UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

CAPITAL PROJECTS
PHYSICAL AND ENVIRONMENTAL PLANNING
300 A and E BUILDING, # 1382
BERKELEY, CALIFORNIA 94720-1382

December, 2009

ENVIRONMENTAL ASSESSMENT AND ADDENDUM #7[1] TO THE 2020 LONG RANGE DEVELOPMENT PLAN ENVIRONMENTAL IMPACT REPORT

Project Title: UC Berkeley
Helios Energy Research Facility and Related Improvements (including demolition of existing facilities)

Project Location: Northeast portion of block bounded by
Oxford, Shattuck, Hearst, Berkeley Way
2151 Berkeley Way
University of California, Berkeley
(Proposed Helios Building at Hearst Avenue and Oxford Street)

County: Alameda County, California

Program EIR: UC Berkeley 2020 Long Range Development Plan EIR, certified by The Regents January 2005, SCH #2003082131; as updated by LRDP Amendment #1 to Address Climate Change and accompanying Addendum #5 to the 2020 LRDP EIR

INTRODUCTION AND SUMMARY

PROJECT OVERVIEW

The University of California, Berkeley would demolish the existing 210,000 gross square feet (GSF) of built space at 2151 Berkeley Way (the former California Department of Health Services, or DHS buildings), develop the initial elements of a site-wide circulation and open space plan, and construct a new approximately 112,600 GSF (63,600 assignable square feet) building comprised of specialized analytical research laboratories, laboratory support space, offices and other support functions, to house research focused on basic scientific problems in the production of carbon-neutral fuels.

[1] Earlier addenda to the UC Berkeley 2020 LRDP EIR were completed for the Anna Head West Student Housing Project (Addendum #6, November 2009); Amendments to the Sustainable Campus chapter of the 2020 LRDP to address climate change (Addendum #5, July 2009); Naval Architecture Building Restoration and Addition (Addendum #4, December 2008); the Durant Hall Renovation Project (Addendum #3, March 2008); the Campbell Hall Replacement Building (Addendum #2, March 2008); and the Center for Biomedical and Health Sciences (Addendum #1, May 2007).

The new building is proposed to house the University's existing Energy Biosciences Institute (EBI) for research focused on the production of renewable, carbon-neutral biofuels, and shell space for future use by the Department of Bioengineering or other compatible program. The Helios Energy Research Facility would be constructed on a university-owned site adjacent to the cluster of bioscience and natural resource programs in the northwest quadrant of the UC Berkeley campus. In this document, as described in the Project Description, the Helios Energy Research Facility, a new south plaza and north/south pedestrian connection, and the demolition of the existing facilities on site are the Project.

Today, UC Berkeley expects that the remainder of the site would one day be developed as a Community Health Campus, home to the School of Public Health and other programs with a community health nexus. Future phase development would include ground floor space reserved for retail or other public-oriented uses along Shattuck Avenue. The site plan for the Project accommodates this future phase development. However, in the foreseeable future the undeveloped portions of the property would likely remain surface parking; future phase development is not presently proposed or part of this Assessment.

Planning for the Project is guided by both the UC Berkeley 2020 LRDP and by a framework for a Berkeley downtown area plan as developed by both a citizen advisory group and the city's Planning Commission over three years. The Project is also consistent with the UC Berkeley physical design framework, presented to the University of California Regents in November 2009: the orthogonal forms of the building reinforce the urban fabric; the façade is finished in a tripartite expression; the building is an architectural expression of sustainable design; the site plan implemented by the project creates public and protected places of interaction; the materials for the site and building are sympathetic to their context.

Project implementation would result in demolition of the vacant DHS structures and complete site clearance to accommodate the initial open space elements of the site including a new south plaza and a pedestrian north/south connection, the Helios facility, plus future campus development as anticipated in the UC Berkeley 2020 LRDP.

ENVIRONMENTAL REVIEW

An Environmental Assessment has been prepared in accordance with CEQA, the CEQA Guidelines, and University of California Guidelines for the Implementation of CEQA, to determine the appropriate level of environmental review for the Helios project.

The UC Berkeley 2020 LRDP EIR indicated that projects implementing the 2020 LRDP would be examined to determine whether subsequent project–specific environmental documents are required. The 2020 LRDP EIR states:

> CEQA and the CEQA Guidelines state that subsequent projects should be examined in light of the program-level EIR to determine whether subsequent project-specific environmental documents must be prepared. If no new significant effects would occur, all significant effects have been adequately addressed, and no new mitigation measures would be required, subsequent projects within the scope of the 2020 LRDP could rely on the environmental analysis presented in the program-level EIR, and no subsequent environmental documents would be required; otherwise, project-specific environmental documents must be prepared (2020 LRDP EIR Vol I page 1-2).

The use of the 2020 LRDP EIR in project review was also specifically addressed in the first Thematic Response to comments received on the 2020 LRDP Draft EIR (2020 LRDP EIR Vol 3a, page 11.1-1). There, the document reiterated the text quoted above, and explained :

Projects subsequently proposed must be examined for consistency with the program as described in the 2020 LRDP and with the environmental impact analysis contained in the 2020 LRDP EIR; if new environmental impacts would occur, or if new mitigation measures would be required, an additional environmental document would be prepared.

In accordance with CEQA (Public Resources Code Section 21000 et seq.), and the University of California Procedures for Implementation of CEQA, this Environmental Assessment was prepared to evaluate the proposed Project in contrast to anticipated development described and analyzed in the 2020 LRDP EIR. The Environmental Assessment concludes the Project would not cause any new significant environmental effect not considered in the 2020 LRDP EIR, nor increase the severity of any impact previously found significant in the 2020 LRDP EIR; that no new information of substantial importance, which was not known at the time the 2020 LRDP EIR was certified, has become available; that the circumstances under which the Project will be undertaken have not changed to involve new significant environmental effects or substantially increased severity in environmental effects; and thus the University has determined that an Addendum to the 2020 LRDP EIR is appropriate for the Project, itself in the form of the following Environmental Assessment.

ORGANIZATION OF THIS DOCUMENT

This Addendum and Environmental Assessment is organized into the following sections:

- **Introduction and Summary**. Summarizes the purpose of the Environmental Assessment, the CEQA provisions applicable to the Project, the approval process for the Project, and its policy context.
- **Project Description.** Presents a description of the Project.
- **Relationship to 2020 LRDP.** Describes the consistency of the Project with the UC Berkeley 2020 Long Range Development Plan and its Environmental Impact Report.
- **Environmental Determination.** States the appropriate level of environmental documentation based on the findings in the Environmental Evaluation section.
- **Environmental Evaluation.** Presents a topic-by-topic evaluation of potential environmental impacts of the Project and a determination of whether those impacts were adequately addressed in the 2020 LRDP EIR, based on the checklist questions set forth in Appendix G of the CEQA Guidelines.

APPENDICES

Appendix A: Mitigation Measures and Continuing Best Practices incorporated into the Project as proposed
Appendix B: Project design guidelines
Appendix C: Summary of City of Berkeley review comments and responses
Appendix D: Current plans, elevations and views
Appendix E: Cumulative projects list
Appendix F: Excerpts, City of Berkeley Downtown Area Plan EIR, Cultural Resource Setting
Appendix G: Training material, UC Berkeley EH&S (Hashimoto), "Transgenic Plant Safety"
Appendix H: Two tables, updating tables C.3-2 and C.3-3 in 2020 LRDP EIR Vol 2 Appendix C (pp C.3-12 and C.3-13) to reflect modeling assumptions in 2009 HRA Update

After review and consideration of the following Environmental Assessment, the Project would be considered by The Regents committee on Grounds and Buildings.

A copy of this Addendum (Addendum #7 to the 2020 LRDP EIR) is available for review during normal operating hours at the offices of Capital Projects' Physical and Environmental Planning offices, Room 1 A&E Building on the UC Berkeley campus; and online at http://www.cp.berkeley.edu. The 2020 LRDP

and the 2020 LRDP Environmental Impact Report (SCH #2003082131) are available online at lrdp.berkeley.edu; LRDP Amendment #1 and Addendum #5 to the 2020 LRDP EIR addressing Climate Change are available online at tinyurl.com/UCBclimate.

PROJECT DESCRIPTION

PROJECT LOCATION

UC Berkeley is located approximately ten miles east of San Francisco, as shown in figure 1. Interstate 80, Highway 13, Highway 24, and Interstate 580 provide regional vehicular access to the campus. Regional transit access is provided by Bay Area Rapid Transit District (BART) and Alameda-Contra Costa Transit (AC Transit).

As shown in figure 2, the Project site is the block south of Hearst Avenue and west of Oxford Street, immediately west of the Berkeley Campus Park. Because the facilities on site formerly housed the state Department of Health Services, the site is also known as the DHS site. Downtown Berkeley's main street, Shattuck Avenue, is the west perimeter of the project site.

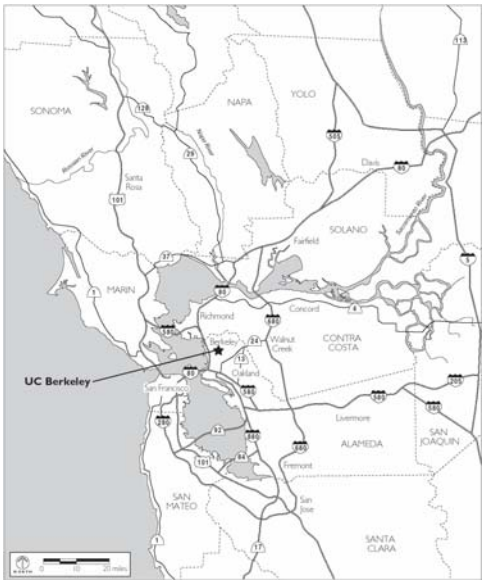


Figure 1. Regional Location

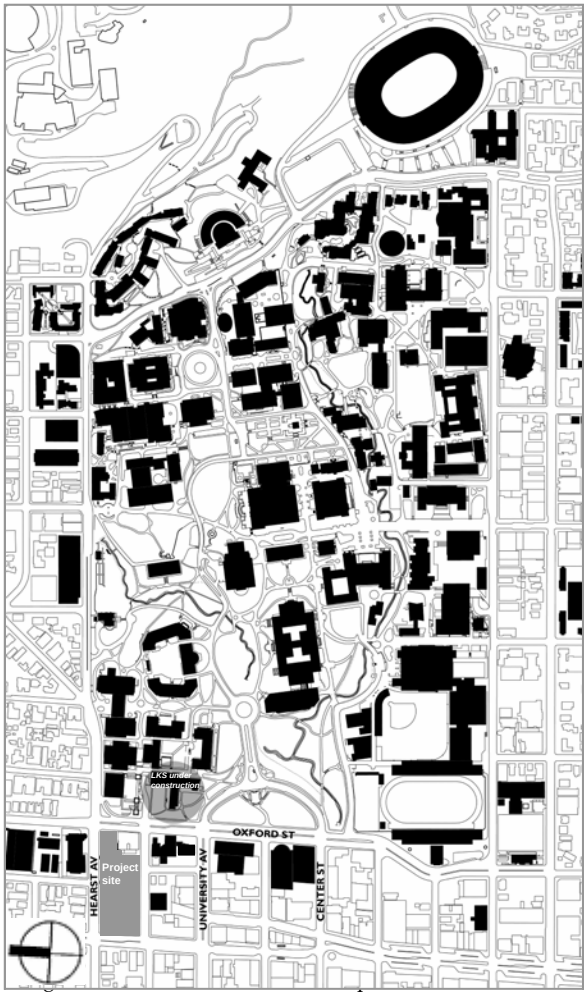


Figure 2. Site location at west end of Campus Park.

SITE DESCRIPTION

As shown in figures 2 and 3, the DHS site lies immediately west of the Campus Park. Uses in the vicinity of the site include University institutional uses (the new Warren Hall at 2195 Hearst Avenue, greenhouse and research facilities and growing grounds on the Oxford Tract, the University Garage south of the project site at 1940 and 1952 Oxford Street) and privately owned apartment buildings across Hearst Avenue and at the southeast corner of the DHS site (1910 Oxford). Immediately across Oxford Street pedestrians can access the northwest quadrant of the University's main campus by a stairway at Berkeley Way. Buildings for biomedical, genetics, plant biology and other physical sciences, and an underground parking facility occur in this quadrant.

The apartments at 1910 Oxford Street, on the same Oxford block front as the proposed Helios project, is a five story building built in 1998. Garage parking incorporated into the apartment building and service access for the building is off of Berkeley Way.

There is approximately a 10-foot elevation drop from north to south through the DHS site, and a 20-foot elevation drop from east to west. The existing facilities at 2151 Berkeley Way interrupt Walnut Street, a public street that continues to the north and south of the block.

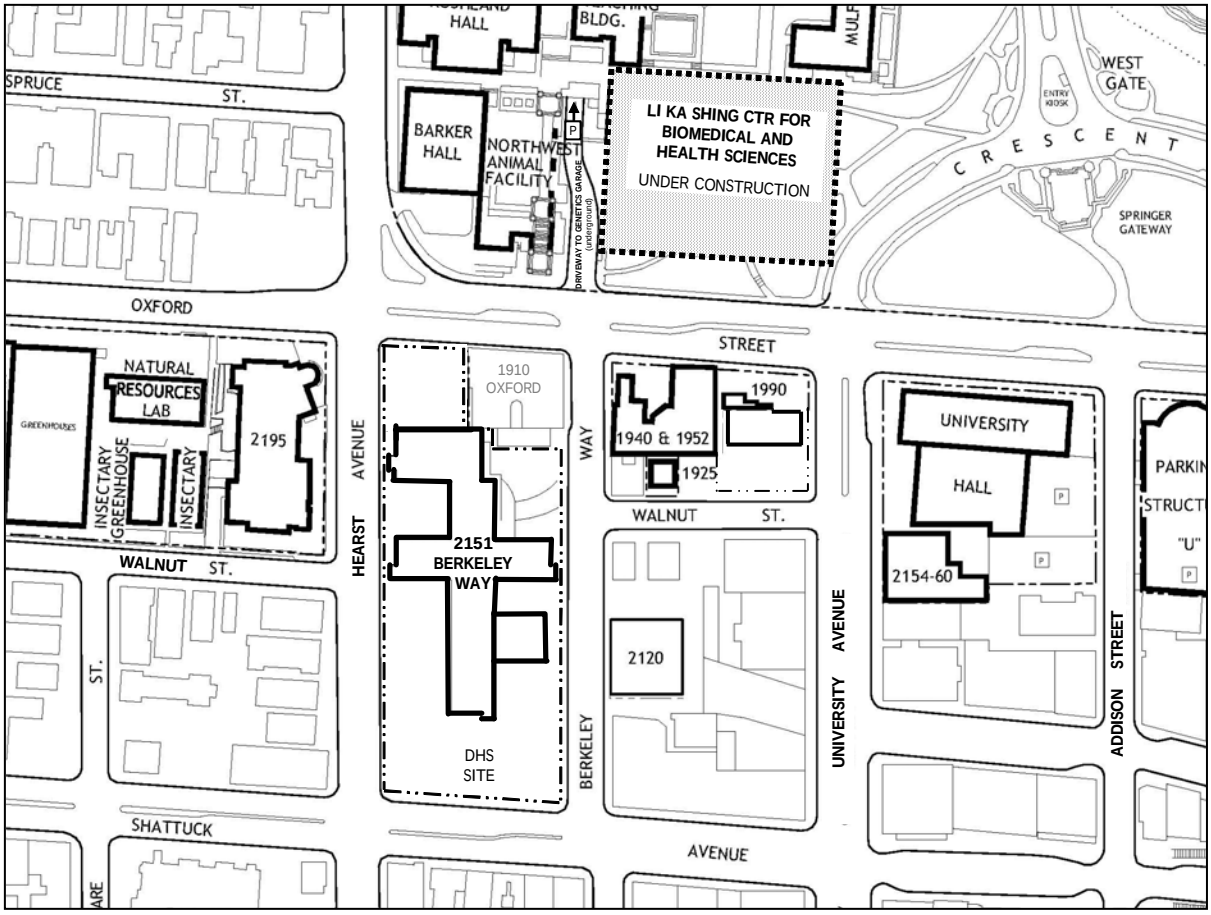


Figure 3. 2151 Berkeley Way and vicinity. University-owned properties are skip-dash outlined, University-owned buildings are boldly outlined.

The DHS site is currently occupied by the following facilities:

- 160,000 square foot eight story, 125 foot tall laboratory building constructed in 1953/54 at the center of the block
- 36,000 square foot wing added to the northeast end of the building in 1964
- two smaller single story structures, the "power plant" and the "service building" added at the south end of the eight story lab building in 1966.

(State Department of Health Services Berkeley Laboratory Consolidation and Expansion Project Draft Environmental Impact Report, SCH 88053109, March 15, 1989 p. 36). Structures on site are typical of older, post-war reinforced concrete buildings, with flat concrete panels separating strip windows comprised of numerous panes. The windows and the building structures are light tones of green in color. The west perimeter of the site has street trees along the sidewalks maintained by the City of Berkeley.

The existing facility on the DHS site at 2151 Berkeley Way formerly held laboratory functions for the state Department of Health Services. The main laboratory was constructed in 1953, and the "Research Disease" wing was added in 1964. The total of existing built spaces is approximately 210,000 square feet

(State of California, Department of Health Services, Richmond Laboratories, DEIR, January 29, 1996 p. II.1).

The laboratories at the Berkeley Way site were one of four DHS locations in the East Bay Area. The facility served as a reference laboratory in support of DHS's mandate to protect public health and to provide analytical laboratory support to state and local agencies with respect to communicable disease and health risk issues associated with occupational and environmental hazards. DHS laboratory programs assure public protection against unsafe food, water, and a variety of consumer products by analyzing samples of waste water, air, soil, food, drugs, and chemical compounds collected throughout the State. Activities at the site involved the handling, processing and storage of small amounts of various chemicals, carcinogens, reproductive toxicants, bio-hazardous materials, medical specimens, radioisotopes, and hazardous substances. The facility also housed and handled laboratory animals used for diagnosing human disease or conditions affecting human health. [1]

The administrative aspects of the facility supported, administered and coordinated regulation of local/county laboratories and their personnel to assure compliance with laboratory techniques and standards. This was accomplished through testing of personnel, licensing, and inspections and evaluation of local/county laboratories. The lab also served as a technical reference center for general public use.[2]

Existing facilities at the DHS site do not meet current standards for laboratory facilities. Studies of the building in the 1990s concluded that the existing "building does not meet current safety standards for laboratory functions. The deficiencies include out-of-date mechanical ventilation systems, asbestos, and fire and life safety issues (State of California, Department of Health Services, Richmond Laboratories, DEIR, January 29, 1996 p. IV.6). A 1994 evaluation of the building prepared for the Division of the State Architect determined the building had a seismic rating of DSA V, which in the DSA rating system is "unacceptable for office/laboratory occupancy". Although it might be possible to correct these seismic deficiencies at substantial cost, the building is programmatically unsuited for the university programs envisioned for the site. Also, its use of its site, ringed with surface parking lots, does not meet the city's urban design goals for the downtown.

In 2005 the Department of Health Services moved to new facilities in the City of Richmond. The Regents acquired the DHS site from the State of California in the fall of 2006. In order to offset parking lost during replacement of the Underhill parking facility, since the summer of 2005, the surface parking ringing the structures has been managed as permit parking by the University of California. University parking at this location has however always been a temporary, interim use of the site, intended to relieve pressure upon the parking system during the construction of the Underhill parking structure, which is now completed and operational.

The existing DHS site has only minimal ornamental landscaping and no significant or specimen plantings (per Horner, October 2009).

DOWNTOWN AREA PLAN FRAMEWORK

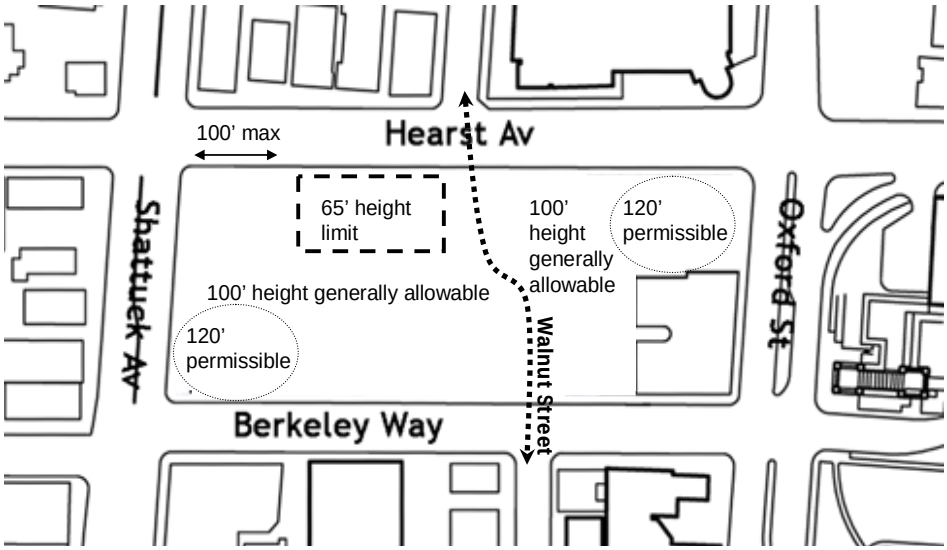
In 2005 the City of Berkeley and the University of California, Berkeley signed an agreement that obligated the University to pay for and participate in joint planning for its properties west of the Campus Park, in a land use planning zone the 2020 LRDP termed the Adjacent Blocks West. The area for joint planning was expanded to include the greater downtown area, bounded by Hearst, Oxford, Dwight and Martin Luther

King, Jr. Way. The agreement between the parties recognized their mutual interest in assuring downtown development would help create an appealing, safe and pedestrian oriented Downtown environment while revitalizing the Downtown economy; further that University investments downtown should help enhance the image, experiential quality, and economic and cultural vitality of downtown Berkeley (2005 Agreement, Statement of Principles, excerpts).

Although the resulting Downtown Area Plan (DAP) is the subject of a pending citizen referendum, University properties have not been the focus of controversy. Each version of the Plan assumed demolition of the 2151 Berkeley Way buildings and redevelopment of the site. The large citizen committee initially working on the DAP determined that University properties could be developed up to 100 feet in height and suggested that the redevelopment of the DHS site include a pedestrian way connecting Walnut Street. Exceptions to this would be possible 120 foot tall towers, and a 65 foot height limit along a portion of the southern edge of Hearst across the street from private apartment buildings. See Figure 4.

The Planning Commission version of the Downtown Area Plan confirmed the heights for University properties, and the City of Berkeley Downtown Area Plan EIR, SCH #2008102032 (hereafter, "DAP EIR") analyzed potential future University development at the DHS site with development up to 100 feet, with 65 feet across from apartment buildings on Hearst, and with a possible 120 foot element somewhere on the site. The DAP EIR also assumed a public open space or plaza would be planned somewhere on the DHS site.

Please see Figure 4 and Appendix B, Project Design Guidelines, which incorporate the Downtown Area Plan framework to guide future planning of the DHS site.



Downtown Area Plan, July 2009, 2151 Berkeley Way site constraints. 100 foot height limit generally; 65 foot height limit for 80 feet deep along Hearst Avenue, beginning 100 feet east of Shattuck Avenue, ending opposite Walnut Street. 120 foot element permissible at corner of Shattuck Avenue and Berkeley Way, or Oxford Street and Hearst Avenue. Site plan should allow pedestrian connection via Walnut Street.

Figure 4. Downtown Area Plan framework for planning at 2151 Berkeley Way site as of July 2009.

SITE PLAN DESCRIPTION

There is an approximately 10-foot elevation drop from north to south through the DHS site, and a 20-foot elevation drop from east to west. The existing facilities at 2151 Berkeley Way interrupt Walnut Street, a public street that continues to the north and south of the block.

The site plan for the Project would develop a 36 foot-wide level pedestrian path connecting the Walnut streets on either side of the site. The Helios building would be sited as a modified oblong or bar shape (see additional building description, below), paralleling Hearst Avenue east to west, sited east of the Walnut Street path. Potential future development of the Community Health Campus could occur west of the Walnut connection, along the Shattuck frontage of the DHS site. Future development could include development of ground floor active, community-oriented use as part of the future Community Health Campus along Shattuck Avenue, in accordance with the DAP.

To capitalize on daylight, the south portion of the Helios building would house offices, meeting space and the entry lobby; the north portion of the Helios building would house laboratory uses. Views between the existing 1910 Oxford apartments (which were built to the property line) and the proposed new building would be indirect due to the offset of the Helios building from the corner, and divergent floor to floor heights. The Helios building would be set back approximately 26 feet from the corner of

Hearst and Oxford. The 5 foot setback from Hearst Avenue would accommodate tree planting along the north facade of the building and potential future development of a greenway and bike path within the Hearst right of way.

Truck deliveries and loading for the Helios building would occur below grade using a 30-foot wide driveway accessed off of Berkeley Way, west of the service entrance for the existing 1910 Oxford apartments and taking advantage of lower elevations at the south side of the site. Trucks would back

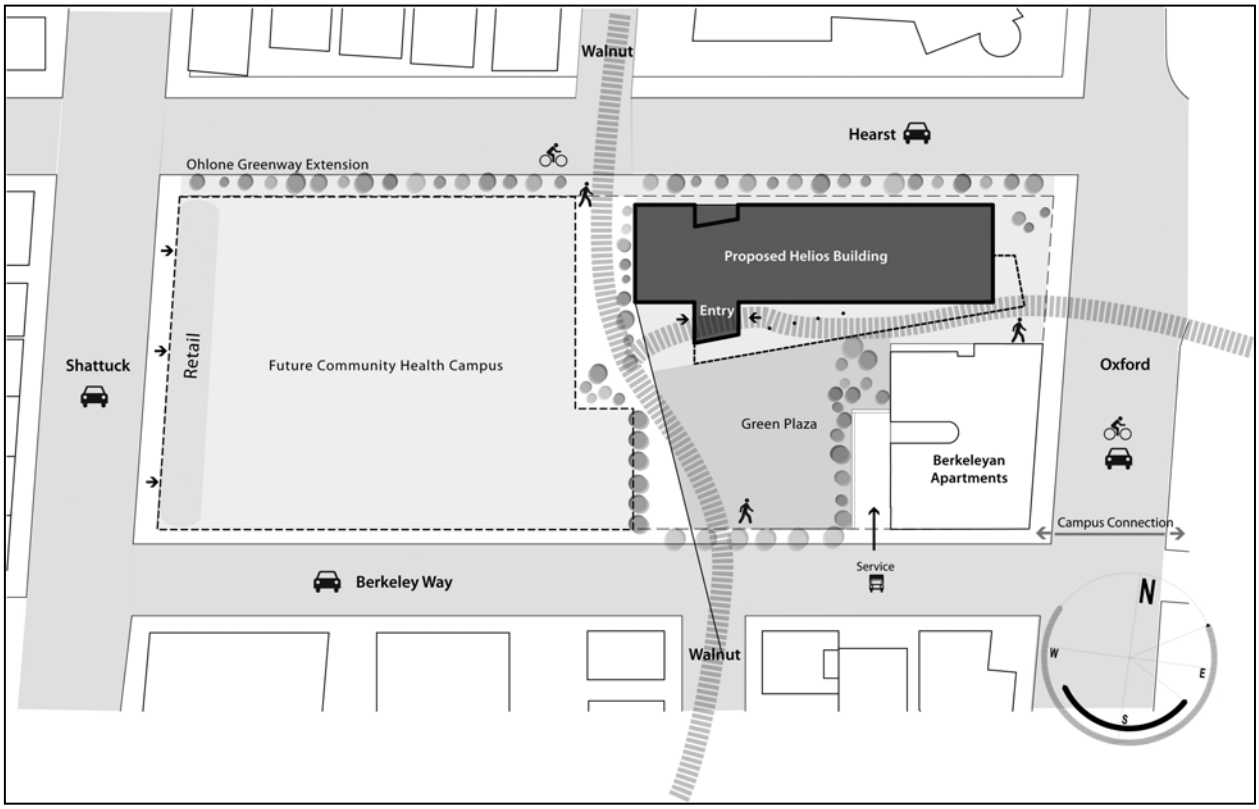


Figure 5. Proposed site plan, incorporating Helios building, Community Health Campus, Shattuck retail, green plaza, Walnut Street path

down a steep 12-13% slope with a minimum clearance of 14 feet. The loading dock will be underground with an earthen covered roof open to the south. Trees may be planted atop the dock. The driveway would have concrete retaining walls on both sides to minimize the site impacts of the subterranean loading dock.

West of the service drive on Berkeley Way a terraced open space would set the new building in a context of green as viewed from the south. A gently sloping accessible path between the new building and Berkeley Way would define the terracing of the open space. Pedestrians would reach the new building entry from the west (downtown, BART, bus) and travel up Berkeley Way, through the open space or Walnut connection or a monumental 95-foot long direct stair way to the entry lobby, or from the campus and the south east by the northwest quadrant staircase leading between the northwest precinct and Oxford Street, reaching the building by Berkeley Way through the open space, or by a colonnaded breezeway off Oxford between the 1910 Oxford apartments and the new building. No building entries would occur along the Hearst frontage of the building; a single focused entry promotes building security, helps to activate the new south plaza, and encourages movement that enlivens downtown Berkeley to the west and south. The single entrance also promotes safe crossing from the Campus Park at the signalized Berkeley Way and Oxford crossing.

The Project allows the potential future development of underground parking on the remainder of the DHS site as part of the eventual CHC project. However, the Project does not include underground parking. No parking would be provided to serve the building, which is well served by transit. University permit parking remains available across Oxford at the Genetics garage. In the interim before further development of the entire property, surface parking would be available on the Shattuck frontage of the site.

Including the Helios building, the site plan can accommodate approximately 420,000 total GSF of new buildings at the DHS site. The site plan can accommodate a possible future courtyard element internal to the potential CHC, as well as landscape elements included in the Project: the Walnut pedestrian pathway, and the open space plaza on Berkeley Way west of the apartment building at 1910 Oxford. See Figure 5.

The Helios building location near the northwest quadrant of the Campus Park promotes interaction and collaboration with the larger community of faculty and students investigating cellular and genetic structures. The Project is within five minutes walking distance of several other campus buildings with synergistic programs:

- Barker Hall: Neuroscience, Molecular and Cell Biology,
- Koshland Hall: Molecular and Cell Biology, Plant Biology
- Genetics and Plant Biology Building: Genetics and Plant Biology, Plant and Microbial Biology
- (under construction) Li Ka Shing Center for Biomedical and Health Sciences

The site plan for the Project, with entrances on the south of the Helios building and an open space on Berkeley Way, promotes interactivity by encouraging safe pedestrian passage between the Project site and the Campus Park by an existing crossing light at Berkeley Way.

SOUTH PLAZA DESCRIPTION

The location south of the Helios building allows the proposed plaza to be defined and protected by buildings from the busiest of adjacent streets. The southern orientation would provide warm microclimates beneficial during most of the academic year. The location of the open space allows longest possible green sightlines for buildings on site, including the apartment building at 1910 Oxford. A metal screen, ranging from 3.5 to 9 feet tall, may employ patterned perforations to artfully mask the 30-foot wide loading dock ramp to the basement level of the Helios building, at the east side of the plaza next to existing service area for 1910 Oxford.

The grade change from sidewalk at Berkeley Way to the proposed entrance of the Helios Building is approximately eleven feet. At the western side of the plaza, a 95-foot long stair corridor provides direct access to the upper plaza area and the main building entrance. The project proposes to landscape the plaza with a series of sloping planes defined by concrete walkways in a zigzag or switchback pattern. Thin galvanized steel walls may be used to retain the slopes and would be from 2 to 3 feet high at the tallest points, melting into the grade at each switchback. Landscaping at both the lower and upper portions of the south plaza would include trees and benches. No fencing is planned: the grade change of eleven feet would create a natural separation between the more public areas of the plaza close to the Berkeley Way sidewalk, and the more building-oriented functions at the north.

WALNUT PEDESTRIAN PATHWAY DESCRIPTION

The Walnut Street pedestrian connection would include creation of a drainage bioswale to collect rainwater run-off, and to slow and filter rainwater before it enters the storm system. Plantings along the pathway may include trees; largely drought-tolerant plants are proposed. The corridor would be paved with asphalt unit pavers that slope toward the planting beds where runoff will be filtered.

BUILDING DESCRIPTION

The proposed five-story Helios building (five stories above grade plus a basement level) would be comprised of two integrated elements: a solid-seeming block paralleling Hearst Avenue and containing the laboratory program, partly wrapped by a lighter glass-enclosed office element overlooking the new south plaza, with views south and east to the Campus Park. An approximately 10-foot high perforated parapet around the entire perimeter of the solid block would veil mechanical systems, including air handlers, exhaust fans and a boiler room. The height of the building to top of parapet would be 100 feet.

The solid form continues the orthogonal definition of urban building fabric at the primary street, including the definition of streetspace from sidewalk to sky. Along Hearst Avenue the façade would feature a five story vertical recess housing the windowed west circulation core of the building; small square punched windows at the ground floor level; a series of bay windows at floors two through five. Finishes and perhaps coloration would texture the base, middle and top of the building, with fine grained and darker features at the ground floor graduating to larger-scale, lighter features at the building parapet. A recess between the building and the parapet would help distinguish the top. There would be no doors on the Hearst Avenue side of the building, promoting physical security and encouraging activity on the new south plaza.

Beginning with four levels of glass- enclosed collaborative meeting spaces at Oxford, the glass element would wrap the solid block to the south and west, fanning from narrow at Oxford to widest over the entry lobby on the southwest of the building, and housing offices overlooking the new south plaza. The transparent form orients itself to the campus gateway and student pedestrian traffic. The glass element would be four stories, sitting lightly upon columns at grade – only the entry lobby would be enclosed at the ground level. A pathway between the new building and the apartment building at 1910 Oxford would lead under the office element to the glass lobby entry of the building, which could be accessed from the west, connecting with downtown and the east, connecting with the campus park. The design intent is that the solid element might be visible through portions of the glass curtain wall, and at the top and bottom of the glass element. Horizontal bladed sunshades are being carefully studied to maximize interior lighting while reducing glare and heat gain; these may be mounted with slim cables.

Active uses at the ground level overlooking the new plaza would include a conference room, and the director's suite; the building lobby would include display space for understanding research conducted in the building.

Please see Appendix C for description of comments received from reviewing City of Berkeley commissions, and Appendix D for illustrations of the Project.

Colors and Materials

To add visual interest, contrast and texture would be employed in the use of exterior materials. Color and textures are inspired by natural forms, i.e. the main lab block is to evoke a rock formation whilst

office functions are housed in a crystalline form. In this manner, the building's main functions are expressed.

Anticipated window systems include a quality structural glass wall and curtain wall to allow large amounts of natural light into public spaces and to minimize the need for artificial light. Sun shading, screening and high performance glazing types will be used to limit the effects of undesirable afternoon heat gain. Operable windows will be utilized at the office suites for natural ventilation in these areas.

Lighting
Exterior lighting would be installed at the entrances, at the pedestrian pathway, and in the proposed south plaza area. All exterior lighting would be designed to minimize glare. The exterior lighting system for the facility includes landscape lighting, and the building exterior lighting would have cut-off shielding to prevent light spill and light pollution; interior lighting would be located and specified to prevent light pollution. Wherever possible and appropriate lighting would be sensory controlled. Custom decorative LED lighting may be used in the main entry lobby (SmithGroup, Schematic Design Narrative, 9.11.09).

Sustainable Design
Sustainable design has been integral to planning for the Project. Concepts under development (subject to further review and feasibility analysis) in the project include:

- The existing site is near 100% impermeable with existing building roofs and hardscapes. The site plan would decrease the impermeable surfaces, reducing stormwater runoff and improving water quality. Further, the Walnut Street path would include a drainage bioswale to collect rainwater run-off, slow it and filter it before the water enters the storm system.
- Bicycle storage and on-site showers and lockers are planned.
- Reduction of heat island effect for non-roof areas by specifying light colored paving and cool roofs where possible.
- Elevators are being specified to be regenerative, which would not require machine rooms and would put energy back into the facilities grid.
- Operable windows for offices.
- Variable flow fume hoods are specified.
- Use of low flow toilets and showers and waterless urinals.
- Commissioning of building systems.
- Use of materials with recycled content as well as rapidly renewable materials (such as bamboo) are planned
- The site is well served by transit and no parking is added by the Project.

PROGRAM DESCRIPTION

The Helios building program is planned to include the areas listed in the schematic program in table 1, although it should be noted the building design is presently in progress and the distribution of space types within the building may be adjusted as the design proceeds.

Table 1. Schematic Space Program (estimated assignable square feet)

Research laboratories		31,000
Open laboratory	18,000	
Support laboratory	13,000	
Office		12,500
Open office	8,500	
Private office	4,000	
Meeting space and operations		7,200
Director's suite	800	
80 seat conference room	1,000	
Operations / Bldg support	5,400	
Shell space for Bioengineering		12,900
Open laboratory	5,600	
Support laboratory	4,300	
Office	3,000	
Total Assignable Square Feet		**63,600**
Estimated Total Laboratory ASF (includes laboratory shell space)		40,900

Research Laboratories. This refers to generic, open lab spaces with lab benches and workdesks which are assigned to faculty principal investigators (PIs) and utilized by the PIs and the postdocs, students, and other researchers working under their direction. Support laboratories include all support spaces related to laboratory work.

Any research in the building now or in the future would be subject to campus hazardous material handling programs outlined in the 2020 LRDP EIR (see 2020 LRDP EIR section 4.6). As noted in the 2020 LRDP EIR, the Chancellor's Advisory Committee on Laboratory and Environmental Biosafety (CLEB) is charged with the responsibility of formulating campus policies to ensure the safe conduct of research involving biohazardous agents and materials, in accordance with guidelines set forth by the NIH, the CDC and the US Department of Agriculture. CLEB reviews and approves all recombinant DNA research using transgenic plants. Research currently proposed would involve the use of transgenic plant material, or plants with genes transferred between species. Research currently proposed for the building would not involve the use of pathogens, or disease-causing agents.

The Helios facility's biological research areas would be designed to accommodate Biosafety Level-2 operations if any are proposed in the future, with no or minor retrofit[3]. In all portions of the building, primary and secondary barriers would be used to reduce or eliminate exposure of the laboratory environment and the outside environment to potentially hazardous agents. Primary barriers (biosafety cabinets and fume hoods) are designed to protect personnel and the laboratory environment from exposure to hazardous agents. Facility design criteria provide secondary barriers as a protection for personnel inside and outside the laboratory. Air changes would be implemented for worker safety. All lab facilities would maintain negative pressure, which would control the release of any airborne materials to non-lab areas via doors and other openings. The laboratory staff and researchers would be trained in the use of certified biosafety cabinets, autoclaving, and other specialized disinfection techniques, and biological materials handing protocols.

The development of and research related to transgenic (genetically modified) plant materials and microorganisms would occur in three thematic areas associated with the EBI program. All research

related to transgenic organisms will be required to comply with National Institutes of Health (NIH) Guidelines for Research Involving Recombinant DNA Molecules. The Guidelines specify containment practices for plants and microorganisms, depending on the potential hazard posed by the organism. The potential for worker exposure is minimized by compliance with Centers for Disease Control (CDC) and NIH guidelines for research involving these materials.

The goal of the EBI research program is to solve the scientific and technical problems associated with large-scale production of renewable biofuels for transportation, conversion of hydrocarbons to clean fuels, improved recovery from existing oil reservoirs, and carbon sequestration. The EBI would perform bioscience research aimed at increasing our understanding and potential application of biofuels to reduce the impact of energy consumption on the environment. Currently about 10 percent of the energy used in the world comes from biomass, however, the biomass is not produced in a sustainable manner. One purpose of the EBI research is to make improvements to the biofuel production process so that sustainable biofuels can account for a greater portion of energy used globally, without necessarily using large areas of arable land. There would be two components within EBI, the non-proprietary University researchers and a small group of scientists in a separate, proprietary division. There would be six interrelated research programs within EBI.

Feedstock Development is sustainable development of plant biomass in close proximity to a processing plant that converts biomass to fuel. The program would research development of biofuels from both crop residues and perennial energy crops in both tropical and temperate climates under different soil conditions so that the research benefits all areas of the world. This research program would be conducted both within the Project and at the Open Air Feedstock Research and Development Center at University of Illinois, Urbana-Champaign (UIUC). The laboratories within the Project would focus on biomass engineering; lignin; and biotic stress. Research programs focused on feedstock production, feedstock genetics and plant breeding, environmental impact and sustainability assessment, and methods to improve harvesting, transport, and storage of biomass, would be conducted at UIUC. The environmental impact and sustainability assessment research would investigate environmental consequences of conversion of land from current uses to feedstock cropping.

Biomass Depolymerization is research into reducing the cost and energy consumption associated with biofuels such as ethanol. This research program would include laboratories that would focus on feedstock pretreatment, enzyme discovery, enzyme structure and function, and enzyme evolution and engineering.

Biofuels Production which is efficient conversion of biomass to fuel under industrial conditions. This research program would involve research in systems biology, pathway engineering, and host engineering.

Fossil Fuel Bioprocessing and Carbon Sequestration is research into biological process for microbially enhanced oil recovery (MEOR), fossil fuel processing and biological carbon sequestration. MEOR techniques involve the use of microorganisms, nutrients, and oxygen to produce metabolic events that lead, by a variety of mechanisms, to enhanced oil recovery. Fossil fuel bioprocessing would cover research on ways to utilize large reserves of fossil fuels, such as tar sands, shale, and soft coal that are likely to be extensively used for fuel production in the future. The research would focus on methods to facilitate the production of liquid or gaseous fuels (e.g., methane) from fossil fuel sources in ways that reduce the environmental impact of processing compared to non-biological methods. Biological carbon sequestration research would involve investigation of methods to improve the rates of removal of carbon dioxide from the atmosphere by photosynthesis and store the carbon dioxide in plants, soils and

sediments; note that no field-testing of any carbon sequestering methods is proposed in California as part of this research effort.

Socio-Economics Systems includes research programs focused on the social and environmental implications of the use of biofuels, including life-cycle environmental effects (such as the net greenhouse gas emissions) of each biofuel production pathway.

Discovery and Development which would support all of the scientific programs and would include computational and data management, chemistry, imaging, and synthetic biology.

The research program would require multi-disciplinary laboratories focused on the conversion of plant-based biomass into environmentally benign transportation fuel, and on the impacts of those biofuels on society. Wet research laboratories (including fume hoods with direct ventilation and specialized piped utilities), and fermentation laboratories would be required to conduct the proposed research and therefore are included in the proposed facility. Advanced imaging and analytical tools related to feedstocks would be required. The laboratory space would also need to be adaptable to a variety of functions to accommodate new technology and different research programs.

Office space. Private office space in the building would typically be on a 150 or 120 square foot module. Open office spaces included in the space total would include gathering spaces, kitchenette and vending, as well as open office cubicle space.

Meeting space and operations. Meeting and operations space included in the above totals refers to an 80-seat conference room and the director's suite, as well as the main lobby of the building, shower, locker and bicycle rooms.

SAFETY AND HEALTH

The development of and research related to transgenic plant materials and microorganisms would occur in laboratories associated with the Helios building. Similar research occurs today in buildings at the Oxford Tract and on the Campus Park, and expansion of these research programs was considered and analyzed in the 2020 LRDP and 2020 LRDP EIR. Similar to all research and development laboratories, the Project will employ controls to reduce the potential for worker exposure, public exposure, and release of hazardous and other scientific materials to the environment: an example of training material promulgated for safe research operations on campus is included in Appendix G. However, in 2009 UC Berkeley also completed an update to the campus-wide air toxics Health Risk Assessment (HRA) first prepared for the 2020 LRDP EIR. An HRA characterizes human health risks as a result of exposure to air pollutants from campus activities. The HRA update examined laboratory operations, hazardous materials bulking operations, natural gas and diesel fired stationary combustion sources (including routine firing of back-up emergency generators), campus painting/maintenance activities, and campus printing press operations. Even with the addition of laboratory research at the Project site and with conservative modeling assumptions, health risks are below the significance level at all offsite receptor locations (2020 LRDP EIR Vol 2 Appendix C; 2009 HRA Update, ERM, November 2009). See also discussion under the heading Program Description: Research Laboratories, above.

PARKING SUPPLY

The Project would be sited immediately west of the northwest corner of the Campus Park. The area is served by campus and Berkeley Lab shuttles, as many as 13 AC Transit lines (7, 9, 15, 40, 40L, 43, 51, 51S, 52, 65, 67, F, FS) and the Bay Area Regional Transit (or BART) station at Downtown Berkeley which is a short walk away.

The surface parking ringing the structures at 2151 Berkeley Way is managed as permit parking by the University of California. University parking at this location has however always been a temporary, interim use of the site, intended to relieve pressure upon the parking system during the construction of the Underhill parking structure, which is now completed and operational. The new Underhill parking facility opened in the fall of 2007, with 1000 marked parking spaces.

No parking would be provided to serve the Helios building, which is well served by transit. University permit parking remains available across Oxford at the Genetics garage. Undeveloped portions of the property would likely remain University permit surface parking after construction of the Project for the foreseeable future.

The 2020 LRDP includes the policy:

'Partner with the City and LBNL on an integrated program of access and landscape improvements at the Campus Park edge'

The University recently worked intensively with the City in planning, including access and streetscape, for the blocks west of the Campus Park. See discussion above regarding the Downtown Area Plan.

As a result of the 2020 LRDP settlement agreement with the City of Berkeley, UC Berkeley agreed to limit new parking constructed under the 2020 LRDP to no more than 1,270 net new parking spaces, provided that the City approves a route for a dedicated lane Bus Rapid Transit project that would serve the downtown area and Telegraph Avenue.

Also as a part of the agreement, UC Berkeley agreed that 'As part of the [Downtown Area Plan], the City and University will seek to maximize the integration of any UC parking into the overall supply of parking in the downtown area and encourage its use by the public at off-peak times when not required for University needs with appropriate pricing and signage.' The University has discussed a possible future parking structure at a site on University Avenue between Shattuck and Oxford, a concept endorsed in all versions of the Downtown Area Plan.

The campus Parking and Transportation unit expects to install a dynamic parking management system [Parking Access Revenue Control System (PARCS)] in the near term that will better enable the management of permitted parking and the driver's awareness of parking availability. Real-time availability information is expected to reduce congestion and 'circling' and could direct people to available parking campus-wide. Dynamic signage on the ground as well as mobile internet access would provide information for garage availability. Similar systems are operational in San Francisco and San Jose today. Where the current monthly permit system is a disincentive to use of alternative transportation modes, the new system may also be used to streamline on-site per-use payment, with expected improvements in the availability of parking for those who must drive to campus.

DEMOLITION OF 2151 BERKELEY WAY

In preparation for the construction of the Project, the vacated Department of Health Services (DHS) facilities, bounded by Oxford St., Shattuck Ave, Hearst St. and Berkeley Way, will be demolished.

The facilities were vacated by DHS in 2006 after which a combination of salvage, decommissioning and hazardous materials removal steps were implemented. The buildings have received radiation clearance from the State, and both chemical and biological decontamination will be completed prior to structural demolition.

Prior to building demolition, the campus has been removing hazardous materials intrinsic to the structure, including asbestos and, where required, lead. The asbestos is found in some floor tiles and portions of fireproof insulation; the lead is found in portions of painted surfaces, both interior and exterior. Removal of hazardous materials is always completed by a licensed hazardous materials contractor, under the oversight of the campus Environment, Health and Safety office, prior to structural demolition.

Recyclable contents and building materials are being removed during abatement and will be removed during demolition. In addition, to meet campus recycling goals, the campus is considering use of the building's concrete for backfilling portions of the large basement mechanical area and loading dock. In this manner, both truck trips are reduced and reuse goals are achieved.

The demolition process is expected to be completed in a controlled manner that includes rendering the taller parts of the buildings into large portions which would then be lowered to ground level in a controlled manner for processing/recycling. Neither a wrecking ball system nor explosives will be employed in the project. Demolition will generally begin with the upper story and proceed downwards to the basement, with engineering staff ensuring the structural integrity of the building as it is disassembled.

The demolition activities will occupy the entire DHS site, and existing campus parking spaces on the DHS site will be removed temporarily, and demand transferred to nearby existing UC lots. The Project aims to limit interruption to vehicular or pedestrian traffic on the surrounding streets, except for vehicles driving onto and off of the site. The Project contractor and University project management will install temporary trailers in the western portion of the site, currently used for parking.

The University will employ truck hauling routes as agreed to with the City of Berkeley. The Project will use the hours of operation allowed by the City of Berkeley noise ordinance, generally Monday – Friday 7:00 a.m. to 7:00 p.m., with limited weekend hours if needed. The demolition and off-haul is expected to take between 16 and 24 weeks.

Temporary protection, such as walks, fences, railings, canopies and covered passageways will be installed as required. Particular attention will be placed on protecting the adjacent residential building on the Southeast corner of the site. A UC construction complaint coordinator will be assigned and will be available by phone during all operating hours.

During the Project, all applicable mitigation measures and continuing best practices from the UC Berkeley 2020 Long Range Development Plan EIR will be implemented. These measures may be found at in Appendix A and online at www.cp.berkeley.edu/LRDP_2020.htm. Historic items, relics and similar

objects including, but not limited to cornerstones, commemorative plaques and tables, antiques and other items of value to the University that are encountered during demotion will be carefully removed or salvaged and delivered to the University.

ANTICIPATED SCHEDULE

UC Berkeley expects to submit the design of the Project to the Regents for their consideration in January 2010. Other public discussion of the Project occurred at an October 8 open house and meeting widely publicized in the vicinity of the Project site; review with the City of Berkeley Planning Commission October 14, and review with the City of Berkeley Design Review Committee October 15, 2009 (See Appendix C, Commission Review comments and responses). Demolition of existing development at 2151 Berkeley Way is planned to begin early in 2010 and the construction of the Project is planned to be completed by December, 2012.

HISTORY OF THE HELIOS PROJECT

Both the Berkeley campus and the Lawrence Berkeley National Laboratory have long-standing research interest in alternative fuels and alternative energy research. In February 2007 energy firm BP announced its selection of the University of California, Berkeley, in partnership with Lawrence Berkeley National Laboratory (LBNL) and the University of Illinois at Urbana-Champaign (UIUC), to lead an unprecedented $500 million research effort to develop new sources of energy and reduce the impact of energy consumption on the environment.

In November 2007, the University published a Draft EIR for the EBI project at an LBNL site in Strawberry Canyon. The proposal was to house the EBI program with independent LBNL research initiatives into advanced photovoltaics (solar panels), storage of electrical energy, and development of chemical processes that mimic photosynthesis in a single facility on UC-owned land at the Lawrence Berkeley National Laboratory (LBNL) site.[†] Unfortunately, the candidate sites at LBNL posed logistical, geotechnical, utility service, and environmental constraints. The initial proposal also resulted in significant public opposition and litigation, reflecting a common public sentiment opposing the location of the proposed project and not the Helios program itself. In response to those challenges and expanding alternative energy research programs, the University of California reevaluated program requirements and siting.

In August 2009 the University requested, and the State Public Works Board approved, the division of the state capital funding support for the Helios program, and the siting of EBI and related programs at the 2151 Berkeley Way site. LBNL currently is in the preliminary stages of evaluating possible sites to house research programs devoted to new photovoltaic and electrochemical solar-energy systems. This future project is not part of this environmental assessment, and there are no unique linkages between the

[†] Note: In January 2009 LBNL held a scoping session for this project in a different configuration. Campus staff have reviewed comments LBNL received at that meeting, and four primary themes are apparent: 1) Commentors asked LBNL to examine alternative sites for the project; 2) commentors asked LBNL to consider the environmental sensitivity of the LBNL site selected; 3) commentors expressed concern about the influence of industry partners for the project on the research outcomes; and finally, 4) commentors expressed concern about risks associated with releases of the research. Site issues are not further addressed in this document as the LBNL site is no longer the site for the current project – site considerations would be evaluated by LBNL in any future proposal. The influence of industry partners is not an environmental issue subject to review under the California Environmental Quality Act and is not further addressed in this document. As described further in this document, the type of research to be conducted in the currently proposed Helios project is not unique to the UC Berkeley campus and is consistent with research growth planned in the 2020 LRDP and examined in the 2020 LRDP EIR.

research programs. The sites under consideration at the LBNL site are not within the scope of the UC Berkeley 2020 LRDP (2020 LRDP EIR Vol 1, p. 3.1-5).

The University has sought the support of the City of Berkeley for the decision to site the current Helios Project downtown, consistent with its partnership in development of the downtown area plan framework and in the "Green Corridor" initiative, a private-public consortium. See http://berkeley.edu/news/media/releases/2009/08/03_helios.shtml.

see also
http://www.lbl.gov/publicinfo/pressroom/assets/docs/About-the-Lab.pdf
http://newscenter.berkeley.edu/news/chancellor/access/access.shtml
http://inews.berkeley.edu/bcc/Fall2007/887.html

RELATIONSHIP TO 2020 LRDP

BACKGROUND

UC Berkeley's Long Range Development Plan was approved by The Regents in January 2005, and describes both the scope and nature of development proposed to meet the goals of the University through academic year 2020-2021, as well as land use principles and policies to guide the location, scale and design of individual capital projects. An amendment was approved in the summer of 2009 to document existing campus commitments to address climate change. Hereafter, the LRDP as amended is referred to as the 2020 LRDP and incorporated herein by reference; the environmental document prepared for Amendment #1 also updated the 2020 LRDP EIR. Hereafter, the 2020 LRDP EIR as updated by Addendum #5 to address climate change is referred to as the 2020 LRDP EIR, also incorporated herein by reference. LRDP Amendment #1 and its related environmental document, Addendum #5, are available online at tinyurl.com/UCBclimate.

The 2020 LRDP Environmental Impact Report provides a comprehensive program-level analysis of the 2020 LRDP, and its potential impacts on the environment, in accordance with Section 15168 of the California Environmental Quality Act (CEQA) Guidelines. Under CEQA, subsequent projects should be examined in light of the program-level EIR to determine whether subsequent project-specific environmental documents must be prepared. Subsequent documents may rely on the program-level EIR for information on setting and regulatory framework, for analysis of general growth-related and cumulative impacts, and for alternatives to the 2020 LRDP. 2020 LRDP mitigation measures and best practices that reduce potential impacts of the project would be implemented as part of the project, and would be identified in the project-specific review. Additional mitigation measures may also be identified.

2020 LRDP EIR mitigation measures and continuing best practices to be incorporated into the Project are identified in each topical section of the **ENVIRONMENTAL EVALUATION** in this document. The 2020 LRDP and the 2020 LRDP Environmental Impact Report (SCH #2003082131) are available on line at lrdp.berkeley.edu; copies are available for review at the offices of Physical and Environmental Planning/Capital Projects/Facilities Services, Room 1, A&E Building on the Berkeley campus, and are available for review at the Berkeley Public Library and campus libraries.

CONFORMANCE TO THE 2020 LRDP

The proposed site for the Project is governed by the 2020 LRDP. The Project would be located on the area designated in the 2020 LRDP as the Adjacent Blocks West, a subset of the City Environs (2020 LRDP EIR Vol 3a, 3.1-5 to 3.1-7). The 2020 LRDP anticipated up to 800,000 net new gross square feet of academic and support space would be developed on the Adjacent Blocks West over the lifetime of the 2020 LRDP, and over 2.2 million net new gross square feet within the entire area governed by the 2020 LRDP (2020 LRDP EIR Vol 3a, 3.1-22). These growth envelopes were analyzed in the 2020 LRDP EIR. As shown in Table 2 below, the Project would result in space levels below levels anticipated in the 2020 LRDP, on a site designated for development in the 2020 LRDP.

The 2020 LRDP also projected increases in campus headcount, broken down by faculty, academic staff and visitors (including researchers and postdocs), and nonacademic staff. Table 3 shows how the Project aligns with the net new headcounts in each category anticipated in the 2020 LRDP, and analyzed in the 2020 LRDP EIR (2020 LRDP EIR Vol 3a, 3.1-14). For the purpose of this environmental analysis, it has been assumed the entire occupancy of the Project represents a net increase in campus headcount. This is because, even though some of the Project occupants may already be housed in other buildings on campus, once they move to the Project their space may be backfilled with other, similar programs.

The 2020 LRDP includes Location Guidelines for the various campus functions housed on and around the campus. The Project conforms to the Location Guidelines, which prioritizes locations on the Adjacent Blocks for functions including research activities without substantial student engagement and participation.

Table 2. Comparison of Project to 2020 LRDP Program: Space			
	# Gross Square Feet		% total LRDP GSF
	By project	totals	
Max New Academic and Support GSF in 2020 LRDP		2,200,000	100%
Max new Academic and Support GSF due to other projects[4]		713,182	33%
Max new Academic and Support GSF due to Helios	112,600		5%
Net new Academic and Support GSF remaining		1,374,018	63%

Table 3. Comparison of Project to 2020 LRDP Program, West Adjacent Blocks: Space			
	# Gross Square Feet		% total Area GSF
	By project	#	
Max New Academic and Support GSF in 2020 LRDP		800,000	100%
Max new Academic and Support GSF due to other projects	0		0%
Max new Academic and Support GSF due to Helios	112,600		14%
Net new Academic and Support GSF remaining		687,200	86%

Table 4. Comparison of Project to 2020 LRDP Program: Estimated Headcount			
	# Individuals		% LRDP Headcount Remaining
	By project	totals	
Faculty			
Max New Faculty in 2020 LRDP		220	
Minus 2020 LRDP Projects Previously Approved[5]		115	
Max new Faculty Before Project		105	
Net new Due to Project	18[6]		
Max Net New Faculty After Project		87	39%
Academic Staff			
Max New Academic Staff in 2020 LRDP		1,840	
Minus 2020 LRDP Projects Previously Approved		420	
Max new Academic Staff Before Project		1,420	
Net new Due to Project	224		
Max Net New Academic Staff After Project		1196	65%
Nonacademic Staff			
Max New Nonacademic Staff in 2020 LRDP		810	
Minus 2020 LRDP Projects Previously Approved		351	
Max new Nonacademic Staff Before Project		459	
Net new Due to Project	30		
Max Net New Nonacademic After Project		429	53%
EBI Proprietary Staff (privately employed)			
	50		
TOTAL PROJECT STAFF	**322**		

OBJECTIVES OF THE 2020 LRDP

The purpose of the 2020 LRDP is to set forth a framework for land use and capital investment undertaken in support of the campus' academic principles. The 2020 LRDP is driven by the following broad objectives: those which are directly relevant to the Project are shown in **bold black** (2020 LRDP EIR Vol 3a, 3.1-10).

- **Provide the space, technology and infrastructure we require to excel in education, research, and public service.**
- **Provide the housing, access, and services we require to support a vital intellectual community and promote full engagement in campus life.**
- **Stabilize enrollment at a level commensurate with our academic standards and our land and capital resources.**
- **Build a campus that fosters intellectual synergy and collaborative endeavors both within and across disciplines.**
- **Plan every new project to represent the optimal investment of land and capital in the future of the campus.**
- **Plan every new project as a model of resource conservation and environmental stewardship.**
- **Maintain and enhance the image and experience of the campus, and preserve our historic legacy of landscape and architecture.**
- **Plan every new project to respect and enhance the character, livability, and cultural vitality of our city environs.**
- **Maintain the hill campus as a natural resource for research, education and recreation, with focused development on suitable sites.**

Provide the space, technology and infrastructure we require to excel in education, research, and public service.

The Project would demolish facilities at 2151 Berkeley Way, identified in state studies as obsolete with a poor seismic rating, and construct a new state of the art research facility and landscaped open space areas. As stated in the 2020 LRDP:

> 'Enrollment is only one of many drivers for growth at UC Berkeley. New academic initiatives and continued growth in research also create demand for more space on and around campus. While some of this demand can be met through renovation of existing buildings, new buildings are also required, particularly for programs that demand high performance infrastructure and other advanced features renovated space can not provide.
>
> The impact of change is most severe in laboratory-based research, where many of our older buildings are unable to meet modern standards for power systems, climate and vibration controls, and safety and environmental protocols … Many of our instructors and researchers struggle with spaces and systems compromised not only by time, but also by decades of inadequate reinvestment. The renewal of our physical plant is crucial to our ability to recruit and retain exceptional individuals, and to pursue new topics of research and new models of instruction.'

The Project is a key element of this renewal: it would provide the campus with the laboratory facilities it requires to support pressing research into carbon neutral biofuels. It would also replace a building with a 'poor' seismic rating, in support of the 2020 LRDP policy to:

> 'Eliminate 'poor' and 'very poor' seismic ratings in campus buildings through renovation or replacement'

Build a campus that fosters intellectual synergy and collaborative endeavors within and across disciplines.

Increasingly interactive, multidisciplinary approaches to both research and education are embraced in projects implementing the 2020 LRDP. As stated in the 2020 LRDP:

> 'The breadth and quality of our academic programs are the equal of any university in the world, but UC Berkeley is more than the sum of its parts. A great research university also requires a vital and dynamic intellectual community, one that provides exposure to a wide range of cultures and perspectives, and generates the encounters and interactions that lead to new insight and discovery.
>
> For such a community to thrive requires a campus organized and designed to foster those interactions … For example, the health sciences initiative brings researchers from physics, biology and chemistry together to study phenomena at the molecular level … Because the potential for synergy is everywhere at UC Berkeley, our first principle of land use should be to retain and reinforce the contiguity of the academic enterprise, in order to encourage interaction and exchange both within and across disciplines.'

The Project itself is deliberately designed to encourage interaction and exchange both within and across disciplines. As shown in the floor plans in Appendix D, the research labs on each floor are large, open, flexible spaces designed to accommodate multiple projects, and organized for easy interaction with the office element, programmed to include both open and enclosed office, lounge and conference spaces.

The Project location in the northwest quadrant of the Campus Park also promotes interaction and collaboration with the larger community of faculty and students investigating the molecular mechanisms of disease. The Project is within a 1000' radius of several other campus buildings with synergetic programs:

- Barker Hall: Neuroscience, Molecular and Cell Biology,
- Koshland Hall: Molecular and Cell Biology, Plant Biology
- Genetics and Plant Biology Building: Genetics and Plant Biology, Plant and Microbial Biology
- (under construction) Li Ka Shing Center for Biomedical and Health Sciences

Plan every new project to represent the optimal investment of land and capital in the future of the campus.

The DHS site represents possibly the largest site for new development in the City's downtown area, and the greatest opportunity site for University growth adjacent to the traditional central campus. Before starting design work for the Project, the University carefully considered development potential of the site as a whole. The Project would optimally use the northeast corner of the DHS property, adjacent to science buildings in the northwest quadrant of the Campus Park, for a laboratory research building; site planning accommodates potential future development of the west portion of the site for University uses and active uses at the ground floor along Shattuck Avenue consistent with the DAP and 2020 LRDP.

Plan every new project as a model of resource conservation and environmental stewardship.

The Project would support 2020 LRDP policies (as amended in July, 2009: see tinyurl.com/UCBClimate) to:

'Design new laboratory buildings to a minimum standard equivalent to LEED Silver or systemwide sustainability policy standards, whichever is more stringent.

'Design new laboratory buildings to a minimum standard equivalent to LEED 2.1 certification and LABS 21 environmental performance criteria or systemwide sustainability policy standards, whichever is more stringent.'

'Design new buildings to outperform the required provisions of Title 24 of the California Energy Code by at least 20 percent or systemwide sustainability policy standards, whichever is more stringent',

'Design new projects to minimize energy and water consumption and wastewater production', and

'Design all aspects of new projects to achieve campus short term and long term climate change emission targets established in the campus Climate Action Plan.'

Both the architecture and the infrastructure of the building have been designed to obtain the optimal performance with respect to energy and water consumption and wastewater production, informed by a an intensive workshop conducted during schematic design. Architectural features such as windows and sunshades designed to maximize natural daylight while minimizing heat gain serve as visible symbols of the campus investment in sustainable design. The placement of the research labs on the north exposures reduces the solar load on mechanical systems and allows full-height windows to maximize natural daylight in the labs.

The design of the building infrastructure has been optimized through right-sizing based on the LABS 21 data base and metering of actual use in existing comparable research labs, thus reducing the number and size of mechanical and electrical system components. The building has been designed to accommodate the addition of 'spot' cooling units as required to meet future localized high demands, and confine peak energy use to only those areas where it is required. Offices are equipped with operable windows and office return air is recirculated through the labs. The number of research lab sinks has been minimized to reduce water consumption. Demolition materials will be recycled to the greatest extent feasible.

Maintain and enhance the image and experience of the campus, and preserve our historic legacy of landscape and architecture.

As stated in the 2020 LRDP:

'The heart of UC Berkeley is often described as a 'university in a park', and it is this parklike character that unifies its disparate buildings and diverse academic functions, and imparts a unique and memorable identity … Although intensively developed, the Campus Park today retains a magnificent legacy of natural and formal open spaces, as well as numerous historic buildings and ensembles. Preserving this legacy is a fundamental objective of the 2020 LRDP: each future project should be scoped and designed to enhance the image and experience of the campus, and the quality of campus life.'

Site planning for the Project has held special importance as an initial project in the modern era at the interface of campus and city. The challenge is to develop a University building that also recognizes the City context of residential and commercial buildings, framing streets and sidewalks. Where the existing development at the DHS site signifies an era of institutional building that surrounded itself with parking disregarding the local context, the University sought to contribute a research building and open space that celebrate both campus and city. Public realm improvements are critical to the Project, including a

pathway connecting Walnut Street north and south of the site, reestablishing an appropriate pedestrian scale for the block. A green plaza south of the Helios building can enrich the city context with an active open space.

In the spirit of the 2020 LRDP statement '… the design of each building should reflect its own time and place …', the architecture of the Project is unmistakably modern: it does not overtly reference classical or other historic styles. In this respect, it is compatible with both its campus and its city context, which is dominated by buildings completed during the last five decades, in a variety of architectural styles.

The design treatment also accommodates a more customized response to each of the varied functions within the building (research labs, instructional spaces, interaction spaces), as well as a sensitive response to solar light and heat.

The Project is also consistent with the UC Berkeley physical design framework, presented to the University of California Regents in November 2009: the orthogonal forms of the building reinforce the urban fabric; the façade is finished in a tripartite expression; the building is an architectural expression of sustainable design; the site plan implemented by the Project creates public and protected places of interaction; the materials for the site and building are sympathetic to their context.

Plan every new project to respect and enhance the character, livability, and cultural vitality of our city environs.

The Project site is located in the City Environs, it lies directly across Oxford Street from the Campus Park, and thus has been designed to be responsive to the interface of campus and city. For this reason, informational presentations at the schematic design stage were made to the city of Berkeley, and city representatives have been present and have participated in all reviews of the Project by the campus design review committee. The city comments have been generally enthusiastic about the site plan for the Project; critical comments focused upon the character of the building itself as it meets the ground plane on the north. Please see Appendix C, City commission comments and responses.

The Project Design Guidelines, reprinted in Appendix B, are drawn largely from agreed-upon ideas developed during the City of Berkeley's Downtown Area Plan process, as outlined in the section "Downtown Area Plan Framework" above.

2020 LRDP CLIMATE CHANGE AMENDMENT

In June 2009, UC Berkeley published a proposed amendment to the UC Berkeley 2020 LRDP, Sustainable Campus chapter, to reflect existing campus commitments to address climate change. The LRDP amendment reflects campus policy, including: "Design all aspects of new projects to achieve short term and long term climate change emission targets established in the campus climate action plan." UC Berkeley targets achievement of 1990 greenhouse gas emission levels by 2014, six years ahead of state mandated targets, and climate neutrality as soon as possible but not later than 2050. The amendment links the 2020 LRDP and the campus climate action plan, which is updated annually: see sustainability.berkeley.edu/calcap.

The amendment to the UC Berkeley 2020 LRDP was approved by the University based on Addendum #5 to the UC Berkeley 2020 LRDP EIR. The Addendum was published in advance of consideration, and the LRDP Amendment was approved in July 2009 by the University, following review and consideration of comments from community members. Addendum #5 described existing climate change conditions and evaluates the potential for development under the UC Berkeley 2020 LRDP, with minor amendments to

reflect current campus policy, to affect climate change. Addendum #5 provided a summary of the current regulatory framework applicable to climate change, discussing the applicable federal, state, regional, and local agencies that regulate, monitor, and control GHG emissions. Addendum #5 concluded that the proposed amendment to the 2020 LRDP Sustainable Campus chapter did not trigger a need to prepare a subsequent EIR to the 2020 LRDP EIR. The Project complies with University policies on sustainable practices, as further described below. See http://tinyurl.com/UCBClimate for documents and information.

ENVIRONMENTAL DETERMINATION

The purpose of the following Environmental Assessment is to determine the appropriate form of environmental review for the Helios Energy Research Facility, and to document that determination.

The UC Berkeley 2020 Long Range Development Plan Environmental Impact Report (SCH #2003082131), certified by The Regents of the University in January 2005, indicated that projects implementing the 2020 LRDP would be examined to determine whether subsequent project–specific environmental documents are required. A portion of the 2020 LRDP EIR text is quoted below:

> CEQA and the CEQA Guidelines state that subsequent projects should be examined in light of the program-level EIR to determine whether subsequent project-specific environmental documents must be prepared. If no new significant effects would occur, all significant effects have been adequately addressed, and no new mitigation measures would be required, subsequent projects within the scope of the 2020 LRDP could rely on the environmental analysis presented in the program-level EIR, and no subsequent environmental documents would be required; otherwise, project-specific environmental documents must be prepared (2020 LRDP EIR Vol I, 1-2).

The use of the 2020 LRDP and 2020 LRDP EIR in project review was also specifically addressed in the first Thematic Response to comments received on the 2020 LRDP Draft EIR (2020 LRDP EIR Vol 3A, 11.1-1). There, the document reiterated the text quoted above, and explained:

> Projects subsequently proposed must be examined for consistency with the program as described in the 2020 LRDP and with the environmental impact analysis contained in the LRDP EIR; if new environmental impacts would occur, or if new mitigation measures would be required, an additional environmental document would be prepared.

This is consistent with Section 15168(c) of the California Environmental Quality Act (CEQA) Guidelines (Title 14, California Code of Regulations) which states in relevant part:

> Subsequent activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared….(2) If the agency finds that pursuant to Section 15162, no new effects could occur or no new mitigation measures would be required, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required…..(4) Where the subsequent activities involve site specific operations, the agency should use a written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were covered in the program EIR.

Section 15162 of the California Environmental Quality Act (CEQA) Guidelines (Title 14, California Code of Regulations, Sections 15000 et seq) sets forth the circumstances under which a project may warrant a Subsequent EIR or Negative Declaration. According to CEQA Section 15162:

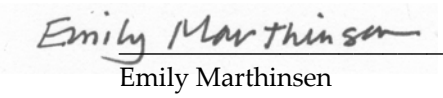
> (a) When an EIR has been certified or a negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:
>
> (1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
>
> (2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
>
> (3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:
>
> (A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
>
> (B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
>
> (C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
>
> (D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Under Section 15163, a supplement to an EIR rather than a subsequent EIR may be prepared when any of the conditions requiring preparation of a subsequent EIR are met, but only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed situation. Under Section 15164, in cases where some changes or additions are necessary to make the previous EIR adequately apply to the project, and none of the conditions calling for a subsequent EIR have occurred, an EIR addendum may be prepared instead of a subsequent or supplemental EIR.

In accordance with CEQA (Public Resources Code Section 21000 et seq.), and the University of California Procedures for Implementation of CEQA, this Environmental Assessment was prepared to evaluate the Project. The Assessment found the Project to be consistent with the UC Berkeley 2020 LRDP EIR which was certified by The Regents in January 2005. The Assessment also concluded that the Project would not cause any new significant environmental effect that was not considered in the 2020 LRDP EIR, or increase the severity of any impact previously found significant in the 2020 LRDP EIR, and that no new information of substantial importance, which was not known at the time the 2020 LRDP EIR was certified, has become available, and thus the University has determined that a subsequent EIR is not required and that an Addendum to the 2020 LRDP EIR has been prepared for the Helios Energy Research Facility project.

On the basis of the initial evaluation that follows, UC Berkeley finds that:

	The proposed project MAY have a 'potentially significant impact' or 'potentially significant impact unless mitigated' impact on the environment, and that these effects have not been adequately analyzed by an earlier EIR. A SUBSEQUENT OR SUPPLEMENTAL EIR will be prepared.
X	Although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards; and (b) have been avoided or mitigated to the extent feasible pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are incorporated into the proposed project, and (c) the project does not involve new information of substantial importance that shows mitigation measures or alternatives which are considerably different from those analyzed in the 2020 LRDP EIR or which were previously considered infeasible, are now feasible; therefore, an ADDENDUM to the 2020 LRDP EIR based upon the documentation enclosed presents sufficient environmental analysis for the project.



Emily Marthinsen — Assistant Vice Chancellor

ENVIRONMENTAL EVALUATION

All answers take account of the whole action involved, including beneficial, direct, indirect, construction-related, operational, and cumulative impacts. A list of references used in the preparation of this Environmental Assessment is included at the end of this document.

Appendix G of the CEQA Guidelines provides only a suggested format to use when preparing an environmental checklist. UC Berkeley has adopted a slightly different format with respect to the response column headings (refer to the definitions provided below), while still addressing the Appendix G checklist questions that are relevant to each environmental issue. In the checklist that follows:

2020 LRDP Analysis Sufficient applies to those issues where the environmental review completed for the 2020 LRDP is determined to be sufficient to address impacts of the Project, and where additional CEQA review would be repetitive. Discussion under each issue area marked '2020 LRDP Analysis Sufficient' includes specific reference to the 2020 LRDP EIR setting, pertinent impact analysis, and continuing best practices and mitigation measures incorporated into the Project to address the potential environmental impact in question.

Further Analysis Required is checked for those potential environmental impacts, which may or may not be significant, for which the environmental review completed for the 2020 LRDP does not in itself provide an adequate basis for a determination of no significant impact, and for which further analysis of the Project is required.

AESTHETICS

SETTING

Visual Character. As noted in the 2020 LRDP EIR, the City Environs – the Adjacent Blocks, the Southside, and the Housing Zone – consist of a grid of city blocks developed with a dense but almost entirely low-rise mix of residential, commercial and institutional buildings. One- to four-story buildings with street level shops and services and office or residences on upper floors predominate along arterials, while interior blocks tend to be exclusively residential.

Because it is closer to downtown, the vicinity of the Project site has slightly taller buildings. "Throughout the Downtown Area there is a mix of older commercial buildings, post-war development and more recent modern additions to the commercial core (DAP EIR p. 4-5)." The existing structures at the DHS site include a tower that is 8 stories and 125 feet tall.

A five story, approximately 60 foot tall residential building occupies the lot at the corner of Berkeley Way and Oxford Street. Multi family residential buildings also occur along the north side of Hearst Avenue west of Walnut, across from the DHS site. Along the north side of Hearst Avenue immediately across from the Project site is the new Warren Hall, approximately 50 feet tall, a campus building constructed in 2003, housing University administrative computing support services.

At University and Oxford west of the Campus Park, University Hall stands seven stories and up to 115 feet high. On the Campus Park, Barker Hall is 7 stories and 110 feet tall, and the Li Ka Shing Biomedical and Health Sciences building, under construction, will be approximately 110 feet tall. For site photos, please see the PowerPoint presentation to City of Berkeley Commissions published in October 2009, at http://www.cp.berkeley.edu/CP/Projects/Helios/Helios_material_presented_to_commissions_Oct2009.pdf.

The project description for the Downtown Area Plan EIR, Figure 3.5 (DAP EIR p. 3-15), identified the DHS site and other sites south and west of the Project site as opportunity sites, potentially subject to a change in visual character if new development is proposed and approved.

2020 LRDP AND 2020 LRDP EIR

The 2020 LRDP and its EIR provide a framework for considering the visual effects of the Helios project within the context of the campus as a whole. The visual setting of the campus and its environs are described in the 2020 LRDP EIR (Section 4.1). The 2020 LRDP policies suggest that every major new project be guided by project-specific design guidelines, to ensure site planning and design is carefully considered.

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Design and construction of the Project would be performed in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of the implementation of the 2020 LRDP upon aesthetics. Where applicable, the Project incorporates the following mitigation measures and/or continuing best practices:

> **2020 LRDP Continuing Best Practice AES-1-b:** Major new campus projects would continue to be reviewed at each stage of design by the UC Berkeley Design Review Committee. The provisions of the 2020 LRDP, as well as project specific design guidelines prepared for each such project, would guide these reviews.

Design guidelines prepared for the Project are attached in Appendix B. The Project conforms to these. For example, the Project develops and frames a new open space south of the new building. The Project is designed to maximize daylighting and natural ventilation, and the landscape design creates usable outdoor spaces. The Project does not impede the potential removal of parking lanes as may be proposed by the City of Berkeley, or the potential for more generous sidewalks as the site is built out. The Project was reviewed by the UC Berkeley Design Review Committee in the summer and fall of 2009: a representative from the City of Berkeley participated in all reviews. In August 2009, the DRC approved design guidelines for the Project. In October 2009, the DRC reviewed schematic level design.

> **2020 LRDP Continuing Best Practice AES-1-e**: UC Berkeley would make informational presentations of all major projects in the City Environs in Berkeley to the Berkeley Planning Commission and, if relevant the Berkeley Landmarks Preservation Commission for comment prior to schematic design review by the UC Berkeley Design Review Committee. Whenever a project in the City Environs is under consideration by the UC Berkeley DRC, a staff representative designated by the city in which it is located would be invited to attend and comment on the project.

The Project was reviewed with both the City of Berkeley Design Review Committee and Planning Commission in October 2009. Please see Appendix C for a summary of comments received and responses. The city planning director was invited to project reviews with the campus Design Review Committee.

> **2020 LRDP Continuing Best Practice AES-1-f:** Each individual project built in the City Environs under the 2020 LRDP would be assessed to determine whether it could cause potential significant aesthetic impacts not anticipated in the 2020 LRDP, and if so, the project would be subject to further evaluation under CEQA.

The Project would demolish an existing institutional complex and asphalt surface parking and construct a new building and open space. At no point in project review have unique aesthetic impacts been identified. The design has not garnered universal support, particularly for its massing along Hearst Avenue. Design of this façade has evolved in response to comments. In general, however, campus and community support removal of the existing institutional buildings and the site planning for the proposed Project.

Project-specific design guidelines were reviewed and endorsed by the Design Review Committee in August 2009; review of the Project based on the guidelines occurred in August and October 2009. The Project was reviewed by the City of Berkeley Design Review Committee and by the Berkeley Planning Commission in October 2009. The Project Design Guidelines draw from the work of the Downtown Area Plan Advisory Committee and the City of Berkeley Planning Commission in drafting plans for the downtown area. However, the City of Berkeley does not have a final Downtown Area Plan.

The site plan implements many principles outlined in extensive community review of the downtown area, and adds desired density at an appropriate scale in an urban environment.

> **2020 LRDP Mitigation Measure AES-3-a:** Lighting for new development projects would be designed to include shields and cut-offs that minimize light spillage onto unintended surfaces and minimize atmospheric light pollution. The only exception to this principle would be in those areas where such features would be incompatible with the visual and/or historic character of the area.

2020 LRDP Mitigation Measure AES-3-b: As part of the design review procedures described in the above Continuing Best Practices, light and glare would be given specific consideration, and measures incorporated into the project design to minimize both. In general, exterior surfaces would not be reflective: architectural screens and shading devices are preferable to reflective glass.

Although still under development, the lighting fixtures would be designed to include shields and other devices to minimize light spillage and atmospheric light pollution.

Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Have a substantial adverse effect on a scenic vista?		●

The important scenic vistas noted in the 2020 LRDP include the view into campus from University Avenue. The Project site is two blocks north of University Avenue and would not impact this vista. There are no other scenic vistas in the vicinity of the Project and no impact will occur. See 2020 LRDP EIR analysis, Vol 1, 4.1-17 through 4.1-24, as amended by Vol 3A, 9.1-6 to 9.1-7.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?		●

No designated scenic routes are in the vicinity of the Project and no impact will occur.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Create a new source of substantial light or glare which would adversely affect day- or night-time views in the area?		●

The Project would replace existing institutional buildings and parking with a new building and landscape with new exterior lighting. Project lighting is being designed to include shields and other devices to minimize light spillage and atmospheric light pollution, and reflective surfaces would be minimized, as prescribed in the 2020 LRDP EIR (Mitigations AES-3a, AES-3b).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
4. Substantially degrade the existing visual character or quality of the site and its surroundings?		●

As described above, the Project implements the provisions of the 2020 LRDP EIR (Best Practices AES-1-b, AES-1-e) with respect to the visual character of the building and landscape. As noted in Appendix C, Summary of City of Berkeley review comments and responses, many aspects of the Project landscape and design have been well received and the design has evolved in response to comments, particularly regarding the building's north facade. The existing visual conditions at the DHS site are poor, featuring an abandoned and undistinguished state institutional laboratory and office building surrounded by asphalt. The Project is expected to improve the existing visual character of the site and its surroundings.

The Campus Landscape Architect has determined no specimen trees occur on the Project site, and none would be adversely affected by the Project (personal communication, Horner, October 2009).

SUMMARY OF AESTHETICS ANALYSIS

The 2020 LRDP EIR determined projects implementing the 2020 LRDP, which would incorporate design provisions of the 2020 LRDP and mitigation measures relating to light and glare, would not result in new significant aesthetic impacts (2020 LRDP EIR Vol 1, 4.1-15 to 4.1-19); nor would the 2020 LRDP make a cumulatively considerable contribution to adverse aesthetic impacts (2020 LRDP EIR Vol 1, 4.1-22 to 4.1-24). The analysis of Aesthetics in the 2020 LRDP EIR appears generally in Vol 1, 4.1-17 through 4.1-24, as amended by Vol 3A, 9.1-6 to 9.1-7, and in the Notice of Preparation at Vol 2, Appendix 1.

The Project is consistent with the 2020 LRDP as analyzed and described in the 2020 LRDP EIR and would not introduce any new potential aesthetic impacts, and no changed circumstance or new information is present that would alter the conclusions of the 2020 LRDP EIR analysis, as described above. With the incorporation of all applicable LRDP EIR mitigation measures and continuing best practices, described above, the Project will not result in any new aesthetics impact. No Project revisions or additional mitigation measures are required and the 2020 LRDP EIR analysis is sufficient and comprehensive to address aesthetic impacts of the Project.

AIR QUALITY

(NOTE: For a discussion of greenhouse gas emissions, see topic area following Geology, below)

SETTING

The air quality setting of the campus and environs is described in the 2020 LRDP EIR (Section 4.2). The following text summarizes context information for air quality relevant to the Helios Energy Research Facility.

Area Source Emissions. Existing campus area sources of air emissions include academic, administrative, and housing buildings. Emissions associated with these land uses include:

- Diesel-powered landscaping equipment emissions.
- Natural gas combustion emissions from space and water heating. Since this is many point sources (venting at housing and buildings) it was treated as an area source.

- Reactive organic gas (ROG) emissions from consumer product use, such as automotive products, household cleaners, and personal care products.
- ROG emissions from increased laboratory space.

Note there is no specific regulatory framework for these types of sources, since they result from various activities by individuals rather than pollutants emitted by businesses or industry. The URBEMIS 2002 model was used to estimate emissions from landscaping equipment, space and water heating, and consumer product use. These calculations were based on the estimated gross square feet (GSF) for current academic and support facility space; emissions of 2020 LRDP development were determined based on the area of expected building (in GSF) for academic and support facilities at full development under the 2020 LRDP, which in this analysis is 2.2 million GSF. URBEMIS is a CARB-approved model that estimates emissions from land use development projects. URBEMIS estimates air pollutant emissions from the area sources mentioned above, as well as construction sources. The model was developed with the cooperation of several California air districts and the California Air Pollution Control Officers Association (CAPCOA).

Toxic Air Contaminant Emissions, 2020 LRDP FEIR: Evaluation of impacts from toxic air contaminants (TACs) is based upon a health risk assessment (HRA). An HRA characterizes human health risks as a result of air pollutants from campus activities. Hundreds of chemicals are used or produced by campus operations, but only a portion of these chemicals contribute substantially to human health risks. A total of 56 chemicals were selected for modeling in the 2020 LRDP HRA based on a detailed assessment of their use, production, volatility, and toxicity. Projected health risks after development under the 2020 LDRP were assessed in the future LRDP scenario by including additional laboratory space, increased operation of the central plant boilers, and additional new emergency generators. The future LRDP scenario included these projected emission increases along with the existing campus emissions and emissions from UC Berkeley projects analyzed in previously certified EIRs.

Laboratory emissions assumptions in the year 2020 were based on an estimated net increase of 147,035 square feet of wet laboratory space associated with the approved Northeast Quadrant Science and Safety (NEQSS) Projects[7] and an estimate of 191,810 assignable square feet of additional new wet laboratory space under the 2020 LRDP. Since new laboratories under the 2020 LRDP could be of any Lab Type, the maximum emission factor per chemical for any Lab Type was used to assess the 2020 LRDP laboratories, as detailed in the 2003 HRA update.[8] This results in overly conservative analysis of potential emissions. Increased TAC emissions from new emergency generators and increased operation of the central plant boilers were estimated from the above-described future operation assumptions.

Toxic Air Contaminant Emissions, 2009 Health Risk Assessment Update: In 2009 the campus completed an update to the campus-wide Health Risk Assessment. The following modeling adjustments were made:

Table 5 – Campuswide Health Risk Assessment 2009 Modeling Adjustments

HRA for 2020 LRDP	2009 HRA Update
Existing conditions analysis assumes 454,952 total square feet of laboratory space	Existing conditions assumes 604,054 total square feet of laboratory space, including recently completed projects and projects under construction
Existing conditions analysis for the northwest zone (Zone A) assumes 151,433 total net existing square feet of laboratory space	Expands area of northwest zone to include campus-owned properties west of central campus and north of

	University Avenue Existing conditions analysis for the northwest zone assumes 203,919 total net existing square feet of laboratory space, including space under construction
Future conditions analysis assumes 112,802 net new square feet of laboratory space for northwest zone (Zone A)	For modeling purposes, future conditions analysis assumes 112,802, plus 40,900 square feet of laboratory space for the Project, to obtain a conservative view of the impact of the Project
Meteorological data from a data station at Lawrence Berkeley National Laboratory was used in air dispersion modeling	Meteorological data from a data station at UC Berkeley was used in air dispersion modeling (this and other elements of modeling protocol approved by BAAQMD)
Assumed that all diesel-fired emergency generators operate a total of 26 hours per year	Assumed diesel-fired emergency generators operate a total of 12 hours per year

See also Appendix H, updating Table C.3-2 and Table C.3-3 of the 2020 LRDP EIR, Vol 2, Appendix C, to reflect these revised modeling assumptions.

TAC Exposure. New stationary and area sources associated with implementation of the 2020 LRDP would not expose campus occupants and other populations in the vicinity of the university to substantial air toxics concentrations, such that the exposure could increase human cancer risk above 10 in one million or exceed a hazard index of one for the maximally exposed individual (MEI).

In 2009 the campus completed an update to the campus-wide Health Risk Assessment, examining the emissions potential of additional laboratory space at campus-owned sites west of Oxford Street. Even with the addition of laboratory research at the Project site and with conservative modeling assumptions, health risks are below the significance level at all offsite receptor locations (2009 HRA Update, ERM, November 2009).

<u>2020 LRDP FEIR analysis, MEI:</u>
The 2020 LRDP EIR concluded the maximum lifetime cancer risk from stationary campus sources at a residential MEI location was estimated at 5.4 in one million. The MEI location was estimated to be along Hearst Avenue, east of Arch Street, where cancer risk from combined campus development (baseline conditions, NEQSS projects, plus 2020 LRDP development) could occur. Emergency generators contribute approximately 69 percent to the total health risk at this location. The laboratories contribute approximately 29 percent. All other sources contribute less than 1 percent each to the cancer risk at this location. The residential MEI calculation assumed continuous exposure over a 70-year period and an average adult body weight of 70 kilograms (154 pounds). The calculated cancer risks at this location include inhalation, soil ingestion, dermal absorption, home garden, and mother's milk exposure <u>pathways.</u>

2009 Update analysis, MEI:
In the 2009 Update, the MEI for current operations, including new sources at new Stanley Hall, Sutardja Dai Hall, and the Li Ka Shing Center currently under construction, was calculated at 2.1 in 1 million, at a location just north of the northwestern corner of the central campus along Hearst Avenue. This risk is based on an assumption of a 365-day-per-year exposure over a 70-year period. The cancer risk during projected future operations with build-out under the 2020 LRDP is estimated to be 2.9 in 1 million. The lower numbers in the updated analysis stems from the use of more realistic data: campus records regarding operating hours of diesel-powered emergency generators were reviewed, and campus meteorological data which better represent actual conditions at the UCB campus were used. Although twelve hours continues to represent an overestimate for diesel generators, this analysis more closely represents actual conditions.

2009 Update analysis, sensitive receptors:
In the 2009 Update, off-site discrete and/or sensitive receptors, including schools, daycare centers, hospitals, and nursing homes, were identified to a radius of 5 miles. A receptor was placed within the Oxford Tract, at the corner of Oxford Street and Hearst Avenue, to represent the hypothetical location of a hypothetical day-care center. Receptors were also placed at various locations within the Central Campus boundary representing student housing, gathering areas, and UC Berkeley staff.

The maximum estimated cancer risks for current operations, including new sources at new Stanley Hall, Sutardja Dai Hall, and the Li Ka Shing Center currently under construction, at any off-site sensitive receptor location, was 1.8 in 1 million, occurring to the south of the Central Campus at the Wright Institute (a clinical psychology graduate school that also offers some clinical groups and counseling services). The highest calculated cancer risk at a sensitive receptor during "Future" operating conditions was calculated to be 2.0 in 1 million located at Montessori Family School north of the central campus on the northern side of Hearst Avenue. At the request of UCB staff, a hypothetical sensitive receptor was placed within the Oxford Tract. Estimated cancer risks at that location from "Current" and "Future" operating conditions are estimated to be 1.6 in 1 million and 2.2 in 1 million, respectively. This estimate was based on a 365-day-per-year exposure over 70 years. This represents an overestimate.

2020 LRDP FEIR analysis, non-cancer hazard index:
Non-cancer health effects from TACs was also assessed in the HRA. Potential non-cancer health risk is assessed by the 'hazard index,' which is the ratio of a given concentration of an air toxic compound to an acceptable or "reference" exposure level. Hazard indices are calculated for both long-term (chronic) and short-term (acute) health effects. Hazard indices of less than 1.0 indicate an acceptable non-cancer health risk. The highest calculated hazard indices for existing Campus Park operations were 0.13 for chronic exposures and 0.29 for acute exposures.

2009 Update analysis, non-cancer hazard index:
In the 2009 Update, the maximum chronic hazard indices for current campus operations, including new sources at new Stanley Hall, Sutardja Dai Hall, and the Li Ka Shing Center currently under construction, are calculated at 0.08. The maximum chronic hazard index for future operations was calculated at 0.1. The maximum acute hazard index from "Current" and "Future" operating conditions are calculated to be 0.2 and 0.3, respectively. (ERM, November 2009)

Construction Emissions. Construction activities are a source of dust emissions that can have temporary impacts on local air quality by possibly exceeding state air quality standards. These emissions are generated from land clearing, ground excavation, cut and fill operations, demolition and the construction of the project facilities. Dust emissions vary from day to day depending on the level of activity, the

specific operations and the prevailing wind conditions. Air emissions modeling completed for the 2020 LRDP EIR assumed up to one million gross square feet of space could be under construction at any time under the 2020 LRDP.

Demolition and renovation activities are regulated for potential emissions of asbestos through BAAQMD Regulation 11, Rule 2. This rule requires wetting, collecting, proper waste handling, and record-keeping for any demolition, renovation, and removal of asbestos-containing material. Hazardous materials management and hazardous waste management laws and regulations govern handling other building materials (e.g. lead particles) that could become airborne during demolition or renovation activities. Other dust from construction and demolition activities would be addressed by BAAQMD Regulation 1, Section 301, which states that sources cannot emit air contaminants that cause nuisances to 'any considerable number of persons or the public,' and by adherence to construction emission mitigation measures incorporated into construction contracts.

In addition to particulate emissions from earth moving, combustion exhaust emissions from construction equipment create a temporary impact on local air quality, for both toxic air contaminants and criteria air pollutants. Such equipment is typically diesel fueled. In the winter 2009/10, the Bay Area Air Quality Management District (BAAQMD) is promulgating new criteria pollutant thresholds for project construction. The BAAQMD Board of Directors may adopt these in January 2010, and they are likely to become final 90 to 120 days later. See analysis of this issue, in Air Quality question 2, below.

In a previous environmental document (SRB 1 EIR, SCH #1999122065, certified July, 2000, p. 226), the campus concluded that building demolition results in about 0.00042 lb/day of particulate matter per cubic foot of building volume. Effective and comprehensive dust control measures reduce these emissions by up to 80 percent (see SRB 1 EIR p. 226). Measures to address fugitive dust emissions are among the campus best practices incorporated into all campus projects. See the list of continuing best practices and mitigations measures from the 2020 LRDP EIR, below.

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Design and construction of the Helios Energy Research Facility would be performed in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of the implementation of the 2020 LRDP upon air quality. Where applicable, the Project incorporates the following mitigation measures and/or continuing best practices:

> **Continuing Best Practice AIR-1:** UC Berkeley shall continue to implement the same or equivalent alternative transit programs, striving to improve the campus mode split and reduce the use of single occupant vehicles among students, staff, faculty and visitors to campus.
>
> **Continuing Best Practice AIR-4-a:** UC Berkeley shall continue to include in all construction contracts the measures specified below to reduce fugitive dust impacts:
> - All disturbed areas, including quarry product piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using tarps, water, (non-toxic) chemical stabilizer/suppressant, or vegetative ground cover.
> - All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or (non-toxic) chemical stabilizer/suppressant.
> - When quarry product or trash materials are transported off-site, all material shall be covered, or at least two feet of freeboard space from the top of the container shall be maintained.

LRDP Mitigation Measure AIR-4-a: In addition, UC Berkeley shall include in all construction contracts the measures specified below to reduce fugitive dust impacts, including but not limited to the following:

- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When demolishing buildings, water shall be applied to all exterior surfaces of the building for dust suppression.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from paved areas of construction sites and from adjacent public streets as necessary. See also CBP HYD 1-b.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions by utilizing sufficient water or by covering.
- Limit traffic speeds on unpaved roads to 15 mph.
- Water blasting shall be used in lieu of dry sand blasting wherever feasible.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with slopes over one percent.
- To the extent feasible, limit area subject to excavation, grading, and other construction activity at any one time.
- Replant vegetation in disturbed areas as quickly as possible.

Continuing Best Practice AIR-4-b: UC Berkeley shall continue to implement the following control measure to reduce emissions of diesel particulate matter and ozone precursors from construction equipment exhaust:

- Minimize idling time when construction equipment is not in use.

LRDP Mitigation Measure AIR-4-b: UC Berkeley shall implement the following control measures to reduce emissions of diesel particulate matter and ozone precursors from construction equipment exhaust:

- To the extent that equipment is available and cost effective, UC Berkeley shall require contractors to use alternate fuels and retrofit existing engines in construction equipment.
- To the extent practicable, manage operation of heavy-duty equipment to reduce emissions, including the use of particulate traps.

Continuing Best Practice AIR-5: UC Berkeley will continue to implement transportation control measures such as supporting voluntary trip-reduction programs, ridesharing, and implementing improvements to bicycle facilities.

LRDP Mitigation Measure AIR-5: UC Berkeley will work with the City of Berkeley, ABAG and BAAQMD to ensure that emissions directly and indirectly associated with the campus are adequately accounted for and mitigated in applicable air quality planning efforts.

Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Conflict with or obstruct implementation of the applicable air quality plan?		●

The 2020 LRDP EIR conservatively found operational emissions from implementation of the 2020 LRDP may hinder the attainment of the Clean Air Plan, because the 2020 LRDP EIR conservatively assumed that growth under the 2020 LRDP was not included in local area projections (2020 LRDP EIR Vol 1, 4.2-26). The 2020 LRDP analysis anticipated up to 2,200,000 million net new GSF of academic and support space, of which this Project represents a net increase of 112,600 GSF, or 5%. As prescribed in the 2020 LRDP EIR, the campus would work with the City of Berkeley, ABAG, and BAAQMD to ensure that campus growth is accurately addressed in the Clean Air Plan, and would continue to develop and implement transportation control measures (Best Practice AIR-5, Mitigation AIR-5).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		●

The 2020 LRDP EIR examined the potential for vehicle and stationary source emissions associated with implementation of the 2020 LRDP to violate state and federal air quality standards or contribute to existing air quality violations, and determined implementation of the 2020 LRDP would not violate the carbon monoxide (CO) standard or expose sensitive receptors to substantial CO concentrations (2020 LRDP EIR Vol 1, 4.2-20).

Construction emissions were also estimated for the 2020 LRDP EIR using the URBEMIS model, which includes demolition activities (see 2020 LRDP EIR Vol 2 Appendix C; also 2020 LRDP EIR Vol 1, 4.2-23 to 4.2-25). The mitigation measures and best practices listed above and incorporated by the Project are intended to reduce emissions in accordance with BAAQMD guidelines.

In the winter 2009/10, the BAAQMD is promulgating new criteria pollutant thresholds for project construction. The BAAQMD Board of Directors may adopt these in January 2010, and they are likely to become final 90 to 120 days later. The BAAQMD's approach to construction emissions at the plan level (i.e., at the level of the 2020 LRDP EIR) relies upon inclusion of BAAQMD-recommended Best Management Practices (BMPs) in goals, policies and objectives. The 2020 LRDP EIR includes mitigation measures and best practices that substantially align with these measures; other measures are part of campus best practices in contracting. The eight BMPs in the draft Guidance document (Final Draft BAAQMD CEQA Guidelines, November 12, 2009, page 9-6) are listed below with their counterparts in the 2020 LRDP EIR:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

Counterpart: 2020 LRDP Continuing Best Practice AIR-4-a (reprinted above)

2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

Counterpart: 2020 LRDP Continuing Best Practice AIR-4-a (reprinted above)

3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

Counterpart: 2020 LRDP Mitigation Measure AIR-4-a (reprinted above)

4. All vehicle speeds on unpaved roads shall be limited to 15 mph.

Counterpart: 2020 LRDP Mitigation Measure AIR-4-a (reprinted above)

5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

Counterpart: 2020 LRDP Mitigation Measure AIR-4-a (reprinted above) and 2020 LRDP Continuing Best Practice HYD-2-d which states: UC Berkeley shall continue to develop and implement the recommendations of the Strawberry Creek Management Plan and its updates, and construct improvements as appropriate. These recommendations include, but shall not be limited to, minimization of the amount of land exposed at any one time during construction as feasible; use of temporary vegetation or mulch to stabilize critical areas where construction staging activities must be carried out prior to permanent cover of exposed lands; installation of permanent vegetation and erosion control structures as soon as practical; protection and retention of natural vegetation; and implementation of post-construction structural and non-structural water quality control techniques.

6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

Counterpart: 2020 LRDP EIR Continuing Best Practice AIR-4-b.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

Counterpart: Campus contractors are required to comply with applicable law and regulation.

8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The phone number of the BAAQMD shall also be visible to ensure compliance with applicable regulations.

Counterpart: All campus construction projects have posted contact information as part of standard practice, with a person responsible for action.

All projects implementing the 2020 LRDP remain in substantial compliance with BAAQMD plan-level thresholds as proposed, mitigating construction impacts at the plan level.

The 2020 LRDP EIR included analysis of estimated criteria pollutant construction emissions from the maximum assumed construction scenario under the 2020 LRDP, which significantly exceeds project level construction-related thresholds. See table below.

Pollutant	Proposed BAAQMD Project Construction Threshold	Estimated Daily Construction-related Emissions, 2020 LRDP (Table 4.2-8, 2020 LRDP EIR)
ROG	54	1123
NOX	54	1565
PM 10 (exhaust)	82	12
PM 2.5 (exhaust)	54	Not calculated

As a project, implementation of the 2020 LRDP exceeds BAAQMD thresholds; however, the 2020 LRDP analysis was particularly conservative.

Construction details for the Project were modeled according to the draft BAAQMD guidance. Assuming incorporation of measures to reduce NOx emissions, daily demolition and construction-related emissions of the Project would be below the proposed BAAQMD thresholds (ERM, December 2009).

Once the BAAQMD adopts its draft thresholds and CEQA guidance for modeling construction-period criteria pollutant emissions, the campus expects to complete an environmental analysis of construction emissions associated with implementation of the 2020 LRDP, to document (in accordance with new guidance) air quality impacts associated with the campus plan.

The 2020 LRDP EIR further found traffic associated with development under the 2020 LRDP would not contribute to a cumulatively considerable increase in or expose receptors to substantial CO concentrations. Using measured CO concentrations associated with peak hour vehicle volumes for the intersection of Mission Boulevard and Jackson Street/Foothill Boulevard in Hayward as a 'worst-case' comparable in the same air basin as the campus, the 2020 LRDP EIR found changes at local intersections resulting from implementation of the 2020 LRDP would not result in significant impacts.

The Project does not include expansion of campus parking supply and for many reasons, including the current budgetary constraints at UC Berkeley that influence staffing levels and has resulted in furloughs, retirements, and layoffs, the Project is not expected to contribute to vehicle traffic that might equal or exceed levels analyzed in the 2020 LRDP EIR (see http://berkeley.edu/news/media/releases/2009/07/10_furlough.shtml). As described above, growth in research activity associated with the Project is within the parameters of campus growth anticipated in the 2020 LRDP and 2020 LRDP EIR.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Expose sensitive receptors to substantial air pollutant concentrations?		●

The 2020 LRDP EIR evaluated whether construction and development activities under the 2020 LRDP would expose sensitive receptors, including nearby schools, to substantial pollutant concentrations. The campus completed a Health Risk Assessment for the 2020 LRDP, which evaluated risks from toxic air contaminants to sensitive receptors, including schools, hospitals, day care centers and senior care facilities. The 2020 LRDP EIR evaluated the maximum exposure risk to sensitive receptors from conditions existing at the time, and estimated the maximum exposure risk to sensitive receptors with buildout of the LRDP program (2020 LRDP EIR Vol 1, 4.2-15 and 4.2-22).

The 2020 LRDP EIR anticipates up to 700,000 net new GSF of research laboratory space, of which 50%, or 350,000 GSF, was assumed to be wet research lab space, with the balance lab support and other types of labs. At a typical ASF:GSF ratio of 55% for lab buildings, this 350,000 GSF equals 192,000 ASF. In order to model potential emission patterns, the 2020 LRDP EIR split the campus into 8 zones, and allocated future growth in wet lab space to each zone based on the existing distribution of wet labs. Zone A, the northwest zone of the Campus Park nearest the Project site, was estimated to account for up to 112,800 ASF of net new wet lab space (2020 LRDP EIR Vol 2, C.3-12).

As shown in Table 1, above, the amount of 'wet research lab' space in the Project is assumed to be approximately 40,900 ASF. As described in 2020 LRDP EIR Addendum #1 for the Biomedical and Health Sciences Center, that project represents a net increase in wet lab research space of 32,800 ASF; combined, the Project and the Biomedical and Health Sciences Center would include 65% of the amount of net new wet research lab space anticipated for Zone A in the 2020 LRDP.

The 2020 LRDP EIR analysis, and the 2009 Health Risk Assessment Update that expanded the area of Zone A to include the Project site as discussed above, determined no sensitive receptors would be exposed to substantial air pollutant concentrations as a result of implementation of the 2020 LRDP (2020 LRDP EIR Vol 1, 4.2-20 to 4.2-22; ERM November 2009).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
4. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?		●

The 2020 LRDP EIR found the 2020 LRDP, in combination with other reasonably foreseeable projects, had the potential to result in a cumulatively considerable increase in non-attainment pollutants and thereby conflict with the Clean Air Plan (2020 LRDP EIR Vol 1, 4.2-31). See also response to Air Quality item 2, above. As noted in response to Air Quality item 1, the 2020 LRDP EIR conservatively assumed that growth under the 2020 LRDP was not included in local area projections. As prescribed in the 2020 LRDP EIR, the campus would work with the City of Berkeley, ABAG, and BAAQMD to ensure that campus growth is accurately addressed in the Clean Air Plan, and would continue to develop and implement transportation control measures (Best Practice AIR-5, Mitigation AIR-5).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
5. Expose people to substantial levels of toxic air contaminants (TACs), such that the exposure could cause an incremental human cancer risk greater than 10 in one million or exceed a hazard index of one for the maximally exposed individual?		●

As described in Air Quality item 3 above, the Project would not result in a new source of substantial air pollutant emissions. In the 2020 LRDP EIR (Vol 1, 4.2-21 to 4.2-22), the total 2020 LRDP development envelope is expected to result in a maximum cancer risk of 5.4 in one million for the maximally exposed individual at a residential location, well below the significance standard of 10 in one million. As described further in the introduction to this analysis, the 2009 HRA Update similarly determined risks would be well below the 10 in one million standard. The 2020 LRDP EIR is sufficient and comprehensive to address this issue adequately.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
6. Cause objectionable odors affecting a substantial number of people?		●

Existing campus facilities are not commonly sources of odors. The Project does not include cooking or other facilities associated with odor emissions, and no element of the proposed Project is anticipated to result in new odors that may affect a substantial number of people.

SUMMARY OF AIR QUALITY ANALYSIS

The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP, guided by compliance with regulation, campus policies and programs to reduce emissions and risk of toxic air contaminant releases, would, with one exception, not result in new significant air quality impacts (2020 LRDP EIR Vol 1 p. 4.2-20 to 4.2-26). As the one exception, the 2020 LRDP EIR conservatively estimated that the Bay Area Air Quality Management District's (BAAQMD) Clean Air Plan did not include an increment for growth at UC Berkeley, and found that campus growth overall may not comply with the Clean Air Plan, and may result in a cumulatively considerable increase in non-attainment pollutants that conflicts with the Clean Air Plan (2020 LRDP EIR Vol 1 p. 4.2-26, and p. 4.2-31). The conclusion relates to the overall LRDP program which encompasses the Project, and the proposed Project would not provide an opportunity to further alter or mitigate this finding. The analysis of Air Quality in the 2020 LRDP EIR appears generally in Vol 1, 4.2-20 through 4.2-34, as amended by Vol 3A, 9.1-7, and in the Notice of Preparation at Vol 2, Appendix A.

Further, as described above, the Project combined with the Center for Biomedical and Health Sciences currently under construction is expected to include approximately 65% of the total anticipated new wet research laboratory space analyzed in Zone A pursuant to the Health Risk Assessment completed for the 2020 LRDP EIR, and would not exceed growth anticipated in the 2020 LRDP EIR. The 2020 LRDP EIR concluded that implementation of the 2020 LRDP program could result in a cumulatively considerable contribution to the increase of toxic air contaminants, including diesel particulate emissions from emergency generators (2020 LRDP EIR p. 4.2-33 to 4.2-34). In implementing the 2020 LRDP the proposed Project would replace an existing outdated facility, presenting the opportunity to install equipment that meets higher regulatory standards. The analysis contained in this Addendum and in the 2009 HRA Update indicates that the proposed Project would not result in new air quality impacts nor new adverse health effects not previously considered; the Project may incrementally contribute to significant environmental impacts previously identified in the 2020 LRDP EIR, but will not result in those impacts

being more severe than as described in the 2020 LRDP EIR, SCH #2003082131. No additional mitigation measures have been identified that would further lessen the previously identified impact, and no additional analysis is required.

(NOTE: For a discussion of greenhouse gas emissions, see topic area following Geology, below)

BIOLOGICAL RESOURCES

SETTING

The biological resources setting of the campus and environs is described in the 2020 LRDP EIR (Section 4.3). The following text summarizes context information for biological resources relevant to the Helios Energy Research Facility.

The Campus Park and surrounding urban lands of Berkeley have only limited value to wildlife due to the extent of existing development and intensity of human activity. Impervious surfaces and structures provide little opportunity for use by wildlife, and species found in the vicinity are typical in urbanized areas.

Special-status species[9] are plants and animals that are legally protected under the state and/or federal Endangered Species Acts[10] or other regulations, as well as other species that are considered rare enough by the scientific community and trustee agencies to warrant special consideration, particularly with regard to protection of isolated populations, nesting or denning locations, communal roosts, and other essential habitat. Due to the extent of past development, the Campus Park does not provide suitable habitat for special-status plant or animal species, with the exception of possible nesting by raptors. Land use zones addressed as part of the LRDP, including the Project site, are largely urbanized areas with little or no remaining natural vegetation and limited wildlife habitat values. No sensitive natural communities, special status species, wetlands or important wildlife movement corridors occur in these zones (2020 LRDP EIR Vol 1 p 4.3-18).

2020 LRDP AND 2020 LRDP EIR

The provisions of the 2020 LRDP would eliminate or minimize the effect on biological resources by guiding the location, scale, form and design of new University projects. The 2020 LRDP includes a number of policies and procedures for individual project review to support the Objectives of the 2020 LRDP. While several of the 2020 LRDP Objectives bear directly or indirectly on biological resources, two are particularly relevant:

- **Plan every new project as a model of resource conservation and environmental stewardship.**
- **Maintain and enhance the image and experience of the campus, and preserve our historic legacy of landscape and architecture.**

The 2020 LRDP acknowledges the Campus Specimen Tree program which provides as follows:

> **CAMPUS SPECIMEN TREE PROGRAM**
>
> UC Berkeley has an existing campus program that it uses to guide the evaluation and designation of specimen trees. Other plants (shrubs, groundcover or grasses) which meet the criteria may also be considered as specimen flora. The Campus Landscape Architect makes the determination of status, using the following criteria: to be considered a specimen, the

tree or plant should be in good health and not pose a hazard to pedestrian and automotive traffic, existing buildings or utilities, and should have one or more of the following qualities:

- **Aesthetics:** The tree is an integral part of an architectural theme, or plays an important role in framing or screening a building or other feature.
- **Historical:** The tree was planted as part of a memorial planting or is a particularly outstanding example of the original botanical garden plantings. The tree is identified by landmark status, named with a plaque, is identified as a contributing feature in an historic structures report and/or identified in the LHP as a character defining feature of the landscape.
- **Educational:** The tree represents a special taxonomic or morphological feature, is unique to the Campus or the San Francisco Bay Area, is a particularly outstanding example of California flora, is part of an experimental planting with a special landscape or agricultural value, or is regularly used by campus instructors as an example of the species.
- **Strawberry Creek:** Removal of the tree would significantly increase erosion potential, affect the natural species diversity of the Creek as a riparian corridor.
- **Natural Area:** The tree is located within either the Wickson, Grinnell or Goodspeed Natural Areas.[11]

Determination of specimen status may extend to a group of trees where individually a tree may not merit such status, but as a group or association the collective import is greater than the individual plants alone.

Under this program, the retention of existing specimen trees, shrubs and grass areas is a priority in the final design of proposed projects. Projects are reviewed with the UC Berkeley Design Review Committee to minimize impacts to specimens. Site preparation is conducted to minimize removal and/or damage of specimen trees or plant species to the full feasible extent. Sensitive construction practices are used to avoid possible damage to trees to be retained, including construction setbacks, installation of temporary construction fencing around individual trees to be preserved, and monitoring by a certified arborist of any required limb removal or disturbance within the dripline of trees to be retained. Grading, vegetation removal and replacement plans, where necessary, are coordinated with the Campus Landscape Architect. Specimens impacted are replaced by successful transplanting, or must be replaced by new planting in kind or from species previously recorded on campus[12] at a ratio of 3 to 1. New plantings are selected as horticulturally appropriate at largest possible nursery sizes. Landscaped areas are restored to the full feasible extent. [13]

Upon review of the site for the Project, the campus landscape architect determined in October 2009, "There are no trees on that site among the loquat, liquidambar, southern magnolia, red flowering gum, bottlebrush, or hollywood juniper that rise to the level of specimen" (personal communication Horner, 2009).

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Project implementation would be performed in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of the implementation of the 2020 LRDP upon biological resources. However, the project site is paved with no unique or specimen vegetation; no 2020 LRDP EIR mitigation measures or continuing best practices with regard to biological resources would apply at the Project site.

Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or US Fish and Wildlife Service (USFWS)?		●

The Project would redevelop an existing developed site with paving, parking and facilities and incidental plantings. The 2020 LRDP EIR states 'No sensitive natural communities, special-status species, wetlands or important wildlife movement corridors occur' in this area (2020 LRDP EIR Vol 1 p. 4.3-18).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFG or USFWS?		●

The 2020 LRDP EIR states 'Sensitive natural communities in the Campus Park are limited to the remnant segments of riparian vegetation along Strawberry Creek. The Campus Park Guidelines designate the riparian areas along the streamcourse, and the woodland areas adjacent to those riparian areas, as Natural Preserves into which no new buildings may intrude.' (2020 LRDP EIR Vol 1, 4.3-27) The Project site lies outside any such areas, and as such is not anticipated to have any impact on riparian habitat or any other sensitive community.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption or other means?		●

There are not jurisdictional wetlands at the Project site. The 2020 LRDP EIR found that the Adjacent Blocks, including the Project site 'occur in urbanized areas with little or no remaining natural vegetation and limited wildlife habitat values. No sensitive natural communities, special status species, wetlands or important wildlife movement corridors occur in these zones' (2020 LRDP EIR Vol 1, 4.3-18 to 4.3-19).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
4. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		●

The Project site is of limited native habitat value due to extensive human activity and alteration. It does not provide a geographic link between two natural areas and, therefore, it does not serve as a primary

wildlife movement corridor. The 2020 LRDP EIR found that the Adjacent Blocks, including the Project site 'occur in urbanized areas with little or no remaining natural vegetation and limited wildlife habitat values. No sensitive natural communities, special status species, wetlands or important wildlife movement corridors occur in these zones' (2020 LRDP EIR Vol 1, 4.3-18 to 4.3-19).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
5. Conflict with any local policies or ordinances protecting biological resources?		●

Local ordinances do not apply to campus projects, because the University is a state agency exempted from local controls in accordance with the state constitution, as further described in the 2020 LRDP EIR at page 4.3-30 of Vol 1. The Project would redevelop a site that is currently developed with paving, parking, buildings and incidental non-specimen plantings. The Project would not conflict with applicable policies.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
6. Conflict with any adopted Habitat Conservation Plan, Natural Communities Conservation Plan or other approved local, regional or state habitat conservation plan?		●

The Project site is not located within any area designated for an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved conservation plan. No additional analysis is required.

SUMMARY OF BIOLOGICAL RESOURCES ANALYSIS

The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP, incorporating existing best practices and 2020 LRDP EIR mitigation measures, would not result in new significant impacts upon biological resources (2020 LRDP EIR Vol 1, 4.3-22 to 4.3-30). The analysis of Biological Resources in the 2020 LRDP EIR appears generally in Vol 1, 4.3-22 through 4.3-30, as amended by Vol 3A, 9.1-7, and in the Notice of Preparation at Vol 2, Appendix A. The Project site is in the City Environs; sensitive species are not known to occur at the Project site. The Project would not result in new or more severe impacts than analyzed in the 2020 LRDP EIR, SCH #2003082131, nor contribute to cumulatively significant adverse effects upon biological resources.

CULTURAL RESOURCES

SETTING

The cultural resources setting of the campus and adjacent blocks is described in the 2020 LRDP EIR (Section 4.4). The cultural resources setting of the Project site is also described in the DAP EIR, pages 4-93 to 4-101 as amended at page R-7 of the DAP Final EIR. The specified DAP EIR pages are reprinted in Appendix F of this document for easy reference. The following text highlights context information for cultural resources relevant to the Project.

Historical Resources. In the 2020 LRDP EIR, the numerous historical resources located within the geographic scope of the 2020 LRDP were divided into two separate categories: Primary Historical Resources and Secondary Historical Resources. Primary Historical Resources include those listed on the

California Register of Historical Resources. Secondary Historical Resources include resources listed on local registers, as well as resources listed on the state Inventory. Secondary Historical Resources are presumed significant *unless* a preponderance of evidence demonstrates otherwise.[14] Historic resources covered here include buildings, sites (which include landscapes), structures (such as bridges), and objects (such as Founders' Rock). Neither resource list includes the buildings at 2151 Berkeley Way.

Archaeological Resources. There are no archaeological resources known to exist in the vicinity of the Project site (DAP EIR p. 4-101).

2020 LRDP AND 2020 LRDP EIR

In recognition of the fact that more than a third of UC Berkeley buildings are over 50 years old and thus potentially eligible for the National Register, the 2020 LRDP includes several objectives that seek to protect potential historic resources for future generations. They include:

- **Plan every new project as a model of resource conservation and environmental stewardship.**
- **Maintain and enhance the image and experience of the campus, and preserve our historic legacy of landscape and architecture.**
- **Plan every new project to respect and enhance the character, livability, and cultural vitality of our city environs.**

The 2020 LRDP would support these objectives by ensuring future Campus Park projects conform to the Campus Park Design Guidelines, which include special provisions to protect significant landscape and open space features, and to preserve and enhance the integrity of the classical core. For projects in the City Environs, the 2020 LRDP would continue the existing UC Berkeley practice of presenting all major City Environs projects to the relevant city commission for information and comment, prior to schematic design review by the UC Berkeley Design Review Committee.

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Implementation of the Project would be performed in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of the implementation of the 2020 LRDP upon cultural resources. Where applicable, the Project would incorporate the following mitigation measures and/or continuing best practices:

Continuing Best Practice CUL-1: In the event that paleontological resource evidence or a unique geological feature is identified during project planning or construction, the work would stop immediately and the find would be protected until its significance can be determined by a qualified paleontologist or geologist. If the resource is determined to be a 'unique resource,' a mitigation plan would be formulated and implemented to appropriately protect the significance of the resource by preservation, documentation, and/or removal, prior to recommencing activities.

LRDP Mitigation Measure CUL-4-a: UC Berkeley will create an internal document: a UCB Campus Archaeological Resources Sensitivity Map. The map will identify only the general locations of known and potential archaeological resources within the 2020 LRDP planning area. For the Hill Campus, the map will indicate the areas along drainages as being areas of high potential for the presence of archaeological resources. If any project would affect a resource, then either the project will be sited to avoid the location or, in consultation with a qualified archaeologist, UC Berkeley will determine the level of archaeological investigation that is appropriate for the project site and activity, prior to any construction or demolition activities.

LRDP Mitigation Measure CUL-4-b: If a resource is discovered during construction (whether or not an archaeologist is present), all soil disturbing work within 35 feet of the find shall cease. UC Berkeley shall contact a qualified archaeologist to provide and implement a plan for survey, subsurface investigation as needed to define the deposit, and assessment of the remainder of the site within the project area to determine whether the resource is significant and would be affected by the project, as outlined in Continuing Best Practice CUL-3-a. UC Berkeley would implement the recommendations of the archaeologist.

Continuing Best Practice CUL-4-b: In the event human or suspected human remains are discovered, UC Berkeley would notify the County Coroner who would determine whether the remains are subject to his or her authority. The Coroner would notify the Native American Heritage Commission if the remains are Native American. UC Berkeley would comply with the provisions of Public Resources Code Section 5097.98 and CEQA Guidelines Section 15064.5(d) regarding identification and involvement of the Native American Most Likely Descendant and with the provisions of the California Native American Graves Protection and Repatriation Act to ensure that the remains and any associated artifacts recovered are repatriated to the appropriate group, if requested.

Continuing Best Practice CUL-4-c: Prior to disturbing the soil, contractors shall be notified that they are required to watch for potential archaeological sites and artifacts and to notify UC Berkeley if any are found. In the event of a find, UC Berkeley shall implement LRDP Mitigation Measure CUL-4-b.

LRDP Mitigation Measure CUL-5: If, in furtherance of the educational mission of the University, a project would require damage to or demolition of a significant archaeological resource, a qualified archaeologist shall, in consultation with UC Berkeley:

- Prepare a research design and archaeological data recovery plan that would attempt to capture those categories of data for which the site is significant, and implement the data recovery plan prior to or during development of the site.
- Perform appropriate technical analyses, prepare a full written report and file it with the appropriate information center and provide for the permanent curation of recovered materials.

Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Cause a substantial adverse change in the significance of a historical resource as defined in CCR Section 15064.5 ?		●

The DHS site is currently occupied by the following facilities:

- 160,000 square foot eight story, 125 foot tall laboratory building constructed in 1953/54 at the center of the block
- 36,000 square foot wing added to the northeast end of the building in 1964
- two smaller single story structures, the "power plant" and the "service building" added at the south end of the eight story lab building in 1966.

(State Department of Health Services Berkeley Laboratory Consolidation and Expansion Project Draft Environmental Impact Report, SCH 88053109, March 15, 1989 p. 36). Structures on site are typical of older, post-war reinforced concrete buildings, with flat concrete panels separating strip windows comprised of numerous panes. The windows and the building structures are light tones of green in color. The west perimeter of the site has street trees along the sidewalks maintained by the City of Berkeley. The existing facility at 2151 Berkeley Way formerly held laboratory functions for the state Department of

Health Services. The main laboratory was constructed in 1953, and the "Research Disease" wing was added in 1964. The total of existing built spaces is approximately 210,000 square feet (State of California, Department of Health Services, Richmond Laboratories, DEIR, January 29, 1996 p. II.1).

The existing site facilities are not listed locally or at the state level.[15] No primary historical resources would be affected by the demolition of the existing facilities and the construction of the Helios Energy Research Facility. The only secondary resource proximate to the Project site is the University Garage at 1952 Oxford, but this is located across Berkeley Way, and neither it nor its context would be significantly affected.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Directly or indirectly destroy a unique paleontological resource, or site, or unique geologic feature?		●

The 2020 LRDP EIR states there are no known paleontological resources or unique geologic features in the geographic scope of the 2020 LRDP (2020 LRDP EIR Vol 1, 4.4-48). As prescribed in the 2020 LRDP EIR, should such resources be revealed work would stop immediately and any found resource would be protected until its significance can be determined (Best Practice CUL-1). If a resource is determined to be a 'unique resource' by a qualified paleontologist or geologist, a mitigation plan would be formulated and implemented to protect the resource by preservation, documentation and/or removal, prior to resuming activity.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CCR Section 15064.5?		●

In conformance with the 2020 LRDP EIR, demolition and construction workers would be notified that they are required to watch for potential archaeological sites and artifacts and to notify UC Berkeley if any are found. Archaeological resources, if present, would be treated in conformance with the protocols established by the 2020 LRDP EIR (Mitigation CUL-4-b and Best Practices CUL-4-a, CUL-4-b, CUL-4-c) and incorporated into the Project as proposed.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
4. Disturb any human remains, including those interred outside of formal cemeteries?		●

Human remains are not anticipated at the Project site. However, in the event human or suspected human remains are discovered, UC Berkeley would notify the County Coroner who would notify the Native American Heritage Commission as appropriate and in accordance with state law (Best Practice CUL-4-b).

SUMMARY OF CULTURAL RESOURCES ANALYSIS

The proposed Project would not impact any known secondary or primary cultural resources, and measures to reduce possible impacts upon unknown potential archaeological resources are incorporated into the Project. The analysis of Cultural Resources in the 2020 LRDP EIR appears generally in Vol 1, 4.4-54 through 4.4-61, as amended by Vol 3A, 9.1-7 to 9.1-8, and in the Notice of Preparation at Vol 2, Appendix A. The Project would not result in new or more severe impacts than analyzed in the 2020

LRDP EIR, SCH #2003082131, nor contribute to cumulatively significant adverse effects upon cultural resources.

GEOLOGY, SEISMICITY, AND SOILS

SETTING

The geological setting of the campus and environs is described in the 2020 LRDP EIR (Section 4.5). The following text summarizes context information for geology, seismicity, and soils relevant to the Helios Energy Research Facility.

The San Francisco Bay Area is considered one of the more seismically active areas in the world, based on its record of historical earthquakes and its position relative to the North American and Pacific Plate boundaries.[16] The Hayward fault is most relevant to UC Berkeley, since it passes through the eastern part of the campus[17], roughly 0.6 miles east of the Project site.

A new study assessing the probability of earthquakes in the San Francisco Bay Area was released in April 2003 by the USGS Working Group on California Earthquake Probabilities. The results of the study indicate the Bay Area is highly likely to experience a damaging earthquake in the next 30 years, with a 62 percent probability for one or more events of magnitude 6.7 or higher. The USGS recently estimated that the Hayward-Rodgers Creek fault has the highest probability of generating a M≥6.7 earthquake before 2032 among Bay Area faults.[18]

2020 LRDP AND 2020 LRDP EIR

The 2020 LRDP would guide the location, scale, form and design of new University projects with sensitivity to geology, seismicity and soils considerations. Two of the 2020 LRDP Objectives are particularly relevant:

- **Provide the space, technology and infrastructure we require to excel in education, research, and public service.**
- **Plan every new project to represent the optimal investment of land and capital in the future of the campus.**

The first objective is supported by policies to eliminate 'poor' and 'very poor' seismic ratings in campus buildings through renovation or replacement; to consider enhanced levels of seismic performance for critical buildings; and to minimize nonstructural hazards in buildings. Under the second objective, the policy to base capital investment decisions on life cycle cost, including the cost of known future expenditures, could help to prioritize seismic safety elements as a factor in safety and recovery of buildings.

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Project implementation would be performed in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of the implementation of the 2020 LRDP upon geology, seismicity and soils. Where applicable, the Project would incorporate the following mitigation measures and/or continuing best practices:

Continuing Best Practice GEO-1-a: UC Berkeley will continue to comply with the California Building Code and the University Policy on Seismic Safety.

Continuing Best Practice GEO-1-b: Site-specific geotechnical studies will be conducted under the supervision of a California Registered Engineering Geologist or licensed geotechnical engineer and

UC Berkeley will incorporate recommendations for geotechnical hazard prevention and abatement into project design.

Geotechnical report for the Project has been drafted (Alan Kropp Associates, October 2009) and recommendations are being incorporated into Project design.

Continuing Best Practice GEO-1-c: The Seismic Review Committee (SRC) shall continue to review all seismic and structural engineering design for new and renovated existing buildings on campus and ensure that it conforms to the California Building Code and the University Policy on Seismic Safety.

Continuing Best Practice GEO-1-d: UC Berkeley shall continue to use site-specific seismic ground motion specifications developed for analysis and design of campus projects. The information provides much greater detail than conventional codes and is used for performance-based analyses.

The Project has been reviewed in accordance with the above measures by the SRC.

Continuing Best Practice GEO-1-e: UC Berkeley will continue to implement the SAFER Program. Through this program, UC Berkeley has already identified all existing buildings in need of upgrades and is currently performing seismic upgrades on several of these buildings.

Continuing Best Practice GEO-1-f: Through the Office of Emergency Preparedness, UC Berkeley will continue to implement programs and projects in emergency planning, training, response, and recovery. Each campus building housing Berkeley students, faculty and staff has a Building Coordinator who prepares building response plans and coordinates education and planning for all building occupants.

Continuing Best Practice GEO-1-g: As stipulated in the University Policy on Seismic Safety, the design parameters for specific site peak acceleration and structural reinforcement will be determined by the geotechnical and structural engineer for each new or rehabilitation project proposed under the 2020 LRDP. The acceptable level of actual damage that could be sustained by specific structures would be calculated based on geotechnical information obtained at the specific building site.

Continuing Best Practice GEO-2: Campus construction projects with potential to cause erosion or sediment loss, or discharge of other pollutants, would include the campus Stormwater Pollution Prevention Specification. This specification includes by reference the 'Manual of Standards for Erosion and Sediment Control' of the Association of Bay Area Governments and requires that each large and exterior project develop an Erosion Control Plan.

Would the Project, with above measures incorporated:

Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Rupture of a known earthquake fault?		●

The 2020 LRDP EIR noted the Hayward fault runs directly through the eastern portion of the UC Berkeley campus. However, given continuing campus best practices including compliance with the University Policy on Seismic Safety and incorporation of geotechnical recommendations that reduce hazards, the 2020 LRDP EIR determined the risk to people or structures due to surface fault rupture

hazards would not be significantly increased with implementation of the 2020 LRDP (2020 LRDP EIR Vol 1, 4.5-17). The Project site is located west of the Campus Park, roughly 0.6 miles from the Hayward fault.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Strong seismic ground shaking?		●

UC Berkeley is located in a seismically active region. Ground shaking has the potential to damage buildings. The University has implemented a process for the design of new buildings that applies the best available engineering procedure to maximize safety and resiliency, which are incorporated into the 2020 LRDP EIR (Best Practices GEO-1-a through GEO-1-g). Given these practices, the 2020 LRDP EIR determined the impacts to people and property due to seismic ground shaking are less than significant. Moreover, in this case the Project would replace existing facilities with seismic deficiencies, with one built to current building codes.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Seismic -related ground failure, including liquefaction?		●

The 2020 LRDP EIR notes that the blocks adjacent to campus, including the Project site, are not located in a liquefaction hazard zone (2020 LRDP EIR Vol 1, 4.5-10).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
4. Landslides?		●

Landslide conditions occur in the Hill Campus. The Project is not located in an area of landslide risk.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
5. Result in substantial soil erosion or the loss of topsoil?		●

As prescribed in the 2020 LRDP EIR, campus construction projects with potential to cause erosion or sediment loss, or discharge of other pollutants, are undertaken in accordance with the campus Stormwater Pollution Prevention Specification. The specification includes by reference the 'Manual of Standards for Erosion and Sediment Control' of the Association of Bay Area Governments, and requires development of an erosion control plan (Best Practice GEO-2). With the inclusion of this practice as part of the Project, no significant erosion impact is anticipated.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
6. Be located on a geologic unit or soil that is unstable, or would become unstable as a result of the project, and potentially result in on- or off-site landslides, lateral spreading, subsidence, liquefaction or collapse?		●

As prescribed in the 2020 LRDP EIR, site-specific geotechnical studies have been conducted, and recommendations for geotechnical hazard prevention and abatement are being incorporated into Project design, prior to construction of the Project (Best Practice GEO-1-b).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
7. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property?		●

Please see response in Geology item 3, above.

SUMMARY OF GEOLOGY, SEISMICITY AND SOILS ANALYSIS

The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP, incorporating existing best practices and 2020 LRDP EIR mitigation measures, would not result in new significant impacts in the area of geology, seismicity, or soils (2020 LRDP EIR Vol 1 p. 4.5-17 to 4.5-24). The proposed Project replaces an existing seismically challenged building with a new structure that meets current seismic design criteria. The Project site is not at high risk for geologic hazards such as landslide, fault rupture or liquefaction. The Project would not result in new or more severe impacts than analyzed in the 2020 LRDP EIR, SCH #2003082131, nor contribute to cumulatively significant adverse effects related to geology, seismicity or soils. The analysis of Geology, Seismicity and Soils in the 2020 LRDP EIR appears generally in Vol 1, 4.5-17 through 4.5-24, as amended by Vol 3A, Section 9, and in the Notice of Preparation at Vol 2, Appendix A.

GREENHOUSE GAS EMISSIONS

UC Berkeley's physical greenhouse gas emission sources include all campus buildings, all student housing on and off campus, and the Richmond Field Station. The GHG emitting operational activities for which UC Berkeley will take responsibility in meeting its 2014 goals include all activities represented in the CCAR/Registry inventory. The Registry only requires emission inventories from purchased electricity, steam generation, natural gas use, fugitive refrigerants and campus fleet. However, the campus also estimates emissions from additional sources such as automobile commute by students, staff and faculty, air travel emissions, solid waste disposal, and embodied energy consumption in water use for UC Berkeley's emissions inventory.

Systemwide policy requires the University as a system to develop an action plan for becoming climate neutral which will include a target date for achieving climate neutrality as soon as possible while maintaining the University's overall mission, and a needs assessment of the resources required to successfully achieve these goals. Climate neutrality means that the University will have a net zero impact on the Earth's climate, and will be achieved by minimizing GHG emissions as much as possible and using carbon offsets or other measures to mitigate the remaining GHG emissions.

UC Berkeley has set more aggressive targets. On April 27, 2007, at the 4th Annual Chancellor's Advisory Committee on Sustainability Summit, UC Berkeley Chancellor Robert Birgeneau officially committed the campus to reducing its greenhouse gas emissions to 1990 levels by year 2014. This goal is six years earlier than State of California and the UC Policy on Sustainable Practices requires. He also committed the campus to working towards climate neutrality.

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Design and construction of Helios Energy Research Facility would be performed in conformance with the 2020 LRDP, as amended in July 2009 (LRDP Amendment #1. See tinyurl.com/UCBclimate). The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of

the implementation of the 2020 LRDP upon greenhouse gas emissions. Where applicable, the Project would incorporate the following mitigation measures and/or continuing best practices:

Continuing Best Practice CLI-1: UC Berkeley would continue to implement provisions of the UC Policy on Sustainable Practices including, but not limited to: Green Building Design; Clean Energy Standards; Climate Protection Practices; Sustainable Transportation Practices; Sustainable Operations; Recycling and Waste Management; and Environmentally Preferable Purchasing Practices.

Continuing Best Practice CLI-2: UC Berkeley would continue to implement energy conservation measures (such as energy-efficient lighting and microprocessor-controlled HVAC equipment) to reduce the demand for electricity and natural gas. The energy conservation measures may be subject to modification as new technologies are developed or if current technologies become obsolete through replacement.

Continuing Best Practice CLI-3: UC Berkeley would continue to annually monitor and report upon its progress toward its greenhouse gas emission targets. UC Berkeley would continue to report actions undertaken in the past year, and update its climate action plan annually to specify actions that UC Berkeley is planning to undertake in the current year and future years to achieve emission targets.

GREENHOUSE GAS EMISSIONS

Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?		●

The Project is planned, designed and would be managed to comply with the University Policy on Sustainable Practices. Further, the Project implements the 2020 Long Range Development Plan as amended and would not generate greenhouse gas emissions in a manner that significantly impacts the environment. The estimated electricity load for the Helios West project building is between 3.5 and 4 million kwh per year, which converts to 1050 to 1200 metric tons of carbon emissions annually.

Lead agencies, including municipalities, counties, and universities, have adopted climate action plans in an effort to meet state mandated greenhouse gas reduction targets through comprehensive efforts. Where the focus of CEQA is commonly on the physical impact of a single new development proposal, on-going pre-existing operations are often the greatest contributors of greenhouse gas emissions. Accordingly, in September 2009 the Bay Area Air Quality Management District published new draft guidelines for compliance with the California Environmental Quality Act to assist lead agencies in evaluating air quality and climate change impacts of projects and plans proposed in the air basin. The new draft guidelines discuss reliance upon an adopted climate action plan to support a finding that greenhouse gas emissions of a proposed plan, such as the 2020 LRDP, are less than significant. As described above, the LRDP was amended to reference the campus climate action plan in July, 2009.[19]

The California Attorney General has published suggested measures to reduce climate impacts. The table below indicates measures to be implemented by the proposed Project.

ID	Attorney General Project-Specific Climate Change Suggested Mitigation Measures	Implemented by project?
Energy Efficiency		
GCC-1-1	Design buildings to be energy efficient. Site buildings to take advantage of shade, prevailing winds, landscaping and sun screens to reduce energy use.	***The building will use shade control measures on its south and west facades. The landscape plantings will provide shade***
GCC-1-2	Install efficient lighting and lighting control systems. Use daylight as an integral part of lighting systems in buildings.	***The building is designed to provide daylight into the interior. The lighting systems will use occupancy sensors and efficient fixtures.***
GCC-1-3	Install light colored "cool" roofs, cool pavements, and strategically placed shade trees	***The landscaping surfaces and plantings are designed to reduce the heat island effect***
GCC-1-4	Provide information on energy management services for large energy users.	***n/a***
GCC-1-5	Install energy efficient heating and cooling systems, appliances and equipment, and control systems.	***The project will have extremely efficient systems and equipment in order to minimize the building energy use.***
GCC-1-6	Install light emitting diodes (LEDs) for traffic, street and other outdoor lighting.	***LED lighting will likely be used for outdoor lighting.***
GCC-1-7	Limit the hours of operation of outdoor lighting.	***Lighting is being designed to be controlled by photo sensors and site occupancy schedule.***
GCC-1-8	Use solar heating, automatic covers, and efficient pumps and motors for pools and spas.	***n/a***
GCC-1-9	Provide education on energy efficiency.	***Information on the building's energy efficiency measures will be provided within the building as part of a LEED innovation credit for education.***
Renewable Energy		
GCC-1-10	Install solar and wind power systems, solar and tankless hot water heaters, and energy-efficient heating ventilation and air conditioning. Educate consumers about existing incentives.	***The Project is required by UC policy to achieve LEED Silver but is targeting LEED Gold certification.***
GCC-1-11	Install solar panels on carports and over parking areas.	***n/a***
GCC-1-12	Use combined heat and power in appropriate applications.	***No. Not proposed at this time.***
Water Conservation and Efficiency		

ID	Attorney General Project-Specific Climate Change Suggested Mitigation Measures	Implemented by project?
GCC-1-13	Create water-efficient landscapes.	***Yes. Where new planting occurs, native, drought-resistant materials are proposed.***
GCC-1-14	Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls.	***Water-efficient irrigations systems will be designed.***
GCC-1-15	Use reclaimed water for landscape irrigation in new developments and on public property. Install the infrastructure to deliver and use reclaimed water.	***No, not proposed at this time.***
GCC-1-16	Design buildings to be water-efficient. Install water-efficient fixtures and appliances.	***Yes. High quality water efficient fixtures, including dual flush toilets and low water use urinals are specified.***
GCC-1-17	Use graywater. (Graywater is untreated household waste water from bathtubs, showers, bathroom wash basins, and water from clothes washing machines.) For example, install dual plumbing in all new development allowing graywater to be used for landscape irrigation.	***Graywater is not being considered.***
GCC-1-18	Restrict watering methods (e.g., prohibit systems that apply water to non-vegetated surfaces) and control runoff.	***Yes, campus seeks to reduce total water use and this is among the means in use.***
GCC-1-19	Restrict the use of water for cleaning outdoor surfaces and vehicles.	***Yes, campus seeks to reduce total water use and this is among the means in use***
GCC-1-20	Implement low-impact development practices that maintain the existing hydrologic character of the site to manage storm water and protect the environment. (Retaining storm water runoff on-site can drastically reduce the need for energy-intensive imported water at the site.)	***The site is currently almost all hardscape. The Project will improve the stormwater management of the site by providing a significant increase in pervious surfaces. A bioswale is proposed where appropriate***
GCC-1-21	Devise a comprehensive water conservation strategy appropriate for the project and location. The strategy may include many of the specific items listed above, plus other innovative measures that are appropriate to the specific project.	***The 2009 Campus Sustainability Plan includes this goal: By 2011 or earlier, set a water reduction goal and analyze and approve feasible water reduction, reuse, and/or recycling projects.***
GCC-1-22	Provide education about water conservation and available programs and incentives.	***These measures will be documented as part of the LEED innovation credit.***
Solid Waste Measures		
GCC-1-23	Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).	***Yes. Project scope will include recycling of demolition waste to the best extent feasible.***
GCC-1-24	Provide interior and exterior storage areas for recyclables and green waste and adequate recycling containers located in public areas.	***Yes. Recycling & composting containers accommodated in all trash rooms and work areas.***
GCC-1-25	Recover by-product methane to generate electricity.	***n/a***

ID	Attorney General Project-Specific Climate Change Suggested Mitigation Measures	Implemented by project?
GCC-1-26	Provide education and publicity about reducing waste and available recycling services.	***Yes. Campus has existing programs to educate.***
Land Use Measures		
GCC-1-27	Include mixed-use, infill, and higher density in development projects to support the reduction of vehicle trips, promote alternatives to individual vehicle travel, and promote efficient delivery of services and goods.	***Yes. The Project intensifies use at an existing developed site that is part of a greater transit and street system.***
GCC-1-28	Educate the public about the benefits of well-designed, higher density development.	***This project is an example of high-density, sustainable development.***
GCC-1-29	Incorporate public transit into project design.	***Yes. The project is located within walking distance of public transit.***
GCC-1-30	Preserve and create open space and parks. Preserve existing trees, and plant replacement trees at a set ratio.	***The Project provides an open space plaza where currently none exists.***
GCC-1-31	Develop "brownfields" and other underused or defunct properties near existing public transportation and jobs.	***Yes. The Project safely demolishes an abandoned and obsolete building with contaminated materials, and redevelops a site near transit***
GCC-1-32	Include pedestrian and bicycle-only streets and plazas within developments. Create travel routes that ensure that destinations may be reached conveniently by public transportation, bicycling or walking.	***The Project includes a pedestrian connection across the site at Walnut Street. This will improve pedestrian access to transportation in the downtown area.***
Transportation and Motor Vehicles		
GCC-1-33	Limit idling time for commercial vehicles, including delivery and construction vehicles.	***Yes. This is part of any project implementing the 2020 LRDP.***
GCC-1-34	Use low or zero-emission vehicles, including construction vehicles.	***Campus exploring use of low emission fleet vehicles. Not currently part of campus construction requirements; will review with selected contractor.***
GCC-1-35	Promote ride sharing programs e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading and waiting areas for ride sharing vehicles, and providing a web site or message board for coordinating rides.	***Project does not provide parking on site. Campus implements and promotes ridesharing programs.***
GCC-1-36	Create car sharing programs. Accommodations for such programs include providing parking spaces for the car share vehicles at convenient locations accessible by public transportation.	***Campus supports car sharing programs, provides parking and promotion***
GCC-1-37	Create local "light vehicle" networks, such as neighborhood electric vehicle (NEV) systems.	***n/a***

ID	Attorney General Project-Specific Climate Change Suggested Mitigation Measures	Implemented by project?
GCC-1-38	Provide the necessary facilities and infrastructure to encourage the use of low or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations.	***n/a***
GCC-1-39	Increase the cost of driving and parking private vehicles by, e.g., imposing tolls and parking fees.	***Campus implements parking permit program and subsidizes transit costs for employees***
GCC-1-40	Build or fund a transportation center where various public transportation modes intersect.	***Project is proximate to major downtown Berkeley transit hub.***
GCC-1-41	Provide shuttle service to public transit.	***Public transit is within walking distance of project.***
GCC-1-42	Provide public transit incentives such as free or low-cost monthly transit passes.	***Yes. Campus subsidizes transit for employees.***
GCC-1-43	Promote "least polluting" ways to connect people and goods to their destinations.	***Yes. Project includes bicycle parking and showers. Project is located within walking/bicycling distance of campus and services.***
GCC-1-44	Incorporate bicycle lanes and routes into street systems, new subdivisions, and large developments.	***The Project site is bordered by streets that have bicycle lanes, including lanes connecting to and from the campus. The campus Parking & Transportation website provides comprehensive information for campus bicyclists, see; http://pt.berkeley.edu/around/bike/info***
GCC-1-45	Incorporate bicycle-friendly intersections into street design.	***The project does not include street design.***
GCC-1-46	For commercial projects, provide adequate bicycle parking near building entrances to promote cyclist safety, security, and convenience. For large employers, provide facilities that encourage bicycle commuting, including, e.g., locked bicycle storage or covered or indoor bicycle parking.	***Yes Project includes locked, interior bicycle parking, as described above.***
GCC-1-47	Create bicycle lanes and walking paths directed to the location of schools, parks and other destination points.	***Yes. Project has been designed to encourage pedestrian crossing to the core campus at Berkeley Way, a signalized intersection. Project provides improved walking access to campus and the surrounding neighborhood and services by providing pedestrian connections through the site.***
GCC-1-48	Work with the school district to restore or expand school bus services.	***n/a***

ID	Attorney General Project-Specific Climate Change Suggested Mitigation Measures	Implemented by project?
GCC-1-49	Institute a telecommute work program. Provide information, training, and incentives to encourage participation. Provide incentives for equipment purchases to allow high-quality teleconferences.	***n/a for this project, however, campus expects to upgrade infrastructure for teleconferencing.***
GCC-1-50	Provide information on all options for individuals and businesses to reduce transportation-related emissions. Provide education and information about public transportation.	***Yes. Public transportation information is available to staff and faculty. All can obtain discount yearly bus passes.***

The Bay Area Air Quality Management District has promulgated the following measures in its draft guidance on greenhouse gas emissions as project sustainability measures: (see http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Workshop%20Draft%20-%20BAAQMD%20CEQA%20Guidelines%209-2009.ashx)

Plant shade trees within 40 feet of the south side or within 60 feet of the west sides of properties.	Project will implement
Require cool roof materials (albedo >= 30)	Not yet determined, however, the roof of the Project is already extensively programmed, accommodating mechanical systems for the building.
Install green roofs	Project does not include green roofs, but substantially increases the amount of pervious and landscaped area on site
Require smart meters and programmable thermostats	Project will implement
Meet GBC standards in all new construction	Projected would meet a minimum standard of LEED Silver
Install solar water heaters	Not likely for project.
Install tank-less water heaters	Not yet determined
Install solar panels on residential and commercial buildings	The roof of the Project is already extensively programmed. The addition of solar panels would require additional height on the building, which already meets suggested height limits. Solar panels are not feasible for the Project.
100% increase in diversity of land use mix	Current active land use at the site is parking as existing facilities are abandoned. Project would replace abandoned facilities with a research building, pedestrian pathway and

	green open space plaza
HVAC duct sealing	Project will implement
Maximize interior day light	Project will implement
Increase roof/ceiling insulation	Project is new construction and will include insulation
Require the provision of storage areas for recyclables and green waste in new construction	Project will implement
Install rainwater collection systems in residential and Commercial Buildings	Project is neither residential nor commercial.
Install low-water use appliances and fixtures	Project will implement
Restrict the use of water for cleaning outdoor surfaces/Prohibit systems that apply water to non-vegetated surfaces	Operational measure to be considered
Implement water-sensitive urban design practices in new construction	Project will implement

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?		●

In July 2009 the University adopted an amendment to the UC Berkeley 2020 LRDP to address climate change. That amendment includes the policy "Design all aspects of new projects to achieve campus short and long term climate change emissions targets established in the campus climate action plan." See http://tinyurl.com/UCBClimate.

Embodied GHG emissions are emissions that are created through the extraction, processing, transportation, construction and disposal of building materials as well as emissions created through landscape disturbance (by both soil disturbance and changes in above ground biomass). The Project would demolish existing facilities on site, and construct a new five story research building, a green plaza and pathway. Each aspect of construction would entail emission of greenhouse gases.

A February 2009 report from the federal Environmental Protection Agency[20] notes that

> Greenhouse gas emissions from the construction industry result from a wide range of activities by hundreds of thousands of companies and sites across the country, producing 6% of all U.S. industrial GHG emissions in 2002. Although aggregate emissions from this large sector are high, no single construction site or company is a significant contributor (p. 29).

As part of the LRDP EIR addendum #5 prepared in accordance with CEQA to consider the LRDP climate change amendment, construction period (including demolition) emissions for UC Berkeley were calculated, assuming 1 million gross square feet of new space under development, or 45.9 acres under construction at UC Berkeley over a twelve-month period. Modeling shows that annual CO_2 emissions of 1,264 metric tons results from construction activities of this scale. For comparison, emissions associated

with campus water consumption were 1,955 metric tons of carbon dioxide equivalent in 2007. Construction at the site could mean 120,000 square feet under construction at one time; however, this is well within the one million square feet of new space under development analyzed in the 2020 LRDP EIR and 2020 LRDP EIR Addendum #5.

The Project is planned, designed and would be managed to comply with the University policy on sustainable practices, as partially outlined in the table "Attorney General Project-Specific Climate Change Suggested Mitigation Measures" above. The Project would implement the 2020 LRDP as amended, which includes compliance with emission targets established in the Campus Climate Action Plan. See http://tinyurl.com/UCBClimate.

HAZARDOUS MATERIALS

SETTING

This section assesses the potential adverse impacts on human health and the environment due to exposure to hazards and hazardous materials that could be encountered as a result of implementation of the Helios Energy Research Facility. This section also addresses impacts related to the use of research materials that do not meet the standard criteria of hazardous materials but whose presence and use at UC Berkeley are a matter of concern to the surrounding community. These include transgenic materials and non-ionizing radiation. The potential for impacts from toxic air emissions is considered in Air Quality, above.

The 2020 LRDP acknowledges that providing the space, technology, and infrastructure required to pursue new fields of inquiry and discovery, and integrate education and research, are paramount to the UC Berkeley mission. As presented in the 2020 LRDP EIR (Section 4.6), the following text summarizes context information for hazardous materials relevant to the Helios Energy Research Facility.

The UC Berkeley Office of Environment, Health, and Safety (EH&S) has primary responsibility for coordinating the management of hazardous materials on campus in compliance with applicable laws, regulations, and standards. The UC Berkeley Environmental Health and Safety Department Emergency Response Team (ERT), staffed by health and safety professionals, hazardous materials technicians, and licensed hazardous materials drivers, responds to most hazardous materials incidents reported on campus. Currently, the ERT is able to respond to an incident within 15 minutes. In the infrequent cases when outside assistance is required, the ERT may request assistance from other nearby agencies, including the Berkeley Fire Department (BFD) and Alameda County Fire Department (ACFD), or from emergency response contractors.

Hazardous materials surveys are conducted by UC Berkeley prior to any capital project in a laboratory building. All abandoned chemicals and other hazardous materials are removed from the building and surfaces are decontaminated. EH&S performs a final evaluation of the decontamination work before releasing the lab to the campus department performing the construction work.

Prior to any demolition or renovation work in a laboratory, all hazardous materials are removed, and EH&S then performs a confirmation survey for contamination resulting from the use of hazardous materials. If there are radioactive materials present, EH&S conducts the survey in coordination with the DHS. Labs are checked for mercury contamination using a portable analyzer and for other contaminants by visual observation. Lab benches and most other surfaces are cleaned using a surfactant regardless of whether contamination is observed. Sink traps, drain piping, and other individual building components are also evaluated as potential hazardous materials based on a review or past site uses and/or sampling, and are handled as hazardous waste if appropriate.

2020 LRDP AND 2020 LRDP EIR

While the 2020 LRDP does not contain specific policies about hazardous materials, it does present objectives and policies that indirectly support the safe use of these materials. Three 2020 LRDP Objectives are particularly relevant:

- **Plan every new project as a model of resource conservation and environmental stewardship.**
- **Provide the space, technology and infrastructure we require to excel in education, research, and public service.**
- **Plan every new project to represent the optimal investment of land and capital in the future of the campus.**

The first Objective supports the practice of responsible use of hazardous materials. The policies under the second and third Objectives to eliminate 'poor' and 'very poor' seismic ratings in campus buildings through renovation or replacement; to consider enhanced levels of seismic performance for critical buildings; and to design new campus laboratory buildings to a standard equivalent to LEED 2.1 certification and LABS 21 environmental performance criteria also support the safe use, production, and disposal of hazardous materials, and help to decrease the risk of releasing these materials into the environment.

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Design and construction of the Project would be performed in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of the implementation of the 2020 LRDP related to hazardous materials. Where applicable, the Project would incorporate the following mitigation measures and/or continuing best practices:

Continuing Best Practice HAZ-1: UC Berkeley shall continue to implement the same (or equivalent) health and safety plans, programs, practices and procedures related to the use, storage, disposal, or transportation of hazardous materials and wastes (including chemical, radioactive, and biohazardous materials and waste) during the 2020 LRDP planning horizon. These include, but are not necessarily limited to, requirements for safe transportation of hazardous materials, EH&S training programs, the Hazard Communication Program, publication and promulgation of drain disposal guidelines, the requirement that laboratories have Chemical Hygiene Plans, the Chemical Inventory Database, the Toxic Use Reduction Program, the Aboveground Storage Tank Spill Prevention Control and Countermeasure Plan, monitoring of underground storage tanks, hazardous waste disposal policies, the Chemical Exchange Program, the Hazardous Waste Minimization Program, the Biosafety Program, the Medical Waste Management Program, and the Radiation Safety Program. These programs may be subject to modification as more stringent standards are developed or if the programs become obsolete through replacement by other programs that incorporate similar health and safety protection measures.

Continuing Best Practice HAZ-3: UC Berkeley shall continue to implement the same (or equivalent) programs related to transgenic materials use during the 2020 LRDP planning horizon, including, but not necessarily limited to, compliance with the NIH Guidelines for Research Involving Recombinant DNA Molecules, USDA requirements for open field-based research involving transgenic plants, and requiring registration with EH&S for all research involving transgenic plants. These programs may be subject to modification as more stringent standards are developed or if the programs become obsolete through replacement by other programs that incorporate similar health and safety protection measures.

Continuing Best Practice HAZ-4: UC Berkeley shall continue to perform site histories and due diligence assessments of all sites where ground-disturbing construction is proposed, to assess the potential for soil and groundwater contamination resulting from past or current site land uses at the site or in the vicinity. The investigation will include review of regulatory records, historical maps and other historical documents, and inspection of current site conditions. UC Berkeley would act to protect the health and safety of workers or others potentially exposed should hazardous site conditions be found.

Continuing Best Practice HAZ-5: UC Berkeley shall continue to perform hazardous materials surveys prior to capital projects in existing campus buildings. The campus shall continue to comply with federal, state, and local regulations governing the abatement and handling of hazardous building materials and each project shall address this requirement in all construction.

Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Create a significant hazard to the public or the environment through the routine transport, use, production, or disposal of hazardous materials?		●

The 2020 LRDP EIR anticipates up to 700,000 net new GSF of research laboratory space, of which 50%, or 350,000 GSF, was assumed to be wet research lab space, with the balance lab support and other types of labs. At a typical ASF:GSF ratio of 55% for lab buildings, this 350,000 GSF equals 192,000 ASF. In order to model potential emission patterns, the 2020 LRDP EIR split the campus into 8 zones, and allocated future growth in wet lab space to each zone based on the existing distribution of wet labs. Zone A, the northwest zone of the Campus Park in which the Project is located, was estimated to account for up to 112,800 ASF of net new wet lab space (2020 LRDP EIR Vol 2, C.3-12).

In the 2009 update to the report, Zone A was expanded to include campus-owned properties west of the Campus Park. See discussion under Air Quality above (2009 HRA Update, ERM, November 2009).

The Project program includes 40,900 ASF of lab space which may be considered within the 'wet research lab' category. As described in 2020 LRDP EIR Addendum #1 for the Biomedical and Health Sciences Center, that project represents a net increase in wet lab research space of 32,800 ASF; combined, the Project and the Biomedical and Health Sciences Center would construct 65% of the amount of net new wet research lab space anticipated for Zone A in the 2020 LRDP.

Finding impacts in this area to be less than significant, the 2020 LRDP EIR states 'Concurrent with this increase in laboratory space there would be an increase in the use of hazardous materials and chemicals, biohazardous materials, radioactive materials, and production of wastes associated with laboratory research activities … Given continuing campus compliance with regulations and policy, the hazards to the public or the environment resulting from the increase in use of hazardous materials under routine conditions would continue to be minimal' (2020 LRDP EIR Vol 1, 4.6-20).

Any research in the building now or in the future would be subject to campus hazardous material handling programs outlined in the 2020 LRDP EIR (see 2020 LRDP EIR section 4.6). As noted in the 2020 LRDP EIR, the Chancellor's Advisory Committee on Laboratory and Environmental Biosafety (CLEB) is charged with the responsibility of formulating campus policies to ensure the safe conduct of research involving biohazardous agents and materials, in accordance with guidelines set forth by the NIH, the CDC and the US Department of Agriculture. CLEB reviews and approves all recombinant DNA research

using transgenic plants. Research currently proposed would involve the use of transgenic plant material, or plants with genes transferred between species. Research currently proposed for the building would not involve the use of pathogens, or disease-causing agents.

The Helios facility's biological research areas would be designed to accommodate Biosafety Level-2 operations if any are proposed in the future, with no or minor retrofit[21]. In all portions of the building, primary and secondary barriers would be used to reduce or eliminate exposure of the laboratory environment and the outside environment to potentially hazardous agents. Primary barriers (biosafety cabinets and fume hoods) are designed to protect personnel and the laboratory environment from exposure to hazardous agents. Facility design criteria provide secondary barriers as a protection for personnel inside and outside the laboratory. Air changes would be implemented for worker safety. All lab facilities would maintain negative pressure, which would control the release of any airborne materials to non-lab areas via doors and other openings. The laboratory staff and researchers would be trained in the use of certified biosafety cabinets, autoclaving, and other specialized disinfection techniques, and biological materials handing protocols.

The development of and research related to transgenic (genetically modified) plant materials and microorganisms would occur in five thematic areas associated with the EBI program. All research related to transgenic organisms will be required to comply with National Institutes of Health (NIH) Guidelines for Research Involving Recombinant DNA Molecules. The Guidelines specify containment practices for plants and microorganisms, depending on the potential hazard posed by the organism. See Appendix G for safety training material prepared by UC Berkeley EH&S staff. The potential for worker exposure is minimized by compliance with Centers for Disease Control (CDC) and NIH guidelines for research involving these materials.

Small amounts of radioactive materials, typically associated with bioscience research, will be used in accordance with UC Berkeley's radioactive materials license issued by the California Department of Public Health. Each principal investigator proposing to use radiation or radioactive materials must be granted a Radiation Use Authorization (RUA) by EH&S. EH&S reviews and approves the RUAs and provides periodic oversight to verify compliance with the license requirements.

Non-ionizing radiation sources, as in Class 4 lasers, are routinely used under protocols overseen by the campus Non-Ionizing/Laser Safety Program. Class 4 laser research facilities require entryway safeguards that typically include laser rated curtains/barrier, in-use warning lights outside the lab doors interlocked to the laser power sources, and emergency-power-off switches inside the lab at the exit door. Other non-ionizing radiation sources such as super conducting magnets (NMRs) also fall under the Non-Ionizing/Laser Safety Program.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?		●

Although the Project would result in an increase in the volume of hazardous materials used, the materials used would be similar to those used in current campus biological research programs. Moreover, the Project would be located on the site of an existing facility that recently housed laboratory programs. The

existing facilities have been extensively surveyed and the campus would comply with federal, state, and local regulations governing the abatement and handling of hazardous building materials prior to demolition of the building. Continuation of current practices referenced in the 2020 LRDP (Best Practices HAZ-1, HAZ-2, HAZ-3, HAZ-4, HAZ-5) would ensure the Project does not pose significant potential impacts. With respect to storage and handling of hazardous materials on campus, those materials would not exist in quantities sufficient to pose a risk to those receptors in the event of an accidental release (2020 LRDP EIR Vol 1, 4.6-30). See also discussion in item 1, above.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?		●

The 2020 LRDP EIR notes several existing schools and day care centers are located within ¼ mile of the campus. However, it found the potential health risk to those receptors from routine air emissions to be less than significant. With respect to storage and handling of hazardous materials on campus, those materials would not exist in quantities sufficient to pose a risk to a school in the event of an accidental release (2020 LRDP EIR Vol 1, 4.6-30).

Section 21151.4 of the Public Resources Code requires that an EIR or negative declaration not be certified for any project involving the construction or alteration of a facility within ¼ mile of a school that might reasonably be anticipated to emit hazardous or acutely hazardous air emissions, or that would handle acutely hazardous substances or a mixture containing acutely hazardous substances in a quantity equal to or greater than the amount specified in section 25532 of the Health and Safety Code, that may pose a health or safety hazard to persons who would attend or be employed at the school, unless the lead agency consults with the school district having jurisdiction over the school, and unless the school district has been given written notification of the project not less than 30 days prior to the proposed certification of the environmental document.

As set forth in item 1 above, the emissions anticipated as a result of the proposed Project are less than the emissions anticipated in the 2020 LRDP EIR for Zone A; the emissions anticipated as a result of 2020 LRDP EIR build out for Zone A, and for the entire 2020 LRDP building envelope, would not be significant. Further, the Berkeley Unified School District does not maintain or propose a school within ¼ mile of the Project site, (the nearest school, Berkeley Arts Magnet, is slightly farther than a quarter mile away) and the District received all notices regarding the 2020 Long Range Development Plan EIR and the Project. As described in the 2020 LRDP EIR and confirmed in the 2009 HRA Update, no health or safety hazard might reasonably be anticipated to persons employed at or attending UC Berkeley, nor any other nearby school. These conclusions are further supported by the 2009 HRA Update, ERM, November 2009.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
4. Be located on a hazardous materials site as listed on the 'Cortese List' (compiled pursuant to Government Code Section 65962.5) and as a result create a significant hazard to the public or the environment?		●

The Project would not be located on a known hazardous materials site. Potential exposure of construction workers and campus occupants or the general public to potentially unknown contaminated soil or groundwater, however, would be minimized through the implementation of campus continuing best

practices prescribed in the 2020 LRDP EIR, which require site histories and due diligence assessments of all sites where ground disturbing construction is proposed (Best Practice HAZ-4).

SUMMARY OF HAZARDOUS MATERIALS ANALYSIS

The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP, incorporating existing best practices and 2020 LRDP EIR mitigation measures, would not result in new significant hazardous materials-related impacts (2020 LRDP EIR Vol 1 p. 4.6-20 to 4.6-35). Although the Project would result in an increase in the volume of hazardous materials used, the materials used would be similar to those used in current UC Berkeley biological research programs. Hazardous emissions, materials use, and waste anticipated as a result of the proposed Project, as a result of 2020 LRDP build out for Zone A, and for the entire 2020 LRDP building envelope, would not pose a significant hazard to the public or environment. The analysis of Hazardous Materials in the 2020 LRDP EIR appears generally in Vol 1, 4.6-20 through 4.6-35, and in the Notice of Preparation at Vol 2, Appendix A. The Project would not result in new or more severe impacts than analyzed in the 2020 LRDP EIR, SCH #2003082131, nor contribute to cumulatively significant adverse effects related to hazardous materials.

HYDROLOGY AND WATER QUALITY

SETTING

The hydrology and water quality setting of the campus and environs is described in the 2020 LRDP EIR (Section 4.7). The following text summarizes context information for hydrology and water quality relevant to the Helios Energy Research Facility.

The Adjacent Blocks West drains through culverts into lower Strawberry Creek in locations west of the Campus Park. In this portion of the watershed, all overland flow is collected by curb-and-gutter systems and delivered through side inlets to the storm drainage culverts beneath local streets[22] (2020 LRDP EIR Vol 1, 4.7-10). Neither the Adjacent Blocks, Southside, nor the Hill Campus are within any 100-year flood zone (2020 LRDP EIR Vol 1, 4.7-11).

UC Berkeley has implemented a number of programs to assure compliance with wastewater discharge requirements, including a coordinated response to sanitary sewer spills, inspecting chemical use areas, drain disposal guidelines and training for photo and research laboratories, shops, physical plant maintenance and construction activities. EBMUD regularly samples wastewater for metals and volatile chemical analysis. In 2004 UC Berkeley received a 'Certificate of Merit for Outstanding Achievement' from the California Water Environment Association for its efforts to protect water quality. [23]

2020 LRDP AND 2020 LRDP EIR

The 2020 LRDP would influence hydrology and water quality by guiding the location, scale, form and design of new University projects. The 2020 LRDP includes a number of policies and procedures for individual project review to support the Objectives of the 2020 LRDP. While several of the 2020 LRDP Objectives bear directly or indirectly on hydrology and water quality, two are particularly relevant:

- **Plan every new project to serve as a model of resource conservation and environmental stewardship.**
- **Maintain and enhance the image and experience of the campus, and preserve our historic legacy of landscape and architecture.**

The 2020 LRDP includes a number of policies and procedures for individual project review to support these Objectives. For each new project to serve as a model of resource conservation and environmental

stewardship, the 2020 LRDP envisions developing a campus standard for sustainable design specific to its site, climate, and facility inventory. The 2020 LRDP policies suggest that every project be guided by project-specific design guidelines, to ensure site planning and design is carefully considered.

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Design and construction of the Project would be performed in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of the implementation of the 2020 LRDP upon hydrology and water quality. Where applicable, the Project would incorporate the following mitigation measures and/or continuing best practices:

Continuing Best Practices HYD-1-a: During the plan check review process and construction phase monitoring, UC Berkeley (EH&S) will verify that the proposed project complies with all applicable requirements and BMPs.

Continuing Best Practice HYD-1-b: UC Berkeley shall continue implementing an urban runoff management program containing BMPs as published in the Strawberry Creek Management Plan, and as developed through the campus municipal Stormwater Management Plan completed for its pending Phase II MS4 NPDES permit. UC Berkeley will continue to comply with the NPDES stormwater permitting requirements by implementing construction and post construction control measures and BMPs required by project-specific SWPPPs and, upon its approval, by the Phase II SWMP to control pollution. Stormwater Pollution Prevention Plans would be prepared as required by the appropriate regulatory agencies including the Regional Water Quality Control Board and where applicable, according to the UC Berkeley Stormwater Pollution Prevention Specification to prevent discharge of pollutants and to minimize sedimentation resulting from construction and the transport of soils by construction vehicles.

Continuing Best Practice HYD-1-c: UC Berkeley shall maintain a campus-wide educational program regarding safe use and disposal of facilities maintenance chemicals and laboratory chemicals, to prevent discharge of these pollutants to Strawberry Creek and the campus storm drains.

Continuing Best Practice HYD-1-d: UC Berkeley shall continue to implement the campus Drain Disposal Policy and Drain Disposal Guidelines which provide inspection, training, and oversight on use of the drains for chemical disposal for academic and research laboratories as well as shops and physical plant operations, to prevent harm to the sanitary sewer system.

Continuing Best Practice HYD-2-a: In addition to Hydrology Continuing Best Practices 1-a and 1-b above, UC Berkeley will continue to review each development project, to determine whether project runoff would increase pollutant loading. If it is determined that pollutant loading could lead to a violation of the Basin Plan, UC Berkeley would design and implement the necessary improvements to treat stormwater. Such improvements could include grassy swales, detention ponds, continuous centrifugal system units, catch basin oil filters, disconnected downspouts and stormwater planter boxes.

Continuing Best Practice HYD-2-c: Landscaped areas of development sites shall be designed to absorb runoff from rooftops and walkways. The Campus Landscape Architect shall ensure open or porous paving systems be included in project designs wherever feasible, to minimize impervious surfaces and absorb runoff.

Continuing Best Practice HYD-3: In addition to Best Practices 1-a, 1-b, 2-a and 2-c above, UC Berkeley will continue to review each development project, to determine whether rainwater

infiltration to groundwater is affected. If it is determined that existing infiltration rates would be adversely affected, UC Berkeley would design and implement the necessary improvements to retain and infiltrate stormwater. Such improvements could include retention basins to collect and retain runoff, grassy swales, infiltration galleries, planter boxes, permeable pavement, or other retention methods. The goal of the improvement should be to ensure that there is no net decrease in the amount of water recharged to groundwater that serves as freshwater replenishment to Strawberry Creek. The improvement should maintain the volume of flows and times of concentration from any given site at pre-development conditions.

Continuing Best Practice HYD-4-b: For 2020 LRDP projects in the City Environs (excluding the Campus Park or Hill Campus) improvements would be coordinated with the City Public Works Department.

Continuing Best Practice HYD-4-e: UC Berkeley shall continue to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions.

Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Violate any water quality standards or waste discharge requirements?		●

In the early 1990s UC Berkeley established a Wastewater Quality Program to manage discharges to the sanitary sewers using innovative educational outreach and waste minimization incentives. The program has served as a model to others: its success at preventing pollution was recognized in 2003 when the campus was one of two honorees to be awarded EBMUD's Pollution Prevention Award for 'exemplary performance in complying with discharge requirements'. The campus instituted the Drain Disposal Policy that prohibits use of drains for disposal of hazardous chemicals (2020 LRDP EIR Vol 1, 4.7-23).

The Project includes no new land use not previously analyzed in the 2020 LRDP EIR that would significantly alter wastewater discharges from the campus, or violate water quality standards. The Project fits within the parameters of growth assessed in the 2020 LRDP EIR, which found the potential impact on water quality standards and waste discharge requirements to be less than significant, given existing campus practices (Best Practices HYD-1-a through HYD-1-d).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Substantially deplete groundwater supplies or quality, or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?		●

The Project site is already predominantly impervious; the proposed Project would add new pervious surfaces to the site, including a new open landscaped plaza south of the proposed Helios building. The 2020 LRDP EIR requires any new project be designed to ensure there is no net decrease in the amount of

water recharged to groundwater that serves to replenish Strawberry Creek: the volume of flows and times of concentration must be maintained at pre-development conditions (Best Practice HYD-3). The Project would not interfere with groundwater supplies or recharge, and may incrementally increase the amount of groundwater recharge at the site.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Substantially alter existing drainage patterns of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in substantial erosion, siltation or flooding on- or off- site?		●

Approximately 97% of the existing site area is impervious surfaces (building and paving). Through a combination of on-site retention, pervious paving materials, and increases in landscaped area, the Project would not result in an increase in the rate or amount of surface runoff from the site. The 2020 LRDP EIR requires that new projects be sited and designed so the aggregate effect of projects under the 2020 LRDP is no net increase in runoff over existing conditions (Best Practice HYD-4-e).

At its current stage of design the Project would develop pervious surface areas comprising approximately 28% of the total site area. The existing conditions at the site have approximately 3% pervious area, according to calculations (Creegan+D'Angelo, October 2, 2009). The Walnut Street pedestrian connection allows the drainage bioswale to collect rainwater run-off, and to slow and filter rainwater before it enters the storm system.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
4. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?		●

See Hydrology item 3. The existing project site is nearly 100% impervious surface area. After the proposed Project, runoff from the site would be reduced by the addition of landscaped areas and on-site retention, including a bioswale in the Walnut landscaped pedestrian connection.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
5. Otherwise substantially degrade water quality?		●

See Hydrology items 1-3.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
6. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?		●

The Project does not include housing.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
7. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?		●

The Project is outside the 100-year flood zone, as illustrated on Figure 4.7-2 of the 2020 LRDP EIR Vol 1, 4.7-13.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
8. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?		●

The Campus Park, its surrounds, and the Hill Campus are outside the inundation hazard area for Berryman and Summit Reservoirs. The Project would therefore not expose people or structures to inundation as a result of dam or levee failure.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
9. Be subject to inundations by seiches, tsunamis, or mudflows?		●

The Project site is sufficiently inland and at a sufficiently high elevation that tsunamis and mudflows are not an anticipated risk. No large, open bodies of water that would represent a substantial seiche risk are located on or around the campus.

SUMMARY OF HYDROLOGY ANALYSIS

The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP, incorporating existing best practices and 2020 LRDP EIR mitigation measures, would not result in new significant impacts upon hydrology and water quality (2020 LRDP EIR Vol 1, 4.7-24 to 4.7-35). The Project is an opportunity to convert a site that is already largely impervious and reduce its contribution to stormwater runoff. Through a combination of on-site retention, pervious paving materials, and other measures as described above, the Project is not expected to result in any significant increase in the rate or amount of surface runoff. The analysis of Hydrology in the 2020 LRDP EIR appears generally in Vol 1, 4.7-24 through 4.7-35, as amended by Vol 3A, 9.1-7, and in the Notice of Preparation at Vol 2, Appendix A. The Project would not result in new or more severe impacts than analyzed in the 2020 LRDP EIR, SCH #2003082131, nor contribute to cumulatively significant adverse hydrology or water quality effects.

LAND USE

SETTING

The land use setting of the campus and environs is described in the 2020 LRDP EIR (Section 4.8). The following text summarizes context information for land use relevant to the Helios Energy Research Facility.

The Project site lies at the western edge of the area designated in the 2020 LRDP as the 'Campus Park', defined by Hearst Avenue on the north, Oxford/Fulton on the west, Bancroft on the south and Gayley/Piedmont on the east. In 2005 the City of Berkeley and the University of California, Berkeley signed an agreement that obligated the University to pay for and participate in joint planning for its properties west of the Campus Park, in a land use planning zone the 2020 LRDP termed the Adjacent Blocks West. Although the resulting Downtown Area Plan itself has not been finalized, design guidelines prepared for the Project reflect areas of agreement for both the Downtown Area Plan Advisory Committee and the City of Berkeley Planning Commission regarding the Project site. Please see Appendix B.

2020 LRDP AND 2020 LRDP EIR

Review of individual projects under the 2020 LRDP would influence land use impacts by guiding the location, scale, form and design of new University projects. The 2020 LRDP includes a number of policies and procedures for individual project review to support the Objectives of the 2020 LRDP. While all the 2020 LRDP Objectives bear directly or indirectly on land use, the following are particularly relevant to the Project:

- **Plan every new project to represent the optimal investment of land and capital in the future of the campus.**
- **Plan every new project as a model of resource conservation and environmental stewardship.**
- **Build a campus that fosters intellectual synergy and collaborative endeavors both within and across disciplines.**
- **Maintain and enhance the image and experience of the campus, and preserve our historic legacy of landscape and architecture.**
- **Plan every new project to respect and enhance the character, livability, and cultural vitality of our City Environs.**

The 2020 LRDP requires that while the design of each campus building should reflect its own time and place, it should also reflect the enduring values of elegance and quality, and contribute to a memorable identity for the University as a whole. Toward this goal, major capital projects would be reviewed at each stage of design by the UC Berkeley Design Review Committee, as prescribed by Best Practice AES-1-b.

The requirement, incorporated in Aesthetics Continuing Best Practice AES-1-b, ensures that committee reviews reflect a coherent aesthetic vision and support the academic goals of the University.

The 2020 LRDP also includes Location Guidelines (2020 LRDP Vol 3a, 3.1-60 to 3.1-61), which prescribe location priorities for the various campus functions by land use zone. The Project conforms to the Location Guidelines, which prioritizes locations on the Adjacent Blocks for functions including research activities without substantial student engagement & participation.

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Design and construction of the Helios Energy Research Facility would be implemented in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices

developed to reduce the effect of the implementation of the 2020 LRDP upon land use. Where applicable, the Project would incorporate the following mitigation measures and/or continuing best practices:

Continuing Best Practice LU-2-b: UC Berkeley would make informational presentations of all major projects in the City Environs in Berkeley to the Berkeley Planning Commission and, if relevant, the Berkeley Landmarks Preservation Commission for comment prior to schematic design review by the UC Berkeley Design Review Committee. Major projects in the City Environs in Oakland would similarly be presented to the Oakland Planning Commission and, if relevant, to the Oakland Landmarks Preservation Advisory Board. Whenever a project in the City Environs is under consideration by the UC Berkeley DRC, a staff representative designated by the city in which it is located would be invited to attend and comment on the project.

Continuing Best Practice LU-2-c: Each individual project built in the Hill Campus or the City Environs under the 2020 LRDP would be assessed to determine whether it could pose potential significant land use impacts not anticipated in the 2020 LRDP, and if so, the project would be subject to further evaluation under CEQA. In general, a project in the Hill Campus or the City Environs would be assumed to have the potential for significant land use impacts if it:

- Includes a use that is not permitted within the city general plan designation for the project site, or
- Has a greater number of stories and/or lesser setback dimensions than could be permitted for a project under the relevant city zoning ordinance as of July 2003.

Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Physically divide an established community?		●

Implementing site planning concepts developed through joint planning with committees within the City of Berkeley, the Project would replace an existing complex of buildings and would include a new pathway connecting pedestrians on Walnut Street through the site.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect ?		●

The University of California is exempt from local land use plans and regulations when using its property in furtherance of its constitutional mission. However, the Project conforms to the design guidelines reprinted in Appendix B that reflect views of planning committees within the City of Berkeley.

The project also conforms to the 2020 LRDPP, which suggests that locations in the Adjacent Blocks are appropriate for research activities that do not include intensive student engagement.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Conflict with any applicable habitat conservation plan or natural community conservation plan?		●

The Project is not located within any area designated for an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved conservation plan.

SUMMARY OF LAND USE ANALYSIS

The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP, incorporating existing best practices and 2020 LRDP EIR mitigation measures, would not result in new significant land use impacts (2020 LRDP EIR Vol 1, 4.8-15 to 4.8-21). The Project site is in the Adjacent Blocks West, and incorporates specific provisions, including height limits, a pedestrian pathway and a green plaza open space, to ensure the Project implements land use goals of both city and university. The analysis of Land Use in the 2020 LRDP EIR appears generally in Vol 1, 4.8-15 through 4.8-21, as amended by Vol 3A, 9.1-7, and in the Notice of Preparation at Vol 2, Appendix A. The Project would not result in new or more severe impacts than analyzed in the 2020 LRDP EIR, SCH #2003082131, nor contribute to cumulatively significant adverse land use effects.

NOISE

SETTING

The noise setting of the campus and environs is described in the 2020 LRDP EIR (Section 4.9). The following text summarizes context information for noise relevant to the Helios Energy Research Facility.

In the Adjacent Blocks, traffic noise on the street network dominates the noise environment. Along Shattuck Avenue (location LT-1), typical hourly average noise levels range from 68 to 71 dBA during the daytime and drop to about 55 dBA at night. The measured day/night average noise level at this location was 71 L_{dn}. Short-term measurements made along other streets in the areas adjacent to the Campus Park showed similar noise levels.

Short term noise measurements were taken for the DAP EIR analysis at Hearst Avenue near the Project site. Noise measurement ST-1 was in front of 2125 Hearst Avenue at a distance of about 25 feet from the centerline of the roadway. The primary noise source at this location was traffic on Hearst Avenue and Shattuck Avenue. The average noise level was approximately 66 dBA $L_{eq.}$ (DAP EIR p. 4-185). As translated across the various means of measuring noise, the findings were as follows:

Noise measurement, 9/24/2008, 3:40 to 3:50 pm, 2125 Hearst Avenue, about 25 feet from center of Hearst

L_{eq}	L_{10}	L_{50}	L_{90}	dBA, L_{dn}
66	69	61	54	69

Source: DAP EIR, p. 4-186

2020 LRDP AND 2020 LRDP EIR

While the 2020 LRDP does not contain any policies that specifically address noise, several Objectives bear directly or indirectly on the noise environment, most importantly:

- **Maintain and enhance the image and experience of the campus, and preserve our historic legacy of landscape and architecture.**

- **Plan every new project to respect and enhance the character, livability, and cultural vitality of our city environs.**

Specific policies relevant to reducing noise impacts on and around the campus include: locating all new university housing within a mile or 20 minutes of campus by transit; reducing demand for parking through incentives for alternate travel modes; collaborating with cities and transit providers to improve service to campus; and minimizing private vehicle traffic in the Campus Park.

Noise impacts resulting from development and operation of the 2020 LRDP were assessed in the 2020 LRDP EIR using several methods. Analyses were conducted using baseline noise levels quantified using noise measurements conducted in March-April, 2001 and February-March, 2003.

Increases in traffic noise levels in the area were calculated based on traffic data generated for the 2020 LRDP. The compatibility of proposed developments was assessed in accordance with State guidelines developed by the Office of Noise Control and discussed in the Regulatory Framework Section (4.9.2). Noise and vibration impacts resulting from construction activities were calculated based on generic construction noise and vibration levels and assessed with respect to existing ambient levels, limits proposed in local ordinances, and other thresholds to protect against vibration effects.

The campus office of EH&S works with construction project teams to implement noise reduction measures and performs noise monitoring at any specific site, upon the request of the campus community.

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Design and construction of Helios Energy Research Facility would be performed in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of the implementation of the 2020 LRDP upon the noise environment. Where applicable, the Project would incorporate the following mitigation measures and/or continuing best practices:

Continuing Best Practice NOI-2: Mechanical equipment selection and building design shielding would be used, as appropriate, so that noise levels from future building operations would not exceed the City of Berkeley Noise Ordinance limits for commercial areas or residential zones as measured on any commercial or residential property in the area surrounding a project proposed to implement the 2020 LRDP. Controls that would typically be incorporated to attain this outcome include selection of quiet equipment, sound attenuators on fans, sound attenuator packages for cooling towers and emergency generators, acoustical screen walls, and equipment enclosures.

Continuing Best Practice NOI-4-a: The following measures would be included in all construction projects:

- Construction activities will be limited to a schedule that minimizes disruption to uses surrounding the project site as much as possible. Construction outside the Campus Park area will be scheduled within the allowable construction hours designated in the noise ordinance of the local jurisdiction to the full feasible extent, and exceptions will be avoided except where necessary.
- As feasible, construction equipment will be required to be muffled or controlled.
- The intensity of potential noise sources will be reduced where feasible by selection of quieter equipment (e.g. gas or electric equipment instead of diesel powered, low noise air compressors).
- Functions such as concrete mixing and equipment repair will be performed off-site whenever possible.

For projects requiring pile driving:

- With approval of the project structural engineer, pile holes will be pre-drilled to minimize the number of impacts necessary to seat the pile.
- Pile driving will be scheduled to have the least impact on nearby sensitive receptors.

- Pile drivers with the best available noise control technology will be used. For example, pile driving noise control may be achieved by shrouding the pile hammer point of impact, by placing resilient padding directly on top of the pile cap, and/or by reducing exhaust noise with a sound-absorbing muffler.
- Alternatives to impact hammers, such as oscillating or rotating pile installation systems, will be used where possible.

Continuing Best Practice NOI-4-b: UC Berkeley would continue to precede all new construction projects with community outreach and notification, with the purpose of ensuring that the mutual needs of the particular construction project and of those impacted by construction noise are met, to the extent feasible.

LRDP Mitigation Measure NOI-4: UC Berkeley will develop a comprehensive construction noise control specification to implement additional noise controls, such as noise attenuation barriers, siting of construction laydown and vehicle staging areas, and the measures outlined in Continuing Best Practice NOI-4-a as appropriate to specific projects. The specification will include such information as general provisions, definitions, submittal requirements, construction limitations, requirements for noise and vibration monitoring and control plans, noise control materials and methods. This document will be modified as appropriate for a particular construction project and included within the construction specification.

LRDP Mitigation Measure NOI-5: The following measures would be implemented to mitigate construction vibration:

- UC Berkeley will conduct a pre-construction survey prior to the start of pile driving. The survey will address susceptibility ratings of structures, proximity of sensitive receivers and equipment/ operations, and surrounding soil conditions. This survey will document existing conditions as a baseline for determining changes subsequent to pile driving.
- UC Berkeley will establish a vibration checklist for determining whether or not vibration is an issue for a particular project.
- Prior to conducting vibration-causing construction, UC Berkeley will evaluate whether alternative methods are available, such as:
- Using an alternative to impact pile driving such as vibratory pile drivers or oscillating or rotating pile installation methods.
- Jetting or partial jetting of piles into place using a water injection at the tip of the pile.
- If vibration monitoring is deemed necessary, the number, type, and location of vibration sensors would be determined by UC Berkeley.

Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Expose people to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies, without mitigation?		●

The heating, ventilating, and air conditioning equipment in the Project would generate noise. As prescribed in the 2020 LRDP EIR, mechanical equipment selection and shielding would be utilized to ensure noise levels from future Project operations do not cause City of Berkeley Noise Ordinance limits to be violated within the Project vicinity. Measures to be incorporated to achieve this requirement include selection of quiet equipment, sound attenuators on equipment, and architectural enclosure of roof top equipment (Best Practice NOI-2).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Result in a substantial permanent increase in ambient noise levels in the project vicinity, without appropriate mitigation?		●

See Noise item 1.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity, without appropriate mitigation?		●

The 2020 LRDP EIR found noise resulting from demolition and construction activities would, in some instances, cause a substantial temporary or periodic increase in noise levels above local standards prescribed in the City of Berkeley Noise Ordinance: this was determined to be a significant and unavoidable impact for the 2020 LRDP program as a whole. The Project would not introduce any new potential noise impacts not already assessed in the 2020 LRDP EIR, and the measures prescribed in the 2020 LRDP EIR would minimize these impacts to the greatest extent feasible (Best Practices NOI-4-a and NOI 4-b).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
Expose people to or generate excessive ground-borne vibration or ground-borne noise levels, without mitigation?		●

Construction activities could expose nearby receptors to groundborne vibration or groundborne noise levels; note, however that the Project is not expected to require pile driving. The Project would not introduce any new potential impacts not already assessed in the 2020 LRDP EIR, and the measures prescribed in the 2020 LRDP EIR would ensure these impacts are less than significant (Mitigation NOI-5).

SUMMARY OF NOISE ANALYSIS

The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP, even with incorporation of existing best practices and 2020 LRDP EIR mitigation measures, could result in significant noise impacts

resulting from demolition and construction activities (2020 LRDP EIR Vol 1, 4.9-16 to 4.9-25). The Project may incrementally contribute to significant environmental impacts previously identified in the 2020 LRDP EIR, but will not result in those impacts being more severe than as described in the 2020 LRDP EIR, SCH #2003082131. The analysis of Noise in the 2020 LRDP EIR appears generally in Vol 1, 4.9-16 through 4.9-25, and in the Notice of Preparation at Vol 2, Appendix A. No additional mitigation measures have been identified that would further lessen the previously identified impact, and no additional analysis is required.

POPULATION

SETTING

The population setting of the campus and environs is described in the 2020 LRDP EIR (Section 4.10). The following text summarizes context information for population relevant to the Helios Energy Research Facility.

The 2020 LRDP describes campus population growth in terms of campus headcount. Campus headcount is the number of individuals enrolled or employed at UC Berkeley, plus an estimate of average daily visitors and vendors. Students make up the largest percentage of campus headcount, followed by nonacademic staff, academic staff, and faculty; the academic staff category includes postdoctoral fellows and visiting scholars. The staff figures are adjusted to exclude student workers in order to avoid double-counting. Under the 2020 LRDP, regular term campus headcount is projected to increase by up to 12 percent over what it was in 2001-2002, compared to a projected increase of 6 percent in the city of Berkeley population, and 20 percent in the regional population, during the period 2000-2020.

2020 LRDP AND 2020 LRDP EIR

The 2020 LRDP would influence population and housing by guiding the location, scale, form and design of new University projects. The 2020 LRDP includes a number of policies and procedures for individual project review to support the Objectives of the 2020 LRDP. 2020 LRDP Objectives particularly relevant to population and housing include:

- **Provide the housing, access, and services we require to support a vital intellectual community and promote full engagement in campus life.**
- **Stabilize enrollment at a level commensurate with our academic standards and our land and capital resources.**
- **Plan every new project to respect and enhance the character, livability, and cultural vitality of our city environs.**

Would the Project:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?		●

The 2020 LRDP EIR determined population growth associated with increased enrollment and employment at UC Berkeley under the 2020 LRDP program would be accommodated in the Bay Region without significant adverse impacts (2020 LRDP EIR, section 4.10). As indicated at Table 4, "Comparison of Project to 2020 LRDP Program: Estimated Headcount" the Project could result in 18 new faculty, 224 new researchers and postdocs, 30 new nonacademic staff, and 50 privately employed researchers, well

within the overall anticipated headcount increase for the 2020 LRDP. Staff headcount numbers have not been adjusted to account for retirements, layoffs and furloughs common at the University in the current economic climate (see http://berkeley.edu/news/media/releases/2009/07/10_furlough.shtml), which results in an overestimation of headcount in the 2020 LRDP EIR. The Project would not introduce any new potential impacts not already assessed in the 2020 LRDP EIR.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Displace substantial numbers of existing housing or people, necessitating the construction of replacement housing elsewhere?		●

The Project does not entail any displacement of housing.

SUMMARY OF POPULATION ANALYSIS

The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP, incorporating existing best practices and 2020 LRDP EIR mitigation measures, would not result in new significant impacts related to population and housing (2020 LRDP EIR Vol 1 p. 4.10-10 to 4.10-19). The analysis of Population in the 2020 LRDP EIR appears generally in Vol 1, 4.10-10 through 4.10-19, and in the Notice of Preparation at Vol 2, Appendix A. The Project would not result in new or more severe impacts than analyzed in the 2020 LRDP EIR, SCH #2003082131, nor contribute to cumulatively significant adverse population effects.

PUBLIC SERVICES

SETTING

The public services setting of the campus and environs is described in the 2020 LRDP EIR (Section 4.11). The following text summarizes context information for public services relevant to the Helios Energy Research Facility.

Police services for campus properties are primarily provided by the University of California Police Department (UCPD). In emergency situations that require an immediate response, the City of Berkeley Police Department assists the UCPD as necessary through a mutual aid agreement. The plan check and design review process would continue to minimize police service impacts of development under the 2020 LRDP. Through this process, the UCPD completes a plan review of all proposed University buildings to maximize public safety features in and around proposed buildings.

The Berkeley Fire Department (BFD) provides fire protection and emergency medical services to the western half of the Campus Park and to the Adjacent Blocks and Southside. Primary response to the campus area from BFD comes from Station Number 2 at 2129 Berkeley Way. Stations 3 and 5 at 2710 Russell Street and 2680 Shattuck Avenue, respectively, offer supplemental support. The average BFD response time throughout the city is four minutes.[24] The BFD services include fire fighting and rescue and emergency response services for immediate threats to life, as well as fire prevention and training and hazardous materials control.

UC Berkeley directly employs fire marshals who are responsible for fire prevention activities, including fire and life safety inspections of campus buildings for code compliance, fire and evacuation drills, and development of self-help educational materials for use by residence halls and campus departments. Fire marshals also assist in arson investigations and also serve as liaisons between responding agencies at the local, state and federal levels.[25]

The UC Berkeley Environmental Health and Safety Department Emergency Response Team (ERT), staffed by health and safety professionals, hazardous materials technicians, and licensed hazardous materials drivers, responds to most hazardous materials incidents reported on campus. Currently, the ERT is able to respond to an incident within 15 minutes. In the infrequent cases when outside assistance is required, the ERT may request assistance from other nearby agencies, including the BFD and Alameda County Fire Department, or from emergency response contractors.

The Office of Emergency Preparedness supports the Berkeley campus community by implementing programs and projects in emergency planning, training, response, and recovery. The mission is to prepare the campus to respond to and recover from any type of emergency or disaster.

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Design and construction of Helios Energy Research Facility would be performed in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of the implementation of the 2020 LRDP upon public services. Where applicable, the Project would incorporate the following mitigation measures and/or continuing best practices:

Continuing Best Practice PUB-1.1: UCPD would continue its partnership with the City of Berkeley police department to review service levels in the City Environs.

Continuing Best Practice PUB-2.3: UC Berkeley would continue its partnership with LBNL, ACFD, and the City of Berkeley to ensure adequate fire and emergency service levels to the campus and UC facilities.

LRDP Mitigation Measure PUB-2.4-a: In order to ensure adequate access for emergency vehicles when construction projects would result in temporary lane or roadway closures, campus project management staff would consult with the UCPD, campus EH&S, the BFD and ACFD to evaluate alternative travel routes and temporary lane or roadway closures prior to the start of construction activity. UC Berkeley will ensure the selected alternative travel routes are not impeded by UC Berkeley activities.

LRDP Mitigation Measure PUB-2.4-b: To the extent feasible, the University would maintain at least one unobstructed lane in both directions on campus roadways at all times, including during construction. At any time only a single lane is available due to construction-related road closures, the University would provide a temporary traffic signal, signal carriers (i.e. flagpersons), or other appropriate traffic controls to allow travel in both directions. If construction activities require the complete closure of a roadway, UC Berkeley would provide signage indicating alternative routes.

Continuing Best Practice PUB-2.4: To the extent feasible, for all projects in the City Environs, the University would include the undergrounding of surface utilities along project street frontages, in support of Berkeley General Plan Policy S-22.

POLICE PROTECTION
Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Result in the need for new or physically altered police facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, service times, or other performance objectives for police protection?		●

Police protection services for the Berkeley campus are provided by the University of California Police Department and the City of Berkeley Police Department. The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP could increase the demand for police services, but are not anticipated to result in construction of new or altered facilities. The Project would not introduce any new potential impacts not already assessed in the 2020 LRDP EIR.

FIRE AND EMERGENCY PROTECTION
Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Result in the need for new or physically altered fire or emergency medical services facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, service times or other performance objectives for fire and emergency protection?		●

The 2020 LRDP EIR determined that implementation of the 2020 LRDP could have direct effects on the need for fire and emergency services as a result of new University facilities and the people they accommodate. The 2020 LRDP EIR found that growth anticipated at UC Berkeley is a fraction of growth anticipated within the City of Berkeley in its General Plan EIR (2020 LRDP EIR Vol 1, 4.11-13). Measures prescribed in the 2020 LRDP EIR include continuing the campus partnership with Lawrence Berkeley National Laboratory, the Alameda County Fire Department station at LBNL, and the City of Berkeley to ensure adequate fire and emergency service levels (Best Practice PUB-2.3).

As further support of this partnership, in May of 2005 the Chancellor and the Mayor of the City of Berkeley signed an agreement earmarking $600,000 annually in campus funds to the City of Berkeley to support emergency and fire protection. The Project would not introduce any new potential impacts not already assessed in the 2020 LRDP EIR.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Expose people or structures to a significant risk of loss, injury or death involving wildland fires?		●

The Campus Park and its environs are presently urbanized and are not subject to wildland fires.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?		●

The Project would replace existing obsolete facilities with a new building. As required by the California Building Code, the Project would be designed to include adequate egress capacity and evacuation areas proximate to building load for decanting.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
4. Result in inadequate emergency access?		●

See previous item.

SCHOOLS
Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Result in the need for new or physically altered school facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, service times or other performance objectives for schools?		●

The 2020 LRDP EIR concluded any expanded demand for schools associated with expanded enrollment and employment at UC Berkeley under the 2020 LRDP would not create a need for new or altered facilities (2020 LRDP EIR Vol 1, 4.11-20). The Project would not introduce any new potential impacts not already assessed in the 2020 LRDP EIR.

PARKS AND RECREATION
Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Result in the need for new or physically altered parks and recreational facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, service times or other performance objectives?		●

The 2020 LRDP EIR concluded any expanded demand for recreation under the 2020 LRDP would not increase the demand for recreation facilities to a point resulting in substantial physical deterioration of parks and recreation facilities, nor create the need for new or expanded facilities to maintain acceptable service ratios (2020 LRDP EIR Vol 1, 4.11-26). The Project would not introduce any new potential impacts not already assessed in the 2020 LRDP EIR.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?		●

See previous item.

	2020 LRDP EIR Analysis Sufficient	2020 LRDP EIR Analysis Sufficient
3. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?		●

The Project does not include recreational facilities, nor require their construction or expansion.

SUMMARY OF PUBLIC SERVICES ANALYSIS

The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP, incorporating existing best practices and 2020 LRDP EIR mitigation measures, would not result in new significant impacts upon public services (2020 LRDP EIR Vol 1, 4.11-11 to 4.11-15; 4.11-10; 4.11-26 to 4.11-28; 4.11-32 to 4.11-33 as amended by Vol 3A, 9.1-7, and in the Notice of Preparation at Vol 2, Appendix A). The Project does not alter assumptions of the 2020 LRDP with regard to recreational facilities, emergency access and emergency services demand, or schools. The Project would not result in new or more severe impacts than analyzed in the 2020 LRDP EIR, SCH #2003082131, nor contribute to cumulatively significant adverse public services effects.

TRANSPORTATION

SETTING

The transportation setting of the campus and environs is described in the 2020 LRDP EIR (Section 4.12), including bicycle, pedestrian and transit modes as well as automobiles. The following text summarizes context information for transportation relevant to the Helios Energy Research Facility.

A faculty/staff survey completed in 2001 indicated 51% of faculty and staff drive alone to work at UC Berkeley. (According to the 2006 faculty-staff survey, 39% of faculty and staff (an estimated 4700 individuals) live within 5 miles of work; overall 47% of all campus employees, or approximately 5750 individuals, drive alone (personal communication, Stoll, March 2008).) The percentage of campus commuters choosing transit increased slightly between 1996 and 2001, to approximately 18%. As distances between home and work have increased since 1996, fewer faculty and staff are walking to work. Only 37% of individuals who live within 5 miles of campus drive alone to work. The primary commute mode for students, according to a student survey completed in 2000, was walking, with some 52% arriving at campus on foot. More than 80% of students live within 5 miles of campus; approximately 10% of students drive alone.

In the 2020 LRDP EIR, the total peak parking demand for parking at the University was estimated at about 11,465 parking spaces during the weekday critical midday period.[26] The difference between the theoretical demand of 11,465 parking spaces, and the existing parking supply of 7,151 spaces at the time of the 2020 LRDP, represents 'latent demand,' which refers to those users who do not currently park at

the University because of constrained parking supply and other factors, but would drive and park in University parking facilities if more parking spaces at current prices were provided on or in close proximity to the Campus Park.

The University faculty/staff and student transportation surveys indicate that approximately 800 commuting faculty/staff and 3,000 commuting students currently drive and regularly park in non-University parking facilities. Most employees parking in non-University facilities are part-time employees, and not all the parking occurs at the same time.[27]

Since certification of the 2020 LRDP EIR, in the summer of 2005, the Berkeley campus obtained the right to use the surface parking at 2151 Berkeley Way, and integrated the approximately 90 parking spaces at that site into the campus parking inventory. The parking was incorporated in part to offset parking lost during replacement of the Underhill parking facility. The Underhill parking facility is now fully operational with 1000 marked spaces. A 2009 survey showed peak period occupancy of Underhill was only 79%, with 205 spaces available (personal communication, Riggs, 9.09). The 2020 LRDP includes an increase in the campus parking inventory to accommodate the full program of campus growth anticipated in the plan.

2020 LRDP AND 2020 LRDP EIR

Review of individual projects under the 2020 LRDP would influence circulation and parking impacts by guiding the location, scale, form and design of new University projects. While all the LRDP Objectives described in the 2020 LRDP bear directly or indirectly on circulation and parking, the following are particularly relevant:

- **Provide the housing, access, and services we require to support a vital intellectual community and promote full engagement in campus life.**
- **Plan every new project to respect and enhance the character, livability, and cultural vitality of our city environs.**

The 2020 LRDP includes a number of specific policies in support of these Objectives that directly affect circulation and parking:

- Ensure university housing and access strategies are integrated and synergetic.
- Increase the supply of parking to accommodate existing unmet demand and future campus growth.
- Replace and consolidate existing university parking displaced by new projects.
- Reduce demand for parking through incentives for alternate travel modes.
- Collaborate with cities and transit providers to improve service to campus.

While the 2020 LRDP includes an expansion of the campus parking supply, to address current unmet demand as well as the need created by future growth, it also includes a number of measures to manage parking demand.

MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Design and construction of the Helios Energy Research Facility would be performed in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of the implementation of the 2020 LRDP upon transportation and traffic. Where applicable, the Project would incorporate the following mitigation measures and/or continuing best practices:

Continuing Best Practice TRA-1-b: UC Berkeley will continue to do strategic bicycle access planning. Issues addressed include bicycle access, circulation and amenities with the goal of increasing bicycle commuting and safety. Planning considers issues such as bicycle access to the campus from adjacent streets and public transit; bicycle, vehicle, and pedestrian interaction; bicycle parking; bicycle safety; incentive programs; education and enforcement; campus bicycle routes; and amenities such as showers.

Bicycle parking is generously accommodated in the proposed Project, including a room within the building envelope for secure bicycle storage for 50 bicycles, with an additional 20 spaces exterior to the building. The Project would also have showers, an amenity that supports bicyclists.

Continuing Best Practice TRA-3-a: Early in construction period planning UC Berkeley shall meet with the contractor for each construction project to describe and establish best practices for reducing construction-period impacts on circulation and parking in the vicinity of the project site.

Continuing Best Practice TRA-3-b: For each construction project, UC Berkeley will require the prime contractor to prepare a Construction Traffic Management Plan which will include the following elements:

- Proposed truck routes to be used, consistent with the City truck route map.
- Construction hours, including limits on the number of truck trips during the a.m. and p.m. peak traffic periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m.), if conditions demonstrate the need.
- Proposed employee parking plan (number of spaces and planned locations).
- Proposed construction equipment and materials staging areas, demonstrating minimal conflicts with circulation patterns.
- Expected traffic detours needed, planned duration of each, and traffic control plans for each.

Continuing Best Practice TRA-3-c: UC Berkeley will manage project schedules to minimize the overlap of excavation or other heavy truck activity periods that have the potential to combine impacts on traffic loads and street system capacity, to the extent feasible.

Continuing Best Practice TRA-3-d: UC Berkeley will reimburse the City of Berkeley 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.

Construction period measures are incorporated into construction documents for implementation.

LRDP Mitigation Measure TRA-6-a through TRA-6-g and **TRA-7**: The University will work with the City of Berkeley to design and, on a fair share basis, implement intersection changes at the following intersections: Cedar Street/Oxford Street; Durant/Piedmont; Derby/Warring; Addison/Oxford; Allston/Oxford; Kittredge/Oxford; Bancroft/Ellsworth; and Bancroft/Piedmont. The University will contribute fair share funding for a periodic (annual or biennial) signal warrant check at these intersections, to allow the city to determine when a signal and the associated improvements are warranted.

The campus completed signal warrant checks for half of the intersections outlined above in 2008. According to the City, no new signals were warranted.

LRDP Mitigation Measure TRA-11: The University will implement the following measures to limit the shift to driving by existing and potential future non-auto commuters:

- Review the number of sold parking permits in relation to the number of campus parking spaces and demographic trends on a yearly basis, and establish limits on the total number of parking permits sold proportionate to the number of spaces, with the objective of reducing the ratio of permits to spaces over time as the number of spaces grows, thus ensuring that new supply improves the existing space-to-permit ratio without encouraging mode change to single occupant vehicles.
- As new parking becomes operational, assign a portion of the new or existing parking supply to short-term or visitor parking, thus targeting parkers who choose on-street parking now, and also effectively reserving part of the added supply for non-commuters.
- Expand the quantity of parking that is available only after 10:00 a.m., to avoid affecting the travel mode use patterns of the peak hour commuting population, as new parking inventory is added to the system.
- Review and consider reductions in attended parking as new parking inventory is added to the system and other impacts do not reduce parking supply.

Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?		●

As noted in the 2020 LRDP EIR (see page F.1-8 and F.1-9 in Volume 2), the primary factor for estimating trip generation is an anticipated increase in population; the number of parking spaces provided also contribute to the overall project trip generation studied. The Project does not include a component adding parking. Population associated with the Project is well within the 2020 LRDP parameters, as noted in Table 4 above. The amount of net new space created by the Project is within the parameters of growth assessed in the 2020 LRDP EIR.

If the anticipated 322 new employees drive at the campus drive-alone rate (as estimated in 2004 for the 2020 LRDP) of 50%, they could conservatively be estimated to represent up to 161 new vehicle trips per day. This is conservative because a high percentage of the researchers would be graduate students who have a lower drive alone rate on campus, but the most conservative environmental analysis would assume all are postdocs or staff researchers. The 2020 LRDP EIR anticipated implementation of the 2020 LRDP would result in 3,490 net new daily trips (see Table F.1-7 in Volume 2 of the 2020 LRDP EIR); thus the number of trips generated is well within the 2020 LRDP EIR parameters, and addressed with implementation of 2020 LRDP EIR mitigation measures and best practices, including periodic warrant checks and intersection improvements as appropriate.

The 2020 LRDP EIR found the 2020 LRDP program as a whole, if fully implemented, would cause a substantial degradation of service at ten intersections. At eight of the intersections, the impacts could be reduced to less than significant with measures prescribed in the 2020 LRDP EIR (Mitigations TRA-6-a through TRA-6-g and TRA-7). However, at the other two intersections, no mitigations are feasible, and the impact was determined to be significant and unavoidable (2020 LRDP EIR Vol 1, 4.12-48 through 4.12-

53). The Project would not introduce any new potential impacts not already assessed in the 2020 LRDP EIR.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?		●

The 2020 LRDP EIR found the 2020 LRDP program as a whole, if fully implemented, would cause seven Alameda County CMP and MTS designated roadways to exceed the level of service established by the Congestion Management Agency. No mitigations are feasible, and the impact was determined to be significant and unavoidable (2020 LRDP EIR Vol 1, 4.12-54). The Project would not introduce any new potential impacts not already assessed in the 2020 LRDP EIR.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?		●

The Project is not anticipated to affect or contribute to air traffic.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
4. Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? Create unsafe conditions for pedestrians or bicyclists?		●

Continuation of the Walnut Street pedestrian pathway through the Project site may encourage mid-block crossing at Hearst Avenue. This is currently striped for safe pedestrian passage. The University is happy to work with the City of Berkeley to determine if additional safety measures are warranted to ensure the new pathway encourages safe pedestrian movement.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
5. Result in inadequate parking capacity?		●

The surface parking ringing the structures at 2151 Berkeley Way is managed as permit parking by the University of California. University parking at this location has however always been a temporary, interim use of the site, intended to relieve pressure upon the parking system during the construction of the Underhill parking structure, which is now completed and operational. The new Underhill parking facility opened in the fall of 2007, with 1000 marked parking spaces.

The plan for the site overall allows the potential development of underground parking as part of the eventual CHC project. However, the Helios project does not include underground parking. No parking would be provided to serve the building, which is well served by transit. University permit parking remains available across Oxford at the Genetics garage and at the University Hall garage on Addison

Street for the foreseeable future. In the interim before further development of the entire property, surface parking would be available on the Shattuck frontage of the site.

The 2020 LRDP includes an increase in the campus parking inventory to accommodate the full program of campus growth anticipated in the plan. The Project would provide office and research space for an increased number of faculty and staff: up to 18 net new faculty and up to 304 net new UC and private researchers and administrative staff. In fact, a percentage of the researchers would be graduate students, but the most conservative environmental analysis would assume all are postdocs or staff researchers. If these 322 new employees drive at the campus drive-alone rate, as estimated in 2004 for the 2020 LRDP, of 50%, they would represent up to 161 new vehicles per day, or roughly 2% of the campus parking space inventory. This impact may be perceptible at certain times and locations, but could be eliminated with a very modest shift in mode toward transit, which supports the campus' environmental objective of fewer drive-alone commuters. Further, these calculations do not account for furloughs, layoffs, retirements and staffing reductions prevalent on campus in the current economic climate (see http://berkeley.edu/news/media/releases/2009/07/10_furlough.shtml) .

As described in the 2020 LRDP the campus has an existing deficit in parking supply (2020 LRDP EIR Vol 3a, 3.1-28). The campus Parking and Transportation unit expects to install a dynamic parking management system [Parking Access Revenue Control System (PARCS)] in the near term that will better enable the management of permitted parking and the driver's awareness of parking availability. Real-time availability information is expected to reduce congestion and 'circling' and could direct people to available parking campus-wide. Dynamic signage on the ground as well as mobile internet access would provide information for garage availability. Similar systems are operational in San Francisco and San Jose today. Where the current monthly permit system is a disincentive to use of alternative transportation modes, the new system may also be used to streamline on-site per-use payment, with expected improvements in the availability of parking for those who must drive to campus.

As a result of the 2020 LRDP settlement agreement with the City of Berkeley, UC Berkeley agreed to limit new parking constructed under the 2020 LRDP to no more than 1,270 net new parking spaces, provided that the City approves a route for a dedicated lane Bus Rapid Transit project that would serve the downtown area and Telegraph Avenue.

Also as a part of the agreement, UC Berkeley agreed that 'As part of the [Downtown Area Plan], the City and University will seek to maximize the integration of any UC parking into the overall supply of parking in the downtown area and encourage its use by the public at off-peak times when not required for University needs with appropriate pricing and signage.' The University has discussed a possible future parking structure at a site on University Avenue between Shattuck and Oxford, a concept endorsed in all versions of the Downtown Area Plan.

The contribution of the Project to the campus parking deficit would be minimal, and would not result in a significant new impact; further, 2020 LRDP EIR mitigation measure TRA-11 would limit the shift to driving by existing and potential future non-auto commuters.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
6. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?		●

The 2020 LRDP describes alternative transportation modes and includes policies to promote and expand their use. Landscape improvements undertaken as part of the Project would encourage pedestrian activity, mobility, and wayfinding, and would include improved bikeways and secure bicycle parking. Further, 2020 LRDP EIR mitigation measure TRA-11 would limit the shift to driving by existing and potential future non-auto commuters that may result from expanded parking capacity.

The Project will provide 70 bike parking spaces; this is ten percent of the fire code allowable person occupancy of the building, which is 700[28]. This aligns with the August 2006 Campus Bicycle Plan, which sets a goal of bicycle parking equal to ten percent of building population.[29]

SUMMARY OF TRANSPORTATION AND TRAFFIC ANALYSIS

The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP, incorporating existing best practices and 2020 LRDP EIR mitigation measures, would as a whole result in some significant impacts upon traffic and transportation, specifically upon indicated intersections and roadways (2020 LRDP EIR Vol 1, 4.12-48 to 4.12-54). The Project does not include a component adding parking. The campus has an existing deficit in parking supply, and the contribution of the Project to that deficit would be minimal, and would not result in a significant new impact. Landscape improvements undertaken as part of the Project would encourage pedestrian activity, mobility, and wayfinding, and would include improved bikeways and secure bicycle parking.

The analysis contained in this Addendum and Environmental Assessment indicates that the proposed Project may incrementally contribute to significant environmental impacts previously identified in the 2020 LRDP EIR, but will not result in those impacts being more severe than as described in the 2020 LRDP EIR, SCH #2003082131. The analysis of Transportation and Traffic in the 2020 LRDP EIR appears generally in Vol 1, 4.12-43 through 4.12-59, as amended by Vol 3A, 9.1-7, and in the Notice of Preparation at Vol 2, Appendix A. No additional mitigation measures have been identified that would further lessen the previously identified impact, and no additional analysis is required.

UTILITIES AND SERVICE SYSTEMS

SETTING

The utilities and service systems of the campus and environs are described in the 2020 LRDP EIR (Section 4.13). The following text summarizes context information for utilities and service systems relevant to the Helios Energy Research Facility.

Water. Water supply and distribution to much of Alameda and Contra Costa County is provided by EBMUD. The campus is served by two water supply systems: the East System and the Central Campus system. The Central Campus system serves water to the area bounded by Bancroft, Oxford, Hearst Avenues and Gayley Road and is fed by six EBMUD stations, three on the east side of campus and three on the west side. EBMUD supplies water to the University-owned distribution system from its supply lines and meters along the periphery of the Campus Park. A 20-inch diameter EBMUD water main runs along Hearst Avenue, Gayley Road, Piedmont Avenue and Bancroft Way. A 48-inch diameter water main runs west under Hearst Avenue and Bancroft Way, and south along Oxford Street.[30]

EBMUD conducted a water supply assessment of the 2020 LRDP in January 2004. EBMUD indicated that, based on extensive forecasting in its water supply management program as well as recent land use based demand forecasting, the projected water demand of 277 mgd can be reduced to 229 mgd with successful water recycling and conservation programs in place. The 2020 LRDP would not change the EBMUD 2020 demand projection.[31]

Wastewater. Wastewater discharge is regulated under the National Pollutant Discharge Elimination System (NPDES) permit program for direct discharges into receiving waters and by the National Pretreatment Program for indirect discharges to a sewage treatment plant. Campus wastewater is treated by EBMUD which has an NPDES Direct Discharge permit to discharge treated wastewater into the San Francisco Bay. Under this permit, EBMUD imposes effluent guidelines and discharge limitations pursuant to the National Pretreatment Program on the campus via the local EBMUD ordinance and by the EBMUD discharge permit issued to the campus.[32]

The following text is excerpted from the DAP EIR, pp 4-329 to 4-330:
Sanitary sewage flows from the Downtown Area toward San Francisco Bay through a network of pipes, beginning with building connections at the upper laterals (which are privately owned and maintained) and continuing on to the lower laterals and to the sewer mains, which are owned and maintained by the City of Berkeley. All of these mains connect into the EBMUD regional interceptor line, which conveys sewage south (parallel to the I-80 freeway) to the EBMUD treatment plant (located near the former Oakland Army Base), which then discharges the treated effluent into San Francisco Bay from a submerged outfall pipe under the Bay Bridge. Much of the sewer system in Downtown and throughout the City was originally designed to handle combined wastewater and storm water flows, and therefore is over-sized for wastewater flows. There are a limited number of anomalous chokepoints in some basins, which are being addressed over time as part of an established program of systemwide improvements.

The EBMUD treatment plant provides secondary wastewater treatment up to a maximum flow of 168 MGD, although storage basins at the plant provide an increased short-term capacity to accommodate a hydraulic peak of up to 415 MGD. The average daily dry-weather flow to the treatment plant is approximately 80 MGD, and the flow coming from Berkeley represents about 10 MGD of that total. However, during heavy rains, 40 to 60 MGD can come to the treatment plant from the City of Berkeley.

Stormwater infiltration and inflow (I/I) allows stormwater to enter aging or compromised sewer joints or pipes, and has created significant overflow problems for the Berkeley sewer system. The City's I/I correction program allows for a 20 percent increase in the base wastewater flow for each of the City's 81 sub-basins due to changes in land use or population. The I/I program, initiated in 1987, proposes rehabilitation or replacement of 50 percent of the City's existing system over 30 years. The program will also provide for 12 miles of new relief sewer. In 2006, the City established a Private Sewer Lateral Program which requires the inspection and replacement of substandard or faulty private sewer laterals upon the sale of property or a major remodeling, which is intended to reduce I/I problems associated with these private laterals.

The City of Berkeley has developed a Sanitary Sewer Management Plan (SSMP) using Regional Water Quality Control Board Guidelines. However, while that plan was being developed, the State Water resources Control Board (SWRCB) adopted statewide guidelines with additional requirements. The City Council has approved a plan and schedule for developing a new SSMP to meet these new State requirements, which must be completed and adopted by City Council by May 2, 2009.

A citywide "Sewer System Evaluation & Capacity Assurance Plan" is currently underway and will provide the City with more exact analytical tools for assessing the impacts of individual projects through hydraulic modeling. Current City practice required development projects to evaluate the capacity of the local conveyance line to meet the immediate needs of a project and to replace it if inadequate. All new development is also required to pay a per fixture fee to help defray the maintenance costs and the cost of upgrading anomalous chokepoints that serve the larger system.

2020 LRDP AND 2020 LRDP EIR
MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Design and construction of Helios Energy Research Facility would be performed in conformance with the 2020 LRDP. The 2020 LRDP EIR includes mitigation measures and continuing best practices developed to reduce the effect of the implementation of the 2020 LRDP upon utilities and service systems. Where applicable, the Project would incorporate the following mitigation measures and/or continuing best practices:

Continuing Best Practice USS-1.1: For campus development that increases water demand, UC Berkeley would continue to evaluate the size of existing distribution lines as well as pressure of the specific feed affected by development on a project-by-project basis, and necessary improvements would be incorporated into the scope of work for each project to maintain current service and performance levels. The design of the water distribution system, including fire flow, for new buildings would be coordinated among UC Berkeley staff, EBMUD, and the Berkeley Fire Department.

Continuing Best Practice USS-2.1-b: UC Berkeley will analyze water and sewer systems on a project-by-project basis to determine specific capacity considerations in the planning of any project proposed under the 2020 LRDP.

Continuing Best Practice USS-2.1-d: UC Berkeley will continue to incorporate specific water conservation measures into project design to reduce water consumption and wastewater generation. This could include the use of special air-flow aerators, water-saving shower heads, flush cycle reducers, low-volume toilets, drip irrigation systems, and the use of drought resistant plantings in landscaped areas.

Continuing Best Practice USS-2.1-e: The current agreement under which UC Berkeley makes payments to the City of Berkeley to help fund sewer improvements terminates at the conclusion of academic year 2005-2006 or upon approval of the 2020 LRDP. Any future payments to service providers to help fund wastewater treatment or collection facilities would conform to Section 54999 of the California Government Code, including but not limited to the following provisions:

- Fees would be limited to the cost of capital construction or expansion.
- Fees would be imposed only after an agreement has been negotiated by the University and the service provider.
- The service provider must demonstrate the fee is nondiscriminatory: i.e. the fee must not exceed an amount determined on the basis of the same objective criteria and methodology applied to comparable nonpublic users, and is not in excess of the proportionate share of the cost of the facilities of benefit to the entity property being charged, based upon the proportionate share of use of those facilities.
- The service provider must demonstrate the amount of the fee does not exceed the amount necessary to provide capital facilities for which the fee is charged.

(Superseded by the 2020 LRDP Litigation Settlement Agreement which provides that the University makes an annual payment of $200,000 to the City of Berkeley to support sewer and storm drain

infrastructure projects, including replacement and rehabilitation of existing sewer and storm drain lines.)

Continuing Best Practice USS-3.1: UC Berkeley shall continue to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions.

Continuing Best Practice USS-5.1: UC Berkeley would continue to implement a solid waste reduction and recycling program designed to reduce the total quantity of campus solid waste that is disposed of in landfills during implementation of the 2020 LRDP.

LRDP Mitigation Measure USS-5.2: Contractors on future UC Berkeley projects implemented under the 2020 LRDP will be required to recycle or salvage at least 50% of construction, demolition, or land clearing waste. Calculations may be done by weight or volume, but must be consistent throughout.

WATER
Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Exceed the capacity of existing and planned water entitlements and resources?		●

The Project would demolish approximately 210,000 GSF of existing obsolete facilities including outdated plumbing fixtures and laboratory sinks, and replace these with modern low flow fixtures. Previous water demand at the site may have been as high as 6,000 gallons per day (gpd) (State of California, Department of Health Services, Richmond Laboratories, DEIR, January 29, 1996 p. III.E.4); estimated project demand is 5,905 gpd (personal communication with Greco, Creegan+D'Angelo Infrastructure Engineers, 10.26.09). The Project would connect to an existing 12" EBMUD waterline in Oxford Street (Greco, 10.26.09).

The Project represents 5% of the total net new academic and support program space anticipated under the 2020 LRDP EIR. This increase was found not to result in a significant impact on water entitlements and resources, nor warrant the construction of new or altered facilities (2020 LRDP EIR Vol 1, 4.13-5).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Require or result in the construction of new or expansion of existing water facilities, the construction of which could cause significant adverse effects?		●

Please see response to Water item 1, above.

WASTEWATER
Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?		●

The 2020 LRDP EIR determined the increased demand for wastewater treatment resulting from implementation of the 2020 LRDP would not result in significant impacts on capacity, and construction of new or altered wastewater collection facilities would not result in significant environmental impacts (2020 LRDP EIR Vol 1, 4.13-10). However, the 2020 LRDP EIR also noted localized clusters of new development could exceed the capacity of individual sub-basins, and incorporated measures to minimize possible collection capacity impacts, including project-by-project analysis of sewer system capacity considerations (Best Practices USS-2.1-b and USS-2.1-d through USS-2.1-e).

Since 1990 UC Berkeley has undertaken an extensive program of improvements to replace sewer mains and increase size of sewer trunk lines and install relief sewers (2020 LRDP EIR Vol 1, 4.13-8). In 1990 the City of Berkeley agreed to upgrade its sewer system as required to serve development proposed by the 1990 LRDP. UC Berkeley paid more than $3 million to the city to support these improvements. As further support of this effort, in May of 2005 the UC Berkeley Chancellor and the mayor of the City of Berkeley signed an agreement earmarking $200,000 annually in campus funds to the City of Berkeley to support sewer and storm drain infrastructure projects. The Project represents 5% of the total net new academic and support program space anticipated under the 2020 LRDP EIR.

The proposed Project would replace existing facilities totaling approximately 210,000 square feet with modern facilities employing low water use fixtures. Preliminarily, pending development of additional information about existing facilities and the Project, the City anticipates sufficient capacity exists to accommodate the Project within an existing 15" sewer line at Hearst Avenue (McGarrahan meeting notes, October 7, 2009).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Require or result in the construction of new or expansion of existing wastewater treatment facilities, the construction of which could cause significant adverse effects?		●

Please see response to Utilities and Service Systems Wastewater item 1, above.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
3. Exceed wastewater treatment requirements of the Regional Water Quality Control Board?		●

EBMUD regulates UC Berkeley's wastewater discharge to their treatment plant through a source control program designed to insure compliance with their NPDES permit conditions. UC Berkeley is required to comply with conditions of EBMUD's Ordinance 311 and the Main Campus Wastewater Discharge Permit

issued by EBMUD's Source Control Division and applicable to all campus laboratory, construction and municipal operations. At the proposed Project site in the City Environs, the Project would meet wastewater treatment requirements determined applicable for the site.

The Project involves no new land use that would significantly alter wastewater discharges from the Project site, or violate water quality standards.

STORMWATER
Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Require or result in the construction of new or expansion of existing stormwater drainage facilities, the construction of which could cause significant adverse effects?		●

As described under *Hydrology and Water Quality*, the campus would continue to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff to storm sewers over existing conditions (Best Practice USS-3.1). The existing site is currently approximately 97% impervious surfacing and the project would increase the pervious area of the site to approximately 28%. Given the Best Practices prescribed in the 2020 LRDP EIR, no significant impact would be created (see in particular Best Practices HYD-1-c and HYD-1-d). The Walnut Street pedestrian connection allows the opportunity to create a drainage bioswale to collect rainwater run-off, and to slow and filter rainwater before it enters the storm system.

SOLID WASTE
Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Violate any applicable federal, state, and local statutes and regulations related to solid waste?		●

The campus is committed through campus policy to continuing and improving waste reduction and minimization efforts. The Project represents 5% of the total net new academic and support program space anticipated under the 2020 LRDP, and the 2020 LRDP EIR found this growth would not result in solid waste impacts that would violate any applicable federal, state or local statute or regulation related to solid waste.

Recyclable contents and building materials will be removed during abatement and demolition. In addition, to meet campus recycling goals, the campus is considering using the building concrete for backfilling portions of the large basement mechanical area and loading dock. In this manner, truck trips would be reduced and reuse goals achieved.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Exceed the permitted capacity of a landfill that serves the project's solid waste disposal needs?		●

UC Berkeley is exempt from county requirements to dispose of solid waste in the county, and therefore selects landfill sites based on lowest cost. In accordance with the UC Policy on Sustainable Practices and the policies of the 2020 LRDP, contractors working for the University would be required to report their solid waste diversion according to the University's waste management reporting requirements. The Project is not anticipated to result in solid waste impacts that would violate any applicable federal, state or local statute or regulation related to solid waste. (2020 LRDP EIR Vol 1, 4.13-21 and 4.13-22)

ENERGY
Would the Project, with above measures incorporated:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Require or result in the construction of new or expansion of existing energy production and/or transmission facilities, the construction of which could cause significant adverse effects?		●

The Project represents 5% of the total net new academic and support program space anticipated under the 2020 LRDP, and the 2020 LRDP EIR found this growth is not anticipated to result in the need for new or altered energy production and/or transmission facilities (2020 LRDP EIR Vol 1, 4.13-25).

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
2. Would the project encourage the wasteful or inefficient use of energy?		●

UC Berkeley would continue to exceed Title 24 energy conservation requirements for new buildings by 20%, and incorporate energy efficient design elements, in accordance with existing policies and 2020 LRDP goals (2020 LRDP EIR Vol 1, 4.13-26).

STEAM AND CHILLED WATER
Would the Project:

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
1. Require or result in the construction of new or expansion of existing steam and/or chilled water facilities, the construction of which could cause significant adverse effects?		●

Due to its location on blocks adjacent to the central campus, the Project will not utilize the campus steam system. The campus would use natural gas or electricity for building heating and cooling and would not require the expansion of steam and/or chilled water facilities.

SUMMARY OF UTILITIES AND SERVICE SYSTEMS ANALYSIS
The 2020 LRDP EIR concluded that projects implementing the 2020 LRDP, incorporating existing best practices and 2020 LRDP EIR mitigation measures, would not result in new significant utilities and

service systems impacts (2020 LRDP EIR Vol 1, 4.13-5, 4.13-10 to 4.13-12, 4.13-15 to 4.13-16, 4.13-18, 4.13-21 to 4.13-22, 4.13-25 to 4.13-28 as amended by Vol 3A, 9.1-7, and in the Notice of Preparation at Vol 2, Appendix A). The Project represents 5% of the total net new academic and support program space anticipated under the 2020 LRDP, and the 2020 LRDP EIR found this growth is not anticipated to result in the need for new or altered steam and/or chilled water facilities, energy production and/or transmission facilities, wastewater or solid waste capacity concerns. Further, the Project is not expected to significantly increase the amount of built or paved surface or otherwise result in stormwater capacity concerns.

The Project would not result in new or more severe impacts than analyzed in the 2020 LRDP EIR, SCH #2003082131, nor contribute to cumulatively significant adverse utilities and service systems effects.

MANDATORY FINDINGS OF SIGNIFICANCE

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		●

The site for the Helios Energy Research Facility is previously developed. The Project does not pose new environmental concerns not analyzed in the 2020 LRDP EIR. Potential impacts of new construction and other 2020 LRDP activities upon fish, wildlife, plant or animal communities, special status species, or important examples of the major periods of California history or prehistory are examined at section 4.3 of the 2020 LRDP EIR, Vol 1, Biological Resources, and section 4.4 of the 2020 LRDP EIR, Vol 1, Cultural Resources. No significant unavoidable impacts upon Biological Resources are anticipated in implementation of the 2020 LRDP. See also Chapter 6 of the 2020 LRDP EIR, Vol 1, CEQA-required assessment conclusions.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
Does the project have impacts that are individually limited but cumulatively considerable? ('Cumulatively considerable' means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other projects, and the effects of probable future projects)?		●

Cumulative impacts of the 2020 LRDP are analyzed in the 2020 LRDP EIR beginning at the following pages: Aesthetics, 4.1-21; Air Quality, 4.2-29; Biological Resources, 4.3-33; Cultural Resources, 4.4-60; Geology, Seismicity and Soils, 4.5-22; Hazardous Materials, 4.6-32; Hydrology and Water Quality, 4.7-31; Land Use, 4.8-19; Noise, 4.9-23; Population and Housing, 4.10-17; Public Services, 4.11-29; Transportation and Traffic, 4.12-59; Utilities and Service Systems, 4.13-27; Addendum #5, page 51 (section Q.8). The 2020 LRDP EIR found significant cumulative impacts on the traffic network due to trips generated by implementation of the 2020 LRDP (see page 4.12-59 of the 2020 LRDP EIR, Vol 1); significant cumulative noise impacts due to construction noise exceedances of local standards (see page 4.9-24 of the 2020 LRDP

EIR, Vol 1); potential significant cumulative impacts upon the resource base of historical or archaeological resources (see page 4.4-61 of the 2020 LRDP EIR, Vol 1); and a potential continuing cumulative exceedance of toxic air contaminant emissions (see page 4.2-34 of the 2020 LRDP EIR, Vol 1). The Project may incrementally contribute to significant environmental impacts previously identified in the 2020 LRDP EIR, but will not result in those impacts being more severe than as described in the 2020 LRDP EIR, SCH #2003082131. No additional mitigation measures have been identified that would further lessen the previously identified impact, and no additional analysis is required. The incremental impacts of the Helios Energy Research Facility project are not cumulatively considerable and have been sufficiently addressed in the 2020 LRDP EIR.

	Further Analysis Required	2020 LRDP EIR Analysis Sufficient
Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		●

Potential adverse effects on human beings, directly or indirectly, are addressed in the 2020 LRDP EIR sections on Air Quality; Climate Change; Geology, Seismicity and Soils; Hydrology; Noise; Public Services – Fire and Emergency Protection; Transportation and Traffic. Implementation of the 2020 LRDP, including implementation of best practices and mitigation measures, is anticipated to reduce adverse effects on human beings. As the Project implements the 2020 Long Range Development Plan, this environmental analysis relies on the 2020 LRDP EIR program document for consideration of cumulatively considerable effects. See the 2020 LRDP EIR Vol 1, as revised by Vol 3a, within each topic area and as revised by Addendum #5 to address Climate Change. The Project is consistent with the 2020 LRDP as analyzed and described in the 2020 LRDP EIR and would not introduce any new potential direct or indirect impacts to humans, and no changed circumstance or new information is present that would alter the conclusions of the 2020 LRDP EIR analysis, as described above. With the incorporation of all applicable LRDP EIR mitigation measures and best practices, described above, the Project will result in a less than significant impact. No Project revisions or additional mitigation measures are required and the 2020 LRDP EIR analysis is sufficient and comprehensive for purposes of the Project.

---

1 State of California Department of Health Services Richmond Laboratories Draft Environmental Report, EIP Associates, January 29, 1996

2 Berkeley Laboratory Consolidation and Expansion Project Draft EIR, State Department of Health Services State Clearing House 88053109. March 15, 1989

3 US Department of Health and Human Services guidelines describe biosafety levels as follows (2020 LRDP EIR Vol 2, E-17): Biosafety level 2 labs are designed for risk group 2 agents, which are considered to be of ordinary (not special) potential hazard and may produce varying degrees of disease through accidental inoculation, but which may be effectively contained by ordinary laboratory techniques and facilities.

4 UC Berkeley, Addendum #4 to the 2020 LRDP EIR.

5 UC Berkeley, Addendum #4 to the 2020 LRDP EIR.

6 New faculty assumes ten new faculty for Bioengineering, eight new faculty related to EBI; this and other data in this table result from personal communications with Tirell (Bioengineering) and Bryan (EBI) and from workstation calculations drawn from floor plans.

7 UC Berkeley, *Northeast Quadrant Science and Safety Projects and 1990 Long Range Development Plan Amendment, Draft Environmental Impact Report*, June, 2001, page 3.7-16. The NEQSS EIR provided an approximate net increase in wet laboratory

space of 146,300 square feet. Upon commencement of project construction, the net wet laboratory space increase for NEQSS was refined to 147,035 square feet.

[8] See Appendix C.3 of the *2020 LRDP EIR*, pages C-13 through C-16.

[9] Special-status species include: 1) listed (rare, threatened, or endangered) and candidate species for listing by the CDFG, 2) listed (threatened or endangered) and candidate species for listing by the USFWS, 3) Species considered to be rare or endangered under the conditions of Section 15380 of the CEQA Guidelines, such as certain of those species identified on lists 1A, 1B, and 2 in the Inventory of Rare and Endangered Plants of California by the California Native Plant Society (CNPS), and 4) possibly other species which are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status, such as those identified as "California Special Concern" (CSC) species by the CDFG. California Special Concern species have no legal protective status under the California Endangered Species Act but are of concern to the CDFG because of severe decline in breeding populations in California. Source: Environmental Collaborative

[10] The federal Endangered Species Act (FESA) of 1973 declares that all federal departments and agencies shall utilize their authority to conserve endangered and threatened plant and animal taxa. The California Endangered Species Act (CESA) of 1984 parallels the policies of FESA and pertains to native California species. Source: Environmental Collaborative.

[11] UC Berkeley, *Hearst Memorial Mining Building Seismic and Program Improvements Draft EIR*, December 1996, page 6-5.

[12] "Trees of the Berkeley Campus" Division of Agricultural Sciences, University of California, revised October 1976, 97 pgs.

[13] UC Berkeley, *Long Range Development Plan Draft Environmental Impact Report*, January 1990, Mitigation Measures 4.4-1(a) through (d), page 4.4-19; and revised March 2004 by CLA Horner.

[14] California Public Resources Code §21084.1, http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=prc, retrieved March 5, 2004.

[15] The 2020 LRDP EIR includes tables listing primary and secondary historic resources within the 2020 LRDP area (2020 LRDP EIR Vol 3a, Tables 4.4-1 through 4.4-15 at pages 4.4-10 through 4.4-45).

[16] Geomatrix Consultants, *Appendix One: Geologic Hazards Investigation,, Central Campus, University of California at Berkeley*, January 2000, page 4, prepared as part of *Economic Benefits of a Disaster Resistant University* by Dr. Mary Comerio, Institute of Urban and Regional Development, UC Berkeley, April 2000.

[17] UC Berkeley, *1997 Preliminary Seismic Evaluation, Phase 1*, Volume 1, September 1997, page 6.

[18] USGS Fact Sheet 039-03, "Is a Powerful Quake Likely to Strike in the Next 30 Years?", 2003, http://geopubs.wr.usgs.gov/fact-sheet/fs039-03/fs039-03.pdf, retrieved February 19, 2004..

[19] The BAAQMD Guidelines also suggest a number of "mitigation" actions that are standard best practices at UC Berkeley. For example, projects should:be located in a mixed use area; be proximate to transit; charge for parking; maintain a bicycle and pedestrian network; operate transportation demand management programs; implement energy efficiency beyond the requirements of Title 24. See http://www.baaqmd.gov/Divisions/Planning-and-Research/Planning-Programs-and-Initiatives/CEQA-GUIDELINES.aspx page 3-11.

[20] http://www.epa.gov/sectors/pdf/construction-sector-report.pdf

[21] US Department of Health and Human Services guidelines describe biosafety levels as follows (2020 LRDP EIR Vol 2, E-17): Biosafety level 2 labs are designed for risk group 2 agents, which are considered to be of ordinary (not special) potential hazard and may produce varying degrees of disease through accidental inoculation, but which may be effectively contained by ordinary laboratory techniques and facilities.

[22] UC Berkeley, *LRDP DEIR*, January 1990, page 4.8-3.

[23] UC Berkeley News, http://www.berkeley.edu/news/media/releases/2004/03/12_cwea.shtml.

[24] *City of Berkeley Draft General Plan EIR*, February 2001, page 68.

[25] UC Berkeley Fire Prevention Division website, http://www.ehs.berkeley.edu/whoweare/fireprev.html, retrieved February 17, 2004.

[26] Wilbur Smith Associates, *UC Berkeley Campus Parking Policy & Planning Options Study*, February 11, 1999, page VI.

[27] UC Berkeley, *Faculty/Staff Housing, Transportation, and Parking Survey*, Spring 2001 and UC Berkeley, *Student Housing and Transportation Survey*, Fall 2000.

[28] SmithGroup, personal communication, Napier, November 2009

[29] UC Berkeley, *Campus Bicycle Plan*, August 2006, page 46

[30] UC Berkeley, *Long Range Development Plan Draft Environmental Impact Report*, January 1990, page 4.13-4.

[31] EBMUD, *Water Supply Assessment – UC Berkeley 2020 Long Range Development Plan*, January 29, 2004.

[32] National Pretreatment Program requirements are outlined in 40 CFR, Chap.1, Subchapter N.; UC Berkeley, *Guidelines for Drain Disposal of Chemicals at UCB*, http://www.ehs.berkeley.edu/pubs/guidelines/draindispgls.html, retrieved January 27, 2004.

APPENDIX A

UC BERKELEY 2020 LRDP EIR MITIGATION MEASURES AND BEST PRACTICES INCORPORATED INTO PROJECT

UC BERKELEY 2020 LRDP EIR MITIGATION MEASURES AND CONTINUING BEST PRACTICES INCORPORATED INTO THE HELIOS AND RELATED IMPROVEMENTS PROJECT – DECEMBER 2009

AESTHETICS

Continuing Best Practice AES-1-b: Major new campus projects would continue to be reviewed at each stage of design by the UC Berkeley Design Review Committee. The provisions of the 2020 LRDP, as well as project specific design guidelines prepared for each such project, would guide these reviews.

Continuing Best Practice AES-1-e: UC Berkeley would make informational presentations of all major projects in the City Environs in Berkeley to the Berkeley Planning Commission and, if relevant, the Berkeley Landmarks Preservation Commission for comment prior to schematic design review by the UC Berkeley Design Review Committee. Major projects in the City Environs in Oakland would similarly be presented to the Oakland Planning Commission and, if relevant, to the Oakland Landmarks Preservation Advisory Board. Whenever a project in the City Environs is under consideration by the UC Berkeley DRC, a staff representative designated by the city in which it is located would be invited to attend and comment on the project.

Continuing Best Practice AES-1-f: Each individual project built in the City Environs under the 2020 LRDP would be assessed to determine whether it could pose potential significant aesthetic impacts not anticipated in the 2020 LRDP, and if so, the project would be subject to further evaluation under CEQA.

LRDP Mitigation Measure AES-3-a: Lighting for new development projects would be designed to include shields and cut-offs that minimize light spillage onto unintended surfaces, and to minimize atmospheric light pollution. The only exception to this principle would be in those areas within the Campus Park where such features would be incompatible with the visual and/or historic character of the area.

LRDP Mitigation Measure AES-3-b: As part of the design review procedures described in the above Continuing Best Practices, light and glare would be given specific consideration, and measures incorporated into the project design to minimize both. In general, exterior surfaces would not be reflective: architectural screens and shading devices are preferable to reflective glass.

AIR QUALITY

Continuing Best Practice AIR-1: UC Berkeley shall continue to implement the same or equivalent alternative transit programs, striving to improve the campus mode split and reduce the use of single occupant vehicles among students, staff, faculty and visitors to campus.

Continuing Best Practice AIR-4-a: UC Berkeley shall continue to include in all construction contracts the measures specified below to reduce fugitive dust impacts:

- All disturbed areas, including quarry product piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using tarps, water, (non-toxic) chemical stabilizer/suppressant, or vegetative ground cover.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or (nontoxic) chemical stabilizer/suppressant.

When quarry product or trash materials are transported off-site, all material shall be covered, or at least two feet of freeboard space from the top of the container shall be maintained.

LRDP Mitigation Measure AIR-4-a: In addition, UC Berkeley shall include in all construction contracts the measures specified below to reduce fugitive dust impacts, including but not limited to the following:

- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When demolishing buildings, water shall be applied to all exterior surfaces of the building for dust suppression.

- All operations shall limit or expeditiously remove the accumulation of mud or dirt from paved areas of construction sites and from adjacent public streets as necessary. See also CBP HYD 1-b.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions by utilizing sufficient water or by covering.
- Limit traffic speeds on unpaved roads to 15 mph.
- Water blasting shall be used in lieu of dry sand blasting wherever feasible.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with slopes over one percent.
- To the extent feasible, limit area subject to excavation, grading, and other construction activity at any one time.
- Replant vegetation in disturbed areas as quickly as possible.

Continuing Best Practice AIR-4-b: UC Berkeley shall continue to implement the following control measure to reduce emissions of diesel particulate matter and ozone precursors from construction equipment exhaust:

- Minimize idling time when construction equipment is not in use.

LRDP Mitigation Measure AIR-4-b: UC Berkeley shall implement the following control measures to reduce emissions of diesel particulate matter and ozone precursors from construction equipment exhaust:

- To the extent that equipment is available and cost effective, UC Berkeley shall require contractors to use alternatives to diesel fuel, retrofit existing engines in construction equipment and employ diesel particulate matter exhaust filtration devices.
- To the extent practicable, manage operation of heavy-duty equipment to reduce emissions, including the use of particulate traps.

Continuing Best Practice AIR-5: UC Berkeley will continue to implement transportation control measures such as supporting voluntary trip-reduction programs, ridesharing, and implementing improvements to bicycle facilities.

LRDP Mitigation Measure AIR-5: UC Berkeley will work with the City of Berkeley, ABAG and BAAQMD to ensure that emissions directly and indirectly associated with the campus are adequately accounted for and mitigated in applicable air quality planning efforts.

CULTURAL RESOURCES

Continuing Best Practice CUL-1: In the event that paleontological resource evidence or a unique geological feature is identified during project planning or construction, the work would stop immediately and the find would be protected until its significance can be determined by a qualified paleontologist or geologist. If the resource is determined to be a "unique resource," a mitigation plan would be formulated and implemented to appropriately protect the significance of the resource by preservation, documentation, and/or removal, prior to recommencing activities.

LRDP Mitigation Measure CUL-4-a: UC Berkeley will create an internal document: a UCB Campus Archaeological Resources Sensitivity Map. The map will identify only the general locations of known and potential archaeological resources within the 2020 LRDP planning area. For the Hill Campus, the map will

indicate the areas along drainages as being areas of high potential for the presence of archaeological resources. If any project would affect a resource, then either the project will be sited to avoid the location or, in consultation with a qualified archaeologist, UC Berkeley will determine the level of archaeological investigation that is appropriate for the project site and activity, prior to any construction or demolition activities.

LRDP Mitigation Measure CUL-4-b: If a resource is discovered during construction (whether or not an archaeologist is present), all soil disturbing work within 35 feet of the find shall cease. UC Berkeley shall contact a qualified archaeologist to provide and implement a plan for survey, subsurface investigation as needed to define the deposit, and assessment of the remainder of the site within the project area to determine whether the resource is significant and would be affected by the project, as outlined in Continuing Best Practice CUL-3-a. UC Berkeley would implement the recommendations of the archaeologist.

Continuing Best Practice CUL-4-b: In the event human or suspected human remains are discovered, UC Berkeley would notify the County Coroner who would determine whether the remains are subject to his or her authority. The Coroner would notify the Native American Heritage Commission if the remains are Native American. UC Berkeley would comply with the provisions of Public Resources Code Section 5097.98 and CEQA Guidelines Section 15064.5(d) regarding identification and involvement of the Native American Most Likely Descendant and with the provisions of the California Native American Graves Protection and Repatriation Act to ensure that the remains and any associated artifacts recovered are repatriated to the appropriate group, if requested.

Continuing Best Practice CUL-4-c: Prior to disturbing the soil, contractors shall be notified that they are required to watch for potential archaeological sites and artifacts and to notify UC Berkeley if any are found. In the event of a find, UC Berkeley shall implement LRDP Mitigation Measure CUL-4-b.

LRDP Mitigation Measure CUL-5: If, in furtherance of the educational mission of the University, a project would require damage to or demolition of a significant archaeological resource, a qualified archaeologist shall, in consultation with UC Berkeley:

- Prepare a research design and archaeological data recovery plan that would attempt to capture those categories of data for which the site is significant, and implement the data recovery plan prior to or during development of the site.
- Perform appropriate technical analyses, prepare a full written report and file it with the appropriate information center and provide for the permanent curation of recovered materials.

GEOLOGY, SEISMICITY AND SOILS

Continuing Best Practice GEO-1-a: UC Berkeley will continue to comply with the CBC and the *University Policy on Seismic Safety*.

Continuing Best Practice GEO-1-b: Site-specific geotechnical studies will be conducted under the supervision of a California Registered Engineering Geologist or licensed geotechnical engineer and UC Berkeley will incorporate recommendations for geotechnical hazard prevention and abatement into project design.

Continuing Best Practice GEO-1-c: The Seismic Review Committee (SRC) shall continue to review all seismic and structural engineering design for new and renovated existing buildings on campus and ensure that it conforms to the California Building Code and the *University Policy on Seismic Safety*.

Continuing Best Practice GEO-1-d: UC Berkeley shall continue to use site-specific seismic ground motion specifications developed for analysis and design of campus projects. The information provides much greater detail than conventional codes and is used for performance-based analyses.

Continuing Best Practice GEO-1-e: UC Berkeley will continue to implement the SAFER Program. Through this program, UC Berkeley has already identified all existing buildings in need of upgrades and is currently performing seismic upgrades on several of these buildings.

Continuing Best Practice GEO-1-f: Through the Office of Emergency Preparedness, UC Berkeley will continue to implement programs and projects in emergency planning, training, response, and recovery. Each campus building housing Berkeley students, faculty and staff has a Building Coordinator who prepares building response plans and coordinates education and planning for all building occupants.

Continuing Best Practice GEO-1-g: As stipulated in the *University Policy on Seismic Safety*, the design parameters for specific site peak acceleration and structural reinforcement will be determined by the geotechnical and structural engineer for each new or rehabilitation project proposed under the 2020 LRDP. The acceptable level of actual damage that could be sustained by specific structures would be calculated based on geotechnical information obtained at the specific building site.

Continuing Best Practice GEO-2: Campus construction projects with potential to cause erosion or sediment loss, or discharge of other pollutants, would include the campus Stormwater Pollution Prevention Specification. This specification includes by reference the "Manual of Standards for Erosion and Sediment Control" of the Association of Bay Area Governments and requires that each large and exterior project develop an Erosion Control Plan.

GREENHOUSE GAS EMISSIONS

Continuing Best Practice CLI-1: UC Berkeley would continue to implement provisions of the UC Policy on Sustainable Practices including, but not limited to: Green Building Design; Clean Energy Standards; Climate Protection Practices; Sustainable Transportation Practices; Sustainable Operations; Recycling and Waste Management; and Environmentally Preferable Purchasing Practices.

Continuing Best Practice CLI-2: UC Berkeley would continue to implement energy conservation measures (such as energy-efficient lighting and microprocessor-controlled HVAC equipment) to reduce the demand for electricity and natural gas. The energy conservation measures may be subject to modification as new technologies are developed or if current technologies become obsolete through replacement.

Continuing Best Practice CLI-3: UC Berkeley would continue to annually monitor and report upon its progress toward its greenhouse gas emission targets. UC Berkeley would continue to report actions undertaken in the past year, and update its climate action plan annually to specify actions that UC Berkeley is planning to undertake in the current year and future years to achieve emission targets.

HAZARDOUS MATERIALS

Continuing Best Practice HAZ-1: UC Berkeley shall continue to implement the same (or equivalent) health and safety plans, programs, practices and procedures related to the use, storage, disposal, or transportation of hazardous materials and wastes (including chemical, radioactive, and biohazardous materials and waste) during the 2020 LRDP planning horizon. These include, but are not necessarily limited to, requirements for safe transportation of hazardous materials, EH&S training programs, the Hazard Communication Program, publication and promulgation of drain disposal guidelines, the requirement that laboratories have Chemical Hygiene Plans, the Chemical Inventory Database, the Toxic Use Reduction Program, the Aboveground Storage Tank Spill Prevention Control and Countermeasure Plan, monitoring of underground storage tanks, hazardous waste disposal policies, the Chemical Exchange Program, the Hazardous Waste Minimization

Program, the Biosafety Program, the Medical Waste Management Program, and the Radiation Safety Program. These programs may be subject to modification as more stringent standards are developed or if the programs become obsolete through replacement by other programs that incorporate similar health and safety protection measures.

Continuing Best Practice HAZ-3: UC Berkeley shall continue to implement the same (or equivalent) programs related to transgenic materials use during the 2020 LRDP planning horizon, including, but not necessarily limited to, compliance with the NIH Guidelines for Research Involving Recombinant DNA Molecules, USDA requirements for open field-based research involving transgenic plants, and requiring registration with EH&S for all research involving transgenic plants. These programs may be subject to modification as more stringent standards are developed or if the programs become obsolete through replacement by other programs that incorporate similar health and safety protection measures.

Continuing Best Practice HAZ-4: UC Berkeley shall continue to perform site histories and due diligence assessments of all sites where ground-disturbing construction is proposed, to assess the potential for soil and groundwater contamination resulting from past or current site land uses at the site or in the vicinity. The investigation will include review of regulatory records, historical maps and other historical documents, and inspection of current site conditions. UC Berkeley would act to protect the health and safety of workers or others potentially exposed should hazardous site conditions be found.

Continuing Best Practice HAZ-5: UC Berkeley shall continue to perform hazardous materials surveys prior to capital projects in existing campus buildings. The campus shall continue to comply with federal, state, and local regulations governing the abatement and handling of hazardous building materials and each project shall address this requirement in all construction.

HYDROLOGY AND WATER QUALITY

Continuing Best Practice HYD-1-a: During the plan check review process and construction phase monitoring, UC Berkeley (EH&S) will verify that the proposed project complies with all applicable requirements and BMPs.

Continuing Best Practice HYD-1-b: UC Berkeley shall continue implementing an urban runoff management program containing BMPs as published in the Strawberry Creek Management Plan, and as developed through the campus municipal Stormwater Management Plan completed for its pending Phase II MS4 NPDES permit. UC Berkeley will continue to comply with the NPDES stormwater permitting requirements by implementing construction and post construction control measures and BMPs required by project-specific SWPPPs and, upon its approval, by the Phase II SWMP to control pollution. Stormwater Pollution Prevention Plans would be prepared as required by the appropriate regulatory agencies including the Regional Water Quality Control Board and where applicable, according to the UC Berkeley Stormwater Pollution Prevention Specification to prevent discharge of pollutants and to minimize sedimentation resulting from construction and the transport of soils by construction vehicles.

Continuing Best Practice HYD-1-c: UC Berkeley shall maintain a campus-wide educational program regarding safe use and disposal of facilities maintenance chemicals and laboratory chemicals, to prevent discharge of these pollutants to Strawberry Creek and the campus storm drains.

Continuing Best Practice HYD-1-d: UC Berkeley shall continue to implement the campus Drain Disposal Policy and Drain Disposal Guidelines which provide inspection, training, and oversight on use of the drains for chemical disposal for academic and research laboratories as well as shops and physical plant operations, to prevent harm to the sanitary sewer system.

Continuing Best Practice HYD-2-a: In addition to Hydrology Continuing Best Practices 1-a and 1-b above, UC Berkeley will continue to review each development project, to determine whether project runoff would increase pollutant loading. If it is determined that pollutant loading could lead to a violation of the Basin Plan, UC Berkeley would design and implement the necessary improvements to treat stormwater. Such improvements could include grassy swales, detention ponds, continuous centrifugal system units, catch basin oil filters, disconnected downspouts and stormwater planter boxes.

Continuing Best Practice HYD-2-c: Landscaped areas of development sites shall be designed to absorb runoff from rooftops and walkways. The Campus Landscape Architect shall ensure that open or porous paving systems be included in project designs wherever feasible, to minimize impervious surfaces and absorb runoff.

Continuing Best Practice HYD-3: In addition to Hydrology Continuing Best Practices 1-a, 1-b, 2-a and 2-c above, UC Berkeley will continue to review each development project, to determine whether rainwater infiltration to groundwater is affected. If it is determined that existing infiltration rates would be adversely affected, UC Berkeley would design and implement the necessary improvements to retain and infiltrate stormwater. Such improvements could include retention basins to collect and retain runoff, grassy swales, infiltration galleries, planter boxes, permeable pavement, or other retention methods. The goal of the improvement should be to ensure that there is no net decrease in the amount of water recharged to groundwater that serves as freshwater replenishment to Strawberry Creek. The improvement should maintain the volume of flows and times of concentration from any given site at pre-development conditions.

Continuing Best Practice HYD-4-b: For 2020 LRDP projects in the City Environs (excluding the Campus Park or Hill Campus) improvements would be coordinated with the City Public Works Department.

Continuing Best Practice HYD-4-e: UC Berkeley shall continue to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions.

LAND USE

Continuing Best Practice LU-2-b: UC Berkeley would make informational presentations of all major projects in the City Environs in Berkeley to the Berkeley Planning Commission and, if relevant, the Berkeley Landmarks Preservation Commission for comment prior to schematic design review by the UC Berkeley Design Review Committee. Major projects in the City Environs in Oakland would similarly be presented to the Oakland Planning Commission and, if relevant, to the Oakland Landmarks Preservation Advisory Board. Whenever a project in the City Environs is under consideration by the UC Berkeley DRC, a staff representative designated by the city in which it is located would be invited to attend and comment on the project.

Continuing Best Practice LU-2-c: Each individual project built in the Hill Campus or the City Environs under the 2020 LRDP would be assessed to determine whether it could pose potential significant land use impacts not anticipated in the 2020 LRDP, and if so, the project would be subject to further evaluation under CEQA. In general, a project in the Hill Campus or the City Environs would be assumed to have the potential for significant land use impacts if it:

- Includes a use that is not permitted within the city general plan designation for the project site, or
- Has a greater number of stories and/or lesser setback dimensions than could be permitted for a project under the relevant city zoning ordinance as of July 2003.

NOISE

Continuing Best Practice NOI-2: Mechanical equipment selection and building design shielding would be used, as appropriate, so that noise levels from future building operations would not exceed the City of Berkeley Noise Ordinance limits for commercial areas or residential zones as measured on any commercial or residential property in the area surrounding a project proposed to implement the 2020 LRDP. Controls that would typically be incorporated to attain this outcome include selection of quiet equipment, sound attenuators on fans, sound attenuator packages for cooling towers and emergency generators, acoustical screen walls, and equipment enclosures.

Continuing Best Practice NOI-4-a: The following measures would be included in all construction projects:

- Construction activities will be limited to a schedule that minimizes disruption to uses surrounding the project site as much as possible. Construction outside the Campus Park area will be scheduled within the allowable construction hours designated in the noise ordinance of the local jurisdiction to the full feasible extent, and exceptions will be avoided except where necessary.
- As feasible, construction equipment will be required to be muffled or controlled.
- The intensity of potential noise sources will be reduced where feasible by selection of quieter equipment (e.g. gas or electric equipment instead of diesel powered, low noise air compressors).
- Functions such as concrete mixing and equipment repair will be performed off-site whenever possible.

For projects requiring pile driving:

- With approval of the project structural engineer, pile holes will be pre-drilled to minimize the number of impacts necessary to seat the pile.
- Pile driving will be scheduled to have the least impact on nearby sensitive receptors.
- Pile drivers with the best available noise control technology will be used. For example, pile driving noise control may be achieved by shrouding the pile hammer point of impact, by placing resilient padding directly on top of the pile cap, and/or by reducing exhaust noise with a sound-absorbing muffler.
- Alternatives to impact hammers, such as oscillating or rotating pile installation systems, will be used where possible.

Continuing Best Practice NOI-4-b: UC Berkeley will continue to precede all new construction projects with community outreach and notification, with the purpose of ensuring that the mutual needs of the particular construction project and of those impacted by construction noise are met, to the extent feasible.

LRDP Mitigation Measure NOI-4: UC Berkeley will develop a comprehensive construction noise control specification to implement additional noise controls, such as noise attenuation barriers, siting of construction laydown and vehicle staging areas, and the measures outlined in Continuing Best Practice NOI-4-a as appropriate to specific projects. The specification will include such information as general provisions, definitions, submittal requirements, construction limitations, requirements for noise and vibration monitoring and control plans, noise control materials and methods. This document will be modified as appropriate for a particular construction project and included within the construction specification.

LRDP Mitigation Measure NOI-5: The following measures will be implemented to mitigate construction vibration:

- UC Berkeley will conduct a pre-construction survey prior to the start of pile driving. The survey will address susceptibility ratings of structures, proximity of sensitive receivers and equipment/operations, and surrounding soil conditions. This survey will document existing conditions as a baseline for determining changes subsequent to pile driving.
- UC Berkeley will establish a vibration checklist for determining whether or not vibration is an issue for a particular project.
- Prior to conducting vibration-causing construction, UC Berkeley will evaluate whether alternative methods are available, such as:
    - Using an alternative to impact pile driving such as vibratory pile drivers or oscillating or rotating pile installation methods.
    - Jetting or partial jetting of piles into place using a water injection at the tip of the pile.
- If vibration monitoring is deemed necessary, the number, type, and location of vibration sensors would be determined by UC Berkeley.

PUBLIC SERVICES

Continuing Best Practice PUB-1.1: UCPD would continue its partnership with the City of Berkeley police department to review service levels in the City Environs.

Continuing Best Practice PUB-2.3: UC Berkeley would continue its partnership with LBNL, ACFD, and the City of Berkeley to ensure adequate fire and emergency service levels to the campus and UC facilities. This partnership shall include consultation on the adequacy of emergency access routes to all new University buildings.

LRDP Mitigation Measure PUB-2.4-a: In order to ensure adequate access for emergency vehicles when construction projects would result in temporary lane or roadway closures, campus project management staff would consult with the UCPD, campus EH&S, the BFD and ACFD to evaluate alternative travel routes and temporary lane or roadway closures prior to the start of construction activity. UC Berkeley will ensure the selected alternative travel routes are not impeded by UC Berkeley activities.

LRDP Mitigation Measure PUB-2.4-b: To the extent feasible, the University would maintain at least one unobstructed lane in both directions on campus roadways at all times, including during construction. At any time only a single lane is available due to construction-related road closures, the University would provide a temporary traffic signal, signal carriers (i.e. flagpersons), or other appropriate traffic controls to allow travel in both directions. If construction activities require the complete closure of a roadway, UC Berkeley would provide signage indicating alternative routes. In the case of Centennial Drive, any complete road closure would be limited to brief interruptions of traffic required by construction operations.

Continuing Best Practice PUB-2.4: To the extent feasible, for all projects in the City Environs, the University would include the undergrounding of surface utilities along project street frontages, in support of Berkeley General Plan Policy S-22.

TRANSPORTATION AND TRAFFIC

Continuing Best Practice TRA-1-b: UC Berkeley will continue to do strategic bicycle access planning. Issues addressed include bicycle access, circulation and amenities with the goal of increasing bicycle commuting and safety. Planning considers issues such as bicycle access to the campus from adjacent streets and public transit; bicycle, vehicle, and pedestrian interaction; bicycle parking; bicycle safety; incentive programs; education and enforcement; campus bicycle routes; and amenities such as showers. The scoping and budgeting of individual projects will include consideration of improvements to bicycle access.

Continuing Best Practice TRA-3-a: Early in construction period planning UC Berkeley shall meet with the contractor for each construction project to describe and establish best practices for reducing construction-period impacts on circulation and parking in the vicinity of the project site.

Continuing Best Practice TRA-3-b: For each construction project, UC Berkeley will require the prime contractor to prepare a Construction Traffic Management Plan which will include the following elements:

- Proposed truck routes to be used, consistent with the City truck route map.
- Construction hours, including limits on the number of truck trips during the a.m. and p.m. peak traffic periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m.), if conditions demonstrate the need.
- Proposed employee parking plan (number of spaces and planned locations).
- Proposed construction equipment and materials staging areas, demonstrating minimal conflicts with circulation patterns.
- Expected traffic detours needed, planned duration of each, and traffic control plans for each.

Continuing Best Practice TRA-3-c: UC Berkeley will manage project schedules to minimize the overlap of excavation or other heavy truck activity periods that have the potential to combine impacts on traffic loads and street system capacity, to the extent feasible.

Continuing Best Practice TRA-3-d: UC Berkeley will reimburse the City of Berkeley 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.

Continuing Best Practice TRA-5: The University shall continue to work to coordinate local transit services as new academic buildings, parking facilities, and campus housing are completed, in order to accommodate changing demand locations or added demand.

LRDP Mitigation Measure TRA-6-a: The University will work with the City of Berkeley to redesign and, on a fair share basis, implement changes to either the westbound or northbound approach of the Cedar Street/Oxford Street intersection to provide a left-turn lane and a through lane. The University will contribute fair share funding for a periodic (annual or biennial) traffic count to allow the City to determine when an intersection redesign is needed. With the implementation of this mitigation measure, the intersection will operate at LOS B during the AM peak hour and LOS D during the PM peak hour.

LRDP Mitigation Measure TRA-6-b: The University will work with the City of Berkeley to design and, on a fair share basis, install a signal at the Durant Avenue/Piedmont Avenue intersection, when a signal warrant analysis shows the signal is needed. The University will contribute fair share funding for a periodic (annual or biennial) signal warrant check at this and other impact intersections, to allow the City to determine when a signal is warranted. With the implementation of this mitigation measure, the intersection will operate at LOS B during both AM and PM peak hours.

LRDP Mitigation Measure TRA-6-c: The University will work with the City of Berkeley to design and, on a fair share basis, install a signal at the Derby Street/ Warring Street intersection, and provide an exclusive right-turn lane and an exclusive through lane on the westbound approach. The University will contribute fair share funding for a periodic (annual or biennial) signal warrant check at this and other impact intersections, to allow the City to determine when a signal and the associated capacity improvements are warranted. With the implementation of this mitigation measure, the intersection will operate at LOS A during the AM peak hour and LOS C during the PM peak hours.

LRDP Mitigation Measure TRA-6-d: The University will work with the City of Berkeley to design and, on a fair share basis, install a signal at the Addison Street/ Oxford Street intersection, and provide the necessary provisions for coordination with adjacent signals along Oxford Street. The University will contribute fair share funding for a periodic (annual or biennial) signal warrant check at this and other impact intersections, to allow the City to determine when a signal and the associated coordination improvements are warranted. With the implementation of this mitigation measure, the intersection will operate at LOS A during both AM and PM peak hours.

LRDP Mitigation Measure TRA-6-e: The University will work with the City of Berkeley to design and, on a fair share basis, install a signal at Allston Way/Oxford Street intersection, and provide the necessary provisions for coordination with adjacent signals along Oxford Street. The University will contribute fair share funding for a periodic (annual or biennial) signal warrant check at this and other impacted intersections, to allow the City to determine when a signal and the associated coordination improvements are warranted. With the implementation of this mitigation measure, the intersection will operate at LOS A during both AM and PM peak hours.

LRDP Mitigation Measure TRA-6-f: The University will work with the City of Berkeley to design and, on a fair share basis, install a signal at the Kittredge Street/ Oxford Street intersection, and provide the necessary provisions for coordination with adjacent signals along Oxford Street. The University will contribute fair share funding for a periodic (annual or biennial) signal warrant check at this and other impacted intersections, to allow the City to determine when a signal and the associated coordination improvements are warranted. With the implementation of this mitigation measure, the intersection will operate at LOS A during both AM and PM peak hours.

LRDP Mitigation Measure TRA-6-g: The University will work with the City of Berkeley to design and, on a fair share basis, install a signal at the Bancroft Way/ Ellsworth Street intersection, and provide the necessary provisions for coordination with adjacent signals along Bancroft Way. The University will contribute fair share funding for a periodic (annual or biennial) signal warrant check at this and other impact intersections, to allow the City to determine when a signal and the associated coordination improvements are warranted. With the implementation of this mitigation measure, the intersection will operate at LOS B during both AM and PM peak hours.

LRDP Mitigation Measure TRA-7: The University will work with the City of Berkeley to design and, on a fair share basis, install a signal at the Bancroft Way/ Piedmont Avenue intersection, and provide an exclusive left-turn lane and an exclusive through lane on the northbound approach. The University will contribute fair share funding for a periodic (annual or biennial) signal warrant check at this and other impact intersections, to allow the City to determine when a signal and the associated capacity improvements are warranted. With the implementation of this mitigation measure, the intersection would operate at LOS B during both AM and PM peak hours.

LRDP Mitigation Measure TRA-11: The University will implement the following measures to limit the shift to driving by existing and potential future non-auto commuters:

- Review the number of sold parking permits in relation to the number of campus parking spaces and demographic trends on a yearly basis, and establish limits on the total number of parking permits sold proportionate to the number of spaces, with the objective of reducing the ratio of permits to spaces over time as the number of spaces grows, thus ensuring that new supply improves the existing space-to-permit ratio without encouraging mode change to single occupant vehicles.
- As new parking becomes operational, assign a portion of the new or existing parking supply to short-term or visitor parking, thus targeting parkers who choose on-street parking now, and also effectively reserving part of the added supply for non-commuters.
- Expand the quantity of parking that is available only after 10:00 a.m., to avoid affecting the travel mode use patterns of the peak hour commuting population, as new parking inventory is added to the system.
- Review and consider reductions in attended parking as new parking inventory is added to the system and other impacts do not reduce parking supply.

UTILITIES AND SERVICE SYSTEMS

Continuing Best Practice USS-1.1: For campus development that increases water demand, UC Berkeley would continue to evaluate the size of existing distribution lines as well as pressure of the specific feed affected by development on a project-by-project basis, and necessary improvements would be incorporated into the scope of work for each project to maintain current service and performance levels. The design of the water distribution system, including fire flow, for new buildings would be coordinated among UC Berkeley staff, EBMUD, and the Berkeley Fire Department.

Continuing Best Practice USS-2.1-b: UC Berkeley will analyze water and sewer systems on a project-by-project basis to determine specific capacity considerations in the planning of any project proposed under the 2020 LRDP.

Continuing Best Practice USS-2.1-d: UC Berkeley will continue to incorporate specific water conservation measures into project design to reduce water consumption and wastewater generation. This could include the use of special air-flow aerators, water-saving shower heads, flush cycle reducers, low-volume toilets, weather based or evapotranspiration irrigation controllers, drip irrigation systems, the use of drought resistant plantings in landscaped areas, and collaboration with EBMUD to explore suitable uses of recycled water.

Continuing Best Practice USS-2.1-e: The current agreement under which UC Berkeley makes payments to the City of Berkeley to help fund sewer improvements terminates at the conclusion of academic year 2005-2006 or upon approval of the 2020 LRDP. Any future payments to service providers to help fund wastewater treatment or collection facilities would conform to Section 54999 of the California Government Code, including but not limited to the following provisions:

- Fees would be limited to the cost of capital construction or expansion.
- Fees would be imposed only after an agreement has been negotiated by the University and the service provider.
- The service provider must demonstrate the fee is nondiscriminatory: i.e. the fee must not exceed an amount determined on the basis of the same objective criteria and methodology applied to comparable nonpublic users, and is not in excess of the proportionate share of the cost of the facilities of benefit to the entity property being charged, based upon the proportionate share of use of those facilities.

- The service provider must demonstrate the amount of the fee does not exceed the amount necessary to provide capital facilities for which the fee is charged.

Continuing Best Practice USS-3.1: UC Berkeley shall continue to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions.

Continuing Best Practice USS-5.1: UC Berkeley would continue to implement a solid waste reduction and recycling program designed to reduce the total quantity of campus solid waste that is disposed of in landfills during implementation of the 2020 LRDP.

Continuing Best Practice USS-5.2: In accordance with the Regents-adopted green building policy and the policies of the 2020 LRDP, the University would develop a method to quantify solid waste diversion. Contractors working for the University would be required under their contracts to report their solid waste diversion according to the University's waste management reporting requirements.

LRDP Mitigation Measure USS-5.2: Contractors on future UC Berkeley projects implemented under the 2020 LRDP will be required to recycle or salvage at least 50% of construction, demolition, or land clearing waste. Calculations may be done by weight or volume, but must be consistent throughout.

APPENDIX B

PROJECT DESIGN GUIDELINES

HELIOS AND 2151 BERKELEY WAY SITE PLAN
DESIGN GUIDELINES AUGUST 2009

Please note: These guidelines are intended to supplement the basic height and envelope guidance adopted for the 2151 Berkeley Way site in the City of Berkeley's Downtown Area Plan (diagram attached.)

Principle for University downtown development #1:
"Campus in a Park brings the Park to the City"

On campus, the park frames the buildings, which are objects in a landscape.
For congruence with City goals and the Downtown Area Plan, University development in the west adjacent blocks constructs buildings that frame parks.

Opportunities:
Hearst Avenue and Oxford Street Parkways
Both Hearst Avenue and Oxford Street are heavily used multi-modal streets that link campus to the city and region. Neither street today has an established character. New University development along these streets should have a strong urban character including tall articulated street walls, possibly up to 100 feet in height. However, these street walls must frame a cohesive parkway that invites linkages between campus and city. A site plan for the 2151 Berkeley Way site should consider:

- Street amenities, including pedestrian scaled lighting and benches, might introduce a campus vocabulary as visitors near the campus park.
- As appropriate to site conditions, consider street trees or glade-like hillocks or landscaped natural-character stormwater retention systems that introduce the campus park palette to its western edges.
- New development should support generous sidewalks and removal of a lane of traffic on Hearst Avenue (as supported by the Downtown Area Plan) or a parking lane on Oxford Street (as supported by the Downtown Area Plan).
- If Hearst Avenue and Oxford Street are redefined as parkways, reduce pedestrian and vehicle conflicts. Use site planning and design to discourage ad hoc street crossing, and develop safe and attractive street crossings where desired, with attractive primary pedestrian routes that lead to them.

Berkeley Way and Walnut Street Pedestrian Way
Walnut Street north of Hearst Avenue typifies a lovely Berkeley residential street, with mature front yard plantings and a canopy of green. Walnut Street south of Berkeley Way has a back-alley character, providing service access to buildings along University Avenue. Berkeley Way itself between Shattuck and Oxford also shares the service corridor character, and on any weekday afternoon four or more UPS trucks might be double parked on the street; in the morning several AC Transit buses may be parked in the street, drivers on layover nearby. The existing apartment building at 1910 Oxford Street (northwest corner of Oxford and Berkeley Way) has parking and service access off of Berkeley Way. Across Oxford Street a major stairway access point to the campus park is aligned with Berkeley Way. The Berkeley Way/Oxford Street crossing is signalized.

The site plan for the 2151 Berkeley Way property should use building entrances, landscaping, wide sidewalks or other means to encourage pedestrians to use Berkeley Way as a primary access point between the Campus Park and the Berkeley Way site.

The design for the 2151 Berkeley Way property must address the character of Walnut Street through the site, with a new pedestrian mews linking Hearst Avenue and Berkeley Way.

The site plan for the 2151 Berkeley Way property may need to continue the existing practice of service off Berkeley Way to take best advantage of the lower existing elevation at this edge and to avoid complication of vehicle and pedestrian movement on the busier, arterial streets. The site plan and landscape design should ensure service entries are thoughtfully screened and otherwise designed to encourage pedestrian access to the site via Berkeley Way.

The site plan for the 2151 Berkeley Way property should test the feasibility of a single level of underground parking with each phase of development, to be accessed off of Berkeley Way in a manner compatible with pedestrian movement.

Open Space Amenity
Consistent with the Downtown Area Plan, some plaza or other public open space is desirable for the Berkeley Way site. This space should be directly accessible at street level and be appropriately scaled with good solar exposure.

Open spaces on site should be inviting and pleasant to building populace and community alike, and comfortably scaled in relation to building heights.

Principle for University downtown development #2:
"University development downtown promotes the image and identity of Berkeley as a City of Learning"

In site planning
Locate and design facilities within the downtown to showcase the work of the university in the public interest, including the entire spectrum of research, and increase its transparency to the community.

Consider a "marker" building or tower at the southwest corner of the Berkeley Way site, that would help define a university presence on Shattuck Avenue, downtown Berkeley's "Main Street."

Ensure development helps define a tall streetwall along Oxford, to establish a discernable campus edge condition, contribute to downtown densities supported by sustainability research and the university, and to contrast with the campus park character.

Seek to minimize or eliminate the impact of service and driveways on pedestrian experience on Shattuck Avenue and Oxford Street: Shattuck because it is downtown Berkeley's "Main Street", and Oxford because it links campus to city.

The northeast corner of the site, at the southwest corner of the Hearst and Oxford intersection, has two suburban-scaled buildings as neighbors: the apartment building at 1910 Oxford, and the new Warren Hall across Hearst west of Oxford. The site plan should explore the opportunity at this corner for a defining element that establishes the north end of the Oxford/campus parkway.

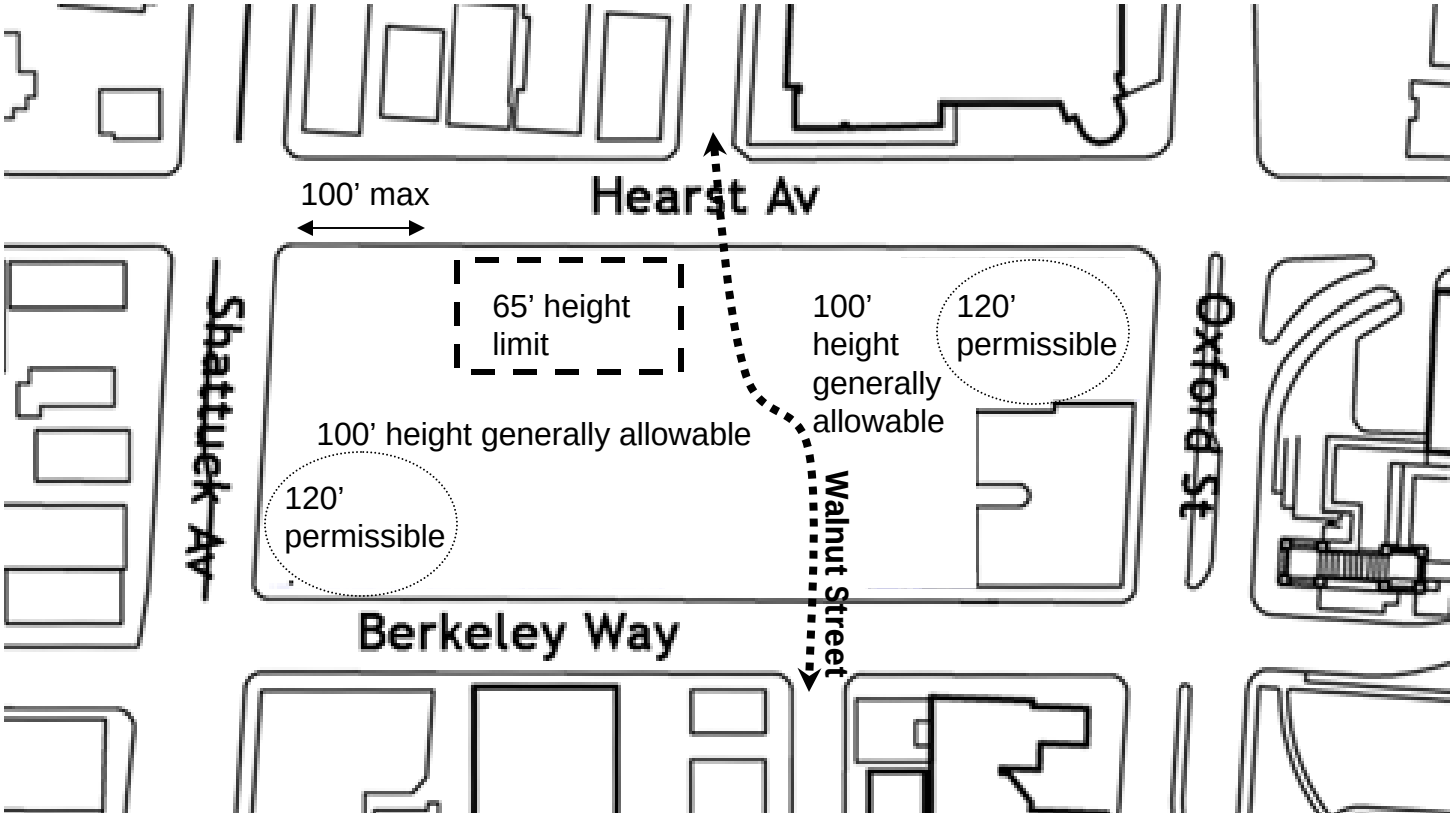
In building design
Assume a minimum 13 foot floor to floor height for maximum flexibility for University uses, with a minimum of 15.5 feet for laboratory functions.

A common vocabulary in existing downtown building facades distinguishes base, middle and top. Design for University buildings downtown should respond to this vocabulary, absent a determination that in a specific instance, extraordinary programmatic or aesthetic purpose merits different treatment.

University buildings in the downtown, like buildings on campus, should be finished in long-lasting, low-maintenance materials. University buildings should be distinguishable from non-University buildings for their timeless design.

University buildings downtown should be sited to bring vitality to the city street, to support and enliven the downtown experience. Setbacks, open spaces, entries and lobbies should be thoughtfully planned interactive spaces for the public. Entries and lobbies can themselves be designed to showcase the work housed by the building, and should have plentiful display space.

Each elevation should incorporate solar control elements responsive to the exposure in the interest of energy management and occupant comfort.



Downtown Area Plan, July 2009, 2151 Berkeley Way site constraints.
100 foot height limit generally; 65 foot height limit for 80 feet deep along Hearst Avenue, beginning 100 feet east of Shattuck Avenue, ending opposite Walnut Street. 120 foot element permissible at corner of Shattuck Avenue and Berkeley Way, or Oxford Street and Hearst Avenue. Site plan should allow pedestrian connection via Walnut Street.

APPENDIX C

COMMENTS FROM CITY OF BERKELEY COMMISSION REVIEWS WITH RESPONSES

Rob Gayle/CapitalProjects
Sent by: Kathleen Kelly

11/10/2009 04:51 PM

To JHarrison@ci.berkeley.ca.us, ABurns@ci.berkeley.ca.us
cc JMunowitch@ci.berkeley.ca.us, AAmoroso@ci.berkeley.ca.us, MBeasley@ci.berkeley.ca.us, dmarks@ci.berkeley.ca.us, mtaecker@ci.berkeley.ca.us,
bcc
Subject University of California Berkeley Helios Energy Research Facility

History: This message has been forwarded.

Thank you for your time and review of the Helios project at your October meeting. Enclosed please find our transmittal, brief notes of your comments, our initial responses, and a study sketch of one potential north facade evolution.

Transmittal to COB 110909 Helios.pdf comments responses and north facade graphics 11.05.09.pdf

Rob Gayle, AIA
Associate Vice Chancellor - Project Management

Facilities Services - Capital Projects
UC Berkeley
1936 University Avenue, 2nd floor
Berkeley, CA 94704-7027

rgayle@cp.berkeley.edu
telephone 510 643 4061
mobile 510 301 0043

fax 510 642 7271

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

FACILITIES SERVICES

BERKELEY, CALIFORNIA 94720-1380

NOVEMBER 10, 2009

TO: CITY OF BERKELEY PLANNING COMMISSION
CITY OF BERKELEY DESIGN REVIEW COMMITTEE

FR: ROB GAYLE, AIA - ASSOCIATE VICE CHANCELLOR, CAPITAL PROJECTS RG kk

RE: UNIVERSITY OF CALIFORNIA BERKELEY HELIOS ENERGY RESEARCH FACILITY

Thank you for your time and review of the Helios project at your October meeting.

The architectural and landscape teams continue to work on a number of aspects of the proposed project. We will continue to refine the design over the next couple of months, before bringing the project to the Regents for their consideration in January. We will post illustrations to the project website and will do our best to let you know of updates.

In the interim we expect to publish the environmental assessment for the Helios project late in the week of November 9th. The graphics we include in that document cannot yet reflect all the changes we expect to make.

However, I wanted to show you an example of our continuing exploration of the north (Hearst Avenue) façade of the building. Enclosed please find our brief notes of your comments, our initial responses, and a study sketch of one potential north façade evolution.

I appreciate your thoughtful review and commentary.

RG/kk

COMMENTS RECEIVED FROM COMMISSIONS WITH RESPONSES
From the City of Berkeley DRC October 15, 2009:

1. Ensure whatever ground turf is selected for planting areas in the plaza keeps them usable for lounging -- nice that these areas are open and not tree covered.

   The University expects that some of the ground turf on the plaza will be manicured to keep it available for use by people. Several of the planted sloped areas have been designed to allow for lounging.

2. The relationship of the building and plaza to the street is good

3. Do not overuse the redwoods - particularly at the northeast corner - because people congregate in open spaces, not under trees, and placing large, dark trees on the site would discourage people from using the site as a gathering place

   The University is reconsidering the planting palette and appreciates the comment. The landscape proposal currently has reduced the number of redwoods across the site; however, current thinking is that the redwoods in the NE corner are acting as a buffer from the busy traffic of the street, relate nicely to the redwoods across Oxford, and serve to soften a solid portion of the façade at the corner. The current site plan assumes that gathering space east of the building will be more to the south of this corner, near the walkway to the building's entrance (and adjacent to bus stop). The redwoods would not shade the gathering space.

4. Gingkos are not a good choice since they are slow growing here - a better, also deciduous, also colorful choice might be something like a red maple which still has the upright form but performs better

   The University is reconsidering the planting palette and appreciates the comment.

5. The masonry material/color should not resemble Soda Hall, should be a matte finish

   The University concurs that the finish material should be subtle. Currently we are looking at non-reflective matte and textured finished materials.

6. The plaza is well designed and deals well with the elevation change. Appreciate that the plaza provides a green background to the urban situation on the south portion of Walnut

7. The north facade will have sun control needs in the summer and vertical sun shades of some kind would answer this as well as providing more articulation on that façade

   This and comments about the monumentality of the north façade has led to a reconsideration of the fenestration patterning of this element. Please see attached graphics illustrating before and after versions of the north façade proposal. The portion of the window facing west will be installed with a sun control material such as perforated panel, silkscreened glazing, or other solar diffusing material.

8. The north facade, in general, needs more articulation and should offer more to the pedestrian experience. Seems "brutal"

   This and comments about the monumentality of the north façade has led to a reconsideration of the fenestration patterning of this element. Please see attached graphics illustrating before and after versions of the north façade proposal.

9. There were several suggestions that we move the building back from Hearst five feet or so

   The University has studied many alternatives for siting a project at Hearst and Oxford. Unfortunately, moving the building southward significantly impacts the character of the area between the 1910 Oxford Apartments and the project, and creates fire and life safety code issues for the Project and the Apartments. It is unfortunate that the 1910 Oxford Apartments were built to the property line on the north without setback. Some units in this building get their only daylight from north-facing windows.

   The City of Berkeley is pursuing opportunities to improve the Hearst Avenue right of way with bicycle and pedestrian amenities. This effort may allow the Hearst Avenue parking lane to be redeveloped with porous pavers or landscaping that softens the north setting for the Project. The University is supportive of this effort, which may be approved by the City in time for the next phase of development at the 2151 Berkeley Way block.

10. There was also appreciation for the pathway/Oxford connection north of the 1910 Oxford apartments

11. The exposed wall at the west facade of the Berkeleyan/1910 Oxford Apartments will be large, blank and unpleasant and the committee would like some consideration to be given to making that more attractive. Can we add a planting strip along east edge of the service entry so that it can be camouflaged? Something that relates to the forms elsewhere in the landscaping was suggested.

    The University has asked the design team to look at ways to expand the landscaping at this area. Currently we are confirming the location of the property line at this location to be sure we have room to add some green element upon University property. We are happy to add planting here if there is space. Otherwise, we have designed the plaza to provide the maximum screening of both the building and loading dock, with a high vine-covered screen and a grouping of shade trees on the east side of the plaza. We think moving the service entrance further west would render the plaza too small to adequately serve as the gathering space it is expected to be. The University prefers to screen the apartment wall as well as possible without sacrificing the usefulness of the plaza itself.

12. Horizontal glass sunshades tend to quickly become visibly dirty

    The University appreciates the difficulty with maintenance. Materials for the sunshades have not yet been determined and all options are being considered. If glass is selected, it will be silkscreened to a high degree of opaqueness and the sunshades will located so that they cannot be viewed from above. The University is providing safety mechanisms to allow for cleaning of the building facades and windows.

13. The north window is too large in scale (Cyclopsian)
    Please see attached graphics illustrating before and after versions of the north façade proposal.

From the City of Berkeley Planning Commission October 14, 2009:

14. The entry facing downtown is good to see

15. Bringing the campus park into downtown and providing open space is good

16. The Walnut connection is good

17. Consider combined service for Helios and CHC (later phase)

    Service for the Project will be below grade, accessed off of Berkeley Way. The University expects to look at the possibility of combining service access with the CHC below grade at this location with that future project.

18. Would like to see the south plaza be a congregating space or more organic with groves of trees - dislike zig zag path

    The zig zag path has generally received favorable reviews on campus, and seems an instance where opinions are simply divergent. The University hopes and expects that the path will successfully define inviting open spaces. The University hopes and expects too that these spaces will be safe with good visibility, attractive to a diverse urban community for brief resting and enjoyment. We have designed the south plaza to be a congregating area with both shaded hardscape with benches as well as an open lawn area. There are groves of trees on the east side of the plaza and at the top of the plaza. The zigzag is a necessary design element to achieve the elevation change between Berkeley Way and the door of Helios without building a steep ramp.

19. Provide ADA access only off Oxford and have the plaza be more open and grove-like

    Please see response above regarding the plaza. The zig zag path is not only provided for ADA access, and is an attractive design element to some reviewers.

20. North elevation is not good - too close to the street and too tall, monolithic. Could parapet be setback from façade face?

    Please see attached graphics illustrating before and after versions of the north façade proposal. Although the parapet cannot be set back and still accommodate the quantity of building mechanical elements upon the roof, the University is working to make the parapet read lightly and also considering a recess between the wall and the parapet to break up and better define the wall face.

21. The Hearst Avenue experience for a pedestrian will be unpleasant

    Please see attached graphics illustrating before and after versions of the north façade proposal. We are working on developing a softer planting plan for this area that could include some columnar trees, deciduous flowering native shrubs and benches. The seasonal interest and seating should increase pedestrian comfort along Hearst. Street trees will continue to buffer pedestrians from traffic. Please see attached graphics illustrating before and

after versions of the north façade proposal, and response to comment 9 above regarding the setback on Hearst Avenue. The University and design team are investigating potential for treating the planting area and the ground floor façade so as to improve the pedestrian level experience of the building mass and to create visual interest and variety as one proceeds along the sidewalk.

22. The Ohlone greenway connection should be explored more – appears not to integrate with project as a whole

    The Greenway concept would be developed by the City of Berkeley, in partnership with the University. Illustrations shown at commission meetings are conceptual only.

23. The architecture is soviet style and airport hotel-esque

    The University is dismayed by this review, but recognizes that opinions may differ. Please see attached graphics illustrating before and after versions of the north façade proposal.

24. Consider more articulation of Hearst frontage, what might help modulate the unbroken wall could be a series of all glass bay windows (doesn't have to be very many) which would project into the 5' setback off Hearst; this would give the wall some plasticity while retaining the sense of mass and be fun to look out from; also along this line, a one story high 1" or 2" recess in the north wall the width of the fenestration above, might help relieve the slightly ponderous feeling.

    Please see attached graphics illustrating before and after versions of the north façade proposal.

25. Consider torqueing the bldg to leave a corner plaza that complements the corner plaza at new Warren Hall, brings the southeast corner of the bldg closer to the 1910 Oxford apartments.

    Please see response at Comment 9, above.

Public comment
Asa Dodsworth: Respond to comments on Helios project from January 09 scoping
Merrilee Mitchell: where will remainder of original program be located in hill?
Stewart Jones: Wants opportunity to comment on environmental document for this project

These are not comments on the design of the Project. The Environmental Assessment for the project will be published and available for review and comment. LBNL will present information about its solar research program when it is available. The campus is reviewing comments from the January 09 meeting to determine if any are relevant to the Project.

North façade view, October 2009 Commissions presentation

North façade view, preliminary (Sketchup) model of design study, late Oct 2009

APPENDIX D

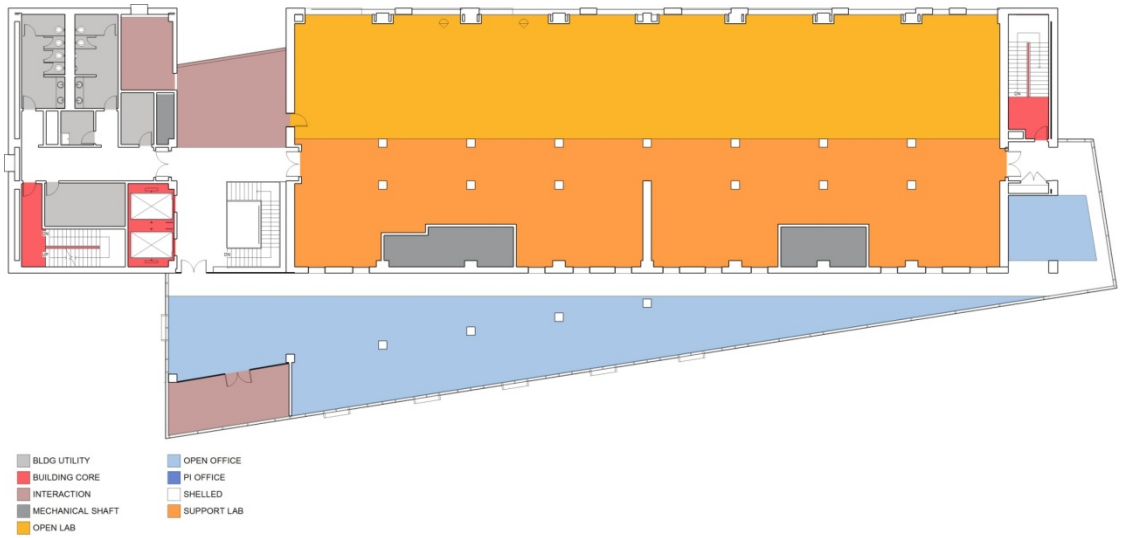
PROJECT GRAPHICS:
PLANS, ELEVATIONS AND VIEWS
CURRENT AS OF NOVEMBER 2009


Walnut
Hearst
Ohlone Greenway Extension
Proposed Helios Building
Entry
Retail
Future Community Health Campus
Shattuck
Oxford
Green Plaza
Berkeleyan
Apartments
Campus Connection
Service
Berkeley Way
Walnut
N
W
E
S

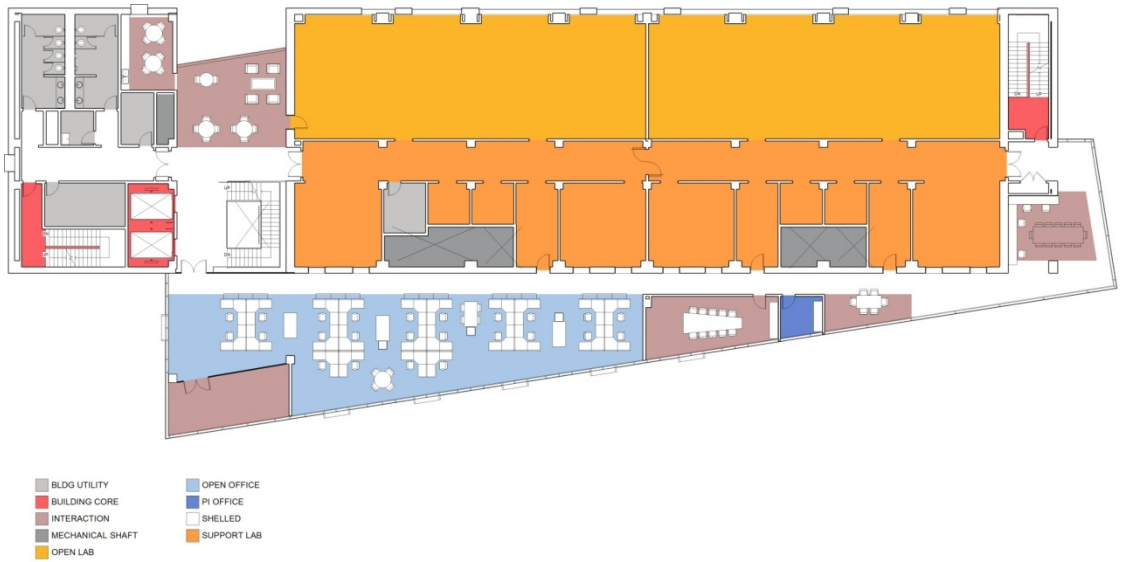
Level 2 + 3

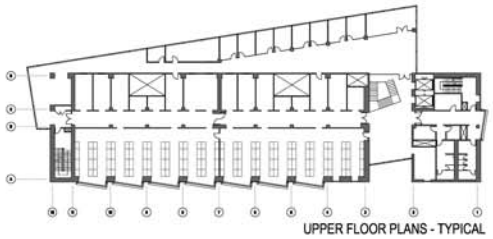
Level 1

Level 5



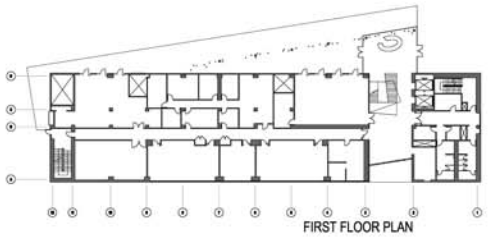
Level 4

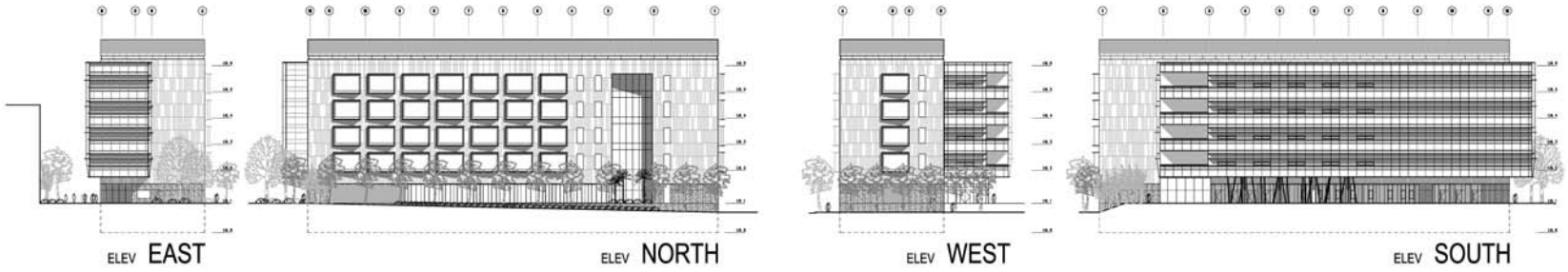




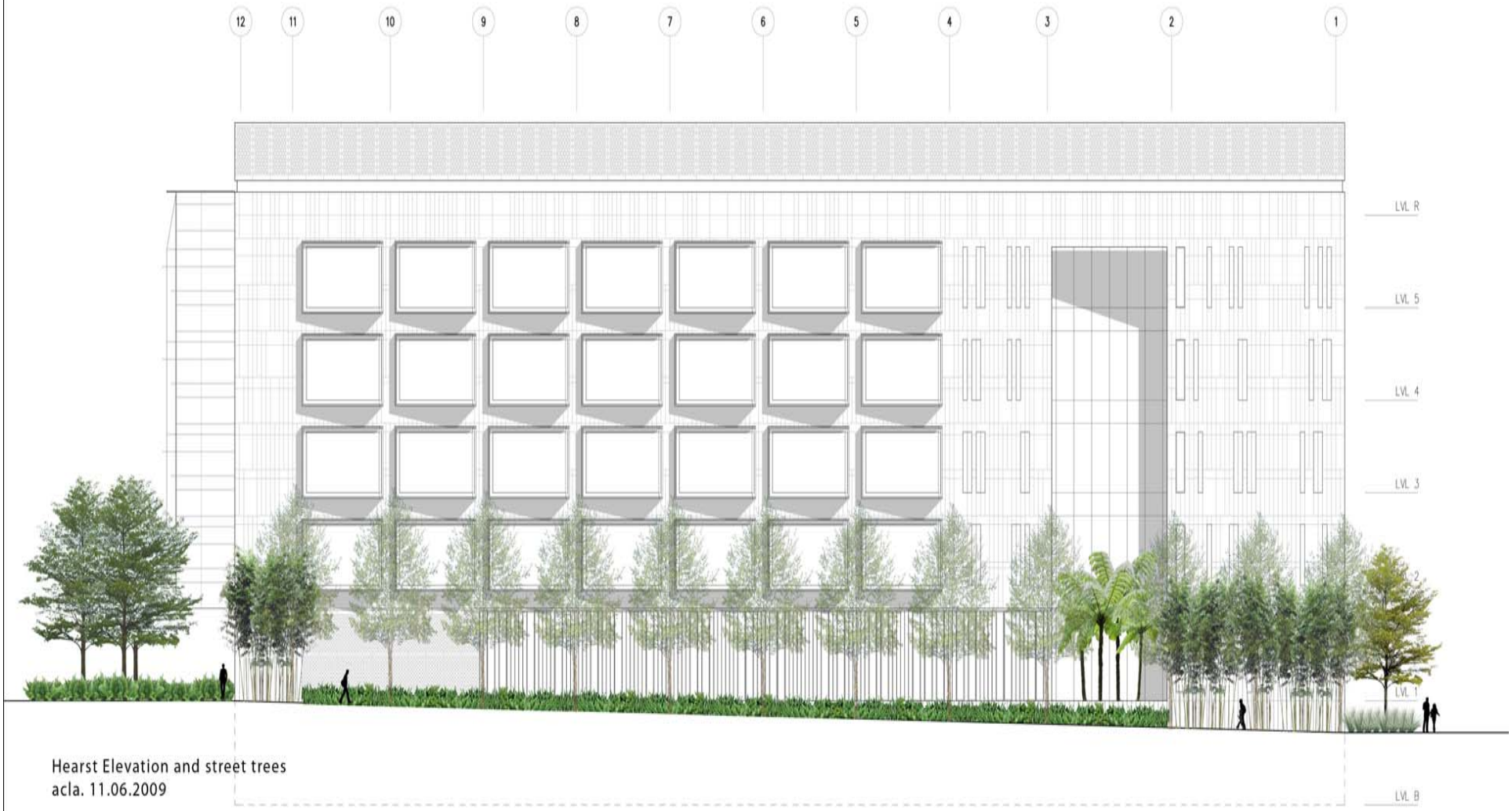
ENERGY RESEARCH FACILITY ELEVATION STUDIES SMITHGROUP 2009 1116

HELIOS






Hearst
Temporary Parking
Oxford plaza
Oxford
Helios Plaza
Demonstration Garden
Walnut Street Connection
Loading Dock
Berkeley Way Plaza
Berkeley Way
0' 4' 8' 16 32'
Project North
True North
Helios Site plan
acla. 11.06.2009



Hearst Elevation and street trees
acla. 11.06.2009

APPENDIX E

CURRENT CUMULATIVE PROJECTS LIST

CUMULATIVE PROJECTS

Section 15130 of the CEQA Guidelines suggest that the following elements are necessary to an adequate discussion of significant cumulative impacts: Either

> (A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or
> (B) a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the Lead Agency.

Adopted plans proximate to the Project site are listed and summarized in part I below. A list of present and probable future projects appears in part II below.

I. Summary of projections in local plans at LBNL, City of Berkeley, UC Berkeley:

UC Berkeley 2020 LRDP EIR

The campus 2020 LRDP EIR, certified by The Regents of the University in January 2005, assumed no more than one million gross square feet of construction would be underway at any one time within the Campus Park, Adjacent Blocks, Southside and Hill Campus land use zones. The 2020 LRDP EIR assumed UC Berkeley would grow by up to 18%, or 2,200,000 gross square feet of academic and support space (which excludes, for example, new housing), over 2005 levels by 2020; up to 700,000 GSF of the space demands would be research laboratory space. Of these overall numbers, 1 million gross square feet of new space would be constructed on the Campus Park, 800,000 GSF would be constructed on the West Adjacent Blocks, 400,000 GSF would be constructed on the South Adjacent Blocks, 50,000 would be constructed on the North Adjacent Blocks, 50,000 would be constructed in the Southside and another 50,000 would be constructed upon other Berkeley properties owned by the University. The LRDP assumed up to 100,000 GSF would be constructed in the Hill Campus. See the 2020 LRDP for a description of these land use areas. Documents available at lrdp.berkeley.edu

LBNL Long Range Development Plan

The Lawrence Berkeley National Laboratory's population in all of the facilities it occupies is projected to grow from 4,515 in 2006 to 5,375 by 2025. The 2006 LRDP describes an entire development program of approximately 980,000 gross square feet of new research and support space construction and 320,000 gross square feet of demolition of existing facilities, for a total of approximately 660,000 gross square feet of net new occupiable space for the site through 2025. The projected net increase in occupied building area on the main site is 612,000 gross square feet (gsf), from 1,808,000 gsf in 2006 to 2,420,000 gsf. See http://www.lbl.gov/LRDP/

City of Berkeley General Plan

The Berkeley City Council gave final approval to the City's General Plan in Spring 2002. The General Plan includes goals to increase the supply of affordable housing in Berkeley, promote living-wage jobs, and encourage infill development. The EIR for the General Plan found that population of Berkeley would remain below 120,000. The City's General Plan can be viewed at http://www.ci.berkeley.ca.us/contentdisplay.aspx?id=488 and the General Plan EIR can be found here: http://www.ci.berkeley.ca.us/contentdisplay.aspx?id=492

II. List of foreseeable projects as of fall 2009:

PROJECTS CURRENTLY UNDER CONSTRUCTION

UC Berkeley - Student Athlete High Performance Center – 142,000 GSF

The new Student-Athlete Center, immediately west of the CMS, will provide a training facility for all Cal student athletes and a home for 13 of Cal's intercollegiate athletic teams. The building includes locker and meeting rooms, office areas, training facilities and academic space. The Center will also house an applied sports science, nutrition and medicine complex. Construction scheduled to complete Fall 2011.

UC Berkeley - Li Ka Shing Center for Biomedical and Health Sciences – 200,000 GSF

The site of this project is at the northwest corner of the Campus Park, east of Oxford Street and south of Hearst Avenue. The new building will have five stories above grade and one below grade. The facility will house laboratories, lecture halls, teaching laboratories, a magnetic imaging facility, and an expansion of the existing animal facility. Construction scheduled to complete Fall 2011.

UC Berkeley - Law School Infill – 52,072 GSF

The addition to the Boalt Hall Law School on the Berkeley campus, at the south edge adjacent to Bancroft Way replaces a south facing courtyard. Constructed two stories below the school's courtyard, it will create a new home for the law library's collection. The design includes efficient compact shelving, which will create more space for student research and reading rooms. At ground level, a pavilion-style building will house a café, student lounge, and a 90-person state-of-the-art classroom. A roof-deck garden will be connected by bridges to the Steinhart Courtyard and to the library's main reading room. A newly landscaped entryway will create a green and vibrant transition from the Berkeley Law complex to Bancroft Way. Construction scheduled to complete Spring 2011.

UC Berkeley - Naval Architecture Restoration and Blum Center – 23,918 GSF

The project is restoring the historic Naval Architecture building, designed by John Galen Howard, and more than double its square footage (13,000 gross square feet will be added to the 10,918 gross square feet of space in the existing building), while also revitalizing it to meet modern building codes and life safety codes. A new wing will be constructed 16 feet away from the original structure to respect its historic integrity. A second-level bridge, first-level terrace and ground floor connector under the terrace will link the historic building to its new wing. A plaza area will connect the entire project to nearby engineering buildings. Most of the ground floor will be devoted to a student work space area, designed to foster student collaboration and the exchange of ideas. Construction scheduled to complete Fall 2010.

UC Berkeley - Durant Hall Renovation – 23,735 GSF

Durant Hall, designed by John Galen Howard and built in 1911 as the first home for Boalt Law School, is being renovated and renewed to serve as a new home for deans and staff of the College of Letters and Science. Improvements to the building's aging support systems as well as disabled access are important elements of the project; a new accessible entrance with a ramp and plaza will be built on the west side of the building. The project is being done with the guidance of a historic preservation architect and will be LEED certified in accordance with UC Berkeley green building practices. Construction scheduled to complete Fall, 2010.

UC Berkeley - Clark Kerr Campus Renovation

The UC Berkeley Clark Kerr Campus, a historic residential campus originally built in 1867 as the California Schools for the Deaf and Blind and acquired by UC in 1982, is undergoing renewal and renovation. There are no big changes to the campus planned — no demolition and no significant new construction, except to exterior pathways to make them more accessible.

Interior renewals include:

- installation of fire sprinklers and an upgrade of the existing fire alarm systems;
- improvements to the connections to the campus computer network
- replacement of electrical wiring
- replacement of bathroom and other fixtures

The project is being done with the guidance of a historic preservation architect, and will make housing operations more sustainable by modernizing and improving the efficiency of the water, power and heating systems. Construction scheduled to complete by summer 2010.

Other builders - The Ed Roberts Campus

Located adjacent to the Ashby BART Station, bounded by Adeline Street to the west. Office and meeting space. Its innovative transit-oriented design provides the disability community, many of whom rely exclusively on public transit, with unprecedented access to organizations, services and opportunities. The Campus will house seven Bay Area non-profits offering a broad range of programs from job training to parenting support and wheelchair sports. Designed by Leddy Maytum Stacy Architects of San Francisco, the 85,000 sq. ft. campus will also include fully accessible meeting rooms, a computer-media center, a fitness center, a café, and a child development center. Construction scheduled to complete in 2010.

Other builders - 1885 University Avenue

Construction of a privately-owned 148 unit apartment building and ground floor retail is underway and expected to continue through May 2010 at the corner of University Avenue and Martin Luther King Jr. Way

Other builders - 2055 Center Street

The nine-story building, located at 2055 Center Street, will include 143 condominiums, 5,000 square feet of retail space, and 10,000 square feet of rehearsal space for the Berkeley Repertory Theater. Construction is underway as of September 2009 and expected to complete in 2010.

City of Berkeley Public Works Improvements

The City has on-going public works improvement programs, including storm drain and paving. See City scheduled construction activities, regularly updated, here:
http://webserver.ci.berkeley.ca.us/ContentPrint.aspx?id=5838

LBNL - Seismic Phase 1

The Seismic Phase 1 project will correct structural deficiencies in LBNL Buildings 50 and 74 in order to improve their performance in a seismic event and upgrade the seismic rating of the buildings from "Poor" to "Good." Work is expected to span from January 2009 to March 2010.

LBNL - Seismic Phase 2

The Seismic Upgrades Phase 2 project will continue the work of Phase 1 and will modernize the major systems within Building 74, build a new 43,000 gross square foot laboratory building, mitigate potential seismic induced landslides at Building 85 & 85A and demolish the equivalent of 43,000 gsf by removing Buildings 25, 25B, 55 and Building 71 trailers. Construction began September 2009 and is expected to be completed January 2014.

LBNL - The User Support Building

The three-story, approximately 30,000 gsf User Support Building (USB), will include assembly space, support laboratories, and offices. An existing 16,038 gsf structure, Building 10, which housed approximately 24 full-time LBNL staff, was demolished to create space for the USB. An Initial Study/Mitigated Negative Declaration was prepared and circulated in the fall 2006 and certified by the UC Regents in January 2007.

Demolition of Building 10 was completed in 2007. Construction of the USB was initiated in June 2008 and is expected to be complete by July 2011.

LBNL - Building 51 and the Bevatron Demolition

An EIR was certified in July 2007 for the demolition and removal of the Building 51 complex, including the Bevatron (a retired particle accelerator), and the concrete blocks and building shell surrounding it. This EIR was tiered from the 1987 LRDP EIR, as amended. Demolition commenced in August 2008 and is expected to continue through December 2011.

LBNL - Building 77 Rehabilitation

The Building 77 Rehabilitation will upgrade the mechanical and electrical systems in Building 77, a 68,500 square foot, high-bay shop building. The Proposed Action will replace a 40-year-old mechanical system with new heating, ventilating, and air conditioning systems to provide temperature control, which is required for precision fabrication and testing. This project is scheduled for completion in November 2009.

LBNL - Building 6 Seismic Upgrade

This project will seismically upgrade LBNL Building 6 Advanced Light Source (ALS) dome structure, as per the UC seismic safety policy. The work will occur during annual, one month shut-down periods over the course of four years. The first phase was completed in 2007 and included the repair of five of 24 planned column bents. The second phase, which took place in May 2008, included the repair of seven bents. Six bents were repaired in May 2009 and another six are scheduled for repair in May 2010.

LBNL - Berkeley Lab Laser Accelerator (BELLA) Laser Acquisition, Installation and Use for Research and Development

BELLA will take place almost entirely within Building 71, involving modifications to the internal structure to support a shielded experimental cave and support functions. The cave will house a new laser accelerator system. An additional utility room and stairwell will protrude from the roof. The construction work is scheduled for an approximately 18-month long period between 2009 and 2012.

BERKELEY CAMPUS PROJECTS APPROVED, CONSTRUCTION PENDING

Anna Head West Student Housing – 142,000 GSF

The Anna Head West Student Housing project would construct a new undergraduate housing complex to meet undergraduate student housing goals as described in the University's 2020 Long Range Development Plan. The 2020 LRDP identified a need for over 1,600 new beds of single-student housing. The 135,000 gsf project will consist of a new residence hall for 160 sophomores and apartments for 264 upper division students. The objectives are to meet single student housing demand and to provide the opportunity for students to have continuity in housing throughout their university careers. Construction may commence Fall 2010, complete June 2012.

Campbell Hall – 81,600 GSF

Design approval has occurred; project delayed due to state budget conditions. Current schedule is to start construction (including abatement and demolition of existing building) in Jan 2011 with a three year construction duration.

CAMPUS PROJECTS, DESIGN APPROVAL PENDING

California Memorial Stadium Seismic and West Program Improvements – 118,000 GSF (refers to net new program space)

The California Memorial Stadium Seismic Corrections and West Program Improvements project is an element of the Southeast Campus Integrated Projects. The CMS West project would entail reconstruction of the west grandstand within the west wall of the California Memorial Stadium with new game day program and fan amenities while retaining the existing bowl shape and the exterior wall. To accomplish this, the project proposes to widen concourses and stairways in lobbies located on the west and north sides of the CMS in order to provide an area with improved access and less crowded conditions. The CMS project would include a new two-level elevated press box on the west side. Anticipated CEQA and design consideration at Regents January 2010, construction to begins soon after and continue through summer 2012.

Helios Energy Research Facility – 113,000 GSF

Currently, the University proposes to construct a new facility for the development of carbon-neutral biofuels, the Helios Energy Research Facility, at a site west of the Berkeley Campus Park, near Oxford Street and Hearst Avenue. The project would require the demolition of existing facilities totaling 210,000 GSF at 2151 Berkeley Way. Planning underway for the redevelopment of the entire site would also accommodate a Community Health Campus for studies in public health. Proposed for CEQA consideration tiered from 2020 LRDP EIR, and design approval January 2010. Demolition of the existing building on site may commence February 2010; construction of the Helios building may begin summer 2010, complete December 2012.

OTHER PENDING CONSTRUCTION

Berryman Reservoir Replacement

EBMUD would begin work to replace the existing empty Berryman reservoir, located on Euclid Avenue, with a modern tank inside the reservoir basin. Construction scheduled to begin mid 2010 and complete late 2011.

LBNL - Seismic Upgrades Phase 3

The Seismic Upgrades Phase 3 project will include the building of a new 40-46,000 gsf General Purpose Laboratory, demolish the equivalent 40-46,000gsf of seismically unsafe and deficient space within LBNL, upgrade Building 26's seismic rating from "Poor" to "Good", upgrade Buildings 45 & 48's seismic rating from "Poor/Fair" to "Good" and seismically upgrade from "Poor" to "Good" or build a new replacement for Building 54. Design is expected to begin January 2011 and construction is scheduled for completion 2018

LBNL - Old Town Demolition

The building demolition & site restoration of buildings in LBNL's "Old Town" will include Buildings 4, 5, 7, 7A, 7C, 14, 16, 17, 25A, 27, 40, 41, 44, 44A, 44B, 52, 52A, 53, 53B. These buildings are seismically rated "Very Poor", "Poor" or "Fair" or unusable due to age. The assessment and characterization of the buildings is expected to begin January 2010 and demolition activities are scheduled for completion 2014

LBNL - Computational Research & Theory (CRT) Facility

This project includes an approximately 140,000 gross square-foot computer facility and office structure, associated infrastructure and access improvements. It will be constructed on UC land adjacent to the UC Berkeley campus on Cyclotron Road. The project's Environmental Impact Report and design were approved by the UC Regents in May 2008, and the project has been subject to litigation delay. Construction may start Fall 2010 and complete Spring 2013.

APPENDIX F

CULTURAL RESOURCE SETTING DOWNTOWN BERKELEY (Excerpt DAP EIR January 2009)

E. CULTURAL RESOURCES

SETTING

Background

Located within Alameda County, California, the development of the City of Berkeley was heavily influenced by East Bay transportation routes and the establishment of the University of California, Berkeley. The principal commercial center for Berkeley began to take shape in 1876 when Francis Kittredge Shattuck and J. L. Barker, persuaded the stockholders of the Central Pacific Railroad (later Southern Pacific) to run a spur line through Shattuck's property. Rail access provided the impetus for new commercial growth in what became Downtown Berkeley. Further, the relocation of the University to lands just east of downtown in 1873 also provided opportunity for commercial growth to support the University community. When the Town of Berkeley was incorporated in 1878, Shattuck Avenue was already established as the city's "Main Street." By the 1890s a fully operational rail line with steam trains ran along Shattuck Avenue terminating at what is now Berkeley Square and Shattuck Square.

The 1906 Earthquake resulted in an influx of new residents to Berkeley, and businesses in the downtown quickly began to accommodate the expanded population. Downtown Berkeley became a bustling business, commercial, and light industrial center in the 1920s, and continued to grow and expand into the 1940s. As with many commercial downtowns in California, post-World War II suburban expansion resulted in the creation of new residential and commercial areas away from the historic commercial core.

Today, Berkeley's commercial downtown is eclectic, with numerous businesses, government agencies, and educational institutions reflective of Berkeley's wealth of ethnic diversity established after World War II. Proximity to the University of California, Berkeley campus and access to public transportation has enabled Berkeley to expand, grow and thrive. Throughout the Downtown Area there is a mix of older commercial buildings, post-war development and more recent modern additions to the commercial core. The historic resources present in downtown reflect a wide range of themes and historic contexts including: residential and commercial development; civic, government and educational institutions; transportation; recreation; and cultural groups.

Historic Resources

Many resources within the Downtown Area have already been listed at the federal, state, and local levels. Within the Downtown Area there are 16 resources currently listed on the National Register. These same 16 resources are listed on the California Register, as National Register-listed resources are automatically entered into the California Register (California Code of Regulations Title 14, Chapter 11.5, Section 4851.3). There are 76 resources

designated as Berkeley Landmarks and 2 resources designated as Berkeley Structures of Merit. There is one historic district present: the Downtown Berkeley Civic Center District (local and National Register designated). There are 66 resources that are on the State Historic Resources Inventory.

The Downtown Berkeley Historic Resource Survey by Architectural Resources Group (ARG) provides more detailed background information on historic resources within Downtown Berkeley. This survey considered all properties and structures within the Downtown Area, and also included those properties "across the street" from the Downtown Area. The report also provides a discussion of historic contexts for the survey area, so that at a future date the historic resources within Berkeley's Downtown Area can be fully evaluated.

Although there have been numerous historic resource survey efforts that have encompassed parts of Downtown Berkeley, none comprehensively surveyed the area covered by the DAP. In preparation for the DAP, ARG prepared the Downtown Berkeley Historic Resource Survey for the Downtown Area Plan Advisory Committee (DAPAC) including a reconnaissance survey and a historic context statement for the Downtown area. At the request of the LPC-DAPAC Subcommittee, in lieu of California Department of Parks and Recreation 523 (DPR) forms as part of an intensive-level survey, efforts were directed toward the creation of a reconnaissance survey list incorporating a more extensive set of attributes and conditions than had initially been conceived. As part of the evaluation, ARG gave a preliminary evaluation of the integrity of the resources (high, good, fair, or poor), and verified assessor's estimated year of construction. An intensive level survey was not conducted, and, therefore, evaluations of individual significance or eligibility were not made. ARG identified 178 properties that were over 45 years of age, retained a high, good, or fair level of integrity, and had not been documented in past surveys.

For the purposes of the DRAFT EIR, historic resources will be those noted on the "Historic Resources and Potential Development Opportunity Sites" map included in the "Historic Preservation & Urban Design" chapter and any of the 178 properties identified by ARG as potential resources needing further evaluation. It is unlikely that all of these 178 properties would be historic resources per CEQA. However, without completing an intensive-level survey, the list cannot be narrowed.

Character-Defining Features of the Downtown Area Plan Historic Areas

The National Register of Historic Places defines a historic district as "a geographically definable area, urban or rural, possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united by past events or aesthetically by plan or physical development. A district may also comprise individual elements separated geographically but linked by association or history." Based on the reconnaissance survey, the survey team identified several clusters of historic resources or distinct streetscapes that might suggest special recognition within Downtown Area Plan (DAP) policies. Two clusters are

presently recognized as historic districts: the Civic Center Historic District and the Berkeley High School Campus National Register Historic District (see discussion below). With additional future evaluation, some subareas that have clusters of historic resources might qualify for consideration as potential historic districts at the local, state, or federal levels. It should be noted that it is unlikely that the entire Downtown Area Plan boundaries would be considered a single historic district. Also note that other policy tools are also available for assuring that new interventions are sympathetic near historic resource clusters, including but not limited to design guidelines, zoning standards (including height & bulk standards), and design review procedures. Some apparent clusters of resources are discussed below.

- The Shattuck Avenue Commercial Corridor runs along Shattuck Avenue, with the area of highest commercial activity from about Durant to University Avenue. This area includes a significant concentration of historic commercial buildings that share historic contexts, themes, physical attributes, and characteristics. The historic resources present in this concentration reflect the following historic contexts including: commercial development, transportation, recreation, and cultural groups. The earliest buildings date from the 1890s extending to a building campaign after World War II that included an increase in student population at the University.

  This potential historic district includes some commercial buildings that face intersecting streets just off of Shattuck Avenue including Bancroft Way, Kittredge Street, Allston Way, Center Street, and Addison Street. With further study, the potential historic district may also include portions of University Avenue to form an overall L- or T-shape, depending on the potential historic district boundary. The Shattuck Avenue Commercial Corridor might also be comprised of one or more smaller districts, each with its own theme and/or period of significance, such as at Shattuck Square.

  An Intensive Level Survey should be undertaken to evaluate the potential for an historic district(s) (at the federal, state or local levels), using *"Guidelines for Local Surveys: A Basis for Preservation Planning" National Register Bulletin 24*, National Register criteria, and Berkeley's Landmarks Protection Ordinance (see below).

  Until a determination is made with regard to additional new historic districts, the loss of character-defining features for potential district(s) should be avoided. Character-defining features for potential historic district(s) in Downtown Berkeley include, but are not limited to the following.

  - Massing: Many potential contributors to a potential historic district are simple rectangular volumes with the short elevation facing the street. There are also examples of commercial blocks, which have block-like massing but are much larger in scale and include multiple storefronts, such as the Barker Building

and the Shattuck Hotel. Some of these have central or corner articulated bays that extend above the roofline and over street rights-of-way.

- Height: Most potential contributors to the potential historic district are one to five stories, with a few notable exceptions such as the twelve-story Wells Fargo Building, and the six-story Shattuck Hotel and Koerber buildings (2054 University).

- Scale: Typical of commercial districts developed over decades, the potential contributors to the potential district range in scale from small one-story storefronts to large commercial blocks. Despite the range in overall size, the buildings' facades share a pedestrian scale, which is communicated through storefront height at the first floor and standard upper floor height clearly delineated by regularly spaced windows repeating at each floor.

- Setback: Most of the potential historic district potential contributors reflect the form of a traditional commercial street, with an almost unbroken street wall and street-front buildings generally linked together in a tightly knit pattern. Most buildings are built up to the sidewalk, and their facades address the street. Storefronts are generally continuous, with few garages and driveways interrupting the sidewalks.

- Building Type: The dominant historic building types in the potential historic district are one-, two-, and three-part "commercial blocks." Throughout the nation from the 1850s through the 1950s, the two-part commercial block was the most common type used for small- and moderate-sized commercial buildings. The type is characterized by horizontal architectural features that divide the building into two sections between the first and upper floors. The separation is often highlighted by an intermediate cornice (horizontal molding between the floors). The distinction between the two usually marks a change in use. On Shattuck Avenue the street-level spaces frequently house public spaces such as retail stores, restaurants, or services. The second floor is usually more private in nature and commonly includes offices, apartments, or meeting halls. Ornamental cornices often top the buildings and project horizontally. The three-part commercial block adds a distinct upper zone, usually one story, which is differentiated from the stories below through architectural detailing. The composition is analogous to the parts of a classical column: base, shaft, and capital.

  In addition to commercial buildings, several unique building types also exist in the potential historic district, including theaters and auto garages.

- Styles: The exteriors of the building are ornamented in a variety of styles. Victorian or Classical details were typical of nineteenth century buildings.

Classical styles, including Beaux-Arts Classicism, continued to be popular in downtown Berkeley into the early twentieth century. In the 1910s and 1920s, Period Revival styles such as Spanish Revival, Renaissance and Mediterranean Revival were also widespread in the potential historic district. More linear styles such as Art Deco were also common in the 1920s. In the post-war years, Midcentury Modernist influences can be seen in the potential historic district potential contributors.

- Materials: Typical of commercial districts that have evolved over time, a range of materials are used for the potential contributors in a potential historic district. Common wall materials include brick, wood siding, stucco, terra cotta and, at the storefront level, tile. Ornamental trim associated with neo-classical styles, such as cornice molding, trim, brackets and pilasters, are typically wood, while Classical medallions, cartouches, swags and pilasters are usually plaster. Cornice lines on the Period Revival style buildings often have false shed roofs covered in red clay tiles. Art Deco buildings are characterized by concrete, stucco, and metal. The materials of Midcentury Modern style buildings include stucco, concrete block, tile, enameled paneled walls, and streamlined metal trim. Brick and terra cotta are used for cladding exterior walls and storefront bulkheads.

- Roof Form: The main roofs of potential contributors of the potential historic district are generally not visible to the public, as they are hidden behind parapet walls or false roofs along the street facades. The main roofs are either flat or gently pitched. The architectural design of some historic buildings includes decorative roofs at the street facades. These include roof visors typically supported by wall brackets, and finished with red clay tiles; tile copings over the tops of parapet walls; and false roofs along the street-facing facades.

- Windows: In the historic commercial buildings, windows fall into two main categories: ground-level storefronts, frequently with complementary transom windows above; and upper level windows on the primary (street) facades. Historically, single- or double-hung or three-part wood windows were used for the upper stories of the majority of the buildings in the potential historic district. There are, in addition, a number of unique window types set into facades in Mediterranean, Spanish, and other Period Revival styles. Above the street-level storefronts and transoms, the windows are generally uniform in size and regularly spaced. Upper-story windows are generally vertical in proportion.

- Signage: From the nineteenth century through today, storefront signage has played an important role in establishing the character of commercial districts.

In the nineteenth century, fascia, hanging or projecting, porcelain, and gold-leaf lettering in windows were all popular forms of signage. Changing technology in the twentieth century resulted in new signage types. Electricity allowed for lighted signs and eventually, signs with movement. Neon became popular in the 1920s, reaching its peak of popularity in the 1940s. Historically and currently, awnings have been used as an option for signage. Projecting, flat, lighted signs, and awning signs are all present in the potential historic district.

- The Civic Center is already designated as a historic district under the City of Berkeley's Landmarks Preservation Ordinance. It is also a National Register-listed historic district. The 1959 John Hudspeth-designed Alameda County Court House may also be considered for inclusion as a contributor. While this building was constructed at a later date than the majority of the historic district potential contributors and is constructed in a different style of architecture, it was constructed in the heart of Berkeley's Civic Center, and it shares the government and civic historic context for which the district is significant. Character-defining features include, but are not limited to:

    - Style: The style chosen for the buildings and plan of the Civic Center reflect important architectural movements, from the Beaux Arts Classicism of the Old Town Hall, to the City Beautiful movement inspired Civic Center plan, to the Classic Modern and Art Deco structures of the Depression and World War II eras.

    - Height and Scale: In keeping with the City Beautiful movement, the buildings are monumental in height and scale; first floors are often overheight.

    - Massing: In general, the buildings have block-like massing; shallow projecting bays give vertical emphasis to the post-war buildings.

    - Roof Forms: Roof forms are typically hipped or flat roofs surrounded by pediments.

    - Setbacks: Setbacks vary from City Hall's gracious landscape setback facing Civic Center Park to the YMCA and Post Office, which conform to the surrounding urban fabric by filling their lots and directly abutting the sidewalk.

    - Materials: Materials are substantial and include stone, stucco-covered reinforced concrete, and brick.

- The Berkeley High School Campus Historic District was listed in the National Register of Historic Places on 9 November 2007. The Berkeley Community Theater,

Florence Schwimley Little Theater, and the shop and science buildings of Berkeley High School were designated a City of Berkeley Landmark on December 7, 1992. Berkeley High School also forms part of the Civic Center Historic District, which is listed in the National Register of Historic Places. Character-defining features include, but are not limited to:

- Styles: The Art Deco–style buildings are reinforced concrete finished in stucco. The buildings have streamlined angular, curvilinear, and zig-zag forms.

- Materials: New building techniques, such as reinforced concrete, made traditional cornices, pitched roofs, window moldings, and emphatic corners obsolete.

- Decoration: Decoration on the Berkeley High buildings includes *bas-relief* murals, lettering and stripes carved into the concrete-stucco exterior surfaces, stepped setbacks, fluted pilasters and columns, rounded bays and corners, stainless steel lettering, large deeply recessed multi-paned windows and glass block windows, curved overhangs, and concrete- and brick-faced planter boxes.

- Residential areas on the periphery of the Downtown Area are generally part of larger residential neighborhoods. The Downtown Area Plan boundaries overlap these residential areas, but do not encompass them fully. Further study of these entire residential neighborhoods should be undertaken at some point to determine the relevant contexts, boundaries and historical associations. Within the DAP boundaries, there are three main residential areas: one is located north of University Avenue and is focused on Hearst Avenue and Berkeley Way; a second is the area south of the downtown west of Shattuck Avenue surrounding Haste and Milvia Streets. Residential development in Downtown Berkeley is diverse, the result of over a century of growth. Historic residences range from Victorian single-family dwellings, to post-earthquake shingled boxes to apartment buildings from the 1930s, 1940s, and 1950s. Although more consistent within subareas, the DAP residential buildings are diverse with large single-family residences, apartment buildings, small cottages, duplexes, and flats. Character-defining features include, but are not limited to:

  - Styles: While the Downtown Area has more Victorian era (Queen Anne, Stick, Eastlake, and Folk Victorian) and Classical Revival houses than any other styles, there are also a number of Shingle style, Colonial Revival, and Spanish Revival style houses. Regardless of style, most of the residential buildings within the neighborhoods are of wood-frame construction.

- The cluster of historic commercial resources around what was once the Dwight Station area (Shattuck Avenue at Dwight Way) should be further studied to determine if a potential historic district is present in this part of the Downtown Area. Character-defining features for the potential historic district include, but are not limited to:

    - Massing: Most potential contributors to this potential historic district are simple rectangular volumes with the short elevation facing the street.

    - Height: The potential contributors to the potential historic district are one to three stories.

    - Scale: The potential contributors to the potential historic district are typically smaller in overall scale than in other areas of Berkeley's downtown. The building's facades share a pedestrian scale, which is communicated through storefront height at the first floor and standard upper floor height clearly delineated by regularly spaced windows repeating at each floor.

    - Setback: Most of the commercial potential historic district reflects the form of a traditional commercial street, with an almost unbroken street wall. Most buildings are built up to the sidewalk, and their facades address the street.

    - Building Type: The dominant historic building types on Dwight Way are one- and two-part commercial blocks. Throughout the nation from the 1850s through the 1950s, the two-part commercial block was the most common type used for small- and moderate-sized commercial buildings. The type is characterized by horizontal architectural features that divide the building into two sections between the first and upper floors. The separation was often highlighted by an intermediate cornice (horizontal molding between the floors). The distinction between the two often marked a change in use. On Dwight Way, the street level spaces frequently house public spaces such as retail stores, restaurants, or services. The second floor is usually more private in nature and commonly includes offices or apartments. Ornamental cornices often top the buildings. In addition to commercial buildings, there are unique building types such as an auto garage.

    - Materials: Common wall materials include horizontal wood siding, brick, and stucco. Ornamental trim such as cornice molding, trim, brackets and pilasters are typically wood. The materials of Midcentury Modern style buildings include stucco and brick and streamlined metal trim. Other exterior cladding materials in the potential historic district include horizontal and vertical wood siding and stucco.

    - Styles: The exteriors of the building are ornamented in a variety of styles. Victorian or Classical details were typical of nineteenth century buildings.

Classical styles including Beaux-Arts Classicism continued to be popular in downtown Berkeley into the early twentieth century. In the post-war years, Midcentury Modernist influences can be seen in the buildings on Dwight Way.

- Roof Form: The main roofs of buildings of the potential historic district are generally not visible to the public, as they are hidden behind parapet walls or false roofs along the street facades. The main roofs are either flat or gently pitched.

- Windows: Windows are a major character-defining feature of any building. In commercial buildings, windows fall into two main categories: ground- level storefronts, frequently with complementary transom windows above; and upper level windows on the primary (street) facades. Historically, single- or double-hung or three-part wood windows were used for the upper stories of the majority of the buildings in the potential historic district. Above the street-level storefronts and transoms, the windows are generally uniform in size and regularly spaced.

- Signage: Projecting, flat, lighted signs, and awning signs are all present on potential district contributors in the potential historic district.

Archaeological Resources

There are no archaeological resources known to exist in the Downtown Area. Although much of the Downtown Area has already been excavated to enable previous development, it is still possible that future excavations could uncover archaeological resources that have not yet been exposed, particularly in the vicinity of the historic alignment of Strawberry Creek.

Paleontological Resources/Unique Geologic Features

There are no paleontological or unique geological resources known to exist in the Downtown Area. However, it is still possible that future excavations in the Downtown Area could uncover paleontological resources that have not yet been exposed.

Human Remains

There are no formal cemeteries located within the Downtown Area, and no human remains are known to be present. However, it is still possible that future excavations in the Downtown Area could uncover human remains that have not yet been exposed

On DRAFT EIR page 4-78, the first complete paragraph has been deleted.

On DRAFT EIR page 4-100, the text of the first sentence in the solid bullet has been modified to read as follows:

> "The cluster of historic commercial resources around what was once the Dwight Station area (Shattuck Avenue at Dwight Way) should be further studied to determine if a potential historic district is present in this part of the Downtown Area and the southside of Dwight Way immediately adjacent."

On DRAFT EIR page 4-149, the text of the second sentence under Groundwater has been modified to read as follows:

> "The urban runoff from these developed areas is collected and carried via the existing storm drainpipes and creeks ~~system~~ culvert, and does not provide significant groundwater recharge."

On DRAFT EIR page 4-149, the text of the first sentence under Alteration of Existing Drainage Patterns Resulting in Erosion has been modified to read as follows:

> "Development under the DAP would not modify the course of any existing stream or river (unless efforts to raise awareness of Strawberry Creek through the possible ~~revised~~ artificial alignment of some creek water through the proposed Center Street Plaza are pursued."

On DRAFT EIR page 4-150, the text of the heading Urban Runoff in Relation to Storm Drainage Capacity and Increased Pollutants has been modified to read as "Urban Runoff in Relation to ~~Storm Drainage Capacity~~ Flow Capacities and Increased Pollutants."

On DRAFT EIR page 4-150, the text of the paragraph under Adverse Effects on Water Quality has been modified to read as follows:

> "As indicated above, proponents of any development projects in the Downtown Area would be required to comply with all City of Berkeley requirements ~~under the~~ and NPDES requirements ~~permit~~, reducing potential impacts to a level of ***less than significant***."

On DRAFT EIR page 4-151, the text of the first two sentences of the second paragraph has been modified to read as follows:

> "Downtown Berkeley's ~~industrial~~ commercial component developed quickly after ~~1878~~ 1876, when Francis Kittredge Shattuck ~~bought~~ brought a spur line of the ~~Southern~~

APPENDIX G

TRANSGENIC PLANT SAFETY TRAINING INFORMATION

UC Berkeley EH&S
February 2008

Transgenic Plant Safety

Environment, Health and Safety
University of California-Berkeley
February 11, 2008

Office of Environment, Health & Safety
University of California, Berkeley

Introduction

The use of transgenic plants must be reviewed in accordance with the National Institutes of Health, Guidelines for the use of Recombinant DNA Molecules and may also be also be subject for oversight by the following agencies:

- United States Department of Agriculture (USDA)
  - Animal Plant Health Inspection Service (APHIS) and its internal agency…
  - The Biotechnology Regulatory Service (BRS)
- The Department of Commerce
- Food and Drug Administration (FDA)
- Environmental Protection Agency (EPA)

Introduction

The University of California's Institutional Biosafety Committee (IBC), the Committee for Laboratory and Environmental Biosafety (CLEB) will review all experiments that involve the use of transgenic plants. Because the University receives NIH funding, it is obligated to follow the Guidelines.

CLEB Requirements

- CLEB requires that a BUA application be completed prior to the initiation of either of the two experiment types involving the use of any transgenic plant.
- The NIH Guidelines require that UC Berkeley identify what section of the Guidelines is appropriate for the experiment. It will either be…

Recombinant DNA Experiments Section III-D-5 of the NIH Guidelines

Section III-D-5 of the NIH Guidelines

Experiments to genetically engineer plants by recombinant DNA methods, to use such plants for other experimental purposes,(e.g., response to stress), to propagate such plants, or to use plants together with microorganisms or insects containing recombinant DNA at *BL2 (or higher)* containment.

Recombinant DNA Experiments Section III-E-2 of the NIH Guidelines

Section III-E-2 of the NIH Guidelines

This section covers experiments involving recombinant DNA-modified whole plants, and/or experiments involving recombinant DNA-modified organisms associated with whole plants, except those experiments that fall under Section III-A through III-D.

- **BL-1 containment is adequate for most experiments involving Agrobacterium and transgenic Arabidopsis.**

Apply to CLEB-What Level of Containment?

- Based on the agent used, e.g. Agrobacterium, and the experiment type (e.g., Section III-D-5 or Section III-E-2), the way to determine the level of containment or **biosafety level** is to review **Appendix G** of the NIH Guidelines.
- If the research involves infection of a transgenic plant in vitro, Agrobacterium, can usually be used in a tissue culture hood at BL-1. Usually a RG1 agent will be used at Biosafety Level 1 but may be higher on a case by case basis (e.g., volume of culture)
- If growth in a greenhouse is required, then BL-1-P containment may be required as described in **Appendix P** of the NIH Guidelines.
- The IBC will review the Scope of Work narrative to review the procedures performed and make the final determination of the Biosafety Level.

Factors That Affect The Level of Containment

- **Source and nature of the introduced DNA**: whether from an exotic infectious agent or pathogenic organism; and whether a fragment of DNA or complete genome;
- **Recipient organism**: mode and ease of dissemination; invasiveness; whether a noxious weed or capable of interbreeding with noxious weeds; potential for outcrossing between recipient organisms and nearby related species; and potential for detrimental impact on natural or managed ecosystems;
- **Nature of expressed protein**: whether a vertebrate toxin or potential or known allergen; and whether toxic to other organisms in local environment;
- **Local environment**: nature and importance of nearby crops; presence of sexually compatible wild or weedy species; and
- **Experimental procedures**; transfer to or from greenhouse; and necessary containment measures.

Appendix P: Plant Containment Levels

- When CLEB reviews a transgenic plant experiment, it will determine what category of experiment it is according to Section III of the NIH Guidelines. Appendix G describes four physical containment levels for experiments involving in-vitro recombinant DNA molecules, e.g., introductory use of Agrobacterium
- For transgenic whole plants, CLEB refers to Appendix P and assigns the appropriate level of containment to one of the four biosafety levels, BL-1-P through BL-4-P.

Appendix P: BL-1-P

Most transgenic plant work at UC Berkeley can be performed at BL-1-P, a low level of containment for experiments involving transgenic plants in which there is no evidence that the modified organism would be able to survive and spread in the environment and, if accidentally released, would not pose an environmental risk.

Appendix P: BL-1-P

BL-1-P also applies to DNA-modified common microorganisms that cannot spread rapidly and are not known to have any negative effects on either natural or managed ecosystems, such as *Rhizobium* and *Agrobacterium*.

- BL-1-P containment would be appropriate for an experiment involving the use of transgenic *Rhizobium* containing *Agrobacterium* genes in a root absorption efficacy study.

Appendix P: BL-2-P

BL-2-P containment is appropriate for:

- experiments with transgenic plants and associated organisms, which, if released outside the greenhouse, could be viable in the surrounding environment but would have a negligible impact or could be readily managed.
- transgenic plants that may exhibit a new characteristic or that may be capable of interbreeding with weeds or related species growing in the vicinity.

For example, transgenic sunflower containing wheat genes intended to confer resistance to a specific trait.

Appendix P: BL-2-P

BL-2-P containment is appropriate:

- for experiments that use the entire genome of an indigenous infectious agent or pathogen such as transgenic plant-associated microorganisms that are either indigenous to the area and potentially harmful to the environment but manageable, or are exotic but have no potential for causing serious harm to managed or natural ecosystems.
- for experiments using plant-associated transgenic insects or small animals as long as they pose no threat to managed or natural ecosystems.

Appendix P: BL-3-P

- BL-3-P containment facilities are designed to prevent the accidental release of transgenic plants, plant pathogens, or other organisms that have a recognized potential for significant detrimental impact on the environment.
- BL-3-P applies to:
  - non recombinant plant research that involves exotic infectious agents capable of causing serious environmental harm. In these cases, *it is the pest or pathogen that requires containment*; the transgenic plant itself may pose no threat.
  - transgenic plants containing genes from an exotic infectious agent in which a complete functional genome of the infectious agent could possibly be reconstituted.

Appendix P: BL3-P

BL-3-P is also appropriate for experiments using:

- transgenic plants or organisms that contain genes coding for vertebrate toxins;
- transgenic microbial pathogens of insects or small animals that associate with plants, if the pathogen has the potential to cause harm to the local environment

Appendix P: BL-4-P

- BL-4-P is recommended for:
  - experiments on certain exotic, readily transmissible infectious agents that are potentially serious pathogens of major US crops, such as soybean rust fungus, maize streak, or other viruses, *and* that are performed in the presence of their arthropod vector.
  - For example, an experiment to test the efficacy of the maize streak virus coat protein to protect corn plants against infection by that virus would necessarily use its leafhopper vector.

Greenhouse Facilities At Berkeley

- At Berkeley, all transgenic plant work is being performed at BL-1-P containment. Some work is performed in greenhouses; some in growth chambers or tissue culture rooms.
- This training session will focus on the current procedures appropriate for this level of containment. As BL-2-P experiments are approved, those researchers will be briefed on the additional containment and administrative requirements on an as needed basis.

CLEB Requirements for PI

- Make an assessment of the required containment to safely use the transgenic plants.
- Report any accidents involving the release of recombinant plants immediately to the Biosafety Officer.
- Ensure all project members are trained with regard to safe work practices and accident reporting.
- Inform the committee of any changes in the scope of work.

Other Considerations in the Field

- The PI must always consider the following when working with recombinant transgenic plants:
  - Prevent interbreeding
  - Inactivate plant waste
  - Safely contain species that can deleteriously harm local plant species
  - Isolate plants from insects and vectors
  - Contain seeds and pollen

Safe Work Practices and Considerations

Appendix P-I-A. The principal purpose of plant containment is to avoid the unintentional transmission of a recombinant DNA-containing plant genome, including nuclear or organelle hereditary material or release of recombinant DNA-derived organisms associated with plants.

Objective: Containment

- Plant containment must be designed in a way that an unintentional release of a plant containing recombinant DNA genome shall not occur.
  - Tissue culture
  - Plant chamber
  - Greenhouse

Good Work Practice: Follow BL-1-P Access Requirements

- Authorized personnel only
- Gloves, overalls recommended
- Read entry signs
- All personnel trained
- Review SOP's

Additional access requirements may be recommended by the greenhouse manager, such as a log book.

Good Work Practice: Secure Seeds

- Use sealed containers to transport seeds
- Secure containers in cabinet or drawer
- Use on a tray or light background (e.g., white paper) to identify colored seeds that may have spilled.
- Avoid spilling seeds on the floor that can be tracked on shoes-clean up spilled seeds as soon as possible.
- Observe for spilled seeds that may have inadvertently germinated. This may be an issue on gravel or other floors that are not solid or continuous.

Good Work Practice: Signage

Appendix P-II-B-1-f-(2). *If organisms are used that have a recognized potential for causing serious detrimental impacts on managed or natural ecosystems, their presence shall be indicated on a sign posted on the greenhouse access doors (For BL-2-P and above containment).*

- Use a warning sign that clearly identifies areas where transgenic plants are used in the greenhouse.
- If the plants have no consequence for human health, ask the Biosafety Officer for an engineered plant sign, rather than a biohazard sign which is required for BL-2-P experiments.

Greenhouse Containment Level

BL-1-P

Genetically Engineered Plants

Room Location (Building/Room): 800 Buchanan, Greenhouse

Name of Investigator (s):

Name of biological material(s) used in this facility:

- **Agrobacterium**
- **Transgenic Arabidopsis, tomato, maize, rice, Brachypodium, tobacco, Upland cotton**

Standard requirements for entering this area:

1.Personnel have specific plant biosafety training from UC Berkeley EHS and PI;
2. Access to the greenhouse or facility shall be limited or restricted, at the discretion of the Greenhouse Director, when experiments are in progress;
3. Personal protective clothing (e.g., gloves, coveralls) is recommended when handling plants;

Other Requirements for Entry:

Prior to entering the greenhouse, personnel shall be required to read and follow instructions on BL1-P greenhouse practices and procedures. All procedures shall be performed in accordance with accepted greenhouse practices that are appropriate to the experimental organism.

Exit Requirements:

1.All personal protective equipment must be removed before leaving the work area.
2. Work surfaces must be disinfected and hands must be washed prior to departure.
3. Autoclaving and other proper disposal procedures are recommended for discarded plants.

Emergency contacts after hours:

Name/Title: _____ Phone: _____

_____

Environment, Health and Safety Office (after hours) 642-3333(UCPD), 911

To amend this door sign, call Environment, Health and Safety, 643-6562 Date Posted:

Good Work Practice: Segregate Transgenic Plant from other work

- Separate the transgenic plant work from non-transgenic plant work in different areas of the greenhouse.
- Ensure workers follow accountability practices for the transgenic plants
- Minimize potential cross-breeding at all times
- If recombinant transgenic plants are used in a common greenhouse, their usage will determine the containment level in accordance with the NIH Guidelines.

Good Work Practice: SOPs

- SOPs for spills, decontamination and other good work practices should be available in accordance with the NIH Guidelines:

  Appendix P-II-A-1-a-(2). *Prior to entering the greenhouse, personnel shall be required to read and follow instructions on BL1-P greenhouse practices and procedures. All procedures shall be performed in accordance with accepted greenhouse practices that are appropriate to the experimental organism.*

Good Work Practice: Containment of Plants

- If transgenic plants have a risk of dissemination of recombinant material:
  - Cover flower and seed heads to prevent seed and pollen dispersal (“bagging flowers”);
  - Harvest transgenic plants prior to sexual maturity or use sterile male lines only,
  - Control the time of flowering so that pollen shed does not coincide with the receptive period of sexually compatible plants;
  - Ensure that cross fertile plants are not within the pollen dispersal range of the experimental plants

Good Work Practice: Inactivation

- To prevent the unintended survival of recombinant transgenic plants outside of containment, all experimental materials must be rendered biologically inactive (devitalized).
  - Autoclave (steam sterilization)
  - Physical destruction
  - Incineration
  - Chemical disinfectants (transgenic seeds)

BL-1-P Facility Considerations

- Glazing windows
- Caulk, Seal for penetrations, openings
- Screening
- HVAC system, negative pressure
- Pest control programs as needed

BL-1-P Emergency Procedures

- Greenhouse Damage
- Fire, earthquake, flood
- Electrical outage-emergency power?
- Alarms-who answers?
- Maintenance support

Reminder: any inadvertent release of transgenic plant material to the environment must be reported to the Biosafety Officer and CLEB to determine if NIH/OBA must be notified.

THE BIOSAFETY RESPONSIBILITIES OF THE PRINCIPAL INVESTIGATOR:
ADDITIONAL PERMITS

USDA/APHIS
CDC
Department of Commerce

Regulatory Permits

The following list of permits are required for certain types of research. Contact EHS if your experiment involves any of the following.

- Import of Specimens
  - USDA/APHIS
  - CDC
- Select Agents/Toxins
  - USDA
  - CDC
- Interstate Commerce and Biotechnology
  - USDA/APHIS
  - BIS
- Other regulatory issues
  - EPA
  - FDA

Import Permits

- **CDC:** a permit is required to import etiologic agents of human disease and in addition, any of the following materials:
  - Human clinical specimens and/or plant specimens containing infectious agents
- **APHIS:** a USDA veterinary permit is needed for materials derived from animals or exposed to animal-source materials from certain areas where endemic disease may be spread to the US.

Contact EHS for more information

Export Permits

- **Department of Commerce:** a permit (BXA-748P) is required to export not just biological materials but also the technology of certain experimental processes. Notify EHS who will help coordinate the shipment and permit of applicable material. The governing agency is the Bureau of Industry and Security:
- http://www.bis.doc.gov/licensing/

Select Agent Permits

Certain plant agents and toxins that have a potential for public health disruption for both humans and agriculture must be registered with the US Department of Agriculture. ***The USDA Plant Pathogens that require a Select Agent permit:***

- ***Candidatus*** Liberobacter africanus
- ***Candidatus*** Liberobacter asiaticus
- ***Peronosclerospora philippinensis***
- ***Ralstonia solanacearum*** race 3, biovar 2
- ***Schlerophthora rayssiae var zeae***
- ***Synchytrium endobioticum***
- ***Xanthomonas oryzae*** pv. ***oryzicola***
- ***Xylella fastidiosa***(citrus variegated chlorosis strain)

USDA Select Agent Permits

- A permit is required to use or possess any of these agents. In addition, the laboratory and greenhouse must meet stringent requirements for containment and all personnel must pass a Department of Justice background check.
- Please call 643-6562 for more information.

Agriculture Permits-USDA

- **PPQ 587** - Application for Permit to Import Plants or Plant Products.
- PPQ **588** - Application for Permit to Import Prohibited Plants or Plant Products for Experimental Purpose
- **PPQ 621 -** Application for Application for Protected Plant Permit to Engage in the Business of Importing, Exporting, or Re-exporting Protected Plants (CITES)
- **PPQ 525a** - Application for Permit to Receive Soil
- **PPQ 586** - Application for Permit to Transit Plants and/or Plant Products through the U.S.

Biotechnology Permits

APHIS (the USDA, Animal Plant Health Inspection Service) has a requirement for permitting genetically engineered plants and animals to minimize the potential for an inadvertent release of a species to the wild.

http://www.aphis.usda.gov/biotechnology/index.shtml

APHIS permits may include the following:

Biotechnology Permits

- **APHIS' Biotechnology Regulatory Services regulates the introduction (importation, interstate movement, and release into the environment) of genetically engineered organisms that may pose a risk to plant health.**
- **APHIS' Veterinary Services', National Center for Import Export regulates the import, export, and interstate movement of all animals and animal products (e.g., tissues, blood, and semen), including those that are genetically engineered.**

Biotechnology Permits

- **APHIS' Veterinary Services' Center for Veterinary Biologics regulates veterinary biologics (e.g., vaccines and diagnostic kits), including those developed using genetically engineered organisms.**

Check with EHS if any of these biotechnology permits are necessary for your work. Be advised that the USDA is required to inspect your facility if you receive any USDA permits.

Environmental Protection Agency

- The EPA regulates the following transgenic plant applications:
  - Novel microorganisms (formed by deliberate combinations of genetic material from different taxonomic genera) that contain or express new combinations of traits and are intended for commercial use as biofertilizers, biosensors, waste treatment or pollutant degradation, or for commodity or specialty chemical production.
  - Plants and microbes producing pesticidal substances, such as plants expressing insect control proteins derived from *Bacillus thuringiensis* (Bt).
- If applicable, contact the Biosafety Officer who will assist with the appropriate permits.

Food and Drug Administration

- The Food and Drug Administration monitors:
  - Commercial products modified by genetic engineering for human and animal consumption, food additives, human and veterinary drugs.
- Normally, FDA oversight would not be applicable to the transgenic plant research performed at UC Berkeley. However, to ensure that the experiment does not require FDA oversight, review this website for potential food and consumption guidelines:

http://vm.cfsan.fda.gov/~lrd/biotechm.html

Conclusion

This presentation was designed to introduce the concept of transgenic plant containment and how UC Berkeley must comply with regulations designed to minimize the release of recombinant plants to the environment. If you have any questions, feel free to call the Biosafety Officer at 643-6562.

APPENDIX H

TABLES UPDATING C.3-2 AND C.3-3 IN THE UC BERKELEY 2020 LRDP EIR VOL 2 APPENDIX C (pp C.3-12 and C.3-13) TO REFLECT MODELING ASSUMPTIONS IN THE 2009 HEALTH RISK ASSESSMENT UPDATE

2009 HRA Update
Revised Table C-3-2
2020 LRDP EIR Vol 2, C.3-11

Existing UC Berkeley Laboratory Space per Campus "Zone"

Building	Lab Type	Lab Size (ft2)	Campus Zone	
Barker	II	20,461	A	
Hilgard	II	16,748	A	
Koshland	II	49,455	A	
Morgan	II	12,119	A	
Mulford	II	5,461	A	
NWAF	II	1,147	A	
NWAF	III	1,213	A	
LSA	II	37,766	A	
Li Ka Shing	II	*56,600*	A	
South Green House	II	*2,949*	A	
Lab Space Total for Section A		**203,919**	**Percent of total**	**33.76%**
VLSB	II	24,351	B	
Wellman	II	6,356	B	
Lab Space Total for Section B		**30,707**	**Percent of total**	**5.08%**
Cory	III	9,970	C	
LeConte	III	17,039	C	
Davis	III	11,615	C	
Etcheverry	III	9,193	C	
Hesse	III	12,648	C	
McCone	III	7,828	C	
O'Brien	III	8,811	C	
Sutardja Dai Hall	III	*31,066*	C	
Lab Space Total for Section C		**108,170**	**Percent of total**	**17.91%**
Giauque	I	7,372	D	
Gillman	I	6,797	D	
Hildebrand	I	24,348	D	
Latimer	I	54,524	D	
Lewis	I	14,342	D	
Tan	I	23,518	D	
New Stanley	III	*81,200*	D	
Lab Space Total for Section D		**212,101**	**Percent of total**	**35.11%**
VLSB	III	24,351	E	
Lab Space Total for Section E		**24,351**	**Percent of total**	**4.03%**
Birge	III	19,275	F	
Lab Space Total for Section F		**19,275**	**Percent of total**	**3.19%**
Minor	III	4,710	G	
Minor Add.	III	821	G	
Lab Space Total for Section G		**5,531**	**Percent of total**	**0.92%**
Total Square Feet		**604,054**	**100.00%**	

Cumulative Laboratory Square Footage for "Future" Operating Conditions

Campus Zone	Existing Wet Lab Space (ASF)	Total Assumed Cumulative Wet Lab Space (ASF) "Future" Operations[1]	Wet Lab Space Increase (ASF) under Helios Energy Research Facility	Total Assumed Cumulative Wet Labo Space (ASF) "Future" Operations[2]
A	203,919	112,802	40,900	357,621
B	30,707	22,872	---	53,579
C	108,170	12,749	---	120,919
D	212,101	6,792	---	218,893
E	24,351	18,128	---	42,479
F	19,275	14,367	---	33,642
G	5,531	4,134	---	9,665
Total	604,054	191,810	40,900	836,764

[1] Source: Appendix C, 2020 LRDP Draft EIR (UCB 2004)