of contaminants. There is no evidence that any of these faults act as conduits for contaminant migration.

Response CMTW-49

Hydrology in the vicinity is discussed in Section 4.2.6, Hydrology and Water Quality, which includes a discussion of the various creeks in the vicinity. The comment does not specify why the description or analysis is deficient, why a watershed map is necessary, nor provide substantial evidence regarding a significant impact that would result from the Proposed Action. See also responses CMTW-15 and CMTW-48.

A similar comment (16-17) was made by CMTW in regard to the CMS report ("The Final CMS Report must include a watershed map for the LBNL hill site showing the various watershed and sub-watershed divides with a detail of the Blackberry Creek watershed and the four-acre Bevatron site as well as the Strawberry Creek watershed including the Chicken Creek sub-basin and the East Canyon area above the UC Botanical Garden.") A portion of the DTSC response to that comment is applicable here:

RESPONSE 16-17 Maps showing the boundary between the Blackberry Creek watershed[15] and the Strawberry Canyon watershed (and also showing site creeks and drainage systems) are provided in the module-specific volumes of the RFI Report. This information is provided along with details of the stormwater discharge system to show which offsite creeks (Strawberry or North Fork Strawberry) are the receptors of surface water runoff from the site. The locations of the sub-basins are not relevant to the CMS.

Response CMTW-50

The Proposed Action will not increase landslide hazards, and it is unnecessary to provide a map showing previous landslides, especially landslides in entire watersheds. The Proposed Action involves demolition of a facility that is currently located on a stable geologic unit. Because the facility would be removed and the facility footprint converted to vacant area, the Proposed Action would not cause a condition that would destabilize the underlying geology. Although portions of LBNL property may be within a Seismic Hazard Zone, this zoning does not apply to the Proposed Action because the building site itself is not zoned, and the Proposed Action involves demolition, with no new facility construction.

It is unnecessary to show "all topographic, geological, geotechnical, and subsurface water conditions which indicate a potential for permanent ground displacement." Lastly, groundwater plumes are discussed in Section 4.2.5. See response CMTW-48. It is unnecessary to show the distribution of groundwater plumes on the entire LBNL site. See response CMTW-15.

Similar comments (9-5, 16-18 and 16-19) were made by Pamela Sihvola and/or CMTW in regard to the CMS report (9-5: "And I would like to read for the record what I read before from a 1949 geologist's report for this site, where the Orinda Formation is used as the foundation for not cleaning up these plumes. The Orinda Formation, and I'm not going to read the whole thing here, the area as available is a four-acre site needs to be X-rayed, this is 1949 before the building was constructed, and leveled off. The bedrock beneath this beveled surface will be comprised of poorly consolidated marine sediments. The Orinda Formation absorbs water freely and a lot of those features that are associated with it are also quite pervious so the whole mass is really saturated in the area adjoining the Lisbon Tract to the east, which is comprised of the same formation as those under consideration, all the Lisbon Tract. They had 68 streams from which they once collected water for the domestic supply of Berkeley in the early days. There appears to have been considerable landsliding in this active area, and the appearance of heavy rainfall, the deep overburden and underlying marine sediment becomes quite soft from the absorbed water, seeps come out of the ground in many places, and even while several inches of rain are falling, this was a stream in 1949." 16-18: "The Final CMS Report must include a Seismic Hazard Zone Map which would show areas in the Strawberry and Blackberry Creek Watersheds where previous landslides have occurred, as well as all topographic, geological, geotechnical, and subsurface conditions which indicate a potential for permanent ground displacement." 16-19: "It

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15 LBNL note: As stated in Section 4.2.6, Blackberry Canyon is in the North Fork of Strawberry Creek watershed. Blackberry Canyon is drained by the North Fork of Strawberry Creek and Strawberry Canyon is drained by the South Fork of Strawberry Creek.

should be noted that in a 1949 geologist (c. Marliave) report on the bedrock conditions at the Bevatron site "…the area at the Bevatron is to be excavated and leveled off to elevation 710. The bedrock beneath this beveled surface will be comprised of poorly consolidated Orinda sediments…The Orinda Formation absorbs water freely and the lava flows and breccia that are associated with it are also quite pervious so that the whole mass becomes readily saturated… There appears to have been considerable land sliding in the amphitheatre in which the Bevatron is to be located – and during periods of heavy rainfall, the underlying Orinda sediments become quite soft from absorbed water … seeps come out of the ground in many place, there are two known permanent springs in the area where tunnels have been driven into the hillside and pipes leading out from the caved entrances have been flowing water for many years" (Attachment 12). Further, though landsliding deposits may have been modified or have fill placed over them their subsurface characteristics /failure planes may exert control on groundwater flow patterns and thus on the movement contaminant plumes at the hill site. Mapping of the historical landslide distribution in the Final CMS Report is extremely important for understanding/interpreting how the contaminant plumes may be distributed on the hill."). Portions of the DTSC responses to those comments are applicable here:

> **RESPONSE 9-5** ...The CMS Report notes that rocks of the Orinda Formation have low permeability values with the exception of a few areas where permeability is relatively high apparently due to the local presence of coarse-grained strata. The hydraulic conductivity (permeability) of the saturated portion of the Orinda Formation at LBNL has been extensively tested in numerous locations by hydraulic testing and yield testing of monitoring wells. The results of these tests are documented in the RFI and CMS report.
>
> **RESPONSE 16-18** ...a map depicting both prior landslides and areas susceptible to future landslides is presented in the RFI Report. This map is based on a synthesis of topographic, geologic, geotechnical, and hydrogeologic data.
>
> **RESPONSE 16-19** Slope stability analyses and extensive engineering of cut-and-fill operations have been an integral part of development of LBNL facilities, particularly large facilities such as the Bevatron. This work has included extensive mapping, drilling, and logging of soil borings, and geotechnical testing of soil samples. Much of these data were used for preparation of geologic maps and cross sections presented in the RFI and CMS reports. The 1949 report by Marliave documents conditions that were present prior to preparation and placement of engineered fill at the Bevatron site, not current conditions.
>
> Geologic maps showing the distribution of historically active landslides and paleolandslides are included in the RFI Report and Appendix I in the CMS Report. The subsurface distribution and hydrogeologic properties of bedrock units and surficial geologic units (including landslide deposits) and the relation of these units to contamination plume locations are discussed in the RFI and CMS Reports, and were a primary consideration in the assessment of the fate and transport of groundwater contaminants and siting of groundwater monitoring wells. Groundwater monitoring wells are located in the downslope area of a number of the slide deposits that intersect contaminated groundwater. Based on the logging

> of the borings for the wells and the groundwater sampling data, there is no evidence that former landslide slip planes are a preferential pathway for contaminant migration.

A portion of DTSC response 16-8 also is relevant:

> **RESPONSE 16-8** Detailed information on areas of slope instability is provided in the RFI Report. Figure 4.2-7 in the RFI Report includes the locations of recent landslide deposits mapped by Harding-Lawson Associates (1982). The RFI Report also contains a landslide hazard map (Figure 4.2-8) showing areas that are considered to have a risk of landslide movement. These areas include both known historical landslide deposits (generally classified as high risk) and areas where landslides have not occurred, but that are known or suspected to be susceptible to landsliding.

Response CMTW-51

See response CMTW-50.

Response CMTW-52

A similar comment (16-20) was made by CMTW in regard to the CMS report ("The Final CMS Report must include the current configuration and condition of the engineered drainage around the Bevatron site. How is groundwater from the seeps and springs intercepted and captured? Where are water source diverted? Do creek beds of the historic creek function as conduits for these waters? According to the 1875 F. Soule Map titled: Strawberry Valley and Vicinity Showing the Natural Sources of the Water Supply of the University of California, at least two of the branches of the North Fork of Strawberry Creek were located directly under the Bevatron Complex. The Final CMS Report should provide a historic map of the site showing these watercourses and their current state."). A portion of the DTSC response to that comment is applicable here:

> **RESPONSE 16-20** ...the RFI Report provides site-wide maps showing the principal stormwater drainage systems and stream courses. The stormwater drainage systems connect to various smaller building subdrain systems within the buildings of the Bevatron Complex. Building subdrains that intercept clean groundwater discharge to the storm drain system that drains to the creeks. Building subdrains that intercept contaminated groundwater (including a portion of the Building 51 subdrain system) are routed to on-site groundwater treatment systems. Segments of several creek beds (including part of North Fork Strawberry Creek), were culverted during construction of the facility.
>
> A number of groundwater monitoring wells has been installed in former creek bed locations in several of the historic creeks to evaluate whether they function as conduits for contaminant migration. These include North Fork Strawberry Creek and some of its tributaries and Chicken Creek. At some locations the historic creek beds appear to be preferential flow paths, while at others they do not. Groundwater contaminant flow paths are discussed in the Draft CMS Report.

> The RFI Report contains detailed maps of both the original topography and current topography of the Bevatron Complex that illustrate the locations of former drainage courses beneath those buildings. Geologic cross sections in the RFI Report and Appendix I of the CMS Report show the geometry of artificial fill that has been placed in these drainages.

Response CMTW-53

In regard to allowing radioactivity to decay in place, see response CMTW-40.

Alternatives to demolition, including the No Action Alternative and an alternative to encase the facility as a central courtyard feature, are discussed in Chapter V, Alternatives. As discussed in that chapter, these alternatives would not achieve the goals of the Proposed Action, as well as possessing other disadvantages. For example, the encasing/central courtyard alternative would require major upgrades to the building and entail significant additional costs.

It should also be noted that in earlier comments to Berkeley Lab, CMTW supported the dismantling of Building 51, in contradiction to its present stance. In its July 17, 2003 written comments opposing the Laboratory's proposed Building 49 Proposed Action, CMTW stated the following:

> The Lawrence Berkeley National Laboratory has several acres of re-usable land, on which huge decommissioned facilities are waiting for clean-up. These sites include the Bevatron Accelerator, Building 51 [and two other buildings], some of which have already been standing idle for over a decade. We are requesting a commitment from Department of Energy and LBNL for a time-line for the comprehensive clean-up of these contaminated sites to facilitate their potential re-use, prior to undertaking any new development on any of the remaining pristine, unused, i.e. new open space lands at LBNL in the Strawberry creek Watershed. The Lab must prepare an EIR under CEQA and an EIS under NEPA for the dismantling of these facilities, the hauling/shipping of resulting radioactive/hazardous debris and for the final disposition of those materials and the contaminated soil/vegetation that will be removed from the sites as a result of the clean-up process.[16]

The Historic American Engineering Record (HAER) addendum has been completed and was accepted by NPS in August 2006. The DOE does not intend to include the addendum in the EA due to its size and bulk. However, the National Park Service letter accepting the HAER is included in the EA as Appendix I.

Response CMTW-54

It is not necessary for the Department of Energy to prepare an additional Memorandum of Agreement (MOA). The MOA is adequate per federal guidelines.

Response CMTW-55

[16] See Appendix B, page B-135, of the *Construction and Operation of the Building 49 Project Draft Environmental Impact Report,* September 2003 (SCH No. 2003062097).

Comment expresses respondent's proposal that LBNL declare an International Architectural Competition to design and restore the Bevatron and is noted.

From: A and MC [mailto:foggy247@earthlink.net]
Sent: Monday, May 22, 2006 9:15 PM
To: CESchwab@lbl.gov
Subject: Bevatron disposal plan

Hello.

I have only recently heard of the plan to dispose of the Bevatron. I am presenting a point of view against such a plan. My point of view is most likely one you've already heard of, but just in case it has not been presented, here it is in brief with all due humility.

I received from UC Berkeley both my B.A., Physics, in 1957, and the Ph.D., Physics, in 1961. I did my graduate work in experimental atomic beam spectroscopy under Professor William Nierenberg who was a student of Professor I. I. Rabi at Columbia University. My experiments were conducted at the Lawrence Berkeley Laboratory, then also referred to as "The Hill", with an atomic beam machine constructed by Professor Nierenberg's team and located in a laboratory in the Chemistry Building. The experiments were conducted from 1958 to 1960 and with the collaboration of Ingvar Lindgren who was visiting from Uppsala University in Sweden where he had just completed his Ph.D. dissertation in the same field. That he chose to work with me on the rare-earth (lanthanide) series was most opportune in that we successfully measured electronic and nuclear ground-state spins of thirteen rare-earth elements. Our work completed the understanding of the electronic structure of the rare-earth series of elements of the periodic table. Professor Lindgren (Chalmers University of Technology and Goteborg University) also was member and chairman of the Nobel Prize Committee for Physics, 1978-91, and Director of the Swedish Foundation for Strategic Research in Science, Technology and Medicine, 1994-98.

My point of view about the Bevatron is the following. The Bevatron is obviously the direct descendant of Ernest O. Lawrence's cyclotron at LBL that helped initiate high-energy particle physics research worldwide. I see the Bevatron as midpoint between the cyclotron and the immense particle machines that followed. AYC-1 The transition was from small group experimental and theoretical research to large group team research with members numbering in the hundreds. I would surmise that the Bevatron was home to hundreds of experimental and theoretical nuclear physicists from the U.S. and worldwide. The Bevatron made possible numerous important discoveries in nuclear physics and as such deserves to be preserved as part of particle physics history. The site of the Bevatron at Lawrence Berkeley Laboratory now stands as a one of a kind AYC-2 monument as part of the glory of physics at the University of California and the nation as a whole. It would be a shame to lose such a treasure. AYC-2 cont.

Most respectfully,

Amado Y. Cabezas, Ph.d. Physics, 1961, UC Berkeley

Amado Y. Cabezas, May 22, 2006[17] (Comments Identified as "AYC-1 and AYC-2")

Response AYC-1

Comment noted. Proposed Action impacts to cultural resources would be reduced by Historic American Engineering Record (HAER) and Historic American Building Survey (HABS) documentation. In addition, LBNL plans to commemorate the scientific achievements attributed to the Bevatron with a monument and/or a display listing the historic discoveries that occurred there.

Response AYC-2

Comment noted. As described in Section 3.0, Description of Proposed Action and Alternatives, without extensive and costly modifications, the building would not be suitable for reuse in the manner suggested in the comment, and such reuse would not meet the objectives of the Proposed Action. The facility does not meet current building codes, the roof leaks in several locations, and portions of the structure do not comply with current seismic design standards. In addition, as described in Section 4.2.5, Hazards and Human Health, various types of hazardous materials are present in Building 51, such as asbestos, lead, and chromium.

[17] Email date

Comment Letter CBPDD

RECEIVED

JUN 2 3 2006

BERKELEY SITE OFFICE

CITY OF BERKELEY

Planning and Development Department

June 21, 2006

Mr. Carl Schwab
U.S. Department of Energy, Berkeley Site Office
MS 90R 1023
One Cyclontron Road
Berkeley, CA 94720

Dear Mr. Schwab:

Attached is a report from the Chair of the Community Health Commission (CHC) to the Berkeley City Council documenting the actions taken by the CHC at its meeting of May 11, 2006, regarding the Draft Environmental Assessment for the Demolition of the Lab's Building 51 and the Bevatron. This action is recorded in the draft minutes of the meeting, which are subject to approval by the full Commission at its next regular meeting.

Unfortunately, the CHC comments were not transmitted to the City Council in time to be sent to you prior to the end of the comment period for the DEA. We hope you will consider these comments during your completion of environmental analysis for the project. Thank you.

Sincerely,

Wendy Cosin

Wendy Cosin
Deputy Planning Director

Cc:
Peggy Gibbons, Deputy Health Department Director
Arrietta Chakos, Assistant City Manager
Terry Powell, LBNL

2118 Milvia Street, 3rd Floor Berkeley, CA 94704 Tel: 510.981-7400 Fax: 510 981-7470 TDD:510 981-7474
E-mail: planning@ci.berkeley.ca.us

- Approximately 4,700 truck trips will occur during this demolition. A single route (Hearst – Shattuck – University Ave.) for the round-trips will be used. During that period, it is possible that major construction will take place at the Ashby interchange at I-80.
- Other construction that is planned or on-going at LBNL, UC Berkeley, and the City of Berkeley (DEA, pp 86-89) are described, but their impacts are not aggregated in the DEA.

2. The DEA states that the "future use of the site is speculative, it is not described in this Environmental Assessment, nor are the impacts of such use evaluated" (DEA, p. 7), however, the 2006 LBNL Long Range Development Plan (LRDP) and its accompanying LRDP EIR will be circulated later this year for review and may described a possible future use for the site (DEA, p. 7)

3. The DEA acknowledges that the demolition activities are subject to Federal and State regulation. Federal regulations, especially over the past 6 years, have been consistently relaxed and frequently unenforced. Not surprisingly, the community may not feel confident that reliance on federal regulation will do much to ensure that their health is protected.

4. The City of Berkeley has recently passed a Precautionary Principle Ordinance which states that the City, in areas of policy defined by the ordinance, will:

   Examine a full range of alternatives and select the alternative with the least potential impact on health and the environment including the alternative of doing nothing.

   Although the issue that is the subject of our recommendation to the City Council is not defined in the Ordinance, it is nevertheless the belief of the CHC that precautionary considerations should be part of the City Council's evaluation process.

B. The Community Health Commission approved the following recommendations to the City Council:

1. Request that plans for the demolition of Building 51 and the Bevatron not be finalized until the public has the opportunity to review and comment on LBNL's Long Range Development Plan due out later this year. CBPDD-1

2. Establish air monitoring equipment along the truck travel routes that can be accessed in real time by the community via the internet. Elements to monitor include criteria pollutants (the federal Clean Air Act, and the EPA identify and set standards to protect human health and welfare for six pollutants: ozone, carbon monoxide, particulate matter [PM10], sulfur dioxide, lead, and nitrogen oxide) as well as PM2.5 and asbestos. Doing so will assure the community that they are not being exposed to harmful contaminants as they have assured in the DEA. An air monitoring system can also be used by researchers looking at air quality issues. A memorandum written by Commissioner Kahn that provides more explanation on why air quality should be monitored is attached. CBPDD-2

Water quality and noise levels in and around the demolition site should be similarly monitored and reported. CBPDD-3

3. Determine if CalTrans plans any major work on the I-80 between Powell and Buchanan Streets over the next 7 years that might exacerbate the projected traffic and air quality conditions throughout the City. CBPDD-4

4. Request assurance that, should the demolition go forward, it be concluded in four years or less reducing the impacts on the neighborhoods close to the demolition site and reducing the possibility that an unfinished demolition site will increase exposures to hazardous materials. CBPDD-5

5. Should the demolition go forward, all trucks that are used for the transportation of rubble should be spot checked for safety and its diesel fuel for adherence to the federal government's latest regulations which go into effect in September 2006. CBPDD-6

6. There has been some community opposition to the Clive, Utah waste disposal site by people living in the area. The City of Berkeley should make the Clive community aware of the proposed disposal of hazardous material and be certain that we are not shipping hazardous waste to a community that is opposed to receiving it. CBPDD-7

POSSIBLE FUTURE ACTION

The CHC acknowledges that it does not have enough information or the capacity to fully evaluate and compare the potential health risks associated with either the demolition of the buildings or leaving the buildings intact. It is therefore the recommendation of the CHC that no action be taken by the University and/or LBNL on Building 51 and the Bevatron – in effect leaving the buildings intact since no action appears to be the least harmful action.

FISCAL IMPACTS OF POSSIBLE FUTURE ACTION

Unknown

Attachment: Memorandum by Commissioner Stanley Kahn

ATTACHMENT

Air Quality and the Demolition of the Bevatron

Extensive discussion of the above topic has been made available by UC Berkeley in a Draft EIR (Environmental Impact Report) in a sixteen page document. I have read it over several times, and find it very difficult to summarize in a few sentences.

There are, however, a number of points to be made.

1. The demolition of Building 51 will require removal of the waste material resulting from the demolition by Diesel powered truck transport, through the City of Berkeley, over major thoroughfares, over an estimated time period of at least fours years or more. CBPDD-8

2. In addition to the potential pollution of the ambient air in Berkeley, both at the demolition site as well as in the vicinity of the truck route, by asbestos particles, particulate matter of various sizes, and chemical pollutants of a wide variety, a major consideration is also tailpipe pollution from Diesel powered trucks. Indeed, the EIR appears to regard this as a more important source of pollution than that of the material carried in the trucks. Furthermore, it is well known that carbon monoxide is a deadly gas produced by automotive exhaust. CO poisons the Hemoglobin carrying of Oxygen to the tissues. CBPDD-9

3. Insofar as measurement of the impact of the demolition process and truck transport is concerned, current facilities for potential measurement of air quality are totally inadequate. **The nearest air pollution measuring facility is the Alice Street Facility, in Oakland, six miles south of the project.** Ozone and carbon monoxide are the primary pollutants measured there. However, **the nearest specific particulate measuring facility is in Fremont, 30 miles southeast of the project site!** CBPDD-10

4. Insofar as demolition site protection is concerned, the sides of the building will not be demolished until all the material inside the building has been removed as a protective measure. Although a variety of "mitigation measures" are proposed by the Berkeley Lab, including frequent wetting down of the demolition site, protection of the aggregate material on trucks by a six-inch freeboard or covering of the cargo, **there is no plan to measure the impact of the entire process by any new special monitoring facilities!** CBPDD-11

5. The draft document discusses at great length the various Federal and State Rules and Regulations, including, of course those of the EPA. There are apparently none existent for the City of Berkeley. The fact that the San Francisco Bay Area Basin, as I interpret the EIR, is a non-attainment area at least for ozone, is a source of concern. The Laboratory evidently plans to keep well within those regulations. CBPDD-12

6. Particulate matter, which is classified in two different sizes, appears to be a major hazard of Diesel tailpipe exhaust. Inhalation of these particles is potentially injurious to humans, especially those with chronic lung and cardiac disorders. I need not emphasize the dangers of inhaled asbestos as a potential carcinogen. CBPDD-13

7. It would appear to me, as a resident of Berkeley, that the demolition project should be very carefully reviewed by the City Council, that an impartial expert in industrial Toxicology be consulted by the Council for third party advice in order to minimize the potential dangers this Demolition project might impact on our citizenry, as well as recommendations for careful monitoring of ambient air in the vicinity of the truck route. CBPDD-14

8. It is not clear to me from the EIR whether there is any possibility of pollution by radioactive material, either at the demolition site or along the truck route. CBPDD-15

Stanley Kahn
Community Health Commission

Wendy Cosin, Deputy Planning Director, City of Berkeley Planning and Development Department, June 21, 2006 (Comments Identified as "CBPDD-1 through CBPDD-15")

Comments from Wendy Cosin were received after the close of the public comment period on the Draft EA; however these comments are pertinent to the Proposed Action.

Identical comments were previously submitted by the City of Berkeley Environmental Health Subcommittee to the Community Health Commission and responses to them are included above (see responses EHS-4 through EHS-17).

Landmarks Preservation Committee
Berkeley, CA
Attn: Robert Johnson, Chairman

Dear Commissioners,

My name is Jim Cunningham. I am a Berkeley resident since 1968 and was a professor at the University of California for many years. It is a great university and deserves our respect and admiration for many reasons.

The University is going through a very difficult time financially, as is, of course, the state of California. The expansion and building projects being proposed are enormous and are being finded in large part by private donations. If you read the article in the Daily Planet on the EIR for the new stadium complex you realize quickly that that part of the city will be gone and the neighborhoods surrounding it will be gone. Berkeley will change.

I am, however, writing these words concerning the vote on the preservation of the Bevatron. I realize that your committee does not just look at the building to be preserved but looks at the neighborhood and the people who live in the neighborhood. I was very pleased at the last meeting when two committee members expressed their great concern that the solution to the problem with the reconstruction of the private home was being decided without the inclusion of those who live there, the people. The "people" were the ones who brought the problem to the attention of the committee. The attitude of involving those who live in the area must always be kept. JC-1

The Bevatron must be kept in place. It can be made into a truly outstanding architectural and educational institution. It can be, and should be, another Hall of Science. No one wants to discuss the horrendous effects, from a health point of view, connected with the tearing down of this structure. If this is done and the materials, described as "slightly radioactive", are carted through the streets of Berkeley, truckload-by-truckload, then again the losers would be the people and citizens of Berkeley. JC-2

Sincerely,

Jim E Cunningham

Jim Cunningham (Comments Identified as "JC-1 and JC-2")

Response JC-1

Comment noted. Cultural resources impacts are analyzed in Section 5.1.3, Cultural Resources. See response LAW-1, 2, 3, above.

Response JC-2

Major and costly modifications to Building 51 would be necessary in order for it to be used for the architectural and educational purposes suggested by the commenter. As described in Chapter III, Proposed Action Description, the facility does not meet current building codes, the roof leaks in several locations, and portions of the structure do not comply with current seismic design standards. In addition, as described in Chapter 4, Section 4.2.5, Hazards and Hazardous Materials, various types of hazardous materials are present at Building 51. In particular, portions of the facility are radiation controlled areas, and are inaccessible to the general public.

APPENDIX G

Bevatron Final EIR Technical Memorandum, July 5, 2007

TECHNICAL MEMORANDUM

1. Purpose of the Memorandum

On October 21, 2005, the University of California released for public review a Draft Environmental Impact Report (DEIR) for the Demolition of Building 51 and the Bevatron at the Lawrence Berkeley National Laboratory (LBNL) in Berkeley, California. The DEIR evaluated the environmental impacts of the demolition of this inactive research facility. As analyzed in the DEIR, the specific sequence of events for the demolition was as follows:

> Under the proposed project, the concrete shielding blocks that surround the Bevatron would be removed, the Bevatron apparatus would be disassembled, Building 51 and the shallow foundation underneath the building demolished, and the resulting debris and other materials removed. The site would then be backfilled, and the fill compacted and leveled.
> (DEIR p. II-1)

The sequence of demolition activities assumed that the existing cranes present in the building would be used for the removal of the shielding blocks. Subsequent analysis and consideration developed a project variant that uses an alternative sequence for the project demolition activities as follows:

> The project would begin with appropriate sampling and surveys for hazardous building construction materials and debris followed by removal and abatement of all hazardous materials within Building 51. Prior to demolition of the building structures, systems and components, the project would set up additional stormwater drainage and collection systems. Once the building is demolished down to the grade level concrete slab, the Bevatron shielding blocks and equipment would be dismantled and removed with the use of two modern mobile cranes. Finally, the project would demolish and remove the building foundations, tunnels, trenches and slabs and backfill with suitable clean fill material.

In addition, an alternative-schedule project variant was developed to reduce the minimum duration of the project activities from four years to three and one-half years.

The primary purposes of this technical memorandum are to assess these potential changes to the schedule or sequence of activities as originally proposed and to determine whether the alternative-sequence project variant or the alternative-schedule project variant, operating individually or together, would: 1) introduce new impacts, 2) change the level of significance of identified impacts, or 3) require additional mitigation measures to control identified impacts, old or new.

2. Background

The project site is part of the LBNL campus, located in the cities of Berkeley and Oakland in Alameda County, on property owned by the University of California. The proposed project would ultimately convert approximately 2.25 acres (the “demolition zone”) from a developed area (i.e., occupied by Building 51) to an undeveloped area for an indeterminate time, until another use is proposed, approved, and initiated. The remaining part of the four-acre site would be used for parking and staging.

Building 51 is a large (approximately 126,500-gross-square-feet) steel-frame shed-like structure that was built to shelter the Bevatron apparatus and its associated mechanical, electrical, shop, and office functions. The facility began construction in 1949 and was occupied by 1950. The approximately 180-foot-diameter Bevatron was constructed in 1954 and used as a proton synchrotron—a particle accelerator that studied high-energy nuclear processes. Later modifications of the Bevatron enabled researchers to accelerate heavy ions and expand the facility’s usefulness in additional areas, including medical research, cancer treatment, and cosmic ray experiments. The facility operated from 1954 until 1993. Since the end of the Bevatron’s operations in 1993, Building 51 has had limited use for equipment storage, office space, and dry laboratories (e.g., for computer repair).

Hazardous materials that were used or generated at the project site include asbestos-containing materials (ACMs) as part of construction, polychlorinated biphenyls (PCBs) and mercury used in electrical and research equipment, lead shielding, lead-based paint, residual lead dust, radioactive waste, beryllium from the Bevatron components, as well as other hazardous materials.

The project site is entirely paved or developed except for two small areas of ornamental landscaping at the entrance to Building 51. Except for two small ornamental trees there, no trees would require removal to allow for demolition of any of the proposed facility components.

Small areas of the site are underlain by the edges of two groundwater plumes containing volatile organic compounds (VOCs). Soils underneath portions of the site were contaminated by VOCs, petroleum hydrocarbons, polychlorinated biphenyls (PCBs), and/or mercury that were released at unknown times during the period when the Bevatron was in operation. Starting in the early 1990s, investigation and cleanup actions have been undertaken. These actions are under the oversight of the California Department of Toxic Substances Control, which consults with such other agencies as the San Francisco Bay Regional Water Quality Control Board, DOE, and the City of Berkeley Toxics Management Division. As a result of the completion of interim corrective measures at two soil units at Building 51 under the Laboratory's Environmental Restoration Program, soil contaminants have been reduced to levels considered "protective of human health and the environment" under U.S. Environmental Protection Agency risk assessment guidelines. Groundwater contamination continues to be remediated under the Environmental Restoration Program.

3. Project Variants

A. Alternative-Sequence Variant

The alternative-sequence variant for the project would revise the sequence of demolition activities without changing the overall objective of the project – namely, to demolish the entire building and Bevatron. The following is an outline of the main categories of project activities, in the order in which they would be accomplished under the alternative sequence:

- Utilities and Cold and Dark. The preliminary measures of locating and rerouting electrical and mechanical utilities as necessary would remain as initial actions to secure the site.

- Hazardous Materials and Waste Abatement. Next would come hazardous materials and waste abatement, which would include sampling and surveys to identify hazardous materials contained within the building and in building construction materials, including asbestos, lead-based paint, PCBs, Mercury, Beryllium, and lead dust, as well as removal of all hazardous materials that can be removed by hand methods. Materials such as the heavy depleted uranium blocks, lead paint, lead dust fixed by painting and solvent spills to be disposed of as part of the floor slabs would be protected from demolition activities until the time when they can be removed individually or disposed of as part of the demolition debris.

- Removal and Abatement of Hazardous Building Materials. The asbestos-containing siding materials (transite) would be removed by extracting the fasteners and then removing the siding panels.

- Construction of Retaining Wall. Prior to remaining demolition activities, construct an approximately 170 foot long retaining inside Building 51 along the uphill side of the structure for slope stability. The foundation wall of the existing wall in this area currently provides slope stability but will be removed as part of the project. The new retaining wall would become a permanent feature of the project but would not protrude above ground

- Construct Site Drainage and Collection Systems. In anticipation of rain or potential stormwater runoff that could potentially come in contact with the exposed building interior features or Bevatron components, drainage controls would be installed at the site. The purpose of the site drainage control and collection systems would be to appropriately collect and retain stormwater for analysis to assure that runoff meets discharge requirements prior to discharge into sanitary sewer or storm drains.

- Non-Hazardous Non-Structural Materials. Remove and abate remaining non-hazardous, non-structural building materials.

- Removal of Structural Materials. Demolish remaining load-bearing structural elements of the building down to grade level with the use of excavators, mobile cranes, heavy equipment, and torch\mechanical cutting methods.

- Bevatron and Shielding Block Demolition. Remove the 750 to 800 concrete shielding blocks that surround the Bevatron. Removal of the shielding blocks is anticipated to be completed in less than 100 days. The Bevatron and associated appurtenances such as the steel yokes, magnets, and beamline pipes would then be disassembled using pneumatic impact tools, mechanical saws, and torches.

- Building Foundations and Backfill. Finally, the project would involve removal of the shallow foundations of the building, tunnels, trenches, and slabs. The resultant subsurface pit would be backfilled with imported clean fill and compacted to surface grade according to engineering specifications. Prior to backfilling, some areas where subsurface soil is suspected to be contaminated would be evaluated and potentially remediated by the Laboratory's Environmental Health and Safety Division under the oversight of the appropriate regulatory agency.

The remaining elements of the proposed project such as hydro-seeding the demolition zone with native grasses and leaving the groundwater monitoring wells in place would be identical to that as originally proposed in the DEIR.

B. Alternative Schedule Variant

The alternative-schedule variant for the project would revise the minimum duration of the project from four years to three and one-half years, with the maximum duration of the project remaining at seven years. This schedule variant could apply to the project and to the alternative-sequence variant.

4. Potential Environmental Impacts and Changes to Impacts

The following describes those impacts identified in the DEIR and then discusses potential for changes in impacts or in the significance of those environmental impacts for each of the 12 resource categories that were analyzed in the DEIR. Unless otherwise stated, the following analysis and discussions refer to effects of the Alternative-Sequence Project Variant, under either the project schedule or under the alternative schedule variant. Effects that are due exclusively to the Alternative Schedule are specifically noted as such.

4.1 Aesthetics

Potential impacts related to aesthetics for project activities in the sequence described in the DEIR were related to the changes in the visual quality of the site as well as the potential for an increase in light glare from nighttime activities. Both the revised sequence and the revised schedule would have no effect on the final visual quality of the site and would therefore remain a less than significant impact. The potential for nighttime work would also not change nor would the measures the Lab would take to minimize glare through the use of night shields on outdoor fixtures. Therefore, the potential impact would remain as less than significant.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Aesthetics	Equal impact	Less than Significant	None necessary

4.2 Air Quality

One potential impact related to air quality was identified in the DEIR. The demolition activities were determined to have a potential to generate short-term emissions of criteria pollutants, including particulate matter (dust), tailpipe emissions, asbestos fibers, and odor.

The primary difference between the sequence for the Project as described in the DEIR and the revised sequence would be that the revised sequence could subject the shielding blocks to potential surface damage during the demolition of the building (as the building roof collapses) and the subsequent exposure to the weather of the shielding blocks and Bevatron during the dismantling of the Bevatron. However, the revised sequence alternative proposes to protect the shielding blocks from damage during demolition of the Building 51 structure, thereby preventing any such surface damage.

There would be no appreciable change in the emissions of particulate matter (dust), tailpipe emissions, asbestos fibers and odor due to the change in sequence. The hazardous surficial materials on-site (such as lead dust), would be abated prior to demolition of the building. Removing these hazardous materials would also clean most horizontal surfaces of accumulated non-hazardous particulates. The demolition activity would be the same under either scenario, as would the Asbestos abatement process needed to remove, transport and dispose of the asbestos-containing materials within the structure.

The collapse of the building roof and supporting beams could be expected to cause minor surface damage primarily to the cap shielding blocks and possibly to the exteriors of the supporting blocks as well. The extent of such damage is not known, but the cap blocks are expected to easily withstand the impacts of the falling roof. The impact of the structure on the concrete could be expected to result in some surface spalling only if the surface protection were to fail, but even if that were the case, the resulting concrete chips should be sufficiently large to not become airborne dust and thus could be cleaned up and disposed of properly. Other particulates produced by the demolition, including those produced from the structure itself, as it collapses, would be the same for the sequence described in the DEIR as for the revised sequence.

The subsequent exposure to the weather of the shielding blocks and Bevatron would raise the possibility that any fine dust particles remaining on the surfaces of the blocks and the Bevatron could become airborne. The potential for airborne particulates would be localized to the vicinity of the site, but would continue throughout the process of removing all of the shielding blocks and dismantling the Bevatron. However, this potential would be fully mitigated by the cleaning and/or sealing of the surfaces of the shielding blocks and Bevatron, a part of the hazardous materials abatement that would occur before these items are shipped for disposal. The revised schedule variant would result in the same impact to air quality as analyzed in the DEIR and would therefore remain a less than significant impact.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Air Quality	Equal impact	Less than Significant	None necessary

4.3 Biological Resources

The DEIR identified four different potential impacts related to biological resources from the proposed project. The potential impacts were related to noise disturbances of nesting special-status birds, noise disturbances to special-status bats, harm or disturbances to common wildlife species, and the potential to disturb special-status plant species. The revised sequence would have no significant effect on the proposed timeline or the type and amount of noise generated from the site. Although mobile cranes would be brought in for the removal of the shielding blocks, the noise levels from the mobile cranes or haul trucks would be substantially less than from the hoe-ram, so this would not represent significantly more noise or disturbance than previously analyzed. For either variant, the potential to harm or disturb common wildlife or special-status species would remain equal to that of the project utilizing the sequence of activities analyzed in the DEIR. Therefore, the potential impact would remain less than significant with implementation of the mitigation measures identified in the DEIR.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Biological Resources	Equal impact	Less than Significant	None necessary

4.4 Cultural Resources

Because the revised sequence would result in the demolition of Building 51 and the Bevatron, the potential cultural resource impacts identified in the DEIR would be the same. The changes to the sequence or schedule would not affect the significant and unavoidable impact of the loss of an identified historical resource. Therefore, the potential impact would remain as significant and unavoidable.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Cultural Resources	Equal impact	Significant and Unavoidable	None necessary

4.5 Geology and Soils

The potential impact of the DEIR project related to geology and soils would result from the potential for soil erosion and loss of topsoil. The earthwork activities that could expose soils to erosion and loss of topsoil would remain as part of the project utilizing the revised sequence or schedule. The proposed excavation of the shallow foundations and any potentially contaminated soils also would remain. Therefore, the impact would be the same and would be less than significant.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Geology and Soils	Equal impact	Less than Significant	None necessary

4.6 Hazards and Hazardous Materials

The DEIR project would have three potential impacts related to hazards and hazardous materials. The first would be the potential for the workers, the public or environment to be exposed to hazardous substances as a result of the demolition. Of particular concern would be the potential exposure to lead dust, asbestos, hazardous materials within the equipment, and hazardous materials within the shielding blocks or concrete slabs. Revising the sequence of activities or schedule would have no effect on the abatement of these hazardous materials because, under either sequence, the work would still be carried out according to the appropriate regulations and using approved protocols. Abatement of surficial hazardous materials, such as lead dust and beryllium, would occur prior to the demolition of the building and therefore the result would be the same under either sequence. Asbestos abatement would be conducted under the LBNL Asbestos Management Program and handled by a licensed and certified asbestos abatement contractor. For the off-site disposal of materials containing low levels of radioactivity, the procedures set in LBNL PUB-3000 would assure that potential exposure to radioactivity would be far below applicable regulatory limits set by the U.S. Department of Energy and the U.S. Department of Transportation.

The second potential impact would be the potential for encountering contaminated soils during demolition of the subgrade foundations, tunnels, and slabs. This potential impact would also be unchanged by the revised sequence or schedule. These activities of the project would inevitably occur after the building and Bevatron were demolished and so the revised sequence would not affect it.

The final impact would be risk from wildland fires, which would be unchanged by the revised sequence or schedule. Therefore, there would be no change to the significance of the impact in the DEIR.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Hazards and Hazardous Materials	Equal impact	Less than Significant	None necessary

4.7 Hydrology and Water Quality

The removal of the building before the Bevatron could potentially expose the Bevatron, the shielding blocks, the concrete slab and the tunnels to rain and to stormwater runoff during a rainfall event. This revised sequence would require certain measures to ensure that water quality in the stormwater runoff from the site would not be affected. Without protection, the tunnels could be exposed to runoff, which might subsequently leach into the subsurface and affect groundwater quality. A drainage control plan with a collection system for retaining runoff during the remaining demolition activities would be required. The Stormwater Pollution Prevention Plan (SWPPP) would have to incorporate measures to control runoff and prevent all construction pollutants from the site from entering receiving waters. The DEIR discussed the LBNL requirement for a SWPPP and BMPs to control runoff that would be associated with demolition contact water, which includes stormwater, water generated from dust suppression activities, and potential basement dewatering. This requirement would be the same as for the DEIR project after demolition of the building structure but during the demolition of the foundations and slabs; however, with the change in sequence, the control measures would have to be more extensive without the shelter of Building 51 for the duration of demolition of the shielding blocks and Bevatron. The water collection system would have to collect, store, and treat, if necessary, all water that falls or runs onto the demolition zone. However, as already discussed in the DEIR, discharge of collected water would still be accomplished in compliance with state and federal regulations. Clean wastewater could be discharged into the storm drain but contaminated wastewater would be treated to an acceptable level under a permit, and discharged into the sanitary system. Therefore, with implementation of site drainage control measures compliant with state and federal regulations and mitigation measures from the 1987 LRDP EIR, as amended, there would be no change to the significance of the impacts to hydrology and water quality. The revised schedule variant would result in the same impact to hydrology and water quality as analyzed in the DEIR and would therefore remain a less than significant impact.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Hydrology and Water Quality	Equal impact	Less than Significant	None necessary

4.8 Land Use and Planning

The revised sequence of demolition activities or schedule variant would have no effect on the significance of Land Use and Planning impacts identified in the DEIR. The project would still create temporary and intermittent impacts during the course of the demolition activities as identified in other sections of the DEIR. The project would also still result in a change of use for the site once the demolition is complete. Therefore, the significance would not change with the revised sequence or schedule.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Land Use and Planning	Equal impact	Less than Significant	None necessary

4.9 Noise

The DEIR identified the potential for demolition activities to generate intermittent and temporary noise levels above ambient levels. The analysis of noise generated during demolition combined the dismantling of the shielding blocks and Bevatron along with the demolition of the building as the first basic stage of demolition activity. This stage was determined to produce a noise level of 83 dBA at 50 feet. The loudest source of noise is estimated to be from the use of a hoe-ram impact hammer during demolition of the foundation and substructure, which would generate approximately 96 dBA at 50 feet. The revised sequence would still require the use of the hoe-ram to complete the demolition of the foundation. As stated in the DEIR, all demolition work would be required to meet the maximum noise levels set by the Berkeley Noise Ordinance and the requirements of the 1987 LRDP EIR, as amended, mitigation measures. Therefore, the potential noise impacts would not change and would remain less than significant. The revised schedule variant would result in the same impact to noise as analyzed in the DEIR and would therefore remain a less than significant impact.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Noise	Equal impact	Less than Significant	None necessary

4.10 Public Services

The revised sequence or schedule would not change the basic demolition activities that would be required, and thus would have no effect on fire and police response times. As to the potential for truck trips to cause wear and tear on public roads, the revised sequence would neither increase nor decrease the number of truck trips or the amounts of materials transported. The same amount of material would be removed from the project site and would require the same type and number of truck trips analyzed in the DEIR. Therefore the potential impact would remain less than significant.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Public Services	Equal impact	Less than Significant	None necessary

4.11 Transportation/Traffic

The DEIR identified four impacts related to Transportation/Traffic, as follows:

- **Impact IV.K-1: The proposed project, including demolition and earthmoving activities such as excavation, backfill, and grading, would temporarily and intermittently increase traffic volumes on roadways used by demolition-related vehicles. (Less than Significant with Mitigation)**

- **Impact IV.K-2: Demolition workers would use the Building 51 staging area for parking. (Less than Significant)**

- **Impact IV.K-3: The project could potentially affect transit service in the project area. (Less than Significant)**

- **Impact IV.K-4: The project would generate truck trips carrying hazardous materials, potentially affecting safety. (Less than Significant)**

Of these, impacts IV.K-2 through IV.K-4 are less than significant without mitigation; only impact IV.K-1 would require the application of the following mitigation measure to be less than significant.

> **Mitigation Measure IV.K-1:** The frequency of truck trips (loaded or empty) shall be no greater than (a) one every 10 minutes (six truck trips per hour) during the a.m. and p.m. peak commute hours, and (b) one every five minutes (12 truck trips per hour) during periods other than the a.m. and p.m. peak commute hours.
>
> Under this limitation, the projected level of truck traffic would have minimal and less-than-significant effects on traffic flow, even if those trucks were to travel through the congested intersections on University Avenue at San Pablo Avenue and Sixth Street during the peak commute hours. Project-generated hourly truck trips would represent an increase of no more than about 0.9 percent above the a.m. and p.m. peak-hour traffic volumes, respectively, at the above-cited congested intersections.[1]

Significance after Mitigation: Less than Significant

Discussion

The DEIR provides the following information about traffic, especially the truck trips generated by the project:

- An estimated maximum of about 4,700 one-way truck trips would be required over the term of the project. Most would be one of two types: 1) inbound trips with empty trucks and outbound trips with trucks hauling away material for appropriate disposal, or 2) inbound trips delivering clean backfill and outbound empty trucks. Other trips would be for the delivery of project-related demolition equipment and miscellaneous supplies.

- Demolition work would be performed approximately 40 hours per week, Monday through Friday, with normal work hours between 7:00 a.m. and 3:30 p.m.

- The highest number of daily truck trips would occur when backfilling is underway. It is estimated that the number of daily truck trips at that time would be about 18 to 34 one-way trips (i.e., up to 17 loaded trucks and 17 empty trucks); during other periods of demolition, the number of truck trips per day would be no more than about 10 one-way trips.[2] Because truck trips would be spread over the course of a workday, the up to 34 daily one-way trips would generate an average of about four one-way trips per hour (i.e., one truck every 15 minutes). However, the actual number of shipments could be greater at particular times.

- The workforce for the project would generate auto commute trips. The number of workers and associated trips would vary over the multi-year demolition period, but is estimated to be about 20 to 25 workers on average per day, with a maximum of up to about 50 workers.

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[1] The maximum 0.9-percent increase was calculated using six one-way truck trips (one every 10 minutes), a passenger-car-equivalence of three cars per one truck, and existing a.m. peak-hour traffic volumes on University Avenue. The percent increase with any other combination of values (e.g., four one-way truck trips, or existing p.m. peak-hour volumes, or total intersection volumes, or cumulative volumes) would be less than 0.9 percent.

[2] For comparison, existing daily traffic entering and exiting LBNL is approximately 5,700 vehicles per weekday.

Conclusion

There is no indication that the alternative-sequence project variant could materially change any of these traffic characteristics of the worker or truck traffic or their impacts. The alternative-sequence variant would not increase the total number or frequency of truck trips, would not increase the workforce and would not increase the amounts of hazardous materials to be removed from the site or the way in which they would be transported. Thus, there would be no material changes in the characteristics related to this traffic. The difference would only be the order in which these phases would occur. Since the demolition phase and the shielding block removal have similar traffic characteristics, switching their order would have no material traffic effect, either directly or as a cumulative traffic effect.[3] Because the actual peak in the truck traffic related to the project would only occur at the end of the project (during the backfilling phase), this peak effect would not be altered in any way under the alternative sequence for the project.

The alternative-schedule project variant, applied to either the project or to the alternative-sequence project variant, would reduce the minimum duration of the project from four years to three and a half years, indicates that there might be a roughly 13 percent reduction in the duration of the overall time to complete the project (or the alternative-sequence project variant). This could result in similar percentage reductions in the durations of any or all of the individual project phases, with accompanying increases in the rates of truck traffic, but without increases in the total number of trips. However, only in the final site-backfill phase could increases in haul truck traffic have any adverse effect, since that is the only phase where the maximum haul truck traffic, 18 to 34 one-way trips per day, would occur. Even during that backfilling phase, increases in haul truck traffic at the lower end of that range would not make a measurable difference, while any increases that would otherwise exceed the maximum rate would trigger the operative mitigation, Mitigation Measure IV.K-1, which would limit the frequency of truck trips (loaded or empty) to no greater than (a) one every 10 minutes (six truck trips per hour) during the a.m. and p.m. peak commute hours, and (b) one every five minutes (12 truck trips per hour) during periods other than the a.m. and p.m. peak commute hours.

Thus, Mitigation Measure IV.K-1 would limit truck traffic under the alternative schedule variant to the same maximum truck traffic rates as truck traffic under the proposed project. For these reasons, reducing the minimum duration of the project from four years to three and a half years would not increase the maximum haul truck traffic generation rates and therefore would not change those resulting impacts and mitigation measures.

Similarly, traffic-related impacts such as exposure to DPM from trucks and to radioactive materials hauled on roadways would be the same under the alternative schedule variant, the alternative-sequence variant and the project, since all such effects would be due only to the total exposures to DPM and radioactive materials, which would be the same under all three cases.

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3 Public concern has been expressed regarding the cumulative effects of this project coupled with the larger construction activities involved with the building program being carried out under the UC Berkeley 2020 LRDP.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Transportation/Traffic	Equal impact	Less than Significant	None necessary

4.12 Utilities, Service Systems, and Energy

Many of the potential impacts identified in the DEIR would be unchanged with the revised sequence of activity. Utility systems would be rerouted to maintain service to other areas of LBNL prior to disconnection at Building 51. No new utilities would be required. The project would generate the same amount of demolition waste and debris and would still require limited quantities of water for dust suppression. With the revised sequence there could be an increase in the amount of water used for dust suppression during the demolition activities; the amount of water that would have to be collected and processed to prevent release of contaminants to storm drains or sewers is expected to be negligible. As discussed in Hydrology above, the removal of the building would require a drainage collection system for collection of stormwater runoff during the remaining demolition activities. The exposure of the Bevatron and shielding blocks would require collection of stormwater prior to discharge to ensure that contaminants are not contained in the water. However, this would be similar to the situation that would exist with the DEIR project after demolition of the building structure but during the demolition of the foundations and slabs. Implementation of additional site drainage control measures and mitigation measures from the 1987 LRDP EIR, as amended, could control the runoff and there would be no change to the significance of the water quality impact or the effect on the sewers or storm drains. With the revised sequence, the project would no longer require the use of the cranes onsite for the removal of the shielding blocks. In their place, mobile diesel-powered cranes would be brought onsite to perform the block removal.

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Utilities, Service Systems, and Energy	Equal impact	Less than Significant	None necessary

5. Summary

The proposed revised sequence of demolition activities would introduce no new impacts that are not already identified in the original DEIR. In most cases, the revised sequence would have no effect on the impacts originally discussed in the DEIR. With the exception of Cultural Resources, all impacts would remain less than significant, while the Cultural Resources impact would remain significant and unavoidable.

The environmental topic for which the revised sequence would have the most effect is Hydrology and Water Quality. As noted above, site drainage controls are already in the project; however, with the revised sequence, these controls would require increased capacity to manage demolition-contact stormwater. While the total amount of stormwater runoff would not change with the revised sequence, there would be an increase in the amount of stormwater runoff that would be in contact with materials housed within the facility (e.g., dust, equipment, demolition debris, etc.). This demolition-contact stormwater would therefore need to be controlled and managed so that water quality is verified prior to its release into the stormwater collection system. Demolition-contact stormwater not meeting water quality standards would be treated and/or, if appropriate and permitted, diverted to the sanitary sewer system. Increased volumes of handling of the demolition-contact stormwater would not alter the significance of the impact because the regulatory controls would be consistent in protecting water quality to receiving waters. Therefore, the impacts to Hydrology and Water Quality would remain less than significant and no additional mitigation measures would be necessary.

Table G-1 presents the results of the alternative sequence analysis, showing that the environmental impacts of the revised sequence for the project should be no different than the project impacts as presented and analyzed in the October 21, 2005 DEIR.

TABLE G-1
COMPARISON OF IMPACTS FOR DEMOLITION OF BUILDING 51 AND BEVATRON, REVISED SEQUENCE VS. DEIR SEQUENCE

Topic	Impact RE: DEIR project	CEQA Significance	Added mitigations?
Aesthetics	Equal impact	Less than Significant	None necessary
Air Quality	Equal impact	Less than Significant	None necessary
Biological Resources	Equal impact	Less than Significant	None necessary
Cultural Resources	Equal impact	Significant and Unavoidable	None available
Geology and Soils	Equal impact	Less than Significant	None necessary
Hazards and Hazardous Materials	Equal impact	Less than Significant	None necessary
Hydrology and Water Quality	Equal impact	Less than Significant	None necessary
Land Use and Planning	Equal impact	Less than Significant	None necessary
Noise	Equal impact	Less than Significant	None necessary
Public Services	Equal impact	Less than Significant	None necessary
Transportation/Traffic	Equal impact	Less than Significant	None necessary
Utilities, Service Systems, and Energy	Equal impact	Less than Significant	None necessary

APPENDIX H

Response to Letter of Concern from the Public Regarding the National Historic Preservation Act

Preserving America's Heritage

September 5, 2007

Ms. L. A. Wood
Ms. Pamela Sihvola
Committee to Minimize Toxic Waste
P.O. Box 9646
Berkeley, CA 94709

REF: Department of Energy's plans for the Bevatron and Building 51 at the Lawrence Berkeley National Laboratory

Dear Ms. Wood and Ms. Sihvola:

On July 12, 2007 the Department of Energy (DOE) provided the ACHP with information concerning steps it has taken to allow the pubic opportunity to comment on its plans to demolish the Bevatron and Building 51, a property determined eligible for listing in the National Register of Historic Places. A copy of their response is enclosed.

DOE's response sets out its public outreach activities since execution of the Memorandum of Agreement (MOA) in 1997. After review of their response we believe that DOE has provided the public with sufficient opportunity to make its views known about the importance of this historic property, and has considered these comments in reaching its decision on the fate of the property. Further, DOE reevaluated the terms of the existing MOA, and found no reason to revise it. We do not dispute DOE's assessment. We believe DOE has met its responsibilities under Section 106 of the National Historic Preservation Act for this undertaking.

If you have any questions, do not hesitate to contact Dr. Tom McCulloch at 202-606-8554 or via e-mail at tmcculloch@achp.gov.

Sincerely,

Reid J. Nelson
Assistant Director
Federal Property Management Section
Office of Federal Agency Programs

Enclosure

John L. Nau, III
Chairman

Susan S. Barnes
Vice Chairman

John M. Fowler
Executive Director

Preserving America's Heritage

September 7, 2007

The Honorable Barbara Lee
U.S. House of Representatives
ATTN: Sarah Andropoulos
1301 Clay Street
Suite 1000N
Oakland, CA 94612

REF: Letter from Ms. L. A. Wood and Pamela Sihvola concerning fate of Bevatron and Building 51 at the Lawrence Berkeley National Laboratory

Dear Congresswoman Lee:

As you requested in your letter to us dated August 24, 2006, we are forwarding to you a copy of our letter to Ms. Wood and Ms. Sihvola regarding the referenced Department of Energy (DOE) project. As you will see from our reply, we believe DOE has provided the public with ample opportunity to express its views on the historic significance of the Bevatron and Building 51 as DOE moves forward with its plans for this historic property.

If we can be of further assistance, or if you have any questions, please do not hesitate to call me or Dr. Tom McCulloch at 606-8505.

Sincerely,

John M. Fowler
Executive Director

Enclosure

ADVISORY COUNCIL ON HISTORIC PRESERVATION
1100 Pennsylvania Avenue NW, Suite 803 • Washington, DC 20004
Phone: 202-606-8503 • Fax: 202-606-8647 • achp@achp.gov • www.achp.gov

APPENDIX I

National Park Service Acceptance of Historic American Engineering Record for Building 51/51A, Bevatron Building

C: B. Savnik
C. Schwab

United States Department of the Interior

NATIONAL PARK SERVICE
Pacific West Region
1111 Jackson Street, Suite 700
Oakland, CA 94607

T. Powell
J. Philliber
file: B51
NEPA/CEQA
(HAER/HABS)

H40(PWR-CR)

August 15, 2006

Aundra Richards
Site Manager, Berkeley Site Office
1 Cyclotron Road, MS 90-1023
Berkeley, CA 94720

Re: HAER documentation for Building 51/51A, Bevatron Building, HAER No. CA-168-A

Dear Ms. Richards:

The National Park Service acknowledges the receipt of and accepts the Historic American Engineering Record (HAER) documentation for the project referenced above.

The completed documentation will be transmitted to the Prints and Photographs Division of the Library of Congress. The records are in the public domain and will be accessible through the library. We will also transmit a copy of the documentation to the State Historic Preservation Officer.

We appreciate this addition to the documentation of America's historic engineering heritage.

Sincerely,

Elaine Jackson-Retondo, Ph.D.
National Register and National Historic Landmarks Program
Pacific West Regional Office

cc: Jennifer Hall, Collections Manager, Department of the Interior, NPS, HABS/HAER/HALS Division, 1849 C Street NW, 2270, Washington, DC 20240
Milford Wayne Donaldson, FAIA, State Historic Preservation Officer, Department of Parks and Recreation, Post Office Box 942896, Sacramento, CA 94296-001
Kelly Yasaitis, Advisory Council on Historic Preservation 1100 Pennsylvania Ave. NW, Room 803, Washington, DC 20004-2501