CHAPTER 6
ALTERNATIVES

6.1 INTRODUCTION

CEQA requires that an EIR evaluate the comparative effects of "a reasonable range of potentially feasible alternatives" to a project. Alternatives are deemed appropriate for EIR analysis if they "would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project" (CEQA Guidelines Section 15126.6(a)). A recognized "rule of reason" holds that the EIR need only analyze those alternatives necessary to permit a reasoned choice (CEQA Guidelines Section 15126.6(f)). Evaluation of a No Project Alternative and identification of an environmentally superior alternative are required. The significant effects of the alternatives shall be discussed, but in less detail than the significant effects of the proposed project (CEQA Guidelines Section 15126.6(d)).

6.2 PROJECT OBJECTIVES

In order to accomplish the purpose and need, the University has the following project objectives for the LRDP. The project should:

- Be located within an approximately 20- to 25-minute commute from the existing LBNL main entrance at Blackberry Gate on Hearst Avenue; or an approximately 20 minute commute from UC Berkeley's main entrance at Oxford and University Avenue.
- Have development capacity for approximately 5.4 million gsf of laboratory, office, and support facilities and related utility and transportation infrastructure to support the University's research, teaching, and public service mission.
- Be located in a safe and welcoming community with a positive civic expression of interest in development of the site.
- Be readily accessible to a variety of modes of public transportation, inclusive of local buses, mass transit (BART, Amtrak, and AC Transit), and shuttle services, and allow safe bicyclist access from designated bicycle routes.
- Allow for electrical, natural gas, and water utilities for the lowest possible cost.
- Allow consolidation of LBNL bioscience programs.
- Allow for establishment of a design framework for development of a state-of-the-art research campus that will be the location of choice for internationally recognized researchers.
- Foster synergy and collaboration between UC Berkeley and LBNL and within and across disciplines and institutions in both the public and private sectors.
- Provide sustainable land use and circulation patterns which maximize density to reduce overall building footprints and conserve open space, and maximize bicycle, pedestrian and shuttle services allow for placement and massing of buildings to maximize shared views.
- Facilitate efficient constructability of facilities (buildings, parking structures, bridges, etc.), infrastructure development (roads, underground utilities, pedestrian walkways, etc.), and open space.
- Foster connectivity with the surrounding community.

- Leverage capital investment for environmental stewardship

The proposed project is expected to have significant and unavoidable adverse impacts on air quality, cultural resources, greenhouse gas emissions, and transportation and traffic. The significant impacts on aesthetics and visual quality, biological resources, geology and soils, noise, and utilities, service systems, and energy could be mitigated to less than significant. Less than significant impacts are anticipated for hazards and hazardous materials, hydrology and water quality, land use and planning, population and housing, and public services and recreation.

6.3 Range of Alternatives Considered

The EIR alternatives were selected in consideration of one or more of the following factors:

- The extent to which the alternative would accomplish most of the basic project objectives (identified in Section 6.2 above);
- The extent to which the alternative would avoid or lessen any of the project's significant adverse environmental effects;
- Feasibility, taking into account site suitability, economic viability, infrastructure availability, regulatory consistency, and the project sponsor's ability to acquire or control the site;
- Contribution toward assembling a "reasonable range" of alternatives necessary to permit a reasoned choice;
- CEQA Guidelines requirements, including for the analysis of "no project" and "environmentally superior" alternatives (CEQA Guidelines Section 15126.6); and
- Scoping requests and suggestions from the public, groups, and/or agencies.

The following project alternatives to full 2014 LRDP development of the RBC site are considered in this EIR:

- Alternate Development Program;
- Reduced Growth Program;
- Development at one of the locations considered during the site selection process; and
- No Project Alternative.

6.4 Alternatives Considered but Rejected

None of the alternatives presented in Section 6.3 were rejected. Alameda Point was selected as representative of a group of sites that were considered during the process that led to identification of the University's Richmond properties as the preferred location for a new research campus.

6.5 Alternatives Considered in Detail

This section provides detailed descriptions and analyses of the following alternatives to full RBC development:

- Alternate Development Program (Alternative 1);
- Reduced Growth Program (Alternative 2);
- Alameda Point Alternative (Alternative 3); and
- No Project Alternative (Alternative 4).

A description of these alternatives, as well as a discussion of their potential impacts compared to those of the proposed project, is provided in the sections that follow. The attributes of these alternatives are presented in Table 6-1.

Table 6-1
Comparison of the LRDP Alternatives

	Proposed Project	Alternative 1	Alternative 2	Alternative 3
Total Acreage	134	134	134	124
Development Acreage	109	109	109	124
Natural Open Space Acreage	25	25	25	0
Development Square Footage	5.4M gsf	5.4M gsf	3.6M gsf	5.4M gsf
Employee Population	10,000	10,000	8,400	10,000
Building Demolition	0.75M gsf	0.75M gsf	0.75M gsf	TBD

6.5.1 Alternative 1: Alternate Development Program

Description

Under the Alternate Development Program, the 2014 LRDP would be modified to include a large-scale future scientific facility or machine with certain unique features/characteristics and utility demands. Such facilities exist at LBNL and other National Laboratories; they are often cutting-edge "user facilities" that attract nationwide and international researchers. These facilities are typically unique and take many forms; at LBNL, user facilities include an electron microscope facility, a light-source synchrotron, a supercomputing center, and a nanoscience laboratory. For this RBC alternative, the University has no particular type of scientific facility in mind, but to keep a wide variety of future options open, there are certain characteristics that would be assumed for planning purposes: the future scientific facility would be housed in a large, dedicated building or buildings; it would likely require generous amounts of utilities, particularly energy for heating, cooling, back-up power, and heavy machinery; and it should have the ability to lay out in a lengthy footprint that could include tunneling or trenching.

Including this facility as part of the RBC would not exceed the total building space that is anticipated under the proposed project, an increase from approximately 1,050,000 gsf at the present time to 5,400,000 gsf at full implementation. Also, this alternative would demolish and retain the same amount of existing building space as would the proposed project. The campus population would also increase in the same manner as the proposed project from approximately 300 persons in 2012 to approximately 10,000 persons in 2050. Under this alternative, approximately 108 acres of the RBC upland parcels would be developed, and approximately 25 acres of the upland parcels would be preserved as natural open space. Land uses under this alternative would be the same as those depicted in proposed project Figure 3-3.

The Alternate Development Program would satisfy all of the University's project objectives. As described below, it would result in impacts similar to those of the proposed project in most resource areas, but would result in potentially greater impacts in the areas of biological resources, air quality, and greenhouse gas emissions.

Impacts

Aesthetics and Visual Quality

Aesthetic impacts under the Alternate Development Program would be substantially the same as that of the proposed project. As with the proposed project, this alternative has the potential to result in potentially significant impacts to the visual character of the campus site through an increase in buildings that are visible from off-site.(LRDP Impact AES-1). Similarly, the Alternate Development Program would not result in significant impacts to the view of scenic vistas in the vicinity (LRDP Impact AES-2) and the impact on artificial light and glare was evaluated to be less than significant due to the existing industrial character of the area and existing facilities in the vicinity of the proposed site (LRDP Impact AES-3). Mitigation measures applicable to the proposed project would apply to this alternative. Impacts of this alternative would be less than significant with mitigation.

Air Quality

The Alternative Development Program would include approximately the same square footage and the total daily site population; the major difference would be inclusion of a large-scale "future scientific facility" with this alternative. The future scientific facility could include research operations that emit criteria air pollutants and TACs. Because the specific nature of such a facility would be based on future proposals, specific details about facility construction and operations cannot be known, and no quantitative analysis has been done to account for these projected uses. Future scientific facility operations could increase air emissions beyond the levels identified and analyzed for the proposed project. The mitigation measures applicable to the proposed project would be incorporated for this alternative, and although these mitigation measures would minimize emissions and address potential long-term health risk, air quality impacts are assumed to remain significant and unavoidable.

Biological Resources

Impacts related to demolition and building construction and increased projected campus populations would be the same.

The proposed project would preserve approximately 15 acres of high quality coastal terrace prairie grassland habitat in the Big Meadow, West Meadow, and EPA Meadow North within the Natural Open Space area. These meadows would not be impacted by project development as approximately 19 acres of the coastal terrace prairie grassland within these meadows would be designated Natural Open Space and would be protected from development and maintained in their natural condition. In comparison, Alternative 1 would likely reduce and/or fragment the area preserved as open space in the Big Meadow and the West Meadow; this could potentially result in a significant impact. The underground tunnel portion of a future scientific facility would be constructed using cut and cover construction techniques, resulting in surface disturbance across the tunnel alignment. Staging areas for equipment and vehicles would be at various locations at the site, including along the tunnel alignment.

Mitigation measures would be as described under the proposed project. Additional mitigation would be required to mitigate the loss of high quality coastal terrace prairie grasslands in the Natural Open Space area.

Cultural Resources

As the area to be developed under this alternative would be substantially the same as under the proposed project, anticipated impacts and mitigation measures for the Alternate Development Program would be the same as the proposed project.

Geology and Soils

Geology and soils impacts under the Alternate Development Program would generally be the same as described for the proposed project. Mitigation measures applicable to the proposed project would apply to this alternative. Impacts of this alternative would be less than significant with mitigation.

Greenhouse Gas Emissions

The Alternate Development Program is essentially the same as the proposed project in terms of the building space that would be constructed and the total daily population that would be on the site. Therefore, GHG emissions associated with construction and operations would be similar to those under the proposed project. This alternative includes a future scientific facility that could have unique features and high utility demands, including water and electricity. The specific details of such a scientific facility are not known at this time and are unavailable for evaluation of operational GHG emissions under this alternative. It is reasonable to assume that this alternative would increase the operational GHG emissions per service person and result in a greater effect on the environment. The same mitigation measure described for the proposed project would apply, and, as with the proposed project, the impact would be significant and unavoidable.

Hazards and Hazardous Materials

Hazards and hazardous material impacts under the Alternate Development Program would be potentially greater than under the proposed project because a future scientific facility could result in higher levels of on-site hazardous materials and an escalation in other hazards, including those associated with specialized scientific equipment. For example, the facility could house a large-scale high-energy lasers or a linear accelerator. Such a facility could generate additional quantities of hazardous wastes, and in the case of an accelerator, could generate low-level radioactive waste associated with activation of materials. Implementation of safety plans, programs, practices, and procedures should ensure that hazards and hazardous materials impacts to the public or the environment would be less than significant.

Hydrology and Water Quality

Under this alternative, there would be no net increase in the maximum 5.4 million gross square feet of proposed development. There would be no change in any of the factors affecting surface or groundwater. The hydrology and water quality impacts would be the same as those of the proposed project and the same mitigation measures would apply. Impacts of this alternative would be less than significant with mitigation.

Land Use and Planning

Under this alternative, there would be no net increase in the maximum 5.4 million gross square feet of proposed RBC development. The land use impacts would be the same as the impacts of the proposed project. Impacts of this alternative would be less than significant.

Noise

Construction. This alternative would involve construction at the same RBC site locations as the proposed project, so the distance between the construction sites and the nearest sensitive receptors also would be the same. Construction of this alternative, including the future scientific facility, would employ the same construction phases described for the proposed project (see Table 4.10-4). Construction noise levels could exceed the limits in the Richmond Noise Ordinance at the nearest sensitive receptor, resulting in a potentially significant impact. The same mitigation measures (LRDP MM NOISE-1a through 1c) would apply and construction noise impacts would be reduced to less than significant.

As with the proposed LRDP, construction would not cause vibration levels at nearby buildings to exceed the damage threshold of 0.5 PPV (in/sec); nor would vibration annoyance thresholds be exceeded in nearby neighborhoods. Vibration would result in a less than significant impact.

Operation. Operation of this alternative, including operation of the future scientific facility, would result in long-term noise impacts from increased site population and traffic volumes and operation of new building cooling towers, air compressors, emergency generators, and new HVAC equipment (see Table 4.10-8). With the exception of generators, operational noise levels would not exceed the limits in the Richmond Noise Ordinance, and the generators would rarely be used. Therefore, operational noise impacts would be less than significant.

Traffic volumes would increase less than 20 percent at the intersections studied (Fehr and Peers 2013). Therefore, the increase in traffic noise would be less than 3 dBA and would not be readily perceivable by the average person so the impact on traffic noise levels would be less than significant.

If vibration-sensitive equipment were to be located at the RBC site, this would be accounted for through the laboratory design process and appropriate vibration-dampening measures would be incorporated as needed.

Population and Housing

Under this alternative, the RBC site population would increase in the same manner as the proposed project from approximately 300 persons in 2012 to approximately 10,000 persons in 2050. The population and housing impacts under the Proposed Project are found to be less than significant. Therefore, population and housing impacts under this alternative also would be less than significant.

Public Services and Recreation

Under this alternative, the RBC population and space increases would be the same as those for the proposed project. Accordingly, public service and recreation impacts would be the same as the impacts of the proposed project. Impacts of this alternative therefore would be less than significant.

Transportation and Traffic

Under the Alternate Development Program, RBC site increases in population and space would be the same as the proposed project. Therefore, impacts to transportation and traffic would be significant and unavoidable and the same as with the proposed project.

Utilities, Service Systems, and Energy

Under this alternative, RBC site increases in population and space would be the same as the proposed project. The utilities and energy impacts of this alternative would be substantially the same as the proposed project, although depending on the specific attributes of the large-scale scientific facility, substantially more water and energy may be used. As the exact nature and specifics of a future scientific facility are not available at this time, it cannot be determined whether provision of additional water and electricity (to account for the future scientific facility) would require the construction of new water and power delivery infrastructure. The wastewater flows from the RBC site would be substantially the same as under the proposed project because the population under this alternative would be the same as the population under the proposed project. The alternative development could potentially contribute to the existing RMSD WWTP and sewer main overflows caused by I&I during wet weather. This would be a potentially significant impact. Impacts of this alternative would be less than significant with LRDP Mitigation Measure UTL-4.

6.5.2 Alternative 2: Reduced Growth Program

Description

Under the Reduced Growth Program, the 2014 LRDP growth parameters for RBC development and population would be lower than those for the proposed project. The amount of building space under this alternative would increase from the RBC site's current 1,050,000 gsf to 3.6 million gsf at full 2014 LRDP implementation. The total site population would increase from its current 300 persons to an estimated 8,400 persons at full implementation of this alternative. Under this alternative, approximately 108 acres of the upland parcels on the RBC would be developed, and approximately 25 acres of the upland parcels would be preserved as natural open space. Land uses under this alternative would be the same as those depicted in Figure 3-3 for the proposed project. As less building space would be constructed on the site's 108 acres designated for development, development density under this alternative would be lower than under the proposed project.

The Reduced Growth Program alternative would satisfy most of the project objectives, but it would not meet the University's objective to provide campus development capacity of up to approximately 5.4 million square feet of new facilities. As described below, it would result in impacts similar to those of the proposed project in most resource areas, but would result in potentially lesser impacts in some resource areas as a result of the smaller development program.

Impacts

Aesthetics and Visual Quality

Aesthetic impacts under the Reduced Growth Alternative would generally be the same as described for the proposed project. However, since this alternative would result in less development at RBC, the visual impacts would be somewhat reduced relative to the proposed project due to a lower density of development under this alternative. Mitigation measures applicable to the proposed project also would apply to this alternative. Impacts of this alternative would be less than significant with mitigation.

Air Quality

The Reduced Growth Program would have less square footage and a smaller daily population than the proposed project. Overall research operations and daily vehicle trips would be reduced, resulting in fewer overall air quality impacts throughout development and implementation of this alternative. Research operations resulting in criteria air pollutant emissions would still occur and require mitigation. Application of the proposed project mitigations for this alternative would minimize air quality impacts; however, impacts would remain significant and unavoidable.

Biological Resources

Compared with the proposed project, impacts on biological resources would be slightly reduced under the Reduced Growth Program Alternative. Impact types would be the same as under the proposed project and Alternative 1 but would be of less magnitude due to the smaller amount of development and smaller project campus population. Natural open space acreage would be the same as under the proposed project and Alternative 1, but landscaped areas in the Research, Education, and Support zone would be greater due to less square footage of buildings. This would provide for a somewhat larger area of marginal habitat for common wildlife species that tolerate human altered landscapes. Mitigation measures applicable to the proposed project would apply to this alternative. Impacts of this alternative would be less than significant with mitigation.

Cultural Resources

Anticipated impacts and mitigation measures for the Reduced Growth Program Alternative would be the same as the proposed project.

Geology and Soils

Geology and soils impacts under the Reduced Growth Program Alternative would generally be the same as described for the proposed project. However, since this alternative would result in less development at RBC, the exposure to geologic and seismic hazards would be marginally reduced. Mitigation measures applicable to the proposed project would apply to this alternative. Impacts of this alternative would be less than significant with mitigation.

Greenhouse Gas Emissions

The Reduced Growth Program would add a smaller amount of building space to the RBC site, and a smaller daily population would be associated with this alternative. Consequently, construction and operational GHG emissions would be somewhat less. As with the proposed project, the impact associated with construction GHG emissions would be less than significant. With respect to the operational GHG emissions, although the emissions would be smaller, they would still result in a rate per service person that would exceed the applicable threshold. The same mitigation measure described for the proposed project would apply, and, as with the proposed project, the impact would be significant and unavoidable.

Hazards and Hazardous Materials

Hazards and hazardous material impacts under the Reduced Growth Program Alternative would generally be the same as described for the proposed project. However, since this alternative would result in less RBC development, the potential impacts would be somewhat reduced. Implementation of safety plans, programs, practices and procedures would ensure that public and environmental impacts from hazards and hazardous material would be less than significant.

Hydrology and Water Quality

The RBC impermeable surfaces area would be reduced under this alternative resulting in somewhat reduced potential for impacts to surface and groundwater. Otherwise the impacts to hydrology and water quality would be the same as described for the proposed project and same mitigation measures would apply. Impacts of this alternative would be less than significant with mitigation.

Land Use and Planning

Under this alternative, the RBC would be developed at the Richmond site, but with a reduction in the total building space and employee population. The land use impacts would be the same as the impacts of the proposed project. Impacts of this alternative would be less than significant.

Noise

Construction. This alternative would involve construction at the same RBC site locations as the proposed project, so the distance between the construction sites and the nearest sensitive receptors would also be the same. Construction for this alternative would employ the same construction phases described for the proposed project (see Table 4.10-4). Construction noise levels could exceed the limits in the Richmond Noise Ordinance at the nearest sensitive receptor, resulting in a potentially significant impact. Mitigation measures LRDP MM NOISE-1a and 1b would apply and construction noise impacts would be reduced to less than significant.

As with the proposed 2014 LRDP project, vibrations associated with construction equipment would not cause vibration levels at nearby buildings to exceed the damage threshold of 0.5 PPV

(in/sec), nor would they exceed established vibration annoyance thresholds at the nearest sensitive receptors, so vibration would result in a less than significant impact.

Operation. Operation of this alternative would result in long-term noise impacts by adding noise-producing site population and traffic volumes and from installing new building cooling towers, emergency generators, and HVAC equipment (see Table 4.10-8). With the exception of generators, operational noise levels would not exceed the limits in the Richmond Noise Ordinance, and the generators would rarely be used. Therefore, operational noise impacts would be less than significant. Because this alternative would produce less noise-producing growth at the RBC site, noise impacts are expected to be marginally less as well.

Traffic volumes would increase less than 20 percent at the intersections studied (Fehr and Peers 2013). Therefore, the increase in traffic noise would be less than 3 dBA and would not be readily perceivable by the average person, so the impact on traffic noise levels would be less than significant.

If vibration-sensitive equipment would be located at the site, existing sources of vibration would be considered during the laboratory design process and appropriate vibration-dampening measures would be incorporated to protect research data quality.

Population and Housing

The population and housing impacts under the Proposed Project would be less than significant. The total site population would increase from an existing 300 persons to an estimated 8,400 persons at full implementation of this alternative. The Reduced Growth Program would reduce the RBC population growth in comparison to the Proposed Project, and the impacts associated with population and housing would be reduced and would remain less than significant.

Public Services and Recreation

Under this alternative, the RBC would be developed at the Richmond site as proposed, but it would provide for the development of a maximum 3.6 million gross square feet of building space. The campus population would increase to an estimated 8,400 persons. Therefore less than significant public service and recreation impacts of the proposed project would be further reduced under this alternative.

Transportation and Traffic

Under this alternative, the RBC would result in a total site population of 8,400 at full implementation. Traffic trips accessing the site would still affect the same study intersections and freeway segments as with the proposed project. Trip generation and distribution would be reduced commensurate with the reductions in total site population as compared with the proposed project. Therefore, impacts to study intersections and freeway sections serving the site would be reduced. Impacts to transit, pedestrian, and bicycle facilities would be reduced by a proportionate level as well and would be less than significant.

Utilities, Service Systems, and Energy

Under this alternative, the RBC would be developed at the Richmond site as proposed, but it would provide for the development of a maximum of 3.6 million gross square feet of building space. The campus population would increase from approximately 300 persons in 2012 to approximately 8,400 persons in 2050. The impacts of this alternative on utilities and energy would be reduced compared to the impacts of the proposed project. The alternative development could potentially contribute to the existing RMSD WWTP and sewer main overflows caused by I&I during wet weather. This would be a potentially significant impact. Impacts of this alternative would be less than significant with implementation of LRDP Mitigation Measure UTL-4.

6.5.3 Alternative 3: Alameda Point Alternative

Description

Under the Alameda Point Alternative, the new campus would be developed in the City of Alameda at Alameda Point (which is a portion of the former Naval Air Station Alameda). The site consists of approximately 124 acres. Development at this site would also be guided by an LRDP which would provide for the development of 5.4 million gsf of building space at full implementation. The campus population would be approximately 10,000 persons in 2050. Development at this location would be guided by planning principles and objectives similar to those identified for the proposed project. Under this alternative, all 124 acres of the site would be developed. Figure 6-1 shows the development footprint for this alternative.

The Alameda Point Alternative would satisfy all of the University's project objectives. As described below, it would result in impacts similar to those of the proposed project in several resource areas, but potentially greater impacts than the proposed project in the areas of traffic and transportation, noise, aesthetics and visual quality, and hydrology and water quality.

Impacts

Aesthetics and Visual Quality

The region surrounding Alameda Point site has a dense urban and industrial character set at the edge of San Francisco Bay. Topography is essentially flat. Alameda site has approximately 6 miles (10 kilometers) of primarily rock-reinforced shoreline. The project site is at the former Naval Air Station (NAS) Alameda Point (Alameda Point) and is roughly bounded by West Atlantic Avenue to the north, Orion Street to the east, and West Hornet Avenue to the south, and adjoining former Naval Air Station properties to the west. The area encompasses approximately 124 acres and includes several buildings, some unpaved areas, paved parking lots, and portions of the paved roadways West Atlantic Avenue, West Pacific Avenue, West Oriskany Avenue, West Ticonderoga Avenue, and Viking Street. The neighboring properties as observed from public streets and sidewalks appear to be occupied with a mix of vacant buildings and some commercial businesses. Signage indicated that areas south of the Site were developed as a park.

This alternative would have potentially significant impacts to the visual character of the site through an increase in constructed area and development. Except for the San Francisco-Oakland Bay Bridge (I-80), no views of the site are available from major highways. Visibility from I-980 is blocked by foreground buildings. Site campus development would result in a significant impact to surrounding scenic vista views. The impressive views of San Francisco Bay, offsite areas, Oakland Inner Harbor, and the surrounding region would be blocked. Because the area has vacant buildings and few commercial businesses, campus development would have a potentially significant impact related to light and glare. Mitigation measures applicable to the proposed project would apply to this alternative. Impacts of this alternative would be significant even with mitigation.

Air Quality

Under this alternative, the Alameda Point site would be developed with the same square footage and daily population as would the proposed project at RBC. Proposed research uses and development would be similar with this alternative, as would assumptions for the phased LRDP growth.

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Alameda Point Campus Site

Legend

Alameda Point Campus Site Boundary

Alameda, California

TETRA TECH

Figure 6-1

The air quality setting for this alternative would be similar to that of the proposed project because the Alameda Point site is also in the same air basin and is subject to the same ARB and BAAQMD provisions and significance thresholds. Although the City of Alameda has adopted the Local Action Plan for Climate Protection, this plan is based on similar goals and timetables as the City of Richmond General Plan 2030 Energy and Climate Change Element; therefore, consistency determination with local programs and policies would also be similar.

The mitigation measures similar to those for the proposed project would be applicable to this alternative, and although these mitigation measures would minimize emissions and address potential long-term health risk, air quality impacts would remain significant and unavoidable.

Biological Resources

Under Alternative 3, fewer biological impacts would occur than under the proposed project or Alternatives 1 and 2 because the site is largely developed. No significant impacts would occur. Site areas that do not contain infrastructure are nevertheless highly altered and contain fill material; these are often vegetated with weeds and nonnative grasses (WRA and Jane Valerius Environmental Consulting 2011b). No sensitive habitats are present. Primary impacts would involve the potential presence of nesting birds and roosting bats in existing buildings.

Bird species that use man-made structures include passerines, such as barn swallow and black phoebe, and raptors, such as barn owl. Bats may roost in these structures, too. Bat species typically found using buildings in this region include pallid bat, Townsend's big-eared bat, big brown bat, western long-eared myotis, fringed myotis, long-legged myotis, Yuma myotis, and Mexican free-tailed bat. No special status plant species are likely to occur. Special status species are likely limited to the potential for CSC bats. Movement corridors in the project area include the estuarine habitat and the open spaces in the developed lands. Developed lands provide an open area for movement of raccoon, skunk, and opossum. Oakland Harbor is a jurisdictional Water of the US. Mitigation measures to address nesting birds and bat roosts would be as described under the proposed project. Impacts on biological resources would be less than significant with mitigation.

Cultural Resources

Historically marshland and tidal flats, the NAS Alameda site was a rich larder where Ohlone would catch fish, hunt waterfowl, and gather shellfish. Due to the fact that most of the land was at least partially submerged, it is unlikely that any permanent settlements were located within the boundaries of the former air station. However, permanent Ohlone settlements were not far away. Until it was quarried to provide surfacing for San Francisco Bay Airdrome runways, a prehistoric midden or refuse heap called Sather Mound was located approximately two miles southeast of NAS Alameda. Consisting of huge mounds of discarded shells, the middens were excavated in 1900 by an amateur archaeologist known as Captain Clark, who found them to contain flaked stone tools and burials. In addition to Sather Mound, five other known Ohlone sites have been identified in what is now the City of Alameda (Page & Turnbull 2005).

As the Alameda Point site is underlain by engineered fill, the potential to encounter previously unknown subsurface archaeological resources and/or human remains during ground-disturbing construction activities is low. Nonetheless, mitigation measures identical to those of the proposed project would avoid any potential impacts.

Under this alternative, there could be significant adverse impacts to historic architectural properties. The Alameda Point site contains the NAS Alameda Historic District, which is located within the former Naval station. This historic district includes 99 contributing buildings and structures, and one contributing site: a historic designed landscape. Significant adverse impacts

could result directly from demolition, relocation, or alteration to any of the 100 historic district contributors. The Alameda Point Alternative may also cause indirect impacts through visual intrusion in the proposed alternative's area of potential effect. Such an impact could result from project introduction of modern construction elements in the areas visually connected to (e.g., adjacent to) the historic district. Implementing a mitigation measure similar to LRDP MM CR-2 would reduce these adverse impacts to historic properties under this alternative to less than significant.

Geology and Soils

The Alameda Point site is constructed on filled tidelands west of Alameda Island in the eastern San Francisco Bay basin. The land surface is low-lying and nearly flat. Elevations are less than 15 feet (5 meters) above mean sea level.

Site borehole logs indicate that the soil profile is relatively horizontal and uniform. A boring near Building 23 (an aircraft maintenance hangar north of the Seaplane Lagoon) showed 16 feet of loose sandy fill underlain by 30 feet of Bay Mud. Below that, 45 feet of Merritt Sand is underlain by 331 feet of stiff clay and another 44 feet of gravel, sand, and clay of the Alameda Formation. The base of the San Antonio Formation was found at a depth of about 256 feet; Franciscan bedrock was encountered at a depth of 466 feet; groundwater was encountered at a depth of 8 feet. Almost the entire site was constructed on engineered fill materials placed over submerged lands or tidal flats.

In the San Francisco Bay Area, the San Andreas fault system stretches across a zone approximately 44 miles wide, consisting of mostly right-lateral strike-slip faults. The Alameda Point site is less than 12 miles from the San Andreas fault. The nearest active fault to the Alameda site is the Hayward fault, approximately 5 miles east.

The entire Alameda Point site lies within an area shown to have liquefaction potential on the State of California Seismic Hazard Zone Map (Alameda Point Site Characteristics). Additionally, based on a 20-foot wave runup at the Golden Gate Bridge, a portion of the Alameda site may be subject to tsunami inundation (Alameda Point Site Characteristics). No known active faults cross the Alameda site, and it is not mapped within a "Special Study Zone" as defined by the Alquist-Priolo Special Studies Zones Act. The site is also not within a landslide hazard zone.

The RBC site is located approximately 2.2 miles from the Hayward fault and within 1 mile of the Bay on flat-lying alluvium. In comparison, the Alameda Point site is about 5 miles from the Hayward fault. Although the effects of locating the project closer to the fault (in the case of RBC) would be mitigated by building design, the Alameda Point site is slightly further from an active fault which may result in a slight reduction in exposure to seismic hazard. Similar to the RBC site, the Alameda Point site is in proximity to the Bay margins. However, the potential for liquefaction is likely greater at Alameda Point (due to the widespread presence of fill material) compared to the proposed project. Additionally, a portion of the Alameda Point site may be subject to tsunami inundation. Mitigation measures applicable to the proposed project would apply to this alternative. Overall, the impacts resulting from this alternative would be similar to those of the proposed project and less than significant with mitigation.

Greenhouse Gas Emissions

The Alameda Point Alternative is essentially the same as the proposed project in terms of the building space that would be constructed and the total daily population that would be on the campus site. Therefore, construction and operational GHG emissions would be similar to those under the proposed project. As with the proposed project, the impact associated with construction GHG emissions would be less than significant and the impact from operational GHG emissions

would be significant. The same mitigation measure described for the proposed project would apply, and, as with the proposed project, the impact would be significant and unavoidable.

Hazards and Hazardous Materials

Implementation of the 2014 LRDP at the Alameda Point Alternative would not result in any significant changes in hazards or hazardous material compared to the impacts presented for the proposed project. Hazards would not be any different at the Alameda Point site than at the RBC and the types and quantities of hazardous materials would not change. Implementation of safety plans, programs, practices, and procedures would ensure that impacts to the public or the environment from hazards and hazardous material would be less than significant.

Hydrology and Water Quality

The Alameda Point site is located on the southwestern corner of Alameda Island. Under Alternative 3,124 acres of land that is currently largely developed would be redeveloped for the campus. This proposed site currently contains approximately 25 buildings and encompasses several fallow fields, paved parking lots, storage/manufacturing sites, and portions of paved roadways.

The proposed site is on engineered fill that was created between 1953 and 1975. Placement of this fill material has resulted in the loss of tidal wetlands and marshes. Edges of the Bay front have been altered through riprapping, Bay fill, and other hard surfaces. The Seaplane Lagoon borders the site to the west. The land is mostly level at 1 meter in elevation. There are no natural streams (WRA and Jane Valerius Environmental Consulting 2011b). Stormwater runs off into culverts that drain into the Bay.

The level of impacts associated with construction runoff and stormwater runoff at the Alameda Point site would be the same (with implementation of the same mitigations) as discussed for the proposed project. Federally funded development would necessarily follow EISA stormwater development strategy to retain all stormwater onsite, as it would not be technically feasible to restore the area's predevelopment hydrology. The dewatering activities under Alternative 3 would also potentially involve the groundwater contaminant plumes from sites to the north of the proposed development. While long-term or high-volume dewatering could affect these plumes, the plumes are not likely to be affected by dewatering required for this construction. The level of impacts (with mitigations) would be the same as discussed for proposed project.

Alameda Point site development would not alter the course of any stream, and would not result in increased erosion from on- or off-site runoff. The Alameda Point site is flat and at a lower elevation than the RBC site.

Land Use and Planning

Under this alternative, the RBC would be developed in the southeastern portion of Alameda Point in the City of Alameda. Alameda Point is a portion of the former NAS Alameda, which the US Navy closed in 1997; the base is currently being transferred to the City for civilian use. The City completed a Reuse Plan for Alameda in 1996. The Plan establishes a vision and direction for Alameda Point development consistent with Alameda's character, historic resources, employment development opportunities, and other aspects. In 2003, the City adopted the Alameda Point General Plan Amendment, which incorporated the Reuse Plan's Alameda Point vision and recommendations into the City's General Plan. Given the transportation constraints of Alameda, the vision calls for a transit-oriented mixed use development at Alameda Point. The City is currently working on developing a Precise Plan for a Town Center and Waterfront Area.

As the new Alameda Point campus site is identified in the Reuse Plan as an employment development area, the proposed alternative would not conflict with City land use plans. Impacts of this alternative related to land use and planning would be less than significant.

Noise

Construction. This alternative would employ the same construction phases described for the proposed action (see Table 4.10-4). The nearest sensitive receptor to the Alameda Point site is the Encinal High School. The high school's property boundary is 25 feet east of the Alameda Point site boundary. Construction noise at this distance from the source could reach a maximum of approximately 72 dBA.[38] Although this would exceed the noise limits found in the Alameda Noise Ordinance (Alameda Municipal Code Section 4-10), the noise ordinance contains an exemption for construction that takes place during certain hours. Implementing mitigation measures similar to LRDP MM NOISE-1a and -1c would minimize construction noise. Implementing other proposed project noise reducing measures would further reduce potential impacts on the school, so construction noise would result in a less than significant impact.

Operation. Operation of this alternative would result in long-term noise impacts from more people at the site and traffic volumes and the installation of cooling towers, emergency generators, and new HVAC equipment associated with the new buildings (see Table 4.10-8). The generators would exceed the limits in the Alameda Noise Ordinance (Alameda Municipal Code Section 4-10) at the nearest sensitive receptor (Encinal High School 25 feet east); however, they would not operate under normal conditions. The other operational equipment noise levels would not exceed the limits in the Alameda Noise Ordinance, which the exception of transformers, which could exceed the nighttime noise limits, resulting in a potentially significant impact. The noise limits in the ordinance are in Table 6-2.

Table 6-2
Alameda Municipal Code Noise Limits

Minutes the Noise Limit can be exceeded in 1 Hour	Noise limit (dBA) for Residences, Schools, Hospitals, Churches, and Public Libraries		Noise Limit (dBA) for Commercial Properties	
	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
30	55	50	65	60
15	60	55	70	65
5	65	60	75	70
1	70	65	80	75
0	75	70	85	80

Source: Alameda Municipal Code Section 4-10.4
dBA A-weighted decibel scale

Mitigation measures could be imposed to reduce operational noise in accordance with the Alameda Noise Ordinance.

[38] This calculation assumes an attenuation rate of 6 dBA for every doubling of distance and a 5 dBA attenuation overall since there is not a clear line of sight between the site and the school.

Traffic volumes would increase approximately 20 percent or less at the intersections studied (Fehr and Peers 2013). Therefore, the increase in traffic noise would be less than 3 dBA and would not be readily perceivable by the average person, so the impact on traffic noise levels would be less than significant.

If vibration-sensitive equipment would be located at the site, existing sources of vibration would be considered during the laboratory design process and appropriate vibration-dampening measures would be incorporated to protect research data quality.

Population and Housing

Growth under the proposed 2014 LRDP would increase the average daily population at the Alameda Point campus site, but it would not result in any substantial population growth in the surrounding Bay Area. The population and housing impacts under the proposed project would be less than significant. The Alameda Point Alternative would involve the same amount of population growth as the Proposed Project. Therefore, population and housing impacts under this alternative would be comparable and also less than significant.

Public Services and Recreation

Under this alternative, the RBC would be developed at the Alameda Point site and would entail the development of 5.4 million gross square feet of building space and a campus population of 10,000 persons. UC Police would provide law enforcement services and the City of Alameda would provide fire services to the campus site, until the results of required emergency and security assessments and plans indicate the need for additional services. In the long run it might become desirable and/or necessary for the University to house security and emergency service equipment and personnel on the campus. The LBNL Protective Services Department would retain responsibility for all security, fire protection, and emergency service requirements for all DOE facilities, assets, and personnel. This alternative's public services and recreation impacts would be substantially the same as the proposed project's projected impacts and would be less than significant.

Transportation and Traffic

Development of the LRDP at Alameda Point would occur at a site that has been designated for long-term development by the Alameda General Plan, Reuse Plan, and various other planning documents. The Alameda Point Element of the General Plan addresses the long range development of the site through policies that promote a mixture of uses, as well as a mix of transportation choices and alternatives to promote transit, bicycle and pedestrian trips. In addition, the Alameda Point Transportation Strategy, last revised in 2009, includes policies for bus rapid transit, new ferry station and expanded service, BART shuttles, light-rail, and a transit hub on the point.

Development at Alameda Point would occur incrementally, similar to planned development at the site as represented in the General Plan and related documents. The proposed uses would differ in that the campus would not include housing, retail, hotel, and similar uses as proposed in the General Plan. However, potential impacts to transit, pedestrian and bicycle facilities would be similar since the expansion of these facilities and development of new facilities serving Alameda Point would occur incrementally throughout the development of the campus, similar to the anticipated timetable for development in adopted planning documents. Therefore, any impacts from development would be less than significant because the transportation infrastructure would be implemented as the requirements of each stage of new development occurs.

The Alameda Point Element promotes the expansion and development of transit, bicycle, and pedestrian trip choices because automobile traffic is already impacted at key intersections and

tunnels and bridges serving Alameda are likewise operating near capacity during peak hours. In Oakland, campus-generated traffic would contribute to LOS F conditions at the Harrison Street/7th Street intersection during both AM and PM peak hours. Traffic generated by the campus would also contribute to LOS E conditions at the Jackson Street/7th Street intersection in Oakland and would potentially degrade the cumulative operation at this intersection to LOS F. Based on the City of Oakland's significance criteria, this would result in a significant and unavoidable impact at one or both of these intersections.

Utilities, Service Systems, and Energy

As with the proposed RBC site campus, EBMUD would also provide potable water for the Alameda Point Alternative. Water supplied to the City of Alameda area is treated at the Orinda WTP and conveyed via pipeline to Alameda.

EBMUD would collect and treat wastewater generated by the Alameda Point Alternative. Alameda is served by EBMUD's Special District No. 1, which treats domestic, commercial, and industrial wastewater for the cities of Alameda, Albany, Berkeley, Emeryville, Oakland, and Piedmont, and for the Stege Sanitary District, which includes El Cerrito, Kensington, and part of Richmond. The primary wastewater treatment plant used by EBMUD is the Main Wastewater Treatment Plant (MWWTP), which treats wastewater from Special District No. 1.

Waste generated at the Alameda Point Site is transported to the Davis Street Transfer Station in San Leandro. The waste is then hauled to the Altamont Landfill in Livermore, California. In 2000, the Altamont Landfill received a total of 1,491,958 tons of refuse from all sources, or an approximate daily average of 4,100 tons per day (City of Alameda 2006). The Altamont Landfill has a permitted maximum daily disposal of 11,500 tons per day with 45,720,000 cubic yards of remaining capacity. The landfill is expected to operate through 2025 (CalRecycle 2012c).

Alameda Municipal Power (formerly Alameda Power & Telecom) provides electricity to the Alameda Point Alternative site and the City of Alameda. Approximately 80 percent of the electricity is generated from clean and renewable sources, a large portion of which comes from geothermal energy, in addition to wind, solar, landfill gas, and hydroelectric sources (Alameda Municipal Power 2013).

Natural gas is delivered by the PG&E system to the Alameda Point Alternative site.

The projected utility demand associated with the Alameda Point Site Alternative in 2050 from 5,400,000 gsf of development and 10,000 on-site employees is presented below in Table 6-3.

This alternative's water supply impacts would be substantially the same as those of the proposed project; both would have the same water demand and EBMUD would be the water supplier. The Alameda Point Alternative would require about 340 mgy, or 9.3 mgd, of water and the maximum flow rate for the project would be 2,230 gpm. Because EBMUD has indicated that it can serve the proposed project, it is assumed that EBMUD would be able to serve this alternative as well. The impact related to water supply would be less than significant.

Table 6-3
Alternative 3 Annual and Peak Utility Demand

Utility	Projected Demand (2050)	Existing Demand at Leased Buildings[1]	Difference in Demand
Potable Water	340 mgy (peak demand – 2,230 gpm)	29.9 mgy	310.1 mgy
Firefighting Water	(peak demand – 6,000 gpm)	NA	NA
Wastewater	273 mgy (peak demand – 2,140 gpm)	23.92 mgy[1]	NA[2]
Electrical energy	142,400 megawatt hours/year (peak demand – 24.7 MW)	12,000 megawatt hours/year	130,400 megawatt hours/year
Standby Power	peak demand – 16 MW (installed capacity –20 MW)	NA	NA
Natural Gas	6,600,000 therms/year (peak demand – 240,300 kBtu/h)	548,000 therms/year	6,052,000 therms/year

Notes:
[1] Wastewater was determined to be 80 percent of the potable water demand.
[2] Wastewater flows cannot be netted out because the leased facilities do not all contribute their wastewater to the same wastewater treatment plant.

gpm Gallons per minute
kBtu/h Kilo-British thermal unit hour
kW Kilowatt
Mgy Million gallons per year
MW Megawatt
NA Not Applicable

The Alameda Point Alternative is estimated to produce 104 mgy, or 284,932 gpd, of wastewater, as shown above in Table 6-3. The MWWTP has a dry weather capacity of 120 mgd and a wet weather wastewater treatment capacity of 168 mgd to secondary treatment standards and 320 mgd to primary treatment standards. The annual average daily flow at the MWWTP is 65 mgd (EBMUD 2011b). If the flows projected to result from the Alameda Point Alternative development of 284,932 gpd were added to the current influent flows of 65 mgd, the total influent would still be substantially below the WWTP's dry weather treatment capacity of 120 mgd. The incremental flows from the Alameda Point alternative would not take up a substantial amount of the WWTP's dry weather treatment capacity. Therefore, similar to the proposed project impacts related to wastewater treatment under this alternative would also be less than significant, as adequate treatment capacity exists at the EBMUD MWWTP to handle the additional flows.

Similar to the conditions in Richmond, wet weather flows in Alameda are affected by high levels of I&I and the MWWTP has inadequate treatment capacity to handle wet weather flows. The City of Alameda and EBMUD are working together to reduce the amount of I&I entering the wastewater collection system, including I&I in the Alameda Point area of the City. Therefore, similar to the proposed project, this alternative would have the potential to discharge wastewater into a system with inadequate wet weather treatment and could potentially add wastewater flows to sewer mains that are at capacity due to I&I and result in localized system overflows. A mitigation measure similar to LRDP MM UTL-4 could be implemented, which would reduce the impact to a less than significant level.

The existing site is a paved parking lot which prevents any infiltration of storm runoff. The Alameda Point Site Alternative would construct landscaping and storm drainage features on the site, in addition to facilities and parking lots, which would result in a reduction of impervious surfaces and consequently of storm runoff from the site. To comply with NPDES requirements, the site runoff would be controlled and new stormwater drainage systems would be developed. No changes to off-site storm drain systems are anticipated. Impacts from storm runoff would be less than significant.

The Alameda Point Alternative would support a population of up to 10,000 persons. The on-site population is expected to generate up to 2.2 tons of waste per day[39] from maintenance and operational activities (CalRecycle 2012b). As stated above, the Altamont Landfill has a permitted daily intake limit of 11,500 tons. The projected increase in Alameda Point Site daily waste disposal would represent 0.2 percent of the peak permitted daily capacity of the Altamont Landfill. The increase would not require regional landfill capacity expansion. The impact related to solid waste would be less than significant.

The Alameda Point Alternative facilities would have a peak power demand of about 24.7 MW, which corresponds to 128,508 MWh of power consumption per year. As stated above, natural gas is delivered by the PG&E system to the Alameda Point Alternative site. The Alameda Point Alternative would have a peak demand of about 240,3000 kBtu/h of natural gas for a total demand of 5,973,877 therms of natural gas per years. Construction on the site would include utilities sized adequately to serve up to the 5,400,000 gsf of research laboratory and office. Impacts related to provision of electricity and natural gas would be similar to those of the proposed project as the same amount of electricity and natural gas would be required. Alameda Municipal Power would supply power to the alternative site. The impacts would be less than significant.

6.5.4 Alternative 4: No Project Alternative

Description

State CEQA Guidelines require consideration of the No Project Alternative. The No Project Alternative would essentially mean that the 2014 LRDP would not be adopted for the RBC or any other site. The amount of building space and the employee population at the University's Richmond properties would remain at their current levels.

Should any development or environmental remediation activities be proposed by UC Berkeley or LBNL at the RBC site, any required CEQA documentation would be prepared on a project-specific basis.

The No Project Alternative would fail to meet the University's stated need and purpose for a new campus, and as such, would not satisfy the project objectives set forth for such a campus. As described below, it would result in no impacts for any of the resource areas, and all impacts of the proposed project would be avoided.

[39] Based on the waste generation rate of 0.8 tons/employee/year from CalRecycle for "Services – Education."

Impacts

Aesthetics and Visual Quality
Under the No Project Alternative, new development would not occur at the RBC site or at any other offsite location. Therefore, this alternative would not result in impacts to aesthetics and visual quality.

Air Quality
No new development would occur at the site with the No Project Alternative. No new air quality impacts would result, and no mitigations would be required.

Biological Resources
Under this alternative, the project would not be implemented, and the existing biological resources environment would not be altered. Therefore, no new impacts would occur from construction of new facilities, and no new impacts from changed operations and altered landscapes would occur. No mitigation measures would be necessary.

Cultural Resources
Under this alternative, there would be no impacts to archaeological or architectural resources at the Richmond Bay Campus because existing buildings would remain and in their current locations. No disturbance, destruction, or demolition of the cultural resources sites and buildings would occur at the RBC site. No potentially existing subsurface resources would be affected.

Geology and Soils
Under the No Project Alternative, new development would not occur at the RBC site. Therefore, this alternative would not result in impacts to geology and soils.

Greenhouse Gas Emissions
As no new development would occur on the RBC site, no new GHG emissions would be generated, and no impact would occur.

Hazards and Hazardous Materials
Under the No Project Alternative, new development would not occur at the RBC site, so this alternative would not result in hazard impacts or hazardous material impacts.

Hydrology and Water Quality
Under this alternative, the LRDP would not be implemented, and the Richmond Field Station and other components of the Richmond site would continue their current operations.

None of the developed portion of the site is currently within a 100-year flood hazard zone. A flood hazard zone exists along the margin of the site due to the potential for offshore winds in combination with high tides to increase water elevations along the shore. An increase in the flood zone will make buildings at the southern margin of the site more vulnerable to inundation. The No Project Alternative would not replace any of the existing buildings nor increase shoreline flood protection for the existing buildings. The placement of fill along the western margin of the site would not occur and there would be potential flood hazards associated with the predicted rise in sea levels. In addition, without new fill to raise the elevation of the land surface along the western margin of the site, the risk of damage from tsunamis is higher under this alternative than for the proposed project

Land Use and Planning

Under this alternative, the project would not be implemented and there would be no impact related to land use and planning. However, maintaining the RBC site with the current level of development and employment would not be consistent with the City's vision for the project vicinity.

Noise

Under this alternative, the project would not be implemented and the existing noise environment would not be altered so there would be no impact.

Population and Housing

Under this alternative the 2014 LRDP would not be adopted for the RBC site. There would be no increase the average daily population at the campus. Therefore, there would be no impacts to population and housing under this alternative.

Public Services and Recreation

Under this alternative the 2014 LRDP would not be adopted for the RBC site. There would be no increase the average daily population at the campus or building space. Therefore, there would be no impacts to public service and recreation under this alternative.

Transportation and Traffic

Under the No Project Alternative, building space and the employee population would remain at their current levels. The existing traffic and circulation levels and patterns would continue for vehicles, transit, pedestrians, and bicycles. No impacts would occur, and no mitigation would be required.

Utilities, Service Systems, and Energy

Under this alternative, there would be no increase in the RBC site's average daily population or building space. Therefore, there would be no impacts to utilities and energy sources under this alternative.

6.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The environmentally superior alternative is the alternative that would result in the least environmental impact. Of the action alternatives analyzed in this EIR, the Reduced Growth Program is the environmentally superior alternative because it would reduce the magnitude of the impacts associated with construction and operation activities relative to the other action alternatives, while achieving some of the project objectives.