

*University of California and
Lawrence Berkeley National Laboratory*

HELIOS ENERGY RESEARCH FACILITY Draft Environmental Impact Report



Prepared By:

IMPACT SCIENCES, INC.

2101 Webster Street, Suite 1825
Oakland, California 94612



November 2007

Helios Energy Research Facility Draft Environmental Impact Report

SCH # 2007072107

Prepared for:

Lawrence Berkeley National Laboratory
One Cyclotron Road
Berkeley, California 94720
(510) 486-5257

Prepared by:

Impact Sciences, Inc.
2101 Webster Street, Suite 1825
Oakland, California 94612
(510) 267-0494

November 2007

TABLE OF CONTENTS

Section	Page
1.0 INTRODUCTION	1.0-1
1.1 Purpose of This EIR.....	1.0-1
1.2 Summary of the Proposed Project.....	1.0-2
1.3 Relationship Between LBNL, University of California, and the U.S. Department of Energy	1.0-2
1.4 Environmental Review Process.....	1.0-3
1.4.1 Type of EIR	1.0-4
1.4.2 Public and Agency Review.....	1.0-4
1.4.3 Intended Uses of the EIR	1.0-5
1.5 Scope of This EIR.....	1.0-5
1.6 Report Organization	1.0-6
2.0 EXECUTIVE SUMMARY	2.0-1
2.1 Purpose	2.0-1
2.2 Project Location	2.0-1
2.3 Project Description	2.0-2
2.4 Project Objection.....	2.0-3
2.5 Topics of Known Concern.....	2.0-3
2.6 Impact Summary	2.0-4
2.7 Alternatives to the Proposed Project	2.0-4
2.8 Issues to be Resolved/Areas of Controversy	2.0-6
3.0 PROJECT DESCRIPTION	3.0-1
3.1 Introduction	3.0-1
3.2 Project Objectives	3.0-1
3.3 Project Need.....	3.0-2
3.3.1 Helios Research Program Goals and Program Elements	3.0-3
3.3.1 EBI Goals and Research Program Elements.....	3.0-3
3.4 Project Location and Surrounding Uses.....	3.0-5
3.5 Project Characteristics.....	3.0-6
3.5.1 Research Building.....	3.0-6
3.5.2 Roadway and Pedestrian Access, On-Site Circulation, and Parking.....	3.0-16
3.5.3 Relocation of LBNL Fence	3.0-20
3.5.4 Landscaping and Tree Removal	3.0-21
3.6 Utilities.....	3.0-23
3.6.1 Potable and Fire Suppression Water	3.0-23
3.6.2 Wastewater	3.0-24
3.6.3 Stormwater	3.0-26
3.6.4 Chilled and Hot Water System	3.0-32
3.6.5 Electricity	3.0-32
3.6.6 Natural Gas.....	3.0-33
3.6.7 Exhaust.....	3.0-33
3.6.8 Hazardous Waste.....	3.0-33

TABLE OF CONTENTS (continued)

Section	Page
3.7 Facility Operation and Management.....	3.0-33
3.8 Chemicals and Research Materials On-Site	3.0-34
3.9 Project Population	3.0-35
3.10 Project Construction.....	3.0-35
3.10.1 Construction Access, Staging, and Environmental Protections	3.0-35
3.10.2 Site Grading Activities	3.0-36
3.10.3 Construction Traffic.....	3.0-36
3.10.4 Construction Schedule	3.0-37
3.11 2006 LRDP Mitigation Measures	3.0-37
3.12 Project Approvals.....	3.0-37
3.6 Utilities.....	3.0-16
3.6.1 Domestic and Fire Water	3.0-16
3.6.2 Wastewater	3.0-17
3.6.3 Storm Water.....	3.0-18
3.6.4 Chilled Water	3.0-18
3.6.5 Electricity	3.0-18
3.6.6 Natural Gas.....	3.0-19
3.6.7 Exhaust.....	3.0-19
3.7 Chemicals and Research Materials On-Site	3.0-20
3.8 Project Population	3.0-21
3.9 Construction.....	3.0-21
3.9.1 Site Grading.....	3.0-21
3.9.2 Schedule	3.0-22
3.9.3 Construction	3.0-22
3.9.4 Construction Access, Staging, and Environmental Protections	3.0-22
4.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES.....	4.0-1
4.1 Introduction	4.0-1
4.2 Approach to Impact Analysis.....	4.0-1
4.3 Levels of Significance.....	4.0-2
4.4 Key to Impact Analysis.....	4.0-3
4.1 Aesthetics	4.1-1
4.1.1 Introduction.....	4.1-1
4.1.2 Environmental Setting.....	4.1-1
4.1.3 Regulatory Considerations.....	4.1-9
4.1.4 Impacts and Mitigation Measures	4.1-13
4.1.5 References	4.1-23
4.2 Air Quality	4.2-1
4.2.1 Introduction.....	4.2-1
4.2.2 Environmental Setting.....	4.2-2
4.2.3 Regulatory Considerations.....	4.2-15
4.2.4 Impacts and Mitigation Measures	4.2-34
4.2.5 References	4.2-52

TABLE OF CONTENTS (continued)

Section	Page
4.3 Biological Resources	4.3-1
4.3.1 Introduction.....	4.3-1
4.3.2 Environmental Setting.....	4.3-1
4.3.3 Regulatory Considerations.....	4.3-17
4.3.4 Impacts and Mitigation Measures	4.3-23
4.3.5 References	4.3-37
4.4 Cultural Resources.....	4.4-1
4.4.1 Introduction.....	4.4-1
4.4.2 Environmental Setting.....	4.4-2
4.4.3 Regulatory Considerations.....	4.4-4
4.4.4 Impacts and Mitigation Measures	4.4-9
4.4.5 References	4.4-12
4.5 Geology and Soils	4.5-1
4.5.1 Introduction.....	4.5-1
4.5.2 Environmental Setting.....	4.5-1
4.5.3 Regulatory Considerations.....	4.5-6
4.5.4 Impacts and Mitigation Measures	4.5-10
4.5.5 References	4.5-17
4.6 Hazards and Hazardous Materials.....	4.6-1
4.6.1 Introduction.....	4.6-1
4.6.2 Environmental Setting.....	4.6-1
4.6.3 Regulatory Considerations.....	4.6-8
4.6.4 Impacts and Mitigation Measures	4.6-18
4.6.5 References	4.6-30
4.7 Hydrology and Water Quality	4.7-1
4.7.1 Introduction.....	4.7-1
4.7.2 Environmental Setting.....	4.7-1
4.7.3 Regulatory Considerations.....	4.7-9
4.7.4 Impacts and Mitigation Measures	4.7-21
4.7.5 References	4.7-30
4.8 Land Use and Planning.....	4.8-1
4.8.1 Introduction.....	4.8-1
4.8.2 Environmental Setting.....	4.8-1
4.8.3 Regulatory Considerations.....	4.8-3
4.8.4 Impacts and Mitigation Measures	4.8-9
4.8.5 References	4.8-16
4.9 Noise.....	4.9-1
4.9.1 Introduction.....	4.9-1
4.9.2 Environmental Setting.....	4.9-1
4.9.3 Regulatory Considerations.....	4.9-7
4.9.4 Impacts and Mitigation Measures	4.9-10

TABLE OF CONTENTS (continued)

Section	Page
4.9.5 References	4.9-20
4.10 Population and Housing	4.10-1
4.10.1 Introduction	4.10-1
4.10.2 Environmental Setting	4.10-1
4.10.3 Regulatory Considerations	4.10-3
4.10.4 Impacts and Mitigation Measures	4.10-5
4.10.5 References	4.10-6
4.11 Public Services	4.11-1
4.11.1 Introduction	4.11-1
4.11.2 Environmental Settings	4.11-1
4.11.3 Regulatory Considerations	4.11-4
4.11.4 Impacts and Mitigation Measures	4.11-9
4.11.5 References	4.11-13
4.12 Transportation and Traffic	4.12-1
4.12.1 Introduction	4.12-1
4.12.2 Environmental Setting	4.12-1
4.12.3 Regulatory Considerations	4.12-15
4.12.4 Impact and Mitigation Measures	4.12-22
4.12.5 References	4.12-40
4.13 Utilities and Service Systems	4.13-1
4.13.1 Introduction	4.13-1
4.13.2 Environmental Setting	4.13-1
4.13.3 Regulatory Considerations	4.13-5
4.13.4 Impacts and Mitigation Measures	4.13-7
4.13.5 References	4.13-12
5.0 CUMULATIVE IMPACTS	5.0-1
5.1 Introduction	5.0-1
5.2 Cumulative Impact Analysis	5.0-1
5.3 Near Term Cumulative Projects	5.0-2
5.3-1 LBNL Near Term Projects	5.0-4
5.3-2 UC Berkeley Near Term Projects	5.0-6
5.3-3 Other Proposed/Planned Near Term Projects	5.0-7
5.4 Long Term Cumulative Projects	5.0-8
5.4-1 LBNL 2006 LRDP	5.0-9
5.4-2 UC Berkeley 2020 LRDP	5.0-9
5.4-3 City of Berkeley General Plan	5.0-10
5.4-4 City of Oakland General Plan	5.0-11
5.5 Topical Impacts	5.0-11
5.5-1 Aesthetics	5.0-11
5.5-2 Air Quality	5.0-13
5.5-3 Biological Resources	5.0-20
5.5-4 Cultural Resources	5.0-23

TABLE OF CONTENTS (continued)

Section	Page
5.5-5 Geology and Soils	5.0-24
5.5-6 Hazards and Hazardous Material	5.0-25
5.5-7 Hydrology and Water Quality	5.0-26
5.5-8 Land Use and Planning	5.0-28
5.5-9 Noise	5.0-28
5.5-10 Population and Housing	5.0-30
5.5-11 Public Services	5.0-31
5.5-12 Transportation and Traffic	5.0-32
5.5-13 Utilities and Service Systems	5.0-38
5.6 References	5.0-39
6.0 ALTERNATIVES	6.0-1
6.1 Introduction	6.0-1
6.1.1 Objectives of the Helios Project	6.0-1
6.1.2 Impacts of the Helios Project	6.0-2
6.2 Alternatives To The Project	6.0-5
6.2.1 Alternatives Considered But Not Evaluated in Detail	6.0-5
6.2.2 Alternatives Considered in Detail	6.0-7
6.3 Environmentally Superior Alternative	6.0-32
7.0 OTHER CEQA CONSIDERATIONS	7.0-1
7.1 Significant Unavoidable Effects	7.0-1
7.2 Growth-Inducing Impacts	7.0-1
7.3 Effects Found Not to be Significant	7.0-3
8.0 ORGANIZATIONS AND PERSONS CONSULTED	8.0-1
9.0 REPORT PREPARATION	9.0-1
9.1 Lead Agency	9.0-1
9.2 EIR Consultants	9.0-1
9.3 Legal Counsel	9.0-2
9.4 Helios Design Team	9.0-2
10.0 ACRONYMS AND ABBREVIATIONS	10.0-1

Appendices

- 1.0 Project Documentation
 - Notice of Preparation and Initial Study
 - 2006 LBNL LRDP EIR Mitigation Measures
- 4.2 Air Quality
 - Greenhouse Gas Emissions
 - Emissions Calculations
- 4.3 Biological Resources
 - Local Plans and Policies
 - Plant Species Identified on the Project Site
- 4.12 Transportation and Traffic
 - Trip Generation for Helios and CRT EIRs
 - Traffic Calculations
- 4.13 Energy Consumption and Cost Report

LIST OF FIGURES

Figure	Page
3.0-1 Regional Location.....	3.0-7
3.0-2 LBNL Site.....	3.0-8
3.0-3 Project Site Location.....	3.0-9
3.0-4 Helios Conceptual Site Plan.....	3.0-10
3.0-5 Longitudinal Cross-Section of the Helios Project.....	3.0-13
3.0-6 Access Road to Centennial Drive Intersection Options.....	3.0-18
3.0-7 Wastewater Option 1.....	3.0-27
3.0-8 Wastewater Options 2 and 3.....	3.0-28
3.0-9 Grading and Utility Plan - Building Site.....	3.0-29
3.0-10 Grading and Utility Plan - Parking Area.....	3.0-30
3.0-11 Grading and Utility Plan Centennial Drive Intersection.....	3.0-31
4.1-1 Photo Viewpoint Locations.....	4.1-3
4.1-2 Public Views of Site and Surroundings.....	4.1-6
4.1-3 Public Views of Site and Surroundings.....	4.1-7
4.1-4 Public Views of Site and Surroundings.....	4.1-8
4.1-5 Visual Simulation – Centennial Drive.....	4.1-15
4.1-6 Visual Simulation – Panoramic Way.....	4.1-16
4.3-1 Vegetation Types at Project Site.....	4.3-3
4.3-2 Sensitive Habitat at LBNL.....	4.3-12
4.5-1 Seismic Hazard Zone Map.....	4.5-5
4.7-1 Existing Drainage Near Project Site.....	4.7-3
4.7-2 Existing LBNL Monitoring Wells.....	4.7-6
4.7-3 Groundwater Contaminant Plume Map.....	4.7-13
4.8-1 2006 LRDP Land Use Diagram.....	4.8-13
4.9-1 2006 LRDP Noise Monitoring Locations.....	4.9-5
4.12-1 Study Intersection Locations, Lane Configurations and Traffic Control.....	4.12-3
4.12-2 Existing Conditions Peak Hour Traffic Volumes.....	4.12-8
4.12-3 Transit Routes in Project Vicinity.....	4.12-13
4.12-4 Near-Term No Project Conditions Peak Hour Traffic Volumes.....	4.12-28
4.12-5 Near-Term With Project Conditions Peak Hour Traffic Volumes.....	4.12-35
5.0-1 Location of Cumulative Project.....	5.0-3
5.0-2 Cumulative With Project Conditions Peak Hour Traffic Volumes.....	5.0-34
6.0-1 Location Alternatives 3 and 4.....	6.0-15
6.0-2 Conceptual Simulation – Alternative 3.....	6.0-18
6.0-3 Conceptual Simulation – Alternative 4.....	6.0-23
6.0-4 Alternative 5: Alternate Roadway Alignment Location.....	6.0-28

LIST OF TABLES

Table	Page
2.0-1 Summary of Impacts and Mitigation Measures	2.0-9
2.0-2 Summary Comparison of Helios Project Alternatives	2.0-32
3.0-1 Helios Building Summary	3.0-12
3.0-2 Trees Affected by Helios Access Road	3.0-22
3.0-3 Trees Affected by Intersection Options	3.0-23
3.0-4 Helios Project Utility Demand	3.0-23
4.0-1 Key to Impact Analysis	4.0-3
4.2-1 Ambient Air Quality Standards	4.2-4
4.2-2 Ambient Pollutant Concentrations Measured at Oakland-Alice Street Station by Year	4.2-7
4.2-3 Six Top GHG Producer Countries and the European Community	4.2-12
4.2-4 GHG Sources in California	4.2-14
4.2-5 National Ambient Air Quality Standards and Status San Francisco Bay Area Air Basin	4.2-16
4.2-6 California Ambient Air Quality Standards and Status San Francisco Bay Area Air Basin	4.2-19
4.2-7 Estimated Operational Emissions	4.2-42
4.2-8 Cumulative (2025) Plus Helios Project CO Concentrations	4.2-44
4.2-9 Summary of Annual COPC Emissions (Carcinogens)	4.2-46
4.2-10 Summary of Maximum Modeled Cancer Risks	4.2-48
4.2-11 Summary of Annual COPC Emissions (Chronic Noncarcinogens)	4.2-49
4.2-12 Summary of Maximum Hourly Laboratory TAC Emissions (Acute Noncarcinogens)	4.2-50
4.2-13 Summary of Maximum Modeled Chronic Noncancer Health Impacts	4.2-51
4.2-14 Summary of Maximum Modeled Acute Noncancer Health Impacts	4.2-51
4.3-1 Special Status Species Documented in the Project Area	4.3-40
4.3-2 Trees Affected by Intersection Options	4.3-32
4.7-1 Basin Plan Water Quality Objective to Protect Beneficial Uses	4.7-10
4.8-1 2006 LRDP Building Space and Approved and Pending Projects	4.8-11
4.8-2 2006 LRDP Adjusted Daily Population and Approved and Pending Projects	4.8-12
4.9-1 Definitions of Acoustical Terms Used in this Report	4.9-2
4.9-2 Typical Noise Levels in the Environment	4.9-3
4.9-3 Measured Noise Levels in the Project Vicinity	4.9-6
4.9-4 City of Berkeley Maximum Allowable Receiving Noise Standards for Residential Land Uses, dB(A)	4.9-8
4.9-5 City of Oakland Maximum Allowable Receiving Noise Standards, dB(A)	4.9-9
4.9-6 Acceptable Exterior Noise Levels for Land Use Categories	4.9-11
4.9-7 Typical Construction Noise Levels	4.9-16
4.9-8 Typical Noise Levels from Construction Equipment	4.9-16
4.8-1 Signalized Intersection Level of Service Criteria	4.8-7
4.8-2 Unsignalized Intersection Level of Service Criteria	4.8-10
4.8-3 Existing Conditions – Study Intersection LOS Summary	4.8-11
4.8-4 Project Vehicle Trip Generation	4.8-32
4.8-5 Near-Term Conditions – Study Intersection LOS Summary	4.8-34
4.8-6 Year 2025 Conditions – Study Intersection LOS Summary	4.8-41
4.12-1 Signalized Intersection Level of Service Criteria	4.12-6
4.12-2 Unsignalized Intersection Level of Service Criteria	4.12-9
4.12-3 Existing Conditions – Study Intersection LOS Summary	4.12-10

LIST OF TABLES (continued)

Table	Page
4.12-4 Project Vehicle Trip Generation	4.12-25
4.12-5 Near-Term Conditions – Study Intersection LOS Summary	4.12-29
5.0-1 Near-Term Cumulative Projects.....	5.0-4
5.0-2 Estimated Greenhouse Gas Emissions, Helios Project	5.0-16
5.0-3 Year 2025 Conditions – Study Intersection LOS Summary	5.0-35
6.0-1 Summary Comparison of Helios Project Alternative	6.0-34

1.0 INTRODUCTION

This Environmental Impact Report (EIR) has been prepared to provide an assessment of the potentially significant environmental effects of the proposed Helios Energy Research Facility Project (hereinafter Helios project or proposed project). As required by California Environmental Quality Act (CEQA), this Draft EIR (1) assesses the potentially significant environmental effects of the proposed project, including cumulative impacts of the proposed project in conjunction with other reasonably foreseeable development; (2) identifies feasible means of avoiding or substantially lessening significant adverse impacts; and (3) evaluates a range of reasonable alternatives to the proposed project, including the No Project Alternative. The University of California (the University) is the “lead agency” for the project evaluated in this Draft EIR. The Board of Regents of the University of California (The Regents) has the principal responsibility for approving this project.

1.1 PURPOSE OF THIS EIR

The Lawrence Berkeley National Laboratory (LBNL) has commissioned this EIR on the Helios project for the following purposes:

- To inform the general public; the local community; and responsible, trustee, and other public agencies of the nature of the proposed project, its potentially significant environmental effects, feasible measures to mitigate those effects, and its reasonable and feasible alternatives;
- To enable the University to consider the environmental consequences of approving the Helios project;
- For consideration by responsible agencies in issuing permits and approvals for the proposed project; and
- To satisfy CEQA requirements.

As described in CEQA and the *CEQA Guidelines*, public agencies are charged with the duty to avoid or substantially lessen significant environmental effects, where feasible. In discharging this duty, a public agency has an obligation to balance the project’s significant effects on the environment with its benefits, including economic, social, technological, legal, and other benefits. This EIR is an informational document, the purpose of which is to identify the potentially significant effects of the proposed project on the environment and to indicate the manner in which those significant effects can be avoided or significantly lessened; to identify any significant and unavoidable adverse impacts that cannot be mitigated; and to identify reasonable and feasible alternatives to the proposed project that would eliminate any significant adverse environmental effects or reduce the impacts to a less than significant level.

The lead agency is required to consider the information in the EIR, along with any other relevant information, in making its decisions on the proposed project. Although the EIR does not determine the ultimate decision that will be made regarding implementation of the project, CEQA requires the University to consider the information in the EIR and make findings regarding each significant effect identified in the EIR. The Regents will certify the Final EIR prior to approving the proposed project. Other agencies may also use this EIR in their review and approval processes.

1.2 SUMMARY OF THE PROPOSED PROJECT

LBNL proposes to construct and operate the Helios Energy Research Facility Project that would be located in the southeastern portion of LBNL in Oakland, Alameda County, California. The proposed project includes an approximately 160,000 gross-square-foot building (including a 250-seat auditorium), an access road to serve only the project site, a parking area with 50 parking spaces, and other utility improvements needed to serve the proposed facility. The proposed building would accommodate research programs focused primarily on alternative and renewable energy sources.

1.3 RELATIONSHIP BETWEEN LBNL, UNIVERSITY OF CALIFORNIA, AND THE U.S. DEPARTMENT OF ENERGY

LBNL is a federal facility managed and operated by the University of California under a U.S. Department of Energy (DOE)/UC contract. The research, service and training work conducted at LBNL is within the University's mission and the land is owned by The Regents of the University of California. The federal government leases land at the Berkeley Lab from The Regents and constructs federally owned buildings on the leased lands. The University is a Management and Operating (M&O) contractor of LBNL as defined under the U.S. DOE Acquisition Regulations. As the Laboratory's M&O Contractor, the University is responsible for providing the intellectual leadership and management expertise necessary and appropriate to manage, operate, and staff the Laboratory; accomplish the missions and activities assigned and funded by DOE to the Laboratory; administer the U.S. DOE/UC Prime Contract; and provide University oversight of the Laboratory's contract compliance and performance.

LBNL's programs advance four distinct goals for U.S. DOE and the nation:

- To perform leading multidisciplinary research in the computing sciences, physical sciences, energy sciences, biosciences, and general sciences in a manner that ensures employee and public safety and protection of the environment;
- To develop and operate unique national experimental facilities for qualified investigators;
- To educate and train future generations of scientists and engineers by promoting national science and education; and

- To transfer knowledge and technological innovations and to foster productive relationships among the LBNL research programs, universities, and industry in order to promote national economic competitiveness.

Classified research is not conducted at LBNL.

Because The Regents may re-acquire full responsibility for the lands should the federal government close LBNL, and for effective ongoing management, The Regents hold themselves accountable for the stewardship of LBNL within the State of California. The Regents require and approve the University-defined Long Range Development Plan (LRDP) and require that its approval be consistent with the University's policy that an LRDP undergo CEQA review and approval. Therefore, in 2004, under the direction of the University, LBNL commenced the preparation of an update to its LRDP. The Regents certified the 2006 LRDP EIR and adopted the 2006 LRDP in July 2007; it is now the governing land use plan for the Berkeley Lab's hill site.

1.4 ENVIRONMENTAL REVIEW PROCESS

LBNL has filed a Notice of Completion (NOC) with the Governor's Office of Planning and Research, State Clearinghouse indicating that this Draft EIR has been completed and is available for review and comment by the public.¹

This Draft EIR is available for review by the public and interested parties, agencies, and organizations for a review period of 54 days, which is longer than the mandated 45-day review period required by California law. In reviewing the Draft EIR, reviewers should focus on the document's adequacy in identifying and analyzing significant effects on the environment and ways in which the significant effects of the project might be avoided or mitigated. To ensure inclusion in the Final EIR and full consideration by the lead agency, comments on the Draft EIR must be received during the public review period at the following address:

Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 69-201
Berkeley, California 94720
Contact: Jeff Philliber, Environmental Planning Group Coordinator
planning@lbl.gov

The Berkeley Lab will accept e-mail comments in lieu of traditional mailed comments; nevertheless, reviewers are encouraged to follow up on any e-mail comments with letters. Following the close of the

¹ LBNL has also published another EIR for the Computational Research and Theory (CRT) Facility project. Both CRT EIR and this EIR are being circulated for agency and public review. Both the CRT and the Helios projects would be located at LBNL's hill site location and would be built over approximately the same period of time.

review period, responses to comments on the Draft EIR will be prepared and published as a separate document. The Draft EIR text and appendices, together with responses to comments and any text changes made to the original Draft EIR will constitute the Final EIR.

The Regents, the decision-making body for the University, will review LBNL's Helios Energy Research Facility Project Final EIR for adequacy and consider it for certification pursuant to the requirements of Section 15090 of the State *CEQA Guidelines*. If The Regents certify the Final EIR, then The Regents will consider the project separately for approval or denial. If The Regents choose to approve the project, findings on the feasibility of reducing or avoiding significant environmental effects will be made and, if necessary, a Statement of Overriding Considerations will be prepared. If The Regents approve the project, a Notice of Determination (NOD) will also be prepared and will be filed with the State Clearinghouse. The NOD will include a description of the project, the date of approval, an indication of whether the Findings were prepared and a Statement of Overriding Considerations was adopted, and the address where the Final EIR and record of project approval are available for review.

1.4.1 Type of EIR

This is a project EIR prepared pursuant to Section 15161 of the *CEQA Guidelines*. Because the proposed project is an element of the growth projected under the 2006 LRDP, relevant mitigation measures identified in the 2006 LRDP EIR and adopted by The Regents in conjunction with the approval of the 2006 LRDP have been included in and made part of the Helios project. These mitigation measures are listed in each resource subsection of **Section 4.0, Environmental Setting, Impacts, and Mitigation Measures**. The analysis presented in **Section 4.0** evaluates environmental impacts that would result from project implementation following the application of these mitigation measures. These mitigation measures that are included in the project would be monitored pursuant to the Mitigation Monitoring and Reporting Plan that will be adopted for the proposed project.

The 2006 LRDP EIR was certified by the Regents on July 19, 2007. Several individuals have since filed a lawsuit challenging the Regents certification of the EIR (*Jones et al. v. Regents*, Alameda County Superior Court Case No. RG07341224). That case is currently pending and, unless and until the court determines otherwise, the Regents certification of the 2006 LRDP EIR remains in effect.

1.4.2 Public and Agency Review

On July 26, 2007, a Notice of Preparation (NOP), including an Initial Study, was published for the Helios Energy Research Facility Project EIR. The 30-day comment period ended on August 24, 2007. A copy of the NOP and the Initial Study is included in **Appendix 1.0**. All comments received on the NOP are available on file with LBNL.

An EIR scoping meeting was held at the North Berkeley Senior Center on August 8, 2007. This meeting was intended to inform the public and interested agencies of the proposed project, solicit comments, and identify areas of concern.

Copies of this EIR and the 2006 LRDP are available for review online at <http://www.lbl.gov/Community/env-rev-docs.html> or at the following locations:

- Berkeley Public Library, 2090 Kittredge Street, 2nd Floor Reference Desk, Berkeley, CA 94704
- Berkeley Laboratory Main Library, One Cyclotron Road, Building 50, Room 4034, Berkeley, CA 94720

1.4.3 Intended Uses of this EIR

This document serves two purposes. The Regents will use this EIR to evaluate the environmental implications of approving the Helios project for implementation. Secondly, this document may be used as a source of information by responsible agencies with permitting or approval authority over the project.

1.5 SCOPE OF THIS EIR

The Berkeley Lab completed a preliminary review of the project, as described in Section 15060 of the *CEQA Guidelines*, and determined that an environmental review was required. The Berkeley Lab prepared an Initial Study in July of 2007 and determined that an EIR was necessary. Based on the Initial Study and the comments received at the scoping meeting and in response to the NOP, it was determined that the EIR would evaluate the following environmental topics in further detail:

- Aesthetics;
- Air Quality;
- Biological Resources;
- Cultural Resources;
- Geology and Soils;
- Hazards and Hazardous Materials;
- Hydrology and Water Quality;
- Land Use and Planning;
- Noise;
- Population and Housing;
- Public Services and Recreation;
- Transportation and Traffic; and
- Utilities and Service Systems.

1.6 REPORT ORGANIZATION

This Draft EIR is organized into the following sections:

Section 1.0, Introduction, provides an introduction and overview describing the purpose and scope of topics addressed in this EIR and the environmental review process.

Section 2.0, Executive Summary, summarizes environmental consequences that would result from the proposed project, provides a summary table that denotes anticipated significant environmental impacts, describes identified mitigation measures, and indicates the level of significance of impacts before and after mitigation.

Section 3.0, Project Description, describes the proposed project.

Section 4.0, Environmental Setting, Impacts, and Mitigation Measures, describes the environmental setting, including applicable plans and policies; provides an analysis of the potential environmental impacts of the proposed project; and identifies mitigation measures to reduce their significance.

Section 5.0, Cumulative Impacts, presents the cumulative environmental impacts of the proposed project, in conjunction with other approved, pending, or reasonably foreseeable near-term and long-term development in the project area.

Section 6.0, Alternatives, summarizes alternatives to the project and the comparative environmental consequences and benefits of each alternative. This section includes an analysis of the No Project Alternative, among others, as required by CEQA.

Section 7.0, Other CEQA Considerations, provides a discussion of the project's significant and unavoidable impacts, the potential for growth inducement from the project, and a brief description of the environmental effects that were found not to be significant and, therefore, not evaluated in further detail.

Section 8.0, Organizations and Persons Consulted, provides a list of organizations and individuals who were contacted in the preparation of the EIR.

Section 9.0, Report Preparation, provides a list of the individuals involved in the preparation of this EIR.

Section 10.0, Acronyms and Abbreviations, identifies and defines acronyms and abbreviations frequently used in the EIR.

2.0 EXECUTIVE SUMMARY

2.1 PURPOSE

This Draft EIR evaluates the potential for significant environmental impacts from the construction and operation of the Helios Energy Research Facility project (Helios project) proposed by the Lawrence Berkeley National Laboratory (LBNL).¹ It is the intent of this Executive Summary to provide the decision makers, responsible agencies, and the public with a clear, simple and concise description of the proposed project and its potential significant environmental impacts. Section 15123 of the *California Environmental Quality Act (CEQA) Guidelines* requires that the summary identify each significant effect, recommended mitigation measure(s), and alternatives that would minimize or avoid potential significant impacts. The summary is also required to identify areas of controversy known to the lead agency, including issues raised by agencies and the public and issues to be resolved. These issues include the choice among alternatives and whether or how to mitigate significant effects. This section focuses on the major areas of importance in the environmental analysis for the proposed project and utilizes non-technical language to promote understanding.

2.2 PROJECT LOCATION

The approximately 6-acre Helios project site is located in the southeastern portion of LBNL. LBNL is located east of the University of California, Berkeley, within the cities of Berkeley and Oakland. The project site, in the Oakland portion of LBNL, is generally located south of Lawrence Road and north of Centennial Drive (in lower Strawberry Canyon). Located on the LBNL hill site, the project site comprises sloping topography. Scenic views of the San Francisco Bay to the west are available from the site. The project site is undeveloped and consists primarily of non-native grasslands.

The project site is surrounded by research facilities associated with the Redwood cluster², including the National Center for Electron Microscopy, the Molecular Foundry, and Advanced Light Source. The LBNL 2006 Long Range Development Plan (LRDP) designates the site for Research and Academic uses.

¹ LBNL has also published another EIR for the Computational Research and Theory (CRT) Facility project. Both the CRT EIR and this one are being circulated for agency and public review. Both the CRT and the Helios projects would be located at LBNL's hill site location and would be built over approximately the same period of time. The cumulative impacts of both projects are considered in this EIR.

² The 2006 LRDP identifies the group of buildings in the project vicinity as the Redwood cluster.

2.3 PROJECT DESCRIPTION

The Helios project consists of an approximately 160,000-gross-square-foot (gsf) research facility for use by two research programs focused on sustainable and alternative energy research: the Helios research program and the Energy Biosciences Institute (EBI) research program. The Helios research program is a collaborative effort between LBNL and UC Berkeley that would conduct research to utilize sunlight to generate efficient energy sources. The EBI is a grant-funded program through British Petroleum (BP) that would conduct research with BP partners, LBNL, UC Berkeley, and the University of Illinois, Urbana-Champaign (UIUC) and would focus research primarily on renewable biofuels for transportation and conversion of heavy hydrocarbons to clean fuels.

The proposed project includes the following components:

- An approximately 160,000 gsf research building, including a 250-seat auditorium and a cafeteria. The auditorium would provide a venue for symposia and other events associated with both research programs. The building has been designed to meet UC Policy on Sustainable Practices.
- A new controlled-access road that would provide access to the project site from Centennial Drive from just below UC Berkeley Botanical Gardens. A small turnaround with designated drop-off areas would be provided at the terminus of the road in front of the Helios facility's lower entrance. Four options are under consideration by LBNL for the intersection of the new access road with Centennial Drive.
- A parking area along the access road with 50 parking spaces.
- Storm drainage improvements, including grassy swales and an underground hydromodification vault.
- Wastewater disposal improvements, including three options for the collection and conveyance of wastewater.
- Other utility improvements, including electrical, natural gas, and water connections, cooling towers, a backup generator, a fuel storage tank, and a liquid nitrogen storage tank located in a utility area north of the main building.

The research facility would be a narrow, stepped-design building, oriented generally north-south with separate levels devoted to different project components. This design would place the building parallel with the contours of the hillside, giving distinct lower and upper hillside entry points. The southern portion of the building would house the Helios program, whereas the northern portion of the building would house the EBI program. The Helios portion of the building would comprise four floors whereas the EBI portion would comprise a total of seven floor levels. The highest point of the building would be about 89 feet above the main entry level.

The building would accommodate approximately 500 people, including researchers, administrative personnel, and visitors. Approximately 132 people would be relocated to the Helios facility from other locations within LBNL or UC Berkeley, and there would be 368 new people that would be at the project site as a result of project implementation. An additional 125 persons could also be at the project site during full capacity events at the proposed auditorium.

2.4 PROJECT OBJECTIVES

Key objectives of the proposed project are to:

- Provide an integrated and appropriately designed facility for high-level/advanced research in solar and other alternative energy sources and technologies;
- Create a facility that draws upon the intellectual, technological, and material resources of LBNL and UC Berkeley to support and stimulate research in developing sciences and technologies and that encourages the next scientific discovery;
- Co-locate different research programs in one facility to promote cross-pollination of ideas and theories and create a multi-disciplinary collaborative environment;
- Locate the facility such that researchers have convenient access to unique and top-rated scientific facilities and that duplication of facilities is avoided;
- Foster interaction and collaboration between the project, LBNL, and UC Berkeley researchers and students by locating the facility near the Berkeley Laboratory's fence line; and
- Create a facility that becomes a benchmark for energy efficient usage for future similar building types.

2.5 TOPICS OF KNOWN CONCERN

To determine which environmental topics should be addressed in this EIR, LBNL prepared an Initial Study and circulated it along with a Notice of Preparation (NOP) in order to receive input from interested public agencies and private parties. Copies of the NOP and Initial Study are presented in **Appendix 1.0** of this EIR. Based on both the Initial Study and the NOP comments, this EIR addresses the following environmental topics in depth:

- Aesthetics;
- Air Quality;
- Biological Resources;
- Cultural Resources;
- Geology and Soils;
- Hazards and Hazardous Materials;
- Hydrology and Water Quality;
- Land Use and Planning;
- Population and Housing;
- Public Services;
- Noise;
- Transportation and Traffic; and
- Utilities and Service Systems.

2.6 IMPACT SUMMARY

A detailed discussion regarding potential impacts is provided in **Section 4.0, Environmental Setting, Impacts, and Mitigation Measures**. In accordance with the *CEQA Guidelines*, a summary of the project's impacts is provided in **Table 2.0-1, Summary of Impacts and Mitigation Measures**, presented at the end of this section. Also provided in **Table 2.0-1** are mitigation measures that are recommended to avoid or reduce significant project impacts. The table indicates whether or not implementation of the recommended mitigation measures would reduce the level of impact to a less than significant level.

2.7 ALTERNATIVES TO THE PROPOSED PROJECT

The alternatives evaluated in this EIR focus on avoiding or further reducing potentially significant project impacts associated with aesthetics, biological resources, geology and soils, hazards and hazardous materials, hydrology and water quality, and traffic and circulation, and cumulative impacts related to traffic and human health risk.. Project alternatives include the following:

Alternative 1: No Project Alternative. This alternative assumes no development would occur on the site, and that the site would remain vacant but may be developed in the future consistent with the 2006 LRDP.

Alternative 2: Reduced Facility Alternative. This alternative would include development of a smaller research facility at the proposed project location by eliminating the Synthetic Biology component of the Helios portion of the proposed project. Under this alternative, the building would have approximately 132,000 gsf of office and laboratory space but the amount of space devoted to the auditorium and other common areas would be the same as for the proposed project. As a result, the building elevation would be one story lower than the proposed project. The number of researchers, staff and visitors that would be accommodated in this reduced facility would be approximately 400. Access road improvements, parking, and improvements to utilities would be the same as for the proposed project.

Alternative 3: Split Site Design Alternative. This alternative would separate the Helios and EBI portions of the project into two separate rectangular buildings that would be located adjacent to each other in the same location as the proposed project. The purpose of this design would be to reduce bulk and visibility of the project. This alternative would maintain the auditorium at the same location as proposed under the project and the parking area and access road would be the same. Both buildings would be four stories high, rather than the seven-story profile of the northerly portion of the proposed building. The total square footage for the buildings combined would be approximately 170,000 gsf, larger than the proposed project. The additional square footage is due to the need to provide additional restrooms, elevators, stairs and lobbies that both buildings would require. Under this alternative, each

building would have its own mechanical equipment and this equipment would be placed on the roof of the buildings. This would eliminate the green roofs proposed for the southern portion of the proposed project. Similar to the proposed project, about 500 researchers, staff, and visitors would be associated with this alternative.

Alternative 4: Alternate LBNL Location. This alternative would use another site within the LBNL hill site for development of the proposed project. This location is approximately 500 feet northeast of the proposed project site and is located east of the Molecular Foundry building on both sides of Centennial Drive. Two buildings would be constructed on either side of Centennial Drive. The first building would be between Centennial Drive and Lawrence Road, and because the area available is small, in order to accommodate the Helios program this building would be a six story, 90 feet high building. The auditorium would be located north of this building. The second building to accommodate the EBI program would be east of Centennial Drive and would be a five story, 75 feet high building. Because the site is served by both Lawrence Road and Centennial Drive, a new access roadway would not be required. All other utility improvements under this alternative would be the same as under the proposed project. Similar to the proposed project, about 500 researchers, staff and visitors would be associated with this alternative.

Alternative 5 Proposed Project with Alternate Roadway Alignment. This alternative would construct the Helios building as envisioned under the proposed project but the new access road would be constructed along a different alignment than the proposed project. Under this alternative, the proposed access road would be located south of the access road included in the proposed project, avoiding Buildings 73 and 73A, and would intersect with Centennial Drive approximately 400 feet southwest of the project's proposed intersection. Similar to the proposed project, advanced flashing lights would be installed on Centennial Drive alerting motorists that there is an intersection ahead. The roadway would include a turnaround area approximately 50 feet from Centennial Drive. All other aspects of the Helios Facility, including the total population, would remain essentially the same as the proposed project under this alternative.

Detailed description of these alternatives and their comparative merits are presented in **Section 6.0** of this EIR. **Table 2.0-2, Summary Comparison of Helios Project Alternatives**, which follows **Table 2.0-1**, presents a comparison of the environmental impacts of each alternative to those that are expected to result from the proposed project.

Based on the analysis presented in the EIR, Alternative 2, Reduced Facility, was identified as the Environmentally Superior Alternative (see **Section 6.0** of this EIR).

2.8 ISSUES TO BE RESOLVED/AREAS OF CONTROVERSY

This EIR addresses environmental issues associated with the proposed project that are known to the lead agency or were raised by other public agencies or interested parties during the EIR scoping process. Comment letters and the transcript of the scoping meeting are on file with LBNL. More comprehensive descriptions of issues raised during project scoping are presented in the appropriate environmental analysis section of this EIR. Following is a list of issues raised in the scoping comments received:

- Past landslides in the project vicinity should be analyzed and likelihood of future landslides should be addressed. The EIR should address the potential for LBNL development to increase the likelihood of landslides. (*See Section 4.5, Geology and Soils*)
- The probability of an earthquake on the Hayward fault should be discussed and analyzed. (*See Section 4.5, Geology and Soils*)
- Strawberry Canyon is alleged to have active faults evidenced by the location of epicenters of earthquakes on the Lab site. (*See Section 4.5, Geology and Soils*)
- The use of genetically-modified organisms (GMO) and nano materials should be fully described and analyzed for effects on human health and the environment. It is unsafe to place such research in an area prone to earthquakes. (*See Section 4.6, Hazards and Hazardous Materials*)
- Toxic materials currently used on the Lab site and proposed toxic materials that the proposed project would utilize are unsuitable for use near residential areas and could be released in the event of a natural disaster. (*See Section 4.6, Hazards and Hazardous Materials*)
- The proposed research cannot be conducted in a safe manner in an area that is near a major fault and is susceptible to landslides and wildland fires. (*See Section 4.6, Hazards and Hazardous Materials*)
- The LBNL site is within an area of high fire danger and the project would require vegetation removal to reduce fire danger. (*See Section 4.6, Hazards and Hazardous Materials*)
- The EIR should address emergency evacuation procedures for LBNL personnel. (*See Section 4.6, Hazards and Hazardous Materials*)
- Contaminants from LBNL under upset conditions can enter surface and groundwater and can adversely affect Strawberry Creek and the Bay. (*See Section 4.6, Hazards and Hazardous Materials, and Section 4.7, Hydrology and Water Quality*)
- The EIR should address the project's effect on hydraugers and groundwater in the project area, including the effect of dewatering on No Name Creek. (*See Section 4.7, Hydrology and Water Quality*)
- The Lab should evaluate impact on Strawberry Canyon cultural landscape. (*See Section 4.4, Cultural Resources*)

- The EIR should explain whether terrestrial carbon sequestering would occur in Strawberry Canyon. (See **Section 3.0, Project Description**)
- The use of public transit should be emphasized as a way to conserve energy. (See **Section 3.0, Project Description** and **Section 4.12, Transportation and Traffic**)
- The East Bay Municipal Utility District (EBMUD) commented that because sanitary sewer capacity is constrained through the city of Berkeley during the wet season, the utilities analysis in this EIR must include additional information regarding the project's contribution to this constrained line and appropriate mitigation measures. (See **Section 3.0, Project Description** for wastewater options under consideration for the proposed project and **Section 4.13, Utilities and Service Systems**)
- Additionally, EBMUD indicated that it proposes to build a new water storage tank near the project site and that the cumulative impact of that project should be considered in this EIR. (See **Section 5.0, Cumulative Impacts**)
- The EIR should address the cumulative impact of past LBNL development combined with the current projects on human and ecological health and safety. (See **Section 5.0, Cumulative Impacts**)
- Roadways in Strawberry Canyon are already overburdened with traffic and would be more hazardous with the addition of project traffic and large construction trucks from the various projects, especially during an emergency. (See **Section 5.0, Cumulative Impacts**)
- Cumulative construction activities, including the UC Berkeley Stadium project, and intensification of land uses in the project area could affect quality of life. (See **Section 5.0, Cumulative Impacts**) Alternative locations for the proposed project with fewer potential impacts related to aesthetics, biological resources, cultural resources, geology and soils, population and housing, and traffic should be considered. Sites specifically identified in the scoping comments include the UC Berkeley Richmond Field Station, Alameda Air Base, Mare Island Shipyard in the city of Vallejo, Merced, and Nevada. (See **Section 6.0, Alternatives**)

The following areas of controversy were raised during the scoping process for this project that do not relate to the environmental impacts of the proposed project and therefore are not discussed in this EIR. According to various commenters:

- Research could be conducted on more environmentally conscious forms of energy rather than trying to maximize fossil fuel based energy resources. (The research in the Helios Facility will be focused on environmentally conscious forms of energy, including energy from the sun and biomass.)
- Where would biodiesel feedstock be grown for commercial biodiesel production? Any such agriculture would be very damaging. (The proposed project does not include commercial biodiesel feedstock production, but instead, as explained in **Section 3.0**, includes research related to biodiesel, including research related to the environmental impact and sustainability assessment relating to feedstock development for biodiesels.)
- BP as a for-profit oil company should not be allowed to take advantage of the tax haven at LBNL, and should locate its research elsewhere in Berkeley. (The tax consequences of the proposed project are not an environmental issue.)

- Global impacts of nanotechnology and GMO development should be examined. (*Evaluation of global impacts is outside the scope of this EIR. However, it is noted that both the international community and the US Government have launched research programs focused at understanding the effects of nanotechnology. Use of transgenic materials in research has been ongoing for a long time and guidelines are in place to protect researchers handling such materials as well as the public and the environment.*)
- A one-year moratorium should be implemented on development at LBNL to analyze projected growth and clean up of previous hazardous material releases. (*The commenter's view is noted. Please note that the environmental effects of the projected growth at the Berkeley Lab are evaluated in **Section 5.0, Cumulative Impacts.***)
- Lifestyle changes should be implemented rather than focusing on research to develop new energy sources. (*The commenter's view is noted.*)

**Table 2.0-1
Summary of Impacts and Mitigation Measures**

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.1 Aesthetics			
Impact VIS-1		Mitigation Measure VIS-1	
Construction activities associated with the project would create temporary aesthetic nuisances for adjacent land uses.	Potentially Significant	LBNL and their contractors shall minimize the use of on-site storage and when necessary store building materials and equipment away from public view to the maximum extent feasible and shall keep activity within the project site and laydown areas.	Less than significant
Impact VIS-2		Mitigation Measure VIS-2	
The proposed project would alter views of the LBNL site and would result in a substantial adverse effect to a scenic vista or substantially damage scenic resources.	Significant	Trees and mature vegetation removal that is required for the access road construction will be minimized to reduce the potential visibility of the improved roadway.	Significant and Unavoidable
Impact VIS-3		Mitigation Measure	
The proposed project would alter the existing visual character of the Berkeley Laboratory site but would not substantially degrade the existing visual character and quality of the site and its surroundings.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.1 Aesthetics (continued)			
Impact VIS-4		Mitigation Measure VIS-4	
The proposed project would create a new source of substantial light or glare that would not adversely affect day or nighttime views in the area.	Potentially Significant	<p>Mitigation Measure VIS-4a: Upon project implementation, the contractor shall install the PV panels at adequate angles that minimize the amount of glare that could be created while maintaining the functionality of the PV system.</p> <p>Mitigation Measure VIS-4b: Upon project implementation, the contractor shall install a mechanized system that controls the angle of the proposed PV louvers. This system shall be designed to ensure screening to building occupants while eliminating PV louver angles that would create substantial sources of glare.</p> <p>Mitigation Measure VIS-4c: To the maximum extent feasible, glazing materials shall be installed on the glass that comprises the PV louvers. The glazing shall be installed only if it can reduce glare while maintaining the functionality of the PV film within the glass.</p>	Less than significant
4.2 Air Quality			
Impact AIR-1		Mitigation Measure	
Construction of the proposed project would generate short-term emissions of fugitive dust and criteria air pollutants that would not adversely affect local air quality in the vicinity of the construction site.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.2 Air Quality (continued)			
Impact AIR-2		Mitigation Measure	
The proposed project would generate long-term operational emissions of criteria pollutants from increases in traffic and stationary and area sources that would not adversely affect air quality.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact AIR-3		Mitigation Measure	
The proposed project would increase carbon monoxide concentrations at busy intersections and along congested roadways in the project vicinity but would not expose sensitive receptors to substantial pollution concentrations.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact AIR-4		Mitigation Measure	
The proposed project would not create objectionable odors affecting a substantial number of people.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact AIR-5		Mitigation Measure	
The proposed project would not expose maximally exposed individuals to cancer risks exceeding 10 in one million.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact AIR-6		Mitigation Measure	
The proposed project would not generate ground level concentrations of noncarcinogenic toxic air contaminants that would result in a Hazard Index greater than 1.0 for the maximally exposed individual.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.3 Biological Resources			
Impact BIO-1		Mitigation Measure BIO-1	
Construction of the proposed project would result in the permanent removal of 4.01 acres of vegetation.	Potentially Significant	<p>Mitigation Measure BIO-1a: All trees removed to construct the proposed project will be replaced at a ratio of 2:1.</p> <p>Mitigation Measure BIO-1b: For trees that would be removed by the project and meet the UC Berkeley Specimen tree criteria, LBNL will replace the trees at a ratio of 3:1, consistent with UC Berkeley's tree replacement policy.</p> <p>Mitigation Measure BIO-1c: To ensure the successful replacement of trees, a tree replacement plan shall be implemented within the LBNL boundary and shall meet the following standards. (1) The plan shall identify suitable areas for tree replacement to occur such that existing native woodlands are enhanced and/or expanded. (2) The plan shall provide for replacing trees at a 2:1 ratio (or 3:1 for specimen trees, as appropriate), with native trees replaced in-kind and non-native trees replaced with appropriate native species. (3) The plan shall specify, at a minimum, the following: (a) the location of planting sites; (b) site preparation and planting procedures; (c) a schedule and action plan to maintain and monitor the tree replacement sites; (d) a list of criteria and performance standards by which to measure success of the tree replacement; and (e) contingency measures in the event that tree replacement efforts are not successful.</p>	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.3 Biological Resources (continued)			
Impact BIO-2		Mitigation Measure BIO-2	
The proposed project could result in direct and indirect adverse effects to creeks and seeps subject to ACOE and CDFG jurisdiction and sensitive plant communities and sensitive habitats.	Less than significant	To further ensure the success of the required Wetland Mitigation Plan, the plan shall specify, at a minimum, the following: (1) the goals of the mitigation effort; (2) the location of the mitigation site; (3) the approach, site preparation and planting procedures; (4) a schedule and action plan to maintain and monitor the mitigation site; (5) a list of criteria and performance standards by which to measure success of the wetland mitigation; and (6) contingency measures in the event that mitigation efforts are not successful.	Less than significant
Impact BIO-3		Mitigation Measure	
The proposed project would not adversely affect special-status nesting birds (including raptors) such that nests are destroyed, they abandon their nests or that their reproductive efforts fail.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact BIO-4		Mitigation Measure	
Removal of trees and structures during the breeding season would not result in direct mortality of special-status bats. In addition, construction noise would not cause maternity roost abandonment and subsequent death of young.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact BIO-5		Mitigation Measure BIO-5	
Construction of the proposed project would not result in take or harassment of Alameda whipsnake.	Less than significant	Signage shall be posted along the road identifying the potential presence of rare and protected wildlife and the need to proceed with caution for the safety of the species.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.4 Cultural Resources			
Impact CUL-1		Mitigation Measure	
The proposed project would not cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact CUL-2		Mitigation Measure	
The proposed project would not cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact CUL-3		Mitigation Measure	
The proposed project would not disturb any human remains, including those interred outside of formal cemeteries.	Less than significant	No project-level mitigation measure required.	Less than significant
4.5 Geology and Soils			
Impact GEO-1		Mitigation Measure	
The proposed project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact GEO-2		Mitigation Measure GEO-2	
The proposed project would not expose people to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic ground-shaking hazards, although some structures could sustain damage.	Potentially Significant	In addition to damage assessment of the Helios building (which is covered in the LBNL Master Emergency Program Plan), assessment of stormwater conveyance systems and detention/retention vaults and Helios retaining walls will be conducted by the Damage Assessment Team following earthquakes strong enough to cause damage.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.5 Geology and Soils (continued)			
Impact GEO-3		Mitigation Measure GEO-3	
The proposed project could expose people and structures to seismic landslide hazards.	Potentially Significant	All recommendations of the site-specific geotechnical study shall be incorporated into the project design and implemented as part of the project.	Less than significant
Impact GEO-4		Mitigation Measure GEO-4	
The proposed project is located in an area of expansive soils that could create substantial risk to life or property.	Potentially Significant	Implementation of Mitigation Measure GEO-3	Less than significant
Impact GEO-5		Mitigation Measure GEO-5	
The proposed project is located on a geologic unit that may be unstable or could become unstable as a result of the project.	Potentially Significant	The project proposes the use of water quality swales to treat stormwater runoff. These treatment facilities often incorporate infiltration of stormwater to provide water quality treatment. If site-specific geotechnical investigations indicate that infiltration of excess stormwater is not feasible due to slope-stability considerations, stormwater control and water quality treatment features will be designed with appropriate underdrain and/or retention systems to maintain the function of these facilities without infiltrating the collected stormwater.	Less than significant
4.6 Hazards and Hazardous Materials			
Impact HAZ-1		Mitigation Measure	
Implementation of the proposed project would increase the routine use, transport and storage of hazardous materials and other scientific materials at LBNL but would not create a significant hazard to the public or the environment under the routine or reasonably foreseeable upset and accident conditions.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.6 Hazards and Hazardous Materials (continued)			
Impact HAZ-2		Mitigation Measure HAZ-2	
The proposed project would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 but some project components would be located in areas where contamination may be present, and as a result, could create a potentially significant hazard to the public or the environment.	Potentially Significant	LBNL will prepare a due diligence assessment of all areas that would be excavated in order to install the new sewer pipeline. If contaminated materials are anticipated, the soils will be tested, and LBNL will implement appropriate measures to ensure that the contaminated soils or groundwater do not adversely affect construction workers and the environment.	Less than significant
Impact HAZ-3		Mitigation Measure	
The proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact HAZ-4		Mitigation Measure	
The proposed project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.7 Hydrology and Water Quality			
Impact HYDRO-1		Mitigation Measure HYDRO-1	
Development of the project site would increase the area of impervious surfaces that would result in increased volume of stormwater runoff that could contribute to erosion and/or siltation in Strawberry Creek.	Potentially Significant	<p>Mitigation Measure HYDRO-1a: Should a hydromodification control facility not be feasible in the lower portion of the Helios access road, the primary hydromodification vault (located under the turnaround) shall be oversized to control and compensate for the additional impervious surfaces not controlled at in the lower portion of the access road. This would be done by redesigning the primary hydromodification vault using the Bay Area Hydrology Model to handle stormwater flow from existing impervious surfaces near the project area (equal to that of the extra access road impervious area) that currently do not contain hydromodification controls.</p> <p>Mitigation Measure HYDRO-1b: Using the Bay Area Hydrology Model, calculations shall be provided following approval of the final project design to show that the proposed hydromodification vault (or vaults) is (are) sized appropriately to control flows such that 'flow duration control' is provided between 10 percent of the 2-year recurrence storm and the 10-year recurrence storm.</p>	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.7 Hydrology and Water Quality (continued)			
Impact HYDRO-2		Mitigation Measure HYDRO-2	
Development of the site would alter surface drainage patterns on the site which could result in increased peak flows and induce flooding in downstream reaches.	Potentially Significant	<p>Mitigation Measure HYDRO-2a: The hydromodification vault will be oversized to incorporate control of peak flows for the 25-, 50-, and 100-year events. The excess storage volume will be designed such that the 'hydromodification control' function of the vault (for peaks and flow duration than the 10-year storm) is not affected. Final design calculations showing no increases in peak runoff for the 25-, 50-, and 100-year events will be provided to and reviewed by LBNL staff upon finalization of the project design.</p> <p>Mitigation Measure HYDRO-2b: Stormwater detention (such as an oversized pipe system or detention vault) shall be provided for the portion of the project draining to the mid-canyon detention basin to control peak flows for the 25-, 50-, and 100-year storms. Final design calculations showing no increase in peak runoff for the 25-, 50-, and 100-year events will be provided to and reviewed by LBNL staff upon finalization of the project design. If a hydromodification vault is included for this section, it may be adapted to control for larger events (assuming that the hydromodification control function is not affected). Alternatively, should capacity allow, stormwater detention may be provided within the mid-canyon detention basin. In this case, final design calculations shall show that project runoff does not increase peak flows for the 25-, 50-, and 100-year storm events from the mid-canyon detention basin.</p>	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.7 Hydrology and Water Quality (continued)			
Impact HYDRO-3		Mitigation Measure	
Project construction activities would not increase turbidity or decrease water quality in surface waterways.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact HYDRO-4		Mitigation Measure HYDRO-4	
Stormwater runoff from the proposed parking area, access road and other impervious surfaces could potentially contribute to long-term pollutant discharges to surface waters, including on-site streams and downstream to Strawberry Creek and the Bay.	Potentially Significant	<p>Mitigation Measure HYDRO-4a: Vegetated swales will be incorporated into the project to maintain water quality of runoff and avoid exceeding water quality objectives prior to discharge to creeks. LBNL shall provide calculations showing that design of the swales meets recognized criteria for design of water quality BMPs. Should it be determined that appropriately sized vegetated swales are not feasible, then alternative RWQCB-approved methods of treating stormwater runoff, such as in-line pollution prevention devices or infiltration galleries, shall be incorporated into the project. All water quality treatment and source controls shall be summarized in the project-specific SWPPP.</p> <p>Mitigation Measure HYDRO-4b: An in-line pollution prevention device (such as a CDS unit or Stormceptor) will be installed within the storm drain system along the proposed access road where vegetated bioswales are not feasible.</p>	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.7 Hydrology and Water Quality (continued)			
Impact HYDRO-5		Mitigation Measure HYDRO-5	
Discharge of groundwater pumped or drained as part of construction-phase or post-construction-phase dewatering activities could adversely affect surface water quality.	Potentially Significant	Tritium monitoring shall continue at existing temporary monitoring wells SB31-02-2 and SB31-02-1 and shall be included in the long-term tritium monitoring program. In addition, sampling of discharges related to dewatering activities in the northern portion of the project, both during (where encountered in pier and/or test borings or other excavations) and after project construction (via pumping or gravity subdrains), shall be added to and managed under the tritium monitoring portion of LBNL Environmental Restoration Program. All water from the dewatering system in the northern portion of the project will be collected and transported to an EPA-approved disposal facility, or will be re-infiltrated near the top of the plume to increase the residence time of the water and allow the tritium to decay.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.8 Land Use and Planning			
Impact LU-1		Mitigation Measure	
The proposed project would not conflict with the applicable land use plan or policy (i.e., 2006 LBNL LRDP, 2006 LBNL Design Guidelines, or UC Berkeley 2020 LRDP) adopted for the purpose of avoiding or mitigating an environmental effect.	Less than significant	No project-level mitigation measure required.	Less than significant
4.9 Noise			
Impact NOISE-1		Mitigation Measure	
Construction/demolition activities would temporarily elevate noise levels at the project site and surrounding areas.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact NOISE-2		Mitigation Measure	
Temporary vibration related to construction activities would not cause an impact.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact NOISE-3		Mitigation Measure	
Vehicular traffic associated with the Helios project would result in an incremental, but imperceptible, long-term increase in ambient noise levels.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact NOISE-4		Mitigation Measure	
The operation of heating, ventilating, and air conditioning equipment at the Helios Facility would not result in a substantial long-term increase in ambient noise levels.	Less than significant	No project-level mitigation measure required.	Less than significant
4.10 Population and Housing			
Impact POP-1		Mitigation Measure	
The proposed project would not induce substantial population growth in an area, either directly or indirectly.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.11 Public Services			
Impact PUB-1		Mitigation Measure	
The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities in order to maintain acceptable service ratios, response times, or other performance objectives, the construction of which could cause significant environmental impacts.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact PUB-2		Mitigation Measure	
The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities in order to maintain acceptable service ratios, response times, or other performance objectives, the construction of which could cause significant environmental impacts.	Less than significant	No project-level mitigation measure required.	Less than significant
4.11 Public Services (continued)			
Impact PUB-3		Mitigation Measure	
The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered school facilities in order to maintain acceptable service ratios or other performance objectives, the construction of which could cause significant environmental impacts.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact PUB-4		Mitigation Measure	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered park or recreational facilities in order to maintain acceptable service ratios or other performance objectives, the construction of which could cause significant environmental impacts.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact PUB-5		Mitigation Measure	
The proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated.	Less than significant	No project-level mitigation measure required.	Less than significant
4.12 Transportation and Traffic			
Impact TRANS-1		Mitigation Measure	
The proposed Helios project would not cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system result in additional delay at study intersections under the Near-Term conditions.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
<p>Impact TRANS-2</p> <p>The design of the proposed Helios parking lot area and access road may would not result in inefficient and unsafe operations.</p>	Less than significant	<p>Mitigation Measure TRANS-2</p> <p>Final design should shall incorporate the following measures to improve the efficiency and ensure the safety of vehicles, bicyclists, and pedestrians:</p> <ul style="list-style-type: none"> • Design the Centennial Drive/Helios Access Road intersection to provide adequate sight distance for a design speed of 35 miles per hour to allow vehicles to safely turn into and out of the new Helios Access Road. Trim foliage near the intersection on a regular basis to maintain adequate sight distance. • Locate the gates on the new roadway to provide adequate sight distance for vehicles approaching the gate. • Provide turn-around area prior to the gate to allow vehicles that enter the access site roadway by error to turn around. • Design the new Centennial Drive/Helios Access Road intersection, roadway, and parking lot area to accommodate shuttle bus circulation. 	Less than significant
<p>Impact TRANS-3</p> <p>The proposed Helios project would result in increases in transit ridership.</p>	Less than significant	<p>Mitigation Measure</p> <p>No project-level mitigation measure required.</p>	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.12 Transportation and Traffic (continued)			
Impact TRANS-4			
The proposed Helios project would result in increased parking demand that may exceed the available parking supply.	Significant	LBNL shall implement the following measures during special events at the Helios auditorium: <ul style="list-style-type: none"> • Implement Provide attendant and/or stacked parking for special events only. Attendant and/or stacked parking should not be used for regular day-to-day operations as it would be inconsistent with the LBNL principle to discourage driving and encourage alternative travel modes; and • Include information on availability of alternative transportation modes, such as LBNL shuttles, in announcements of special events at the Helios auditorium. 	Less than significant
Impact TRANS-5			
The proposed Helios project would potentially not result in increased hazards to pedestrians or bicyclists or conflicts with adopted policies, plans, or programs promoting walking or bicycling.	Less than significant	Mitigation Measure No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.12 Transportation and Traffic (continued)			
Impact TRANS-6		Mitigation Measure TRANS-6	
The construction of the proposed Helios project would temporarily and intermittently result in impacts on vehicles, pedestrians, or bicyclists, and parking.	Less than significant	LBNL shall Implement Construction Traffic Management Plan as included in LRDP BP 6b. include the following additional measures in the CTMP prepared for the proposed project: <ul style="list-style-type: none"> • For trucks hauling fill material from the CRT site or the on-site borrow area, propose internal truck routes within the LBNL site to minimize disruption to vehicle, bicycle, and pedestrian circulation and parking. • Consider stacked parking within the LBNL site or off-site parking for construction workers to minimize parking demand. • If necessary, require a flag person shall to direct traffic when trucks enter and exit the Helios Access Road on Centennial Drive. 	Less than significant
4.13 Utilities and Service Systems			
Impact UTILS-1		Mitigation Measure	
Implementation of the Helios project would not require an expansion of the EBMUD wastewater treatment plant or an expansion of the City's/EBMUD's sewer conveyance facilities.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact UTILS-2		Mitigation Measure	
The proposed project would require the construction of new storm water drainage facilities, the construction of which would not cause significant environmental impacts.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.13 Utilities and Service Systems (continued)			
Impact UTILS-3		Mitigation Measure	
The proposed project would result in the need for additional chilled water facilities, the construction and operation of which would not result in a significant environmental impact.	Less than significant	No project-level mitigation measure required.	Less than significant
Impact UTILS-4		Mitigation Measure	
The proposed project would create additional demand for electricity and natural gas, but would not result in the construction of new or expansion of existing transmission or energy production facilities.	Less than significant	No project-level mitigation measure required.	Less than significant
5.0 Cumulative Impacts			
Cumulative Impact VIS-1		Mitigation Measure	
Construction activities associated with the proposed project in conjunction with other near-term development, would not substantially affect visual resources.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact VIS-2		Mitigation Measure	
The proposed project, in conjunction with reasonably foreseeable near-term and long-term development, would not substantially affect visual resources.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact AIR-1		Mitigation Measure	
The proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
5.0 Cumulative Impacts (continued)			
Cumulative Impact AIR-2		Mitigation Measure	
Although the proposed project would result in greenhouse gas emissions, its contribution to the significant cumulative impact associated with greenhouse gas emissions would not be cumulatively considerable.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact AIR-3		Mitigation Measure	
Even though overall cumulative impacts will decrease over time, the proposed project will make some incremental contribution to cumulative cancer risk impacts associated with future development of LBNL and UC Berkeley.	Significant	Because most of the cancer risk from TACs is due to diesel particulate emissions, measures to reduce the risk (beyond regulations already in place that will substantially reduce diesel particulate emissions in the next 20 years) shall include those measures that could reduce vehicle travel to and from the Helios project (LRDP Mitigation Measures TRANS-1d and TRANS-3), and those measures that reduce emissions from construction equipment and the project's backup generator (LRDP Mitigation Measures AQ-1b and AQ-4a).	Significant and Unavoidable
Cumulative Impact AIR-4		Mitigation Measure	
The proposed project would not result in a cumulatively considerable contribution to cumulative noncancer health impacts associated with future development of LBNL and UC Berkeley.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact BIO-1		Mitigation Measure	
The proposed project, in conjunction with other reasonably foreseeable near-term projects and long term development, would not result in a significant cumulative impact on biological resources.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
5.0 Cumulative Impacts (continued)			
Cumulative Impact CUL-1		Mitigation Measure	
The proposed project, in conjunction with other reasonably foreseeable near-term and long-term development, would not result in a significant cumulative impact on cultural resources.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact GEO-1		Mitigation Measure	
The proposed project, in conjunction with reasonably foreseeable near-term and long-term development, would place new structures and introduce an increased population in a seismically active region.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact HAZ-1		Mitigation Measure	
The proposed project, in conjunction with reasonably foreseeable near term and long term development, would involve the use of hazardous chemicals that would not pose a significant cumulative risk to the public or the environment.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact HAZ-2		Mitigation Measure	
The proposed project, in conjunction with reasonably foreseeable near term and long term development, would result in a cumulative impact related to emergencies associated with a wildland fire or a major earthquake, but the project's contribution to the cumulative impact would not be considerable.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
5.0 Cumulative Impacts (continued)			
Cumulative Impact HYDRO-1		Mitigation Measure	
The proposed project, in conjunction with reasonably foreseeable near term and long term development, would not result in a cumulative impact on surface water resources.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact LU-1		Mitigation Measure	
The proposed project, in conjunction with reasonably foreseeable near term and long term development, would not involve a significant cumulative impact related to land use.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact NOISE-1		Mitigation Measure	
Near-term development in the vicinity of the project site would increase exterior noise levels during construction.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact NOISE-2		Mitigation Measure	
The proposed project, in conjunction with reasonably foreseeable near term and long term development, would not result in a significant cumulative permanent increase in ambient noise levels.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact POP-1		Mitigation Measure	
The proposed project, in conjunction with reasonably foreseeable near-term and long-term development, would not result in a significant cumulative impact on population or housing.	Less than significant	No project-level mitigation measure required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
5.0 Cumulative Impacts (continued)			
Cumulative Impact PUB-1		Mitigation Measure	
The proposed project, in conjunction with reasonably foreseeable near-term and long-term development, would not result in a significant cumulative demand for public services.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact TRANS-1		Mitigation Measure Cumulative TRANS-1	
The proposed project, in conjunction with reasonably foreseeable near-term and long-term development, would not result in a significant cumulative increase in levels of service.	Significant	Further mitigation is not feasible.	Significant and Unavoidable
Cumulative Impact TRANS-2		Mitigation Measure	
Although construction traffic associated with near-term projects could result in temporary periods of traffic congestion on city streets, the project's contribution to the impact would not be cumulatively considerable.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact TRANS-3		Mitigation Measure	
The proposed project, in conjunction with other reasonably foreseeable near-term and long-term development, would not substantially affect transit, parking, or pedestrian and bicycle circulation.	Less than significant	No project-level mitigation measure required.	Less than significant
Cumulative Impact UTILS-1		Mitigation Measure	
The proposed project, in conjunction with reasonably foreseeable near-term and long-term development, would not result in a significant cumulative demand for utilities and service systems.	Less than significant	No project-level mitigation measure required.	Less than significant

**Table 2.0-2
Summary Comparison of Helios Project Alternatives**

Helios Project Impact		Proposed Helios Project (Before Mitigation)	No Project Alternative	Reduced Facility Alternative	Split Design Alternative	Alternate LBNL Location Alternative	Proposed Project with Alternate Roadway Alignment
VIS-1	Construction activities associated with the project would create temporary aesthetic nuisances for adjacent land uses.	PS (Less than Significant with Mitigation)	NI*	=/-	=	+	=
VIS-2	The proposed project would alter views of the LBNL site and would result in a substantial adverse effect to a scenic vista or substantially damage scenic resources.	S (Significant and Unavoidable)	NI*	=	=	+	=
VIS-4	The proposed project would create a new source of substantial light or glare that would not adversely affect day or nighttime views in the area.	PS (Less than Significant with Mitigation)	NI*	=/-	=	+	=

Helios Project Impact		Proposed Helios Project (Before Mitigation)	No Project Alternative	Reduced Facility Alternative	Split Design Alternative	Alternate LBNL Location Alternative	Proposed Project with Alternate Roadway Alignment
BIO-1	Construction of the proposed project would result in the permanent removal of 4.01 acres of vegetation.	PS (Less than Significant with Mitigation)	NI	=	=	-	-
GEO-2	The proposed project would not expose people to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic ground-shaking hazards, although some structures could sustain damage.	PS; (Less than Significant with Mitigation)	NI*	=	=	=	=
GEO-3	The proposed project could expose people and structures to seismic landslide hazards.	PS; (Less than Significant with Mitigation)	NI*	=	=	=/-	=
GEO-4	The proposed project is located in an area of expansive soils that could create substantial risk to life or property.	PS; (Less than Significant with Mitigation)	NI*	=	=	=/-	=
GEO-5	The proposed project is located on a geologic unit that may be unstable or could become unstable as a result of the project.	PS; (Less than Significant with Mitigation)	NI*	=	=	=/-	=

Helios Project Impact		Proposed Helios Project (Before Mitigation)	No Project Alternative	Reduced Facility Alternative	Split Design Alternative	Alternate LBNL Location Alternative	Proposed Project with Alternate Roadway Alignment
HAZ-2	The proposed project would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, but some project components would be located in areas where contamination is present and as a result, could create a potentially significant hazard to the public or the environment.	PS; (Less than Significant with Mitigation)	NI*	=	=	=	=
HYDRO-1	Development of the project site would increase the area of impervious surfaces that would result in increased volume of stormwater runoff that could contribute to erosion and/or siltation in Strawberry Creek.	PS; (Less than Significant with Mitigation)	NI*	-	+	-	-

Helios Project Impact		Proposed Helios Project (Before Mitigation)	No Project Alternative	Reduced Facility Alternative	Split Design Alternative	Alternate LBNL Location Alternative	Proposed Project with Alternate Roadway Alignment
HYDRO-2	Development of the site would alter surface drainage patterns on the site which could result in increased peak flows and induce flooding in downstream reaches.	PS (Less than Significant with Mitigation)	NI*	=	+	-	=
HYDRO-4	Stormwater runoff from the proposed parking area, access road and other impervious surfaces could potentially contribute to long-term pollutant discharges to surface waters, including on-site streams and downstream to Strawberry Creek and the Bay.	PS (Less than Significant with Mitigation)	NI*	=	+	-	=
HYDRO-5	Discharge of groundwater pumped or drained as part of construction-phase or post-construction-phase dewatering activities could adversely affect surface water quality.	PS (Less than Significant with Mitigation)	NI*	=	=	-	=

Helios Project Impact		Proposed Helios Project (Before Mitigation)	No Project Alternative	Reduced Facility Alternative	Split Design Alternative	Alternate LBNL Location Alternative	Proposed Project with Alternate Roadway Alignment
TRANS-4	The proposed Helios project would result in increased parking demand that may exceed the available parking supply.	PS (Less than Significant with Mitigation)	NI*	=	=		=
Cumulative TRANS-1	Implementation of the proposed Helios project, in conjunction with Berkeley Lab growth under the 2006 LRDP, and other regional growth would degrade the level of service at certain local intersections under 2025 conditions.	S (Significant and Unavoidable)	NI*	=	=	=	=
Cumulative AIR-3	Even though overall cumulative impacts will decrease, the proposed project will make some incremental contribution to cumulative cancer risk impacts associated with future development of LBNL and UC Berkeley.	S (Significant and Unavoidable)	NI	=	=	=	=

Helios Project Impact		Proposed Helios Project (Before Mitigation)	No Project Alternative	Reduced Facility Alternative	Split Design Alternative	Alternate LBNL Location Alternative	Proposed Project with Alternate Roadway Alignment
New Impact (related to Alternatives 4 and 5)	Project driveway/roadway connection to Centennial Drive could be unsafe.	LS	NI*	=	=	+ (PS)	+ (PS)

KEY

- S Significant impact
LTS Less than significant impact
NI No Impact
= Impact similar to proposed project
-- Impact less than proposed project
+ Impact greater than proposed project

Source:

NI* There would be environmental impacts from the development of another project at the proposed site, pursuant to the 2006 LRDP.