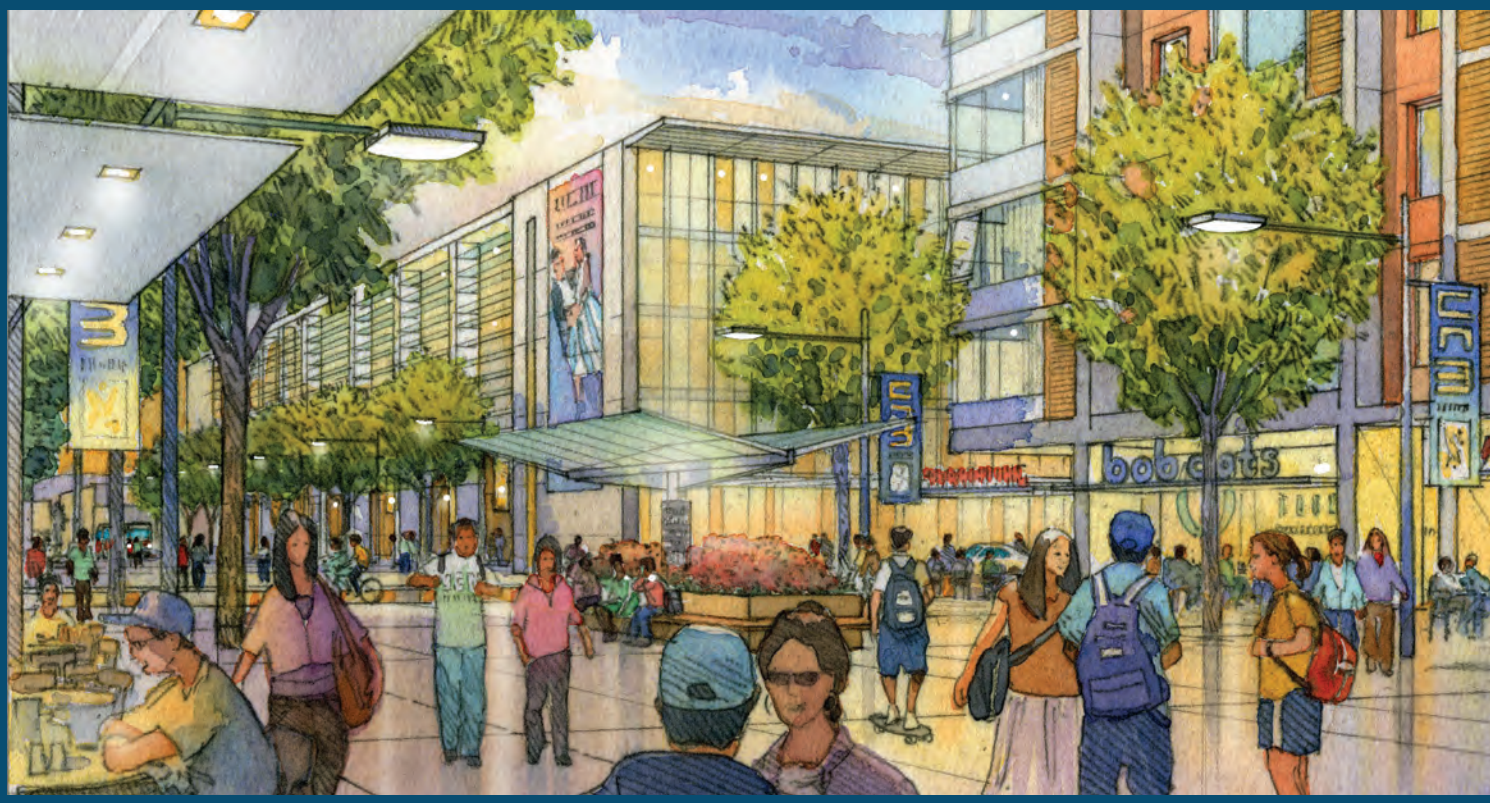
UC Merced and University Community Project
Draft Environmental Impact Statement/Environmental Impact Report



Volume 1

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U.S. Army Corps of Engineers, Sacramento District

University of California

UC Merced and University Community Project
Draft Environmental Impact Statement/ Environmental Impact Report

Volume 1

SCH # 2008041009

November 2008

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UC Merced and University Community Project
Draft Environmental Impact Statement/Environmental Impact Report
Merced County, California

State Clearinghouse #2008041009
State of California

Lead Agencies:
NEPA Lead Agency: US Army Corps of Engineers (USACE)
CEQA Lead Agency: The Board of Regents of the University of California (The Regents)

NEPA Cooperating Agencies:
US Environmental Protection Agency (EPA)
CEQA Responsible Agencies:
California Department of Fish and Game
California State Regional Water Quality Control Board, Central Valley Region (RWQCB)

ABSTRACT

This joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR) serves as the environmental review document for the development of the UC Merced and University Community Project. The project consists of the development of a major research university in Merced County that would support up to 25,000 full-time equivalent (FTE) students with a contiguous associated community needed to support the university. The campus would occupy an 815-acre site and the adjacent University Community would occupy a total of 1,951 acres and would be organized into Community North (833 acres) and Community South (1,118 acres).

The EIS has been prepared in support of the application by The Regents and the University Community Land Company, LLC, (UCLC) for a permit under US Clean Water Act (CWA) Section 404 for the fill activities and associated development of the University of California, Merced Campus, and for the northern section of the associated supporting and contiguous University Community. The USACE intends to adopt this document to satisfy the requirements of the National Environmental Policy Act (NEPA) for the permit decision under Section 404 to allow for the discharge of fill material into 76.7 acres of wetlands, considered "waters of the United States" as defined by the CWA. The EIR has been prepared in support of the following actions by The Regents: (1) the adoption of an updated Long Range Development Plan (LRDP) for the UC Merced Campus; (2) the execution of an agreement or agreements with the UCLC for the acquisition of land needed for the campus in a manner consistent with the agreed upon plan for development for Community North; and (3) the execution of an memorandum of understanding (MOU) between the University, UCLC, and the owners of the Community South (LWH

Farms, LLC), to facilitate the coordinated development of the University Community, including Community South.

This Draft EIS/EIR is prepared in compliance with NEPA, the Council on Environmental Quality's Regulations for Implementing NEPA, and USACE NEPA Regulations; and the California Environmental Quality Act (CEQA) and State CEQA Guidelines. Consistent with NEPA and CEQA requirements, this Draft EIS/EIR evaluates the direct, indirect, and cumulative impacts on the environment in the Merced region that would result from the Proposed Action.

Comments on this document should be submitted by no later than 5:00 PM on January 5, 2008 to:

NEPA-Related Comments

US Army Corps of Engineers, Sacramento District
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EXECUTIVE SUMMARY

ES.1 PURPOSE

This Environmental Impact Statement/Environmental Impact Report (EIS/EIR) evaluates the potential for significant environmental impacts associated with the development and operation of a major research university campus in Merced County that will support up to 25,000 full-time equivalent (FTE) students with a contiguous associated community needed to support the university. This Executive Summary is intended 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. Both the National Environmental Protection Act (NEPA) (40 CFR 1502.12) and the *2008 California Environmental Quality Act Statutes and Guidelines (CEQA) (*Section 15123) require that a summary be included in an EIS/EIR that identifies all major conclusions, identifies 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.

ES.2 PROJECT LOCATION

The project site is located in eastern Merced County, approximately 2 miles northeast of the limits of the City of Merced. The project site occupies portions of Sections 26, 27, 34, and 35, Township 6 South, Range 14 East and Sections 3 and 2, Township 7 South, Range 14 East. The site is south southeast of Lake Yosemite Regional Park and east of Lake Road. Yosemite Avenue forms the southern project site boundary. The project site is composed of approximately an 815-acre Campus and a 1,951-acre University Community. The University Community is itself organized into an 833-acre Community North and 1,118-acre Community South.

Existing land uses on the site include the developed Phase 1.1 Campus, grasslands used for seasonal grazing, and lands under cultivation. The 104-acre Phase 1.1 Campus, which was established on a portion of the former Merced Hills Golf Course, is developed with a number of campus buildings for teaching and research, student housing, campus support uses, and parking. A small lake and two ponds are present on the Phase 1.1 Campus site, which receive runoff from the developed campus. Gently rolling grasslands used for seasonal grazing occupy lands to the north, northeast, and east of the Phase 1.1 Campus. Vernal pools and other wetlands are dispersed throughout the grassland areas of the site. Agricultural lands lie to the south of the Phase 1.1 Campus. Agricultural lands within the Campus and

Community North are used as a grazing pasture, and within Community South are used for row and field crops.

ES.3 PROJECT DESCRIPTION

The proposed project consists of the development of the UC Merced Campus and contiguous associated University Community in support of the campus. Consistent with the University of California procedures, an updated Long Range Development Plan (2009 LRDP) has been prepared to guide the development of the campus. In addition, the University must acquire from the UCLC, a portion of the former Flying M Ranch in order to develop the Campus. The contractual arrangements needed for this transaction will be premised on a plan for development of the remainder of the Flying M Ranch that has been developed by the University in coordination with UCLC. Before the Regents can enter into these contractual arrangements, the arrangement must be reviewed for their environmental impacts. Finally, because the development of Community South is important to the development of the campus, the University proposes an MOU before the University, UCLC and the owners of the Community South.

Therefore for CEQA purposes, the Proposed Project for this EIR consists of the following actions by The Regents: (1) the adoption of an updated LRDP for the UC Merced Campus; (2) the execution of an agreement or agreements with the UCLC for the acquisition of land needed for the campus in a manner consistent with the agreed upon plan for development of Community North; and (3) the execution of an MOU between the University, UCLC, and LWH Farms, LLC to facilitate the coordinated development of the University Community, including Community South. As discussed later in this section, other land use approvals and actions will need to be completed by Merced County, the Merced County Local Agency Formation Commission (LAFCO), and/or the City of Merced before any development within the University Community could occur.

For NEPA purposes, this EIS/EIR considers the federal actions associated with the development of the Campus and University Community. These federal actions are referred to under NEPA as the "Proposed Action." The development of the UC Merced Campus and the associated University Community as proposed would affect Waters of the United States.

Acting as co-applicants, the University and the UCLC have submitted a Clean Water Act (CWA) Section 404 permit application to the US Army Corps of Engineers (USACE) for permission to fill 76.7 acres[1] of wetlands present on the proposed campus site and on Community North in conjunction with the development of the Campus and Community North. A Section 404 permit application has not been filed

1 This is the total wetland acreage present within the Campus and Community North and does not include the wetlands present on the Community South portion of the project site.

for Community South. However, consistent with the federal statement of purpose discussed below and the USACE's conclusion that the Campus and University Community are connected actions, the impacts associated with all fills required for the Campus and University Community will be addressed in this EIS. Thus, for purposes of evaluation in this EIS/EIR under NEPA, the "Proposed Action" encompasses the Campus, Community North, and Community South.

In summary, for evaluation under both NEPA and CEQA, the Proposed Action (under NEPA) and the Proposed Project (under CEQA) encompass the development of the proposed Campus, Community North, and Community South. For ease of reading, the term "Proposed Action" is used throughout this EIS/EIR to refer to both the proposed federal action and the proposed project under CEQA.

ES.4 PURPOSE AND NEED/OBJECTIVES OF THE PROPOSED ACTION

The overall purpose of the Proposed Action is to establish a major research university in Merced County that would ultimately support up to 25,000 FTE students with a contiguous associated community needed to support the university.

The University's objectives are focused on developing a premier research university in the heretofore-underserved San Joaquin Valley in furtherance of the University of California's mission of teaching, research, and public service excellence. The purpose of the updated 2009 LRDP is to guide the physical planning and development of a new UC campus in Merced County, as well as to establish a paradigm for the University's character. Specifically, the objectives of the University are summarized below:

- Meet Enrollment Demand Meet anticipated increases in enrollment demand for the University of California system, both short-term and long-term
- Serve Historically Underrepresented Populations: Maximize the University's mission of service excellence by enabling the University to better serve populations that are historically underrepresented in UC enrollments.
- Model Environmental Stewardship: To the extent practicable, plan and develop the campus to model environmental stewardship.
- Minimize Costs: Develop the campus at a reasonable cost.
- Maximize Academic Distinction: Plan and develop the campus as a research university of the same academic quality as the other UC campuses, consistent with contemporary research campus needs.
- Create an Efficient and Vital Teaching and Learning Environment: Plan and develop the campus to facilitate faculty-student interaction, ease and enjoyment of use of academic facilities, and an environment conducive to learning.
- Attract High-Quality Faculty: Recruit and retain high-quality faculty.

- Provide a High-Quality Campus Setting: Provide an attractive, livable campus in order to attract high-caliber students and faculty.

- Accommodate Student Housing Needs: Offer attractive and centrally located on-campus housing, consistent with UC-wide student housing policies.

- Provide Student Support: Offer high-quality, convenient student support services.

- Provide Athletic and Recreational Opportunities: Provide sufficient athletic facilities to offer high-quality NCAA, recreational, and club athletic programs commensurate with other premier universities.

- Ensure Community Integration: Ensure that UC Merced is sustained by a strong, unifying sense of community—one founded upon the values, academic principles, and diverse cultural experiences that bind its members together in common commitments, and includes direct constituents (students, faculty, and staff) and indirect constituents (local, San Joaquin, and Central Valley residents).

- Promote Regional Harmony: Reflect the landscape, history, resources, and diverse cultures of the San Joaquin Valley in both physical development and in unique features of the curriculum.

The specific objectives with respect to the University Community are summarized below:

- To support the successful development of the UC Merced Campus by providing for a community that is physically contiguous to and integrated with the Campus

- To provide adequate land and development opportunities to absorb the equivalent of 100 percent of the new growth generated by UC Merced over time in close proximity to the Campus to avoid adverse effects of new development

- To provide a community that can be developed in an integrated fashion rather than through fragmented subdivision processes

- To provide a community with patterns of land use and urban form that support principles of livable communities and environmental sustainability

- To provide adequate circulation and utility infrastructure that supports the long-term sustainability of the UC Merced campus and University Community

- To establish and support linkages and transitions that will integrate the University Community with greater Merced

- To complement and support the economy of the City of Merced and the greater Merced region

- To support the educational goals of VST by enhancing its scholarship fund

- To support regional programs to conserve and protect the County's important agricultural and natural resources as development of UC Merced and the University Community proceeds

- To be configured and planned so that environmental permitting allows community development to proceed at the pace necessary to support campus development
- To be affordable and financially feasible
- To support implementation of the Merced County General Plan

ES.5 TOPICS OF KNOWN CONCERN

To determine which environmental topics should be addressed in this EIS/EIR, UC Merced and the USACE circulated a Notice of Preparation (NOP) and Notice of Intent (NOI) in order to receive input from interested public agencies and private parties. Copies of the NOP and NOI are presented in **Appendix ES** of this EIS/EIR. Based on the NOI and NOP comments, this EIS/EIR addresses the following environmental topics in depth:

- Aesthetics
- Agricultural Resources (including Prime Farmlands)
- Air Quality
- Biological Resources (including wetlands, ecologically critical areas, endangered and threatened species)
- Cultural Resources (historical and archaeological resources)
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Socioeconomics Environmental Justice
- Public Services and Recreation (including Parklands)
- Transportation and Traffic
- Utilities and Service Systems
- Other Resources (mineral resources, navigation, and wild and scenic rivers)

ES.6 ISSUES TO BE RESOLVED/AREAS OF CONTROVERSY

Specific issues that were raised during the public scoping meeting and/or in written scoping comments include potential impacts related to

- conversion of prime farmland
- wetlands, aquatic resources, and other biological resources
- groundwater and surface water quality
- water supply and water supply infrastructure
- storm water drainage

- energy use, air quality, and climate change
- traffic and road safety
- growth inducement
- project location

Commenters also requested that the EIR/EIS examine off-site alternatives and alternatives that would reduce impacts to aquatic resources, and that it discuss differences between the proposed project and the County's previously approved plan for the University Community area. All of the scoping comments were addressed in the impact analysis.

ES.7 ALTERNATIVES

Consistent with NEPA and CEQA requirements, a reasonable range of alternatives were evaluated and considered in an effort to assist in the identification of a preferred alternative that was consistent with the stated purpose of the Proposed Action. The alternatives analyzed in detail in this Draft EIS/EIR are presented below.

Alternative 1 - Proposed Action

As described in more detail in **Section 2.0, Project Description**, the Proposed Action Alternative consists of the development of a major research university in Merced County that will support up to 25,000 FTE students with a contiguous associated community needed to support the university. The Proposed Action encompasses two major areas: the UC Merced Campus and the University Community. The UC Merced Campus includes the 815-acre Campus that would be built with academic buildings, student housing, campus support, recreation facilities and infrastructure, and a 1,307-acre Campus Natural Reserve that would not be developed. The University Community comprises the 833-acre Community North and the 1,118-acre Community South. Community North would be developed with a town center, business park, residential neighborhoods, parks, open space, schools, and other amenities. With respect to Community South, it is anticipated that this approximately 1,118-acre area would be developed in accordance with the previously adopted University Community Plan. The University Community would include 11,616 dwelling units and a total residential population of about 30,780 persons. The Proposed Action also includes numerous environmental commitments that the University and Merced County have already made to reduce the environmental impacts of the Proposed Action. Among other things, these include acquisition of conservation easements over more than 26,600 acres of land in eastern Merced County to mitigate for loss of wetlands and related species as a result of the Proposed Action.

Alternative 2 - Yosemite Avenue Alternative

The Yosemite Avenue Alternative site is located in the same general area as the Proposed Action. Under this alternative, campus development would occur in two areas: the already developed 104-acre Phase 1.1 Campus and a 711-acre campus area bordered on the west by Lake Road and located south of the Phase 1.1 Campus up to Cardella Road. The University Community under this alternative includes a total of approximately 1,951 acres and is organized into a Community North and Community South. The Community North includes about 833 acres and is located south of the campus approximately between Cardella Road and Yosemite Avenue and east of Lake Road. The Community South includes 1,118 acres and is located approximately between East Yosemite Avenue and Olive Avenue. All other attributes of the Campus and University Community under this alternative, including total Campus and University Community population, would be the same as under **Alternative 1, Proposed Action**.

Alternative 3 - Bellevue Ranch Alternative

The Bellevue Ranch Alternative is located primarily on land commonly identified as the Bellevue Ranch in the northern portion of the City of Merced. Under this alternative, campus development would occur in two areas: the already developed 104-acre Phase 1.1 Campus and a 710-acre Campus that would be located on Bellevue Ranch site, east of State Route 59 about 2 miles west of the Phase 1.1 Campus. The University Community would be located immediately to the west and south of the campus site. The University Community would include about 1,951 acres and would be organized into a Community North and a Community South. All other attributes of the Campus and University Community, including total Campus and University Community population, would be the same as under **Alternative 1, Proposed Action**.

Alternative 4 - 2002 Proposed Project

The 2002 Proposed Project Alternative consists of an approximately 2,000-acre UC Merced Campus and an adjacent 2,133-acre University Community located in eastern Merced County. This alternative site is generally east and south of Yosemite Lake and bounded by Lake Road on the west and Yosemite Avenue on the south. The Campus would include a 910-acre[2] Main Campus, a 340-acre Campus Land Reserve, and a 750-acre Campus Natural Reserve. The 340-acre Campus Land Reserve would remain undeveloped and available to meet potential future needs of the campus. The 750-acre Campus Natural Reserve would remain in an undeveloped state, and would be dedicated to conservation and limited controlled research and educational activities. The approximately 2,133-acre University Community would be located

2 While the net area of the campus under the 2002 Proposed Project is 910 acres, if the land within the on-site canal easements is included, the total acreage is 981 acres.

directly south of the Campus, and would include development of a mixed-use Town Center comprised of retail, office, civic, cultural, and residential uses. The University Community would accommodate the growth that would be generated by the Campus, and therefore would include 11,616 housing units and house about 30,782 persons, the same as under the Proposed Action. The University Community would provide about 2 million square feet of non-residential space, which is less than the non-residential space under the Proposed Action.

Alternative 5 - No Action Alternative

From the USACE's perspective, the No Action Alternative would result from denying the permit that has been requested by the University and UCLC to fill waters of the United States including wetlands to build the Campus and Community North. From the perspective of the applicants, the No Action Alternative would mean that the full buildout of the Campus and Community North would not occur at the requested location. The denial of the Section 404 permit would mean that the Campus and Community North could develop so long as filling of wetlands or any other adverse changes to the hydrology of the wetlands are avoided. Given the distribution and density of wetlands, very limited areas could be developed on the campus site under this alternative. With the avoidance of wetland areas, the acreage of the campus site would be substantially reduced which would make the campus infeasible. Because the density of wetlands on the Community North site is lower as compared to the campus site, more of Community North site could potentially be developed. However, in the event that the Campus does not develop at the proposed site, neither Community North nor Community South as proposed would be developed. Therefore, under this alternative the Campus and the University Community developments would be abandoned altogether or built in a manner that does not fully meet the project purpose. In any case, the San Joaquin Valley would continue to be underserved by the University of California system until an acceptable solution could be implemented. Community South could still proceed with development that would be unrelated to the Campus based on development plans proposed by the owners of that land, if a permit from the USACE is not required.

Alternative 6 - No Build Alternative

Unlike the No Action Alternative, the No Build Alternative assumes no construction at all would occur on the project site, regardless of whether the USACE issues a permit for the fill of waters of the United States. Under this alternative, the project site would not be developed with the Campus or its associated Community. The Phase 1.1 Campus development would remain on the site; however because no further development of the campus would occur, UC Merced would not be established as a new campus beyond the 104-acre existing Phase 1.1 Campus. In the short term, the remainder of the campus and the community site would likely remain rural in character with continued agricultural and pasture

operations dominating the land uses. In the long term however, the project site could be subject to some form of development in the future as the City of Merced and the San Joaquin Valley continue to increase in population.

ES.8 IMPACT SUMMARY

A detailed discussion regarding potential impacts of the Proposed Action is provided in **Section 4.0 Affected Environment and Environmental Consequences.** A summary of the impacts of the Proposed Action is provided in **Table ES-1, Summary of Impacts and Mitigation Measures**. Also provided in **Table ES-1** are mitigation measures that are proposed to avoid or reduce significant project impacts. The table indicates whether implementation of the recommended mitigation measures would reduce the impact to a less than significant level. **Table ES-2, Summary Comparison of Alternatives**, presents the environmental impacts of each alternative to allow the decision makers, agencies and the public to compare and contrast these alternatives and weigh their relative merits and demerits.

Table ES-1
Summary of Proposed Action Impacts and Mitigation Measures

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.1 Aesthetics			
Impact AES-1		**Mitigation Measure AES-1**	
The Proposed Action would affect scenic vistas.	Significant	**Mitigation Measure AES-1a:** The University will plant tall trees along the campus' western boundary to screen views of the campus facilities from Lake Yosemite Regional Park. (*Applicability – Campus only)* **Mitigation Measure AES-1b:** Where possible, major vehicular and pedestrian transportation corridors on the Campus shall be located and designed to provide views of the Sierra Nevada. (*Applicability – Campus only*)	Significant and unavoidable
Impact AES-2		**Mitigation Measure AES-2**	
Development under the Proposed Action would not adversely affect scenic resources.	No Impact	No mitigation is required.	No Impact

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.1 Aesthetics (continued)			
Impact AES-3		**Mitigation Measure AES-3**	
The Proposed Action would substantially adversely alter the visual quality and character of the site and its surroundings.	Significant	**Mitigation Measure AES-3a:** The University shall design all new aboveground infrastructure on the campus to the following standards: (a) Screen aboveground infrastructure from view from public rights-of-way or scenic vistas, via landscaping, fencing, or other architectural screening; (b) Require creative design measures to camouflage structures by integrating them with existing buildings and among other existing uses; (c) Locate aboveground infrastructure on sites that are not visible from visually sensitive areas, such as residential communities and open space areas; (d) Require providers to co-locate their structure on a single site, where technically feasible and visually desirable; and (e) Locate antennae and equipment on other existing community facility sites, such as water tanks or utility poles. (*Applicability – Campus*) **Mitigation Measure AES-3b:** The County or the City should require that new aboveground infrastructure in the University Community be designed to the following standards: (a) Screen aboveground infrastructure from view from public rights-of-way or scenic vistas, via landscaping, fencing, or other architectural screening; (b) Require creative design measures to camouflage structures by integrating them with existing buildings and among other existing uses; (c) Locate aboveground infrastructure on sites that are not visible from visually sensitive areas, such as residential communities and open space areas; (d) Require providers to co-locate their structure on a single site, where technically feasible and visually desirable; and (e) Locate antennae and equipment on other existing community facility sites, such as water tanks or utility poles. (*Applicability – University Community*)	Significant and unavoidable

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.1 Aesthetics (continued)			
Impact AES-4		**Mitigation Measure AES-4**	
The Proposed Action would create a new source of substantial nighttime light and glare in the vicinity.	Significant	The County or the City shall require developers with projects in the University Community to implement the following: • All outdoor lighting shall be focused and directed to the specific location (e.g., roads, walkways), be shielded to avoid the production of glare, minimize up-light, and light spill. • All light fixtures shall be located, aimed, or shielded so as to minimize stray light trespassing across property boundaries and other sensitive areas. (*Applicability – University Community)*	Significant and unavoidable
4.2 Agricultural Resources			
Impact AG-1		**Mitigation Measure AG-1**	
The Proposed Action would result in the conversion of Important Farmland, including Prime Farmland, Farmland of Statewide Importance, and Unique Farmland.	Significant	Developers with projects within the University Community will mitigate the loss of Important Farmland by securing agricultural easements on comparable farmland at a minimum ratio of 1:1 prior to the development of any portion of the University Community site. (*Applicability –University Community)*	Significant and unavoidable
Impact AG-2		**Mitigation Measure AG-2**	
The Proposed Action Alternative would not expose residents to agricultural nuisances, substantially conflict with existing General Plan policies or zoning for agricultural use, or involve other changes that could result in the conversion of Important Farmland to non-agricultural uses.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.3 Air Quality			
Impact AQ-1		**Mitigation Measure AQ-1**	
The Proposed Action would result in construction emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation.	Significant	**Mitigation Measure AQ-1a:** The Campus and the developers within the University Community shall include in all construction contracts the measures specified in SJVAPCD Regulation VIII (as it may be amended for application to all construction projects generally) to reduce fugitive dust impacts, including but not limited to the following: • All disturbed areas, including storage piles, which are not being actively utilized for construction purpose, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, or vegetative ground cover. • All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant. • All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions using application of water or by presoaking. • When materials are transported off-site, all material shall be covered, effectively wetted to limit visible dust emissions, or at least 6 inches of freeboard space from the top of the container shall be maintained. • All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit visible dust emissions. Use of blower devices is expressly forbidden.)	Significant and unavoidable

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.3 Air Quality (continued)			
Impact AQ-1 (continued)		**Mitigation Measure AQ-1 (continued)**	
		• Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, storage piles shall be effectively stabilized of fugitive dust emissions by using sufficient water or chemical stabilizer/ suppressant. (*Applicability – Campus and University Community*) **Mitigation Measure AQ-1b:** The Campus and the developers within the University Community shall include in construction contracts for large construction projects near sensitive receptors the following control measures characterized by the SJVAPCD as enhanced and optional control measures: • Limit traffic speeds on unpaved roads to 15 mph. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than 1 percent. • To the extent feasible, limit area subject to excavation, grading, and other construction activity at any one time. (*Applicability – Campus and University Community*) **Mitigation Measure AQ-1c:** The Campus and the developers within the University Community shall implement the following mitigation measures to reduce impacts of ROG and NO_x emissions from construction equipment exhaust: • When feasible, use construction equipment operated by alternative fuel. • Minimize idling time to a maximum of 10 minutes when construction equipment is not in use. • To the extent practicable, manage operation of heavy-duty equipment to reduce emissions.	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.3 Air Quality (continued)			
Impact AQ-1 (continued)		**Mitigation Measure AQ-1 (continued)**	
		• Employ construction-activity management techniques such as extending the construction period outside the ozone season of May through October. • Use low-emission on-site stationary equipment. (*Applicability – Campus and University Community*) **Mitigation Measure AQ-1d:** The Campus and the developers within the University Community shall implement the following mitigation measures to reduce impacts of ROG and NO_x emissions from construction equipment exhaust: • When feasible, use construction equipment operated by alternative fuel. • Minimize idling time to a maximum of 10 minutes when construction equipment is not in use. • To the extent practicable, manage operation of heavy-duty equipment to reduce emissions. • Employ construction-activity management techniques such as extending the construction period outside the ozone season of May through October. • Use low-emission on-site stationary equipment. (*Applicability – Campus and University Community*)	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.3 Air Quality (continued)			
Impact AQ-2		**Mitigation Measure AQ-2**	
The Proposed Action would result in operational emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation.	Significant	**Mitigation Measure AQ-2a:** The Campus will work with the SJVAPCD to ensure that emissions directly and indirectly associated with the Campus, University Community, and induced growth are adequately accounted for and mitigated in applicable air quality planning efforts. The SJVAPCD can and should adopt adequate measures consistent with applicable law to ensure that air quality standard violations are avoided. (*Applicability—Campus only*)	Significant and unavoidable
		Mitigation Measure AQ-2b: The Campus and the developers within the University Community shall implement the following measures to reduce emissions from vehicles: • Provide pedestrian-enhancing infrastructure to encourage pedestrian activity and discourage vehicle use. • Provide bicycle facilities to encourage bicycle use instead of driving. • Provide transit-enhancing infrastructure to promote the use of public transportation. • Provide facilities to accommodate alternative-fuel vehicles such as electric cars and CNG vehicles. Improve traffic flows and congestion by timing of traffic signals to facilitate uninterrupted travel. (*Applicability – Campus and University Community*)	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.3 Air Quality (continued)			
Impact AQ-2 (continued)		**Mitigation Measure AQ-2 (continued)**	
		Mitigation Measure AQ-2c: The Campus and the developers within the University Community shall implement the following measures to reduce emissions from area sources, as feasible: • Use solar or low-emission water heaters. • Orient buildings to take advantage of solar heating and natural cooling and use passive solar designs. • Increase wall and attic insulation. • EPA certified wood burning appliances, or residential natural-gas fireplaces. • Provide electric equipment for landscape maintenance. (*Applicability – Campus and University Community*)	
Impact AQ-3		**Mitigation Measure AQ-3**	
The Proposed Action would not expose sensitive receptors to substantial pollutant concentrations of carbon monoxide.	Less than significant	No mitigation is required.	No Impact
Impact AQ-4		**Mitigation Measure AQ-4**	
The Proposed Action would result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).	Significant	**Mitigation Measures AQ-1** and**AQ-2** would apply to this impact. No further mitigation is available.	Significant and unavoidable

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.3 Air Quality (continued)			
Impact AQ-5		**Mitigation Measure AQ-5**	
The Proposed Action would not conflict with or obstruct implementation of the applicable air quality plan.	Less than significant	No mitigation is required.	Less than significant
Impact AQ-6		**Mitigation Measure AQ-6**	
The Proposed Action would not create objectionable odors affecting a substantial number of people.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.4 Biological Resources			
Impact BIO-1		**Mitigation Measure BIO-1**	
The Proposed Action would not result in a net loss of wetland area or functions through direct removal, filling, hydrological interruption, or other means because of the environmental commitments included in the Proposed Action.	Less than significant	No additional mitigation measures beyond the measures included in the Proposed Action are required.	Less than significant
Impact BIO-2		**Mitigation Measure BIO-2**	
The Proposed Action would result in adverse impacts on special-status plant species.	Significant	Mitigate for loss of special-status plants and habitat through additional off-site compensation. To compensate for the loss of succulent owl's-clover, shining navarretia, and dwarf downingia plants, seeds from all three species will be collected from the project site and translocated to suitable habitat within the CNR. Translocating the stands to the CNR would minimize any potential genetic contamination, because the affected stands are part of the occurrences present within the CNR and, presumably, part of the same populations. The University will retain a qualified restoration ecologist to work closely with resource agency specialists (USFWS and CDFG staff) and knowledgeable individuals to locate and determine the suitability of translocation sites within the CNR. Translocation of the stands that would be affected by the Proposed Action would involve (1) identifying suitable transplant sites, (2) moving the plant material to the transplant sites, and (3) monitoring the transplant sites to document recruitment and survival rates. The restoration ecologist will develop a detailed transplantation and monitoring plan that provides detailed information on: • coordination efforts with agencies and knowledgeable individuals,	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.4 Biological Resources (continued)			
Impact BIO-2 (continued)		**Mitigation Measure BIO-2 (continued)**	
		• methods for collecting seeds from the affected populations, • seed storage methods, planting plan and specifications (including planting locations and densities), • measurable success criteria that can be achieved within a 10-year period, • monitoring and reporting methods and schedule, • funding source and responsible party, and • adaptive management measures to ensure that the desired success criteria are achieved. The University will submit draft copies of the transplantation and monitoring plan to the appropriate resource agencies (e.g., USFWS and CDFG) for review and comment. The plan will be approved by the appropriate agencies before it is implemented. As part of the plan, the following general steps would be involved in the translocation and monitoring efforts, as appropriate: • A site analysis will be conducted to document the biotic and physical requirements of succulent owl's-clover, shining navarretia, and dwarf downingia within the project site. This task will include an evaluation of the populations. Information on soil type, plant species associations, aspect, vegetation cover, and level of disturbance will be gathered during this evaluation. • Sites that may be suitable for transplanting the seeds will be identified and evaluated. Suitable sites may not contain existing stands of species being translocated. The same information as identified above will be gathered for the translocation sites.	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.4 Biological Resources (continued)			
Impact BIO-2 (continued)		**Mitigation Measure BIO-2 (continued)**	
		• Seeds will be collected for propagation or storage purposes. Seed collection, storage, and propagation will be done by a qualified restoration ecologist. The seeds will be planted at the transplant sites at the appropriate time to ensure higher survival rates. • Dried plants and topsoil containing seeds will be excavated from the area containing the affected plants. The seed material will be excavated after the plants have set seed and dried (generally by late summer). The excavation will be done using hand tools. A post-translocation report that documents the measures used to relocate the populations and where they were relocated will be prepared. • Translocated populations will be monitored to document survival and recruitment rates over a period of time established in consultation with the resource agencies but for a minimum of five years. The populations would be monitored annually during the flowering period to document success rates and to identify remedial actions. The detailed transplant and monitoring plan will provide specific monitoring protocol and documentation procedures. A copy of the annual monitoring reports and the final monitoring report will be provided to the appropriate resource agencies for review. (*Applicability – Campus*)	
Impact BIO-3		**Mitigation Measure BIO-3**	
The Proposed Action would not result in a substantial adverse impact on vernal pool species critical habitat.	Less than significant	No additional mitigation measures beyond the measures included in the Proposed Action are required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.4 Biological Resources (continued)			
Impact BIO-4		**Mitigation Measure BIO-4**	
The Proposed Action would not result in a substantial adverse impact on special-status invertebrate species due to the loss of vernal pool ecosystems.	Less than significant	No additional mitigation measures beyond the measures included in the Proposed Action are required.	Less than significant
Impact BIO-5		**Mitigation Measure BIO-5**	
The Proposed Action would not result in a substantial adverse impact on special-status amphibians dependent on vernal pool ecosystems, annual grasslands, and stock ponds due to the loss of these habitats.	Less than significant	No additional mitigation measures beyond the measures included in the Proposed Action are required.	Less than significant
Impact BIO-6		**Mitigation Measure BIO-6**	
The Proposed Action would not result in a substantial adverse impact on western pond turtle from the loss or disturbance of ponds and seasonal freshwater marsh communities.	Less than significant	No additional mitigation measures beyond the measures included in the Proposed Action are required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.4 Biological Resources (continued)			
Impact BIO-7		**Mitigation Measure BIO-7**	
The Proposed Action would not result in a substantial adverse impact on Swainson's hawk from the loss of suitable foraging habitat.	Less than significant	Mitigate for loss of Swainson's hawk foraging habitat in accordance with CDFG requirements. To mitigate for the loss of foraging habitat in the Community South, consistent with Policy PA 2.3, the County shall require the project proponents to provide habitat management lands consistent with CDFG foraging habitat mitigation requirements for projects located within 10 miles of an active nest (California Department of Fish and Game 1994). CDFG requirements state that projects within 10 miles of an active nest but greater than 5 miles from an active nest shall provide 0.5 acre of habitat management lands for each one acre of urban development authorized (0.5:1). All habitat management lands protected under this requirement may be preserved by fee title or conservation easement on agricultural lands, or other suitable habitats (as approved by the CDFG) that provide foraging habitat for Swainson's hawk. (*Applicability – Community South only*)	Less than significant
Impact BIO-8		**Mitigation Measure BIO-8**	
The Proposed Action would not result in a substantial adverse impact on special-status avian species from the loss of foraging habitat.	Less than significant	No additional mitigation measures beyond the measures included in the Proposed Action are required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.4 Biological Resources (continued)			
Impact BIO-9		**Mitigation Measure BIO-9**	
The Proposed Action would result in potentially significant adverse impacts on nesting special-status bird species and non-special-status migratory birds and raptors.	Potentially significant	Avoid and minimize impacts on special-status and non-special-status migratory birds, and raptors. (a) Limit construction to the non-breeding season or, if breeding season work is required, conduct pre-construction (tree, shrub, and ground) nest surveys to identify and avoid active nests or as an option, remove potential breeding habitat during the non-breeding season. • If feasible, the project proponent shall conduct all construction-related activities including (but not limited to) tree and shrub removal, other vegetation clearing, grading, or other ground disturbing activities during the non-breeding season (between August 16 and February 14) for special-status and non-special-status migratory birds and raptors. If construction activities are scheduled to occur during the breeding season, a qualified avian biologist, with knowledge of the species to be surveyed, shall be retained to conduct focused nesting surveys within 15 days of the start of ground-disturbing or construction activities and within the appropriate habitat. • Specifically, tree, shrub, and ground nesting surveys for special-status birds (including but not limited to white-tailed kite, Swainson's hawk, northern harrier, burrowing owl, loggerhead shrike, and tricolored blackbird), and other migratory birds and raptors shall be conducted before any construction disturbances occur in or near suitable nesting habitat within 500 feet (0.25 mile for Swainson's hawk) of the construction work area between February 15 and August 15.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.4 Biological Resources (continued)			
Impact BIO-9 (continued)		**Mitigation Measure BIO-9 (continued)**	
		• If an active nest is located on or within 500 feet (0.25 mile for Swainson's hawk) of the project area, CDFG shall be consulted to determine an appropriate no-disturbance buffer around the nest until the nest is no longer active and the young have fledged. No construction shall be allowed within this exclusion area without consulting with CDFG. A wildlife biologist shall monitor the nest site during construction at least once a week, or at a frequency determined by CDFG, to ensure that the nest site is not disturbed and the buffer is maintained. • If the project proponent elects to remove a nest tree, nest trees may only be removed between August 16 and February 28, after the qualified avian biologist has determined that the nests are unoccupied. (b) Minimize impacts to burrowing owl and compensate for habitat loss. The CDFG (1995) recommends that preconstruction surveys be conducted to locate active burrowing owl burrows in the construction work area and within a 500-foot-wide buffer zone around the construction area. The project proponent or its contractor shall retain a qualified biologist to conduct preconstruction surveys for active burrows according to the CDFG's Staff Report on Burrowing Owl Mitigation (California Department of Fish and Game 1995). The preconstruction surveys shall include a breeding season survey and a wintering season survey. If no burrowing owls are detected, no further mitigation is required.	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.4 Biological Resources (continued)			
Impact BIO-9 (continued)		**Mitigation Measure BIO-9 (continued)**	
		If active burrowing owls are detected, the following additional measures are required: • Occupied burrows shall not be disturbed during the breeding season (February 1 to August 31), which requires a 250 foot no disturbance buffer. • If owls must be moved away from the project site during the nonbreeding season, passive relocation techniques (e.g., installing one-way doors at burrow entrances) shall be used instead of trapping, as described in CDFG guidelines. At least 1 week will be necessary to complete passive relocation and allow owls to acclimate to alternate burrows. • When destruction of occupied burrows is unavoidable during the nonbreeding season (September 1 to January 31), unsuitable burrows shall be enhanced (enlarged or cleared of debris) or new burrows created (by installing artificial burrows) at a ratio of 2:1 on protected lands approved by the CDFG. Newly created burrows shall follow guidelines established by the CDFG (1995). These guidelines also require compensation for loss of foraging habitat described in detail under **Impact BIO-8** above. (*Applicability – Campus and University Community*)	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Impact BIO-10		**Mitigation Measure BIO-10**	
The Proposed Action would not result in substantial adverse impacts to San Joaquin kit fox due to the loss of suitable residence and dispersal habitat.	Less than significant	Avoid and minimize impacts to San Joaquin kit fox. The County shall ensure that surveys for dens/burrows that could be occupied by vagrant San Joaquin kit fox are surveyed prior to any ground-disturbing activities within the UCP area. These surveys shall be conducted within 2 weeks or less of any ground-disturbing activities. If dens/burrows meeting the criteria suitable for use by San Joaquin kit fox are found, the dens/burrows shall be cleared using the methodologies described in the June 1999 Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance. Additionally, avoidance and minimization of impacts to kit foxes that could move through the project site will be achieved through implementation of standard protection measures contained in USFWS' 1999 recommendations for kit fox, mentioned above (USFWS 1999). (*Applicability – Community South Only)*	Less than significant
Impact BIO-11		**Mitigation Measure BIO-11**	
Diversions from the Merced River to recharge the groundwater basin would not adversely affect fish species.	Less than significant	No mitigation required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.5 Cultural Resources			
Impact CUL-1		**Mitigation Measure CUL-1**	
Implementation of the Proposed Action could damage or destroy significant historic resources located within the project footprint.	Potentially Significant	Prior to development, the site developer will evaluate Site MCN-4 in accordance with the stipulations and requirements of the Programmatic Agreement (PA) executed for this project. If Site MCN-4 is found to be eligible for the NRHP and CRHR, a Historic Properties Treatment Plan will be prepared and identified treatment measures will be implemented prior to any direct effects to MCN-4 as required by the PA. (*Applicability – Community North Only*) **Mitigation Measure CUL-1b:** Prior to the development of the Campus and Community North, the University shall ensure that the two previously-evaluated historic irrigation canals, Fairfield Canal and the Le Grand Canal, the farm complex, the fence line and prehistoric site MCN-1 which were recommended to be found ineligible for listing under the NRHP and CRHR, are be formally evaluated. Formal NRHP and CRHR evaluations of these resources will be reviewed by the SHPO for concurrence. If SHPO does not concur with the findings of these previous evaluations, the development of any necessary treatment measures will be stipulated in a Historic Properties Treatment Plan as requirements of the PA executed for this project. Identified treatment measures will be implemented prior to any direct effects to the canals as required by the PA. (*Applicability – University Community and Campus*)	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.5 Cultural Resources (continued)			
Impact CUL-2		**Mitigation Measure CUL-2**	
Implementation of the Proposed Action could cause damage to unidentified or buried cultural resources.	Potentially Significant	If buried cultural resources, such as chipped or ground stone, historic debris, building foundations, or non-human bone are inadvertently discovered during ground-disturbing activities on the campus, work will stop in that area and within 100 feet of the find until a qualified archaeologist can assess the significance of the find and, if necessary, develop appropriate treatment measures. Treatment measures typically include development of avoidance strategies or mitigation of impacts through data recovery programs such as excavation or detailed documentation. If cultural resources are discovered during construction activities, the construction contractor and lead contractor compliance inspector will verify that work is halted until appropriate treatment measures are implemented in coordination with the USACE and UC Merced. (*Applicability – Campus Only*)	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.5 Cultural Resources (continued)			
Impact CUL-3		**Mitigation Measure CUL-3**	
Implementation of the Proposed Action could cause damage to previously unidentified human remains.	Potentially Significant	**Mitigation Measure CUL-3:** If human remains of Native American origin are discovered during ground-disturbing activities, the Campus and/or developer will comply with state laws relating to the disposition of Native American burials, which falls within the jurisdiction of the California Native American Heritage Commission (Public Resources Code Section 5097). If human remains are discovered or recognized in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: • the coroner of Merced County has been informed and has determined that no investigation of the cause of death is required; and • if the remains are of Native American origin, • the descendants from the deceased Native Americans have made a recommendation to the land owner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or • the California Native American Heritage Commission was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the Commission. (*Applicability – University Community and Campus*)	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.5 Cultural Resources (continued)			
Impact CUL-4		**Mitigation Measure CUL-4**	
Development of the Proposed Action would have the potential to disturb or destroy paleontological resources.	Potentially Significant	**Mitigation Measure CUL-4a:** Prior to project construction, construction personnel will be informed of the potential for encountering significant paleontological resources. All construction personnel will be informed of the need to stop work in the vicinity of a potential discovery until a qualified paleontologist has been provided the opportunity to assess the significance of the find and implement appropriate measures to protect or scientifically remove the find. Construction personnel will also be informed of the requirements that unauthorized collection resources are prohibited. (*Applicability – Campus Only*) **Mitigation Measure CUL-4b:** A qualified paleontologist will be intermittently present to inspect exposures of Merhten Formation, North Merced Gravels, and Riverbank Formation during construction operations to ensure that paleontological resources are not destroyed by project construction. (*Applicability – Campus Only*)	Less than significant
4.6 Geology and Soils			
Impact GEO-1		**Mitigation Measure GEO-1**	
The Proposed Action would not expose people or structures to increased risk from fault rupture.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.6 Geology and Soils (continued)			
Impact GEO-2		**Mitigation Measure GEO-2**	
The Proposed Action could expose people or structures to increased risk of structural damage and injury from ground shaking and related hazards.	Potentially Significant	During project-specific building design, a site-specific geotechnical investigation shall be performed by a Certified Engineering Geologist or Licensed Geotechnical Engineer to assess detailed seismic, geologic, and soil conditions at each construction site. The study shall include an evaluation of liquefaction potential, slope stability, landslide potential, expansive and compressible soils, and other structural characteristics and shall identify specific geotechnical recommendations designed to mitigate for the site hazards. The geotechnical recommendations will be followed. (*Applicability – Campus only*)	Less than significant
Impact GEO-3		**Mitigation Measure GEO-3**	
The Proposed Action would not expose people or structures to increased risk of structural damage and injury from slope failure.	Less than significant	No mitigation is required.	Less than significant
Impact GEO-4		**Mitigation Measure GEO-4**	
The Proposed Action would not result in substantial soil erosion or the loss of topsoil from grading activities.	Less than significant	No mitigation is required.	Less than significant
Impact GEO-5		**Mitigation Measure GEO-5**	
The Proposed Action would not create substantial risks to life or property from development on expansive soils.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.6 Geology and Soils (continued)			
Impact GEO-6		**Mitigation Measure GEO-6**	
The Proposed Action would not involve construction on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems.	Less than significant	No mitigation is required.	Less than significant
4.7 Hazards and Hazardous Materials			
Impact HAZ-1		**Mitigation Measure HAZ-1**	
The Proposed Action would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Less than significant	No mitigation is required.	Less than significant
Impact HAZ-2		**Mitigation Measure HAZ-2**	
The Proposed Action would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	Less than significant	No mitigation is required.	Less than significant
Impact HAZ-3		**Mitigation Measure HAZ-3**	
The Proposed Action would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.	No Impact	No mitigation is required.	No Impact

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.7 Hazards and Hazardous Materials (continued)			
Impact HAZ-4		**Mitigation Measure HAZ-4**	
The Proposed Action could be located on a site that contains hazardous materials and, could create a significant hazard to the public or the environment.	Potentially significant	In the event that non-permitted disposal sites, trash burn pits, wells, underground storage devices, or unknown hazardous materials are encountered during construction on the campus site, construction activities would cease until all contaminated areas are identified, and remediated or removed. This process of identification and remediation or removal would be coordinated with the Merced County Division of Environmental Health. (*Applicability – Campus only*)	Less than significant
Impact HAZ-5		**Mitigation Measure HAZ-5**	
The Proposed Action would not be located within an airport land use plan or within 2 miles of a public airport or public use airport.	No Impact	No mitigation is required.	No Impact
Impact HAZ-6		**Mitigation Measure HAZ-6**	
The Proposed Action would not result in a safety hazard for people residing or working in the project area due to the project's proximity of a private airstrip.	Less than significant	No mitigation is required.	Less than significant
Impact HAZ-7		**Mitigation Measure HAZ-7**	
The Proposed Action would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.7 Hazards and Hazardous Materials (continued)			
Impact HAZ-8		**Mitigation Measure HAZ-8**	
The Proposed Action would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	Less than significant	No mitigation is required.	Less than significant
Impact HAZ-9		**Mitigation Measure HAZ-9**	
The Proposed Action would not expose people to a significant public safety hazard associated with irrigation canals.	Less than significant	No mitigation is required.	Less than significant
4.8 Hydrology and Water Quality			
Impact HYD-1		**Mitigation Measure HYD-1**	
Implementation of the Proposed Action would not result in discharges that would cause the City's Wastewater Treatment Plant to violate water quality standards or waste discharge requirements.	Less than significant	No mitigation is required.	Less than significant
Impact HYD-2		**Mitigation Measure HYD-2**	
Construction-related earth disturbing activities under the Proposed Action would result in soil erosion and sedimentation, but water quality would not be adversely affected.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.8 Hydrology and Water Quality (continued)			
Impact HYD-3		**Mitigation Measure HYD-3**	
Dewatering activities performed during construction of the Proposed Action would not result in the discharge of sediments or pollutants into receiving waters, potentially affecting water quality.	Less than significant	No mitigation is required.	Less than significant
Impact HYD-4		**Mitigation Measure HYD-4**	
The Proposed Action would not substantially deplete groundwater supplies such that the production of existing nearby wells would drop to levels that would not support the uses.	Less than significant	No mitigation is required.	Less than significant
Impact HYD-5		**Mitigation Measure HYD-5**	
The new impervious surfaces added by the Proposed Action would not substantially interfere with groundwater recharge such that there would be a net deficit in aquifer volume.	Less than significant	No mitigation is required.	Less than significant
Impact HYD-6		**Mitigation Measure HYD-6**	
The Proposed Action Alternative would increase the amount of storm runoff and alter existing drainage patterns, but would not increase the risk of flooding downstream and flooding to Cottonwood Creek and Fairfield Canal.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.8 Hydrology and Water Quality (continued)			
Impact HYD-7		**Mitigation Measure HYD-7**	
The Proposed Action would not substantially increase the amount of sediment and urban pollutants in the site runoff and therefore would not result in water quality degradation.	Less than significant	No mitigation is required.	Less than significant
Impact HYD-8		**Mitigation Measure HYD-8**	
The Proposed Action would not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.	Less than significant	No mitigation is required.	Less than significant
4.9 Land Use and Planning			
Impact LU-1		**Mitigation Measure LU-1**	
Implementation of the Proposed Action would not physically divide an established community.	No Impact	No mitigation is required.	No Impact
Impact LU-2		**Mitigation Measure LU-2**	
Implementation of the Proposed Action would not conflict with the Merced County General Plan land use designations or policies.	Less than significant	No mitigation is required.	Less than significant
Impact LU-3		**Mitigation Measure LU-3**	
Implementation of the Proposed Action would not conflict with the City of Merced General Plan land use designations or policies.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.9 Land Use and Planning continued)			
Impact LU-4		**Mitigation Measure LU-4**	
Implementation of the Proposed Action would not result in land use designations that could result in incompatible land uses.	Less than significant	No mitigation is required.	Less than significant
Impact LU-5		**Mitigation Measure LU-5**	
Annexation of the Proposed Campus and University Community would not conflict with Merced County LAFCO policies.	Less than significant	No mitigation is required.	Less than significant
Impact LU-6		**Mitigation Measure LU-6**	
Development of Special Districts to provide urban services to the Proposed Action would not conflict with Merced County LAFCO policies.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.10 Noise			
Impact NOI-1		**Mitigation Measure NOI-1**	
Implementation of the Proposed Action would result in increased vehicular traffic on the regional road network, which would increase ambient traffic noise levels at existing off-site noise-sensitive uses.	Significant	For existing sensitive receptors that are predicted to be exposed to traffic noise increases that exceed the noise significance thresholds, project proponents shall commission a study, conducted by a qualified acoustical professional, to define reasonable and feasible noise mitigation, and shall implement the recommendations. Mitigation measures would include the following: • Re-pave the streets with 'quiet' pavement types such as a porous Open-Grade Asphalt Concrete with fine aggregate size to reduce exterior noise levels to meet the noise thresholds (60 dBA L_{dn} for residences, schools, and libraries, and 70 dBA L_{dn} for parks). The effectiveness of this measure would depend on the existing pavement conditions along the roadway segment. Noise reductions of 3 to 4 dBA below the noise levels associated with 'average' pavements have been achieved using quiet pavement. (*Applicability – Campus and University Community*)	Significant and unavoidable

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.10 Noise (continued)			
Impact NOI-1 (continued)		**Mitigation Measure NOI-1 (continued)**	
		• In areas where 'quiet' pavement is not an option or would not reduce exterior noise levels to meet the noise thresholds, forced-air mechanical ventilation or building sound insulation such as sound-rated windows and doors shall be provided to reduce interior noise levels in existing residences that are anticipated to exceed 45 dBA L_{dn} inside homes. This mitigation would be provided on a case-by-case basis and would typically be applicable in rural areas where the construction of sound barriers or the use of 'quiet' pavement is not found to be feasible and interior noise levels inside residences are anticipated to exceed 45 dBA L_{dn}. (*Applicability – Campus and University Community*)	
Impact NOI-2		**Mitigation Measure NOI-2**	
Daily operations within the Campus and University Community and special events at the Campus could expose existing off-site and future on-site noise-sensitive receptors to elevated noise levels.	Potentially Significant	**Mitigation Measure NOI-2a:** In areas where new noise-generating Campus or Community uses are proposed adjacent to or integrated with noise-sensitive uses within the Campus or Community North, the project proponents shall retain a qualified acoustical consultant to prepare a design-level study to define reasonable and feasible noise mitigation to reduce noise levels to comply with noise standards. The identified mitigation shall be included in the design of the project. Measures that can be implemented to achieve this include but are not limited to:	Significant and unavoidable

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.10 Noise (continued)			
Impact NOI-2 (continued)		**Mitigation Measure NOI-2 (continued)**	
		• Using site planning to minimize noise in noise-sensitive areas by locating noise-generating operations in areas that are set back or acoustically shielded from noise-sensitive uses. • Incorporating appropriate noise controls so that mechanical equipment from proposed uses does not generate noise levels in excess of 60 dBA L_{dn} at residential façades. • Limiting the hours of noise-generating activities, such as maintenance, loading and unloading, and drive-through operations, to 7:00 AM to 10:00 PM, where potential noise conflicts exist. (*Applicability – Campus and Community*) **Mitigation Measure NOI-2b:** Noise considerations shall be taken into account during the design of the multi-purpose stadium and any other noise-generating event facilities. The project proponents shall perform a design-level study, conducted by a qualified acoustical professional, during the project level analysis to define reasonable and feasible noise mitigation for noise-sensitive receptors that are predicted to be exposed to noise levels that exceed the noise significance thresholds (60 dBA L_{dn} for residences, schools, and libraries, and 70 dBA L_{dn} for parks). (*Applicability – Campus and Community*)	
Impact NOI-3		**Mitigation Measure NOI-3**	
Construction of the Proposed Action could expose existing off-site and future on-site noise-sensitive receptors to elevated noise levels.	Potentially Significant	Prior to initiation of campus or community construction, the project proponents shall approve a construction noise mitigation program including but not limited to the following.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.10 Noise (continued)			
Impact NOI-3 (continued)		**Mitigation Measure NOI-3 (continued)**	
		• Construction activities within 500 feet of any residences shall be restricted to between the hours of 7:00 AM and 6:00 PM on weekdays and Saturdays with no construction on Sundays and holidays. • All noise-producing project equipment and vehicles using internal combustion engines shall be equipped where appropriate with exhaust mufflers and air-inlet silencers in good operating condition that meet or exceed original factory specifications. • Mobile or fixed "package" equipment (e.g., arc-welders, air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment. • All mobile or fixed noise-producing equipment used on the project that is regulated for noise output by local, state or federal agency shall comply with such regulation while engaged in project-related activities. • Electrically powered equipment shall be used instead of pneumatic or internal combustion powered equipment, where practicable.	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.10 Noise (continued)			
Impact NOI-3 (continued)		**Mitigation Measure NOI-3 (continued)**	
		• Material stockpiles and mobile equipment staging, construction vehicle parking and maintenance areas shall be located as far as practicable from noise-sensitive land uses. • Stationary noise sources such as generators or pumps shall be located away from noise-sensitive land uses as feasible. • The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only. No project-related public address loudspeaker, two-way radio, or music systems shall be audible at any adjacent noise-sensitive receptor except for emergency use. • The erection of temporary noise barriers shall be considered where project activity is unavoidably close to noise-sensitive receptors. • The noisiest construction operations shall be scheduled to occur together to avoid continuing periods of the greatest annoyance, wherever possible. • Construction vehicle trips be routed as far as practical from existing residential uses. • The loudest Campus construction activities, such as demolition, blasting, and pile driving, shall be scheduled during summer, Thanksgiving, winter, and spring breaks when fewer people would be disturbed by construction noise. • Whenever possible, academic, administrative, and residential areas that will be subject to construction noise shall be informed a week before the start of each construction project. (*Applicability – Campus and University Community*)	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.10 Noise (continued)			
Impact NOI-4		**Mitigation Measure NOI-4**	
Pile driving activities during construction could expose nearby receptors to perceptible levels of groundborne vibration.	Potentially Significant	**Mitigation Measure NOI-4a:** The project proponents shall avoid impact pile driving where possible in vibration-sensitive areas. Drilled piles or the use of vibratory pile driving will be used where geological conditions permit their use. For impact pile driving activities occurring within 50 feet of typical structures, limit groundborne vibration due to construction activities to 0.50 inch/second, ppv (limit of potential for damage to typical structures) in the vertical direction at sensitive receptors. Since in many cases the information available during the preliminary engineering phase would not be sufficient to define specific vibration mitigation measures, the project proponents shall describe and commit to a mitigation plan to minimize construction vibration damage using all feasible means available. Thresholds for individual structures could be established based on the assessment of each structure's ability to withstand vibration, and vibration monitoring could be conducted to ensure compliance with the vibration thresholds. (*Applicability – Campus and University Community*) **Mitigation Measure NOI-4b:** For construction adjacent to highly sensitive uses such as laboratories, apply additional measures as feasible, including advance notice to occupants of sensitive facilities to ensure that precautions are taken in those facilities to protect ongoing activities from vibration effects. (*Applicability – Campus and Community North*)	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.10 Noise (continued)			
Impact NOI-5		**Mitigation Measure NOI-5**	
New on-site noise-sensitive land uses, such as Campus and University Community residences, could be exposed to noise levels exceeding noise thresholds.	Potentially Significant	**Mitigation Measure NOI-5a:** For new noise-sensitive Campus and University Community development, noise considerations shall be taken into account during initial site planning, in order to maximize shielding by the planned structures or other on-site features. In areas where new residential development or noise-sensitive park uses would be developed adjacent to noise-generating project development or along Campus Parkway, the project proponent shall retain a qualified acoustical professional to prepare a design level study to define reasonable and feasible noise mitigation to reduce exterior and interior noise levels in noise-sensitive areas to comply with the land use compatibility guidelines (60 dBA L_{dn} exterior and 45 dBA L_{dn} interior for residences). The identified mitigation shall be included in the design of the project. Measures that can be implemented to achieve reductions in noise levels include but are not limited to:	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.10 Noise (continued)			
Impact NOI-5 (continued)		**Mitigation Measure NOI-5 (continued)**	
		• Using site planning to minimize noise in parks and residential outdoor activity areas by locating these areas as far as possible from noise sources or at locations behind buildings. • Paving Campus Parkway section within the project site with a 'quiet' pavement type such as a porous Open-Grade Asphalt Concrete with fine aggregate size. Noise reductions of 3 to 4 dBA below noise levels associated with 'Average' pavements have been achieved using a 'quiet' pavement. • Using noise barriers or berms to acoustically shield these uses where site planning methods are not sufficient to reduce noise in noise-sensitive exterior use areas to below 60 dBA L_{dn}. • Providing mechanical ventilation so that windows can remain closed to maintain interior noise levels below 45 dBA L_{dn} where exterior noise levels at residential façades are predicted to exceed 60 dBA L_{dn}. • Providing sound-rated windows and applying other noise-reducing construction methods where exterior noise levels at residential facades are predicted to exceed 65 dBA Ldn. (*Applicability – Campus and University Community*) **Mitigation Measure NOI-5b:** Noise considerations shall be taken into account during the design of residences to ensure that airstrip or other agricultural operations do not adversely affect residents. During the project level analysis, the project proponents shall perform a design level study, conducted by a qualified acoustical professional, to define reasonable and feasible noise mitigation for noise-sensitive receptors that are predicted to be exposed to noise levels that exceed the noise significance thresholds.	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.10 Noise (continued)			
Impact NOI-5 (continued)		**Mitigation Measure NOI-5 (continued)**	
		Potential aircraft noise could be addressed through siting, building design and construction, and/or working with the airstrip owner to modify hours of operation and/or flight patterns. (*Applicability – University Community*)	
4.11 Public Service and Recreation			
Impact PUB-1		**Mitigation Measure PUB-1**	
The Proposed Action would increase demand for law enforcement services and would require the construction of new facilities.	Less than significant	No mitigation is required.	Less than significant
Impact PUB-2		**Mitigation Measure PUB-2**	
The Proposed Action would increase demand for fire protection services and would require the construction of a new facility.	Less than significant	No mitigation is required.	Less than significant
Impact PUB-3		**Mitigation Measure PUB-3**	
The Proposed Action would increase enrollment in local public schools, which would require construction of new facilities.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.11 Public Service and Recreation (continued)			
Impact PUB-4		**Mitigation Measure PUB-4**	
The Proposed Action would increase demand for public libraries in Merced County.	Less than significant	No mitigation is required.	Less than significant
Impact PUB-5		**Mitigation Measure PUB-5**	
The Proposed Action would result in an increased demand for parks and recreational facilities, but would not require the construction of new recreational facilities off site.	Less than significant	No mitigation is required.	Less than significant
Impact PUB-6		**Mitigation Measure PUB-6**	
The Proposed Action would increase the use of Lake Yosemite Regional Park which could accelerate physical deterioration of park facilities.	Potentially Significant	**Mitigation Measure PUB-6a:** The University shall work with the County to develop a program for joint use of on-campus sports, recreational, and parking facilities. (*Applicability – Campus only*). **Mitigation Measure PUB-6b:** The University shall work with the County to avoid physical deterioration of existing facilities at Lake Yosemite Regional Park, and/or improve park facilities within the existing park site as necessitated by the increased uses associated with development of the Campus. (*Applicability – Campus only*). **Mitigation Measure PUB-6c:** The University will pay its fair share of the cost of necessary improvements to the regional park. The University's share of funding will be based on the percentage that on-campus residential population represents of the total population in eastern Merced County at the time that an improvement is implemented. (*Applicability – Campus only*).	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.11 Public Service and Recreation (continued)			
Impact PUB-6 Continued)		**Mitigation Measure PUB-6 (continued)**	
		Mitigation Measure PUB-6d: In recognition of the sensitive resources present on lands immediately adjacent to the regional park, all regional park improvement projects that are implemented by the County within 250 feet of the park's eastern boundary pursuant to **Mitigation Measures PUB-6b and -c** above, will implement mitigation measures to avoid and minimize indirect effects on biological resources. These measures shall be based on and as effective as the measures in the *Conservation Strategy* to control indirect impacts to biological resources. (*Applicability – Campus only*)	
4.12 Socioeconomics/Environmental Justice			
Impact SOC-1		**Mitigation Measure SOC-1**	
The Proposed Action Alternative would directly induce substantial population growth in Merced City and Merced County.	Significant	No feasible mitigation measures are available.	Significant and unavoidable
Impact SOC-2		**Mitigation Measure SOC-2**	
The Proposed Action Alternative would not displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.12 Socioeconomics/Environmental Justice (continued)			
Impact SOC-3		**Mitigation Measure SOC-3**	
The Proposed Action Alternative would not displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.	Less than significant	No mitigation is required.	Less than significant
Impact SOC-4		**Mitigation Measure SOC-4**	
The Proposed Action would contribute 1 percent or more to the traffic growth projected for 18 roadway segments planned to be widened in the future, cause the LOS of two study intersections to deteriorate to unacceptable levels, and result in a significant increase in delay at one intersection.	Less than significant	No mitigation is required.	Less than significant
4.13 Transportation and Traffic			
Impact TRANS-1		**Mitigation Measure TRANS-1**	
Implementation of the Proposed Action would result in exceedance of the LOS threshold along three roadway segments.	Significant	**Mitigation Measure TRANS-1A: <u>Campus Traffic Mitigation Program (CTMP)</u>.** The Campus Traffic Mitigation Program (CTMP) is a proposed program to monitor trip generation, reduce peak-hour trips, and/or participate in roadway improvements to mitigate off-site impacts associated with the roadway segments and intersections affected by the development of the Campus. CEQA provides that an agency can mitigate its contribution to local and regional environmental impacts by contributing its proportional share of funding to mitigation measures designed to alleviate the identified impact (CEQA Guidelines §15130(a)(3)). The CTMP will consist of the following elements/measures:	Significant and unavoidable

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.13 Transportation and Traffic (continued)			
Impact TRANS-1 (continued)		**Mitigation Measure TRANS-1 (continued)**	
		Measure TRANS-1A-1: <u>Travel Demand Management.</u> To reduce on- and off-campus vehicle trips and resulting impacts, the University will implement a range of Transportation Demand Management (TDM) strategies. TDM strategies will include measures to increase transit and shuttle use, encourage alternative transportation modes including bicycle transportation, implement parking polices that reduce demand, and implement other mechanisms that reduce vehicle trips to and from the campus and community. (*Applicability – Campus*) **Measure TRANS-1A-2: <u>Transit Enhancement.</u>** To enhance transit systems serving the Campus and University Community, the University will work cooperatively with the City of Merced, County of Merced, Cat Tracks, The Bus, StaRT, YARTS, and other local agencies to coordinate service routes with existing and proposed shuttle and transit programs. (*Applicability – Campus*) **Measure TRANS-1A-3: <u>Sustainability and Monitoring</u>.** The University shall review individual projects proposed under the 2009 LRDP for consistency with UC sustainable transportation policy and UCM Transportation Demand Management (TDM) strategies set forth in the 2009 LRDP to ensure that bicycle and pedestrian improvements, alternative fuel infrastructure, transit stops, and other project features that promote alternative transportation are incorporated to the extent feasible. The University shall monitor the performance of campus TDM strategies through annual surveys. (*Applicability – Campus*)	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.13 Transportation and Traffic (continued)			
Impact TRANS-1 (continued)		**Mitigation Measure TRANS-1 (continued)**	
		Measure TRANS-1A-5: <u>Campus Traffic Impact Monitoring.</u> The University will monitor trip generation resulting from the campus development under the 2009 LRDP to track the actual trip generation relative to the projections in this EIS/EIR. The University will conduct traffic cordon counts of the campus with each 3,000 person increase in student population, measured by three-term average headcount enrollment increases with 2007-08 as the base year. If this monitoring determines that traffic attributable to the Campus contributes to a significant traffic impact at any of the roadway segments or intersections listed in **Table 4.13-10** the University will implement measures to reduce vehicle trips contributing to the impact or provide its proportional share of funding for improvements at the impacted intersections and/or roadway segments. (*Applicability – Campus*) **Measure TRANS-1A-6: <u>Proportional Share Determination</u>.** At the time a significant impact is identified pursuant to the monitoring under Measure TRANS-1A-5, the University's actual percent contribution to the total traffic volume at pertinent intersections and roadway segments will be calculated and used as the basis for determining the University's mitigation obligation, or proportional share of funding for the traffic improvements listed in the table. **Table 4.14-10** provides the projected percent contribution of the Campus to the total traffic volume on the roadway segment impact locations and at the intersection impact locations, respectively. The tables also show the projected contribution from the Community North and Community South.	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.13 Transportation and Traffic (continued)			
Impact TRANS-1 (continued)		**Mitigation Measure TRANS-1 (continued)**	
		A fourth column indicates the projected contribution of traffic on the roadway segments and at the intersections attributable to all other sources. (This category includes existing traffic and growth in traffic from non-Campus, non-University Community sources). In the future, the actual contributions of campus traffic to the affected intersections and roadway segments will be calculated. (*Applicability – Campus*) **Measure TRANS-1A-7: <u>Mitigation Payments.</u>** The amount of the University's mitigation payments will be based on the University's proportional share of the affected jurisdiction's actual cost of the relevant traffic improvement(s) at the time of final design. The amount will be calculated by applying the University's proportional share determined in Measure TRANS-1A-6 to the total cost of the improvement, after accounting for all other federal and state funding sources. Funding will be internally committed by the University at the time the traffic impact is triggered pursuant to the results of monitoring under Measure TRANS-1A-5. Payments will be made to the appropriate jurisdiction at the time the improvements are constructed. If improvements are constructed before the impact is triggered, the University will pay its proportional share at the time that the impact is triggered. Mitigation payments will be made after the University reviews the scope and budget of the improvement project. (*Applicability – Campus*)	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.13 Transportation and Traffic (continued)			
Impact TRANS-1 (continued)		**Mitigation Measure TRANS-1 (continued)**	
		Measure TRANS-1A-8: <u>Alternate Improvements.</u> Feasible traffic improvements are identified in **Table 4.13-11** to mitigate the Proposed Action's significant traffic impacts to a less than significant level. As the identified improvements would be planned, designed, and implemented by the City of Merced, Merced County, or other affected jurisdictions, the final configuration of future transportation improvements may vary from those identified in **Tables 4.13-11**. Detailed planning, environmental analysis and engineering studies for some of these improvements has not been completed; therefore, the implementing agency has not committed to all identified improvements. If any improvement described herein is found to be ineffective or infeasible, and alternative improvements are determined to be required to achieve an acceptable LOS, the University will work in collaboration with the public agency to implement alternative improvements. (*Applicability – Campus*) **Mitigation Measure TRANS-1B: <u>University Community Traffic Mitigation.</u>** The following measures will be implemented to mitigate the traffic impacts from the development of the University Community. **Measure TRANS-1B-1:** To enhance transit systems serving the Campus and University Community, the affected jurisdiction will work cooperatively with Cat Tracks, The Bus, StaRT, YARTS, and other local agencies to coordinate service routes with existing and proposed shuttle and transit programs. (*Applicability – University Community*)	

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.13 Transportation and Traffic (continued)			
Impact TRANS-1 (continued)		**Mitigation Measure TRANS-1 (continued)**	
		Measure TRANS-1B-2: The City of Merced and Merced County should conduct traffic impact fee studies[1] to update their respective traffic impact fee programs and set the appropriate fees for new development to assure that the improvements identified in **Tables 4.13-11** can be funded and constructed. These fees would apply to development within the University Community, along with other development projects in the City and the County. The fees that may be adopted and applied to development projects in the University Community should be consistent with the fair share and nexus requirements of California mitigation fee law (Government Code 66000 et seq.). (*Applicability – University Community*) **Measure TRANS-1B-3:** The proponents of development projects in the University Community shall contribute to the improvements identified in **Tables 4.13-11** through payment of the traffic impact fees similar to other development in the Merced area. The proportional share percentages shown in **Table 4.13-10** provide an estimate, based on the current analysis, of the University Community's proportional share of total future traffic at the impact locations. The actual fees that would be collected by the City or County will be based on traffic impact studies completed for the development projects at the time that they are proposed. (*Applicability – University Community*)	

1 Alternately, MCAG may update the Regional Transportation Impact Fee Study to reflect the cost of an expanded regional improvement project list, which the City of Merced and Merced County would then adopt similar to what the City and County did in 2005.

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.14 Utilities and Service Systems			
Impact UTILS-1		**Mitigation Measure UTILS-1**	
The Proposed Action would generate demand for potable water that would be met with existing resources.	Less than significant	No mitigation required.	No Impact
Impact UTILS-2		**Mitigation Measure UTILS-2**	
The Proposed Action-related demand for potable water for indoor and outdoor uses would require the construction of new water supply and conveyance facilities; these facilities would not result in significant impacts on the environment.	Less than significant	No mitigation is required.	Less than significant
Impact UTILS-3		**Mitigation Measure UTILS-3**	
The Proposed Action would generate additional wastewater flows but would not require construction or expansion of new wastewater conveyance or treatment facilities; nor would the Proposed Action result in a determination by the wastewater treatment provider that it has inadequate capacity to serve the project's projected demand in addition to existing commitments.	Less than significant	No mitigation is required.	Less than significant

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
4.14 Utilities and Service Systems (continued)			
Impact UTILS-4		**Mitigation Measure UTILS-4**	
Implementation of the Proposed Action would generate solid waste that would not require the expansion of the regional landfill.	Less than significant	No mitigation is required.	Less than significant
Impact UTILS-5		**Mitigation Measure UTILS-5**	
Implementation of the Proposed Action would require on- and off-site improvements to electric transmission lines and natural gas pipelines.	Less than significant	No mitigation is required.	Less than significant
4.16 Global Climate Change			
Impact GCC-1		**Mitigation Measure GCC-1**	
The Proposed Action would impede or conflict with the emissions reduction targets and strategies prescribed in or developed to implement AB 32.	Significant	The local jurisdiction with land use authority over the University Community should prepare a Climate Action Plan (CAP) as a separate element of the General Plan or as a component of an existing General Plan Component. The CAP should inventory baseline GHG emissions, 1990 GHG emissions, and 2020 GHG emissions. The CAP should also set reduction targets in accordance with AB 32, other state laws, and applicable local or regional enactments addressing GHG emissions. It is anticipated that implementation of the CAP will help the local jurisdiction achieve a reduction in GHG emissions, as compared to a "business as usual" scenario. The local jurisdiction should require development within the University Community to comply with the requirements of the CAP for new development. (*Applicability – University Community*)	Significant and unavoidable

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
5.0 Cumulative Impacts			
Cumulative Impact AES-1		**Cumulative Mitigation Measure AES-1**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in a change in visual quality and character, loss of scenic vistas, and generation of light and glare.	Significant	The City and the County should continue to review all future development proposed within the study area to ensure that new development does not include excessive amounts of new exterior lighting that would increase skyglow.	Significant and unavoidable
Cumulative Impact AG-1		**Cumulative Mitigation Measure AG-1**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would involve the conversion of undeveloped land to urban uses, resulting in the loss of Important Farmland.	Significant	The City and the County should continue to implement policies to control the conversion of farmland within Merced County.	Significant and unavoidable
Cumulative Impact AQ-1		**Cumulative Mitigation Measure AQ-1**	
The construction and operation of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, could hinder air quality attainment and maintenance efforts for criteria pollutants.	Significant	The City and the County should continue to review each development project to ensure that all feasible mitigation measures are incorporated into the development project to minimize the new air emissions resulting from the project.	Significant and unavoidable

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
5.0 Cumulative Impacts (continued)			
Cumulative Impact BIO-1		**Cumulative Mitigation Measure BIO-1**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in the loss or adverse modification of vernal pool wetlands, clay slope wetlands, and other seasonal wetlands.	Less than significant	No mitigation is required.	Less than significant
Cumulative Impact BIO-2		**Cumulative Mitigation Measure BIO-2**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in the loss or adverse modification of important special status plant and wildlife habitat, including adverse effects to special status plant and wildlife species that occupy or could potentially occupy these habitats.	Less than significant	No mitigation is 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		**Cumulative Mitigation Measure CUL-1**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not damage or destroy unidentified prehistoric, historic or paleontological resources.	Less than significant	No mitigation is required.	Less than significant
Cumulative Impact GEO-1		**Cumulative Mitigation Measure GEO-1**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, could result construction site erosion and sedimentation. However, compliance with federal, state and local laws and regulations would reduce this cumulative impact to a less than significant level.	Less than significant	No mitigation is 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 HAZ-1		**Cumulative Mitigation Measure HAZ-1**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would involve the use, storage, transport, and disposal of hazardous materials and wastes that could increase human health risk in the study area.	Less than significant	No mitigation is required.	Less than significant
Cumulative Impact HAZ-2		**Cumulative Mitigation Measure HAZ-2**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not significantly increase the risk from wildland fires.	Less than significant	No mitigation is required.	Less than significant
Cumulative Impact HYD-1		**Cumulative Mitigation Measure HYD-1**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, could cumulatively increase surface runoff but would not substantially increase local and regional flooding.	Less than significant	No mitigation is 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 HYD-2		**Cumulative Mitigation Measure HYD-2**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would cumulatively increase surface runoff but would not substantially degrade water quality.	Less than significant	No mitigation is required.	Less than significant
Cumulative Impact HYD-3		**Cumulative Mitigation Measure HYD-3**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not substantially interfere with groundwater recharge but would deplete groundwater supplies resulting in an overdraft of the regional groundwater aquifer.	Significant	**Cumulative MM HYD-3a:** The University shall support MAGPI in pursuing and securing cooperative arrangements with state and local agencies for purposes of expanding the basin's conjunctive use capabilities. **Cumulative MM HYD-3b:** The City of Merced should implement an aggressive water conservation program that will reduce water demand to levels that can be served on a long-term basis within the safe yield of the groundwater basin.	Significant and unavoidable
Cumulative Impact PUB-1		**Cumulative Mitigation Measure PUB-1**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in increased need for law enforcement services, the provision of which would not result in a significant cumulative environmental impact.	Less than significant	No mitigation is 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-2		**Cumulative Mitigation Measure PUB-2**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would generate an increased demand for fire protection services, the provision of which would not result in a significant cumulative environmental impact.	Less than significant	No mitigation is required.	Less than significant
Cumulative Impact PUB-3		**Cumulative Mitigation Measure PUB-3**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would generate an increased demand for elementary and secondary school facilities, the provision of which would not result in a significant cumulative impact.	Less than significant	No mitigation is 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-4		**Cumulative Mitigation Measure PUB-4**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in increased demand for library services, the provision of which would not result in a significant cumulative impact.	Less than significant	No mitigation is required.	Less than significant
Cumulative Impact PUB-5		**Cumulative Mitigation Measure PUB-5**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not result in a cumulative impact related to neighborhood and community parks, but would result in a cumulative impact associated with the deterioration of the Lake Yosemite Regional Park facilities from increased use. The Proposed Action's contribution would not be cumulatively considerable.	Less than significant	No mitigation is 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 SOC-1		**Cumulative Mitigation Measure SOC-1**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would substantially increase regional population.	Significant	No mitigation is available.	Significant and unavoidable
Cumulative Impact UTILS-1		**Cumulative Mitigation Measure UTILS-1**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not require the construction of new water supply facilities that would result in significant environmental impacts. The cumulative development would result in a substantial increase in demand for water which potentially could result in significant environmental impacts.	Significant	**Cumulative MM UTILS-1a:** The University shall implement Cumulative Mitigation Measure HYD-3a. **Cumulative MM UTILS-1b:** The City of Merced and MID should implement Cumulative Mitigation Measure HYD-3b.	Significant and unavoidable
Cumulative Impact UTILS-2		**Cumulative Mitigation Measure UTILS-2**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in a significant cumulative impact on wastewater collection and treatment facilities.	Significant	**Cumulative MM UTILS-2a:** The University shall continue to monitor and minimize the total amount of wastewater discharged from the site. **Cumulative MM UTILS-2b:** The University shall evaluate the feasibility of developing a recycled water plant on the Campus or in Community North to further reduce wastewater flows discharged to the City's sewer system.	Significant and unavoidable

Environmental Topic and Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
5.0 Cumulative Impacts (continued)			
Cumulative Impact UTILS-3		**Cumulative Mitigation Measure UTILS-3**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, could result in a significant cumulative impact on the regional landfill capacity.	Significant	The City and the County should implement programs to minimize the generation of solid waste and further improve recycling and resource recovery efforts so as to reduce the need for new landfill capacity.	Significant and unavoidable
Cumulative Impact UTILS-4		**Cumulative Mitigation Measure UTILS-4**	
Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not result in a significant cumulative impact related to electrical and natural gas facilities.	Less than significant	No mitigation is required.	Less than significant

Table ES-2
Summary Comparison of Alternatives (NEPA/CEQA)

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
AES-1: Affect scenic vistas.	Significant (SU following mitigation)	Significant (SU following mitigation)	Less than Significant	Significant (SU following mitigation)	Significant (SU following mitigation)	No Impact
AES-2: Adversely affect scenic resources.	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
AES-3: Substantially alter the visual quality and character of the site and its surroundings.	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	No Impact
AES-4: Create a new source of nighttime light and glare in the vicinity.	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	No Impact
AG-1: Result in the conversion of Important Farmland, including Prime Farmland, Farmland of Statewide Importance and Unique Farmland.	Significant Prime – 609 acres Statewide – 109 acres Unique – 434 acres Total – 1,152 acres	Significant Prime – 1,227 acres Statewide – 110 acres Unique – 545 acres Total – 1,882 acres	Significant Prime – 230 acres Statewide – 195 acres Unique –587 acres Total – 1,012 acres	Significant Prime – 619 acres Statewide – 110 acres Unique – 435 acres Total – 1,164 acres	Significant Prime – 589 acres Unique – 429 acres Statewide – 55 acres Total – 1,073 acres (SU following mitigation)	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
AG-2: Expose residents to agricultural nuisance, substantially conflict with existing general plan policies or zoning for agricultural use, or involve other changes that could result in the conversion of Important Farmland to non-agricultural uses.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
AQ-1: Result in construction emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation.	Significant Exceeds Thresholds for ROG and NOx (SU following mitigation)	Significant Exceeds Thresholds for ROG and NOx (SU following mitigation)	Significant Exceeds Thresholds for ROG and NOx (SU following mitigation)	Significant Exceeds Thresholds for ROG and NOx (SU following mitigation)	Less than Significant (SU following mitigation)	No Impact
AQ-2: Result in operational emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation.	Significant Exceeds Thresholds for ROG, NOx, and PM (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM (SU following mitigation)	Less than Significant Exceeds Thresholds for ROG, NOx, and PM (SU following mitigation)	No Impact
AQ-3: Expose sensitive receptors to substantial pollutant concentrations of carbon monoxide.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Significant Exceeds thresholds for ROG and NOx.

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
AQ-4: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).	Significant Exceeds Thresholds for ROG, NOx, and PM10 (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM10 (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM10 (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM10 (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM10 (SU following mitigation)	Less than Significant
AQ-5: Conflict with or obstruct implementation of the applicable air quality plan.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Significant
AQ-6: Create objectionable odors affecting a substantial number of people.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
BIO-1: Result in a net loss of wetland area or functions through direct removal, filling, hydrological interruption, or other means because of the environmental commitments included in the project.	Less than Significant* 85 acres Direct Loss	Less than Significant* 29 acres Direct Loss	Less than Significant* 25 acres Direct Loss	Significant 127 acres Direct Loss	No Impact (United States Army Corps of Engineers would deny 404 permit)	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
BIO-2: Result in adverse impacts on special-status plant species.	Less than Significant* 9 vernal pools and 21 stands	Less than Significant* 3 vernal pools and 7 stands	Less than Significant* None	Less than Significant* 18 vernal pools and 39 stands	Less than Significant None	No Impact None
BIO-3: Result in a substantial adverse impact on vernal pool species critical habitat.	Less than Significant 0 acres	Less than Significant 0 acres	Less than Significant 0 acres	Significant Loss of 38 acres of critical habitat	Less than Significant 0 acres	No Impact
BIO-4: Result in a substantial adverse impact on special-status invertebrate species due to the loss of vernal pool ecosystems.	Less than Significant* <57 acres direct loss	Less than Significant* 13 acres direct loss	Less than Significant* 6 acres direct loss	Less than Significant* 120 acres direct loss	Less than Significant 0 acres direct loss	No Impact
BIO-5: Result in a substantial adverse impact on special-status amphibians dependent on vernal pool ecosystems, annual grasslands, and stock ponds due to the loss of these habitats.	Less than Significant* 1,648 acres direct loss	Less than Significant* 812 acres direct loss	Less than Significant* N/A	Less than Significant* 1,988 acres direct loss	Less than Significant 0 acres direct loss	No Impact
BIO-6: Result in a substantial adverse impact on western pond turtle from the loss or disturbance of ponds and seasonal freshwater marsh communities.	Less than Significant* 44.02 acres direct loss	Less than Significant* 30.34 acres direct loss	Less than Significant* 7.16 acres direct loss	Less than Significant* 44.7 acres direct loss	Less than Significant 4.64 acres direct loss	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
BIO-7: Result in a substantial adverse impact on Swainson's hawk from the loss of suitable foraging habitat.	Less than Significant* Loss of 2,614 acres of suitable foraging habitat	Less than Significant* Loss of 1,563 acres of suitable foraging habitat	Less than Significant* Loss of 2,268 acres of suitable foraging habitat	Less than Significant* Loss of 2,854 acres of suitable foraging habitat	Less than Significant 0 acres direct loss	No Impact
BIO-8: Result in a substantial adverse impact on special-status avian species from the loss of foraging habitat.	Less than Significant* Loss of 2,614 acres of suitable foraging habitat	Less than Significant* Loss of 1,563 acres of suitable foraging habitat	Less than Significant* Loss of 2,2268 acres of suitable foraging habitat	Less than Significant* Loss of 2,854 acres of suitable foraging habitat	Less than Significant	No Impact
BIO-9: Result in potentially significant adverse impacts on nesting special-status bird species and non-special-status migratory birds and raptors.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
BIO-10: Result in substantial adverse impacts to San Joaquin kit fox due to the loss of suitable residence and dispersal habitat.	Less than Significant* Direct impact to 2,444 acres	Less than Significant* Direct impact to 2,477 acres	Less than Significant* Direct impact to 2,376 acres	Less than Significant* Direct impact to 2,741 acres	Less than Significant Direct impact to 1,030 acres	No Impact
BIO-11: Diversions from the Merced River to recharge the groundwater basin would not adversely affect fish species.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
CUL-1: Damage or destroy significant historic resources located within the project footprint.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
CUL-2: Cause damage to unidentified or buried cultural resources.	Potentially Significant (LTS following mitigation)	Less than Significant	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
CUL-3: Cause damage to previously unidentified human remains.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
CUL-4: Have the potential to disturb or destroy paleontological resources.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
GEO-1: Expose people or structures to increased risk from fault rupture.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
GEO-2: Expose people or structures to increased risk of structural damage and injury from ground shaking and related hazards.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
GEO-3: Expose people or structures to increased risk of structural damage and injury from slope failure.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
GEO-4: Result in substantial soil erosion or the loss of topsoil from grading activities.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
GEO-5: Create substantial risks to life or property from development on expansive soils.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
GEO-6: Involve construction on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems.	No Impact	No Impact	No Impact	No Impact	Less than Significant	No Impact
HAZ-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HAZ-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HAZ-3: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
HAZ-4: Be located on a site that contains hazardous materials and, could create a significant hazard to the public or the environment.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
HAZ-5: Be located within an airport land use plan or within 2 miles of a public airport or public use airport.	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
HAZ-6: Result in a safety hazard for people residing or working in the project area due to the project's proximity of a private airstrip.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HAZ-7: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HAZ-8: Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
HYD-1: Implementation would not result in discharges that would cause the City's Wastewater Treatment Plant to violate water quality standards or waste discharge requirements.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HYD-2: Construction-related earth disturbing activities would result in soil erosion and sedimentation, but water quality would not be adversely affected.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HYD-3: Dewatering activities performed during construction would not result in the discharge of sediments or pollutants into receiving waters, potentially affecting water quality.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HYD-4: Implementation would not substantially deplete groundwater supplies such that the production of existing nearby wells would drop to levels that would not support the uses.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
HYD-5: The new impervious surfaces would not substantially interfere with groundwater recharge such that there would be a net deficit in aquifer volume.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HYD-6: Increase the amount of storm runoff and alter existing drainage patterns, but would not increase the risk of flooding downstream and flooding to Cottonwood Creek and Fairfield Canal.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
HYD-7: Substantially increase the amount of sediment and urban pollutants in the site runoff and therefore would not result in water quality degradation.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HYD-8: Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.	Less than Significant	Significant (SU following mitigation)	Significant (SU following mitigation)	Less than Significant	Less than Significant	No Impact
LU-1: Physically divide a community.	No Impact	No Impact	Less than Significant	No Impact	No Impact	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
LU-2: Conflict with the 2000 Merced County General Plan.	Less than Significant	Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
LU-3: Conflict with the City of Merced General Plan.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
NOI-1: Result in increased vehicular traffic on the regional road network, which would increase ambient traffic noise levels at existing off-site noise-sensitive uses.	Significant >60 dbA on Cardella Road and Kibby Road (SU following mitigation)	Significant >60 dbA on Cardella Road and Kibby Road (SU following mitigation)	Significant and Unavoidable >60 dbA on Bellevue Road (SU following mitigation)	Significant and Unavoidable >60 dbA on Yosemite Avenue (SU following mitigation)	Significant and Unavoidable >60 dbA on Kibby Road (SU following mitigation)	No Impact
NOI-2: Expose existing off-site and future on-site noise-sensitive receptors to elevated noise levels.	Potentially Significant (SU following mitigation)	Potentially Significant (SU following mitigation)	Potentially Significant (SU following mitigation)	Potentially Significant (SU following mitigation)	No Impact	No Impact
NOI-3: Expose existing off-site and future on-site noise-sensitive receptors to elevated noise levels.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
NOI-4: Expose nearby receptors to perceptible levels of groundborne vibration.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
NOI-5: expose new on-site noise-sensitive land uses, such as Campus and University Community residences, to noise levels exceeding noise thresholds.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
PUB-1: Increase demand for law enforcement services and require the construction of new facilities.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
PUB-2: Increase demand for fire protection services and require the construction of a new facility.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
PUB-3: Increase enrollment in local public schools, which would require construction of new facilities.	Less than Significant 8,251 school-age children	Less than Significant 8,251 school-age children	Less than Significant 8,251 school-age children	Less than Significant 8,251 school-age children	Less than Significant fewer school-age children than under Alt. 1	No Impact
PUB-4: Increase demand for public libraries in Merced County.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
PUB-5: Result in an increased demand for parks and recreational facilities, but would not require the construction of new recreational facilities off site.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
PUB-6: Increase the use of Lake Yosemite Regional Park, which could accelerate physical deterioration of park facilities.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
SOC-1: Directly induce substantial population growth in Merced City and Merced County.	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Less than Significant	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
SOC-2: Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
SOC-3: Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
SOC-4: Result in disproportionate, adverse environmental effects on minority or low-income populations.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
TRANS-1: Contribute 1 percent or more to the traffic projected for 18 roadway segments, planned to be widened in the future, cause the LOS of two study intersections to deteriorate to unacceptable levels, and cause significant increase in delay at one intersection.	Significant	Significant	Significant	Significant	Significant	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
TRANS-2: Place additional demand on local and regional transit service being deployed to connect the Campus and Community with major destinations with Merced County.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
TRANS-3: Generate pedestrian and bicycle travel in higher concentrations and amounts than found in many other parts of the County.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
TRANS-4: Generate off-site "spillover" parking that would affect nearby areas.	Less that Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
TRANS-5: The Campus and University Community road network system would be adequately sized and designed to facilitate emergency access vehicles.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
UTILS-1:Generate demand for potable water for indoor and outdoor uses that would increase water drawn from the aquifer.	Less than Significant Total demand: 7,166 afy	Less than Significant Total demand: 7,166 afy	Less than Significant Total demand: 7,166 afy	Less than Significant Total demand: 7,166 afy	Less than Significant Total demand: 2,852 afy	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
UTILS-2: Generate wastewater flows that would not require construction of new conveyance or treatment facilities.	Less than Significant Total wastewater flows: 3.09 mgd	Less than Significant Total wastewater flows: 3.09 mgd	Less than Significant Total wastewater flows: 3.09 mgd	Less than Significant Total wastewater flows: 3.09 mgd	Less than Significant Total wastewater flows: 1.04 mgd	No Impact
UTILS-3: Generate solid waste that would not require the expansion of the regional landfill.	Less than Significant Total solid waste: 55,145 tons per year	Less than Significant Total solid waste: 55,145 tons per year	Less than Significant Total solid waste: 55,145 tons per year	Less than Significant Total solid waste: 55,145 tons per year	Less than Significant Total solid waste: Less than 55,145 tons per year	No Impact
UTILS-4: Require on- and off-site improvements, including an extension of electric transmission lines.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
GCC-1: Impede or conflict with the emissions reduction targets and strategies prescribed in or developed to implement AB 32.	Significant (SU following mitigation)	Significant Same as Proposed Action Impact (SU following mitigation)	Significant Same as Proposed Action Impact (SU following mitigation)	Significant Greater than Proposed Action Impact (SU following mitigation)	Significant Less than Proposed Action Impact (SU following mitigation)	Less than Significant

Table reports impact conclusions pre-mitigation; post-mitigation impact conclusions are reported in parentheses.
LTS – Less than Significant; SU – Significant and Unavoidable
** Less than significant due to environmental commitments included in the Proposed Action/alternative.*

1.0 INTRODUCTION

1.1 INTRODUCTION

This Draft Environmental Impact Statement/Environmental Impact Report (Draft EIS/EIR) evaluates the probable environmental effects from the development of a major research university campus in Merced County that will support up to 25,000 full-time equivalent (FTE) students with a contiguous associated community needed to support the university. This section presents an overview of the proposed project; project background and history; the purpose of and need for the project and project objectives; the authorities of the lead agencies preparing this Draft EIS/EIR (the Board of Regents of the University of California [The Regents] and US Army Corps of Engineers [USACE]); the roles of other federal, state, and local agencies and specific approvals necessary for the proposed project; agency coordination and scoping process; issues of known controversy; and the organization of this Draft EIS/EIR. This joint EIS/EIR serves as the environmental review document associated with the application by The Regents of the University of California for a US Clean Water Act, Section 404 permit for the development of the University of California, UC Merced Campus, and for the northern section of the associated supporting and contiguous University Community, which is under the jurisdiction of the County of Merced. This joint EIS/EIR will analyze the entire University Community area located within the jurisdiction of the County of Merced.

1.2 OVERVIEW OF THE PROPOSED ACTION

In 2002, the University of California prepared and certified an EIR (SCH # 2001021065) that evaluated the environmental impacts from the approval and implementation of a Long Range Development Plan (2002 LRDP) for the development of the UC Merced Campus. In addition to a program-level analysis of the effects of the 2002 LRDP, that EIR included a project-level evaluation of the environmental impacts from the development of the first phase of the campus (Phase 1.1 Campus). Based on that approval, the Phase 1.1 Campus was built on the site of a former golf course and UC Merced opened to students in 2005. Although the Phase 1.1 Campus is now operational on 104 acres, the campus is not able to expand further because a permit to fill wetlands present on the remainder of the campus site is needed from the USACE. In order to obtain this permit, the University has been working with the USACE, US Environmental Protection Agency (US EPA), other resource agencies, and concerned citizen groups to develop a campus footprint that would reduce potential impacts on wetlands to the maximum extent possible. As a result of this consultation process, the proposed location and footprint of the campus have changed compared to the project that was evaluated in 2002. The University has, therefore, prepared an updated UC Merced 2009 LRDP (2009 LRDP) that addresses the proposed changes in campus location

and footprint. The University must evaluate and disclose the environmental impacts of the 2009 LRDP in compliance with the California Environmental Quality Act (CEQA) before The Regents can adopt the UC Merced 2009 LRDP.

In 2004, the County of Merced certified a program EIR that evaluated the environmental impacts from the development of a University Community adjacent to and south of the campus pursuant to a University Community Plan (UCP). Since then, in response to the changes in the location and footprint of the campus, the proposed location and the footprint of the University Community also have changed.

In 2002, the northern portion of the University Community (the former Flying M Ranch) was acquired by the University Community Land Company, LLC (UCLC), a not-for-profit independently incorporated entity jointly owned by Virginia Smith Trust (VST) and the University of California. Because the proposed changes to the footprint of the campus would extend the campus south into what was originally part of the University Community, the University must acquire from the UCLC those portions of the former Flying M Ranch needed to accommodate the campus. The contractual arrangements needed to accomplish this transaction will be premised on a plan for development of the remainder of the Flying M Ranch (hereafter Community North) that has been developed by the University in coordination with the UCLC, and which will be presented to the County of Merced for its consideration as an amendment to the UCP. Before The Regents can enter into these contractual arrangements with the UCLC, the arrangements must be reviewed for their environmental impacts in compliance with CEQA. The proposed plan ultimately will require approval of the local agency with land use jurisdiction, the County of Merced.

Lastly, because the development of the southern portion of the University Community (Community South) is important for the development of the Campus, the University proposes that The University and UCLC execute a memorandum of understanding (MOU) with the owners of the Community South (LWH Farms, LLC) to help facilitate the development of the Community South area in support of the Campus. This MOU would provide for the coordinated planning and development of the campus and University Community.

Therefore, for CEQA purposes the Proposed Project for this Draft EIS/EIR consists of the following actions by The Regents: (1) the adoption of an updated LRDP for the UC Merced Campus; (2) the execution of an agreement or agreements with the UCLC for the acquisition of land needed for the campus in a manner consistent with the agreed upon plan for development of Community North; and (3) the execution of an MOU between the University, UCLC, and LWH Farms, LLC, to facilitate the coordinated development of the University Community, including Community South. As discussed later in this section, other land use approvals and actions will need to be completed by Merced County, the

Merced County Local Agency Formation Commission (LAFCO), and/or the City of Merced before any development within the University Community could occur.

For National Environmental Policy Act (NEPA) purposes, this Draft EIS/EIR considers the federal actions associated with the development of the Campus and University Community. These federal actions are referred to under NEPA as the "Proposed Action." The development of the UC Merced Campus and the associated University Community as proposed would affect Waters of the United States. Acting as co-applicants, the University and the UCLC have submitted a Clean Water Act (CWA) Section 404 permit application to the USACE for permission to fill 76.7 acres[1] of wetlands present on the proposed campus site and on Community North in conjunction with the development of the Campus and Community North. A Section 404 permit application has not been filed for Community South. However, consistent with the federal statement of purpose discussed below and the USACE's conclusion that the Campus and University Community are connected actions, the impacts associated with all fills required for the Campus and University Community will be addressed in this Draft EIS/EIR. Thus, for purposes of evaluation in this EIS/EIR under NEPA, the "Proposed Action" encompasses the Campus, Community North, and Community South.

In summary, for evaluation under both NEPA and CEQA, the Proposed Action (under NEPA) and the Proposed Project (under CEQA) encompass the development of the proposed Campus, Community North, and Community South. For ease of reading, the term "Proposed Action" is used throughout this EIS/EIR to refer to both the proposed federal action and the proposed project under CEQA.

1.3 BACKGROUND AND HISTORY

In 1988, the University initiated planning for a new campus to accommodate projected growth in student enrollment. The University focused this effort in the San Joaquin Valley and identified over 85 potential sites. The University narrowed the list to 20 candidate sites, and then to eight preferred sites. Of these eight sites, three finalist sites were selected for further analysis and environmental review. In 1995, the University selected the Lake Yosemite Site in eastern Merced County as the preferred location for the UC Merced Campus.

The Lake Yosemite site selected in 1995 comprised 2,000 acres of a 10,300-acre property offered to the University of California which was collectively owned by the VST and the Cyril Smith Trust (CST).[2]

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1 This is the total wetland acreage present within the Campus and Community North and does not include the wetlands present on the Community South portion of the project site.

2 The VST and CST are non-profit organizations whose mission is to support education in Merced County. Both trusts provide college scholarships to Merced high school students.

Within the VST property, the campus site was identified as 2,000 acres in the northwestern portion of the property which consisted of rolling hills and grasslands. In 2000, the University and Merced County commenced the planning and environmental review of the development of the campus and an associated community on the VST property. Concurrent with the planning process, the University initiated early consultation with state and federal regulatory agencies to expedite the permitting of the proposed Campus project. In late 2000, in response to input from the agencies and public concern regarding the potential impacts on vernal pools and biological resources from locating the campus at the original 2,000-acre site, the University shifted the campus site to the southwestern portion of the VST property. This change in campus location also entailed a corresponding relocation of the adjacent community to the south of the VST property. This shift reduced impacts to vernal pools and biological resources by approximately 90 percent, resulted in a reduction in the size of the campus from approximately 2,000 acres to 1,250 acres, and reduced the size of the supporting University Community to 2,133 acres. The campus site was acquired pursuant to authorization by The Regents on January 17, 2002. In 2002, the UCLC acquired the 1,240-acre parcel of the University Community contiguous to the southern border of the UC Merced Campus site. The remainder of the University Community site is privately owned by LWH Farms, LLC.

In 2001–02, the University prepared a program EIR that evaluated the environmental impacts from the development of a 2,000-acre university campus under the guidance of an LRDP at this adjusted site, and a project-level EIR for the initial phase of the campus (Phase 1.1) development. The 2002 LRDP planned for a student population of 25,000 FTE students and a faculty and staff population of approximately 6,600. The 2002 LRDP proposed the campus be composed of three areas: a 910-acre Campus area, a 340-acre Campus Land Reserve (CLR) area, and a 750-acre Campus Natural Reserve (CNR) area. The UC Merced 2002 LRDP EIR was certified in 2002. Concurrently, the University Community Plan (UCP) was developed by Merced County and was evaluated in a program EIR that was certified by the County in 2004 (SCH # 2001021056).

Development of Phase 1.1 of the UC Merced Campus did not require a CWA Section 404 permit because it occupies 104 acres of a 197-acre site that formerly was a golf course. Construction of the Phase 1.1 Campus began in 2002 and the Campus was formally opened for undergraduate enrollment in the fall of 2005. UC Merced currently has an enrollment of approximately 2,700 undergraduate and graduate students; it is anticipated to increase student enrollment to 5,000 by 2012–13.

Following the certification of the 2002 LRDP EIR, UC Merced submitted an application to the USACE for a CWA Section 404 permit to fill a total of approximately 86 acres of wetlands present on the 910-acre campus site. Concurrently, the County of Merced submitted an application for a CWA Section 404 permit to fill 4.5 acres of wetlands to build certain backbone infrastructure needed to serve the campus but

located within the boundaries of the University Community. The USACE initiated preparation of an EIS and issued a public notice for the permit applications and a Notice of Intent for the EIS. The USACE held scoping meetings and prepared a Draft EIS. However, upon further review, the USACE withheld publication of the Draft EIS. Following the USACE decision to withhold publication of the Draft EIS, the University re-examined and assessed possible alternative designs for the Campus and University Community that would further reduce impacts to wetlands. The University and the County of Merced solicited feedback from several federal and state agencies during this process, including the USACE, US EPA, United States Fish and Wildlife Service (USFWS), and California Department of Fish and Game (CDFG). The University also solicited the views of several non-governmental environmental organizations and leaders, as well as UC faculty. During these discussions, the University identified an alternative that would reduce the campus' impacts to wetlands by reducing the size of the developed portion of the campus from 910 acres to approximately 815 acres and shifting a 286-acre portion of the campus site south onto the currently recognized Community North area. As part of this alternative, the 340-acre CLR was added to the CNR.

In response to the change in campus location, and to compensate for the previous University Community land that would now be part of the campus, the UCLC developed a revised footprint for the Community North, which proposed to add a 222-acre area, situated to the east of the currently recognized University Community Plan area and which was not originally proposed for development. Also of these proposed changes are approved, the total area of the University Community Plan would be reduced by about 180 acres. These proposed changes to both the Campus and the University Community have resulted in the development of revised land use plan proposals for both the Campus and Community North.

In view of these proposed changes, the University and the County withdrew their previous applications to the USACE, and the University and UCLC, as co-applicants, have elected to submit a revised permit application to the USACE for filling of wetlands under revised plans for the Campus and Community North. This joint EIS/EIR evaluates the environmental impacts of the Proposed Action for compliance with NEPA.

Under CEQA, this EIR has been prepared for The Regents as a "subsequent EIR." As such, it updates all of the analysis contained in the 2002 UC Merced LRDP EIR in light of the changed locations of both the Campus and the University Community, as well as the changed land use proposals for the Campus and Community North. It also evaluates any impacts stemming from substantial change in the circumstances under which the Proposed Action would now be undertaken or from new information of substantial importance that has become available since the certification of the previous EIRs. This EIR will not serve as a subsequent EIR to the County's 2004 UCP FEIR. The County is expected to prepare and circulate a separate EIR that will evaluate the environmental impacts of adopting the revised UCP that will

encompass both Community North and Community South, and approving a general plan amendment related to the revised UCP.

1.4 PURPOSE AND NEED/OBJECTIVES OF THE PROPOSED ACTION

1.4.1 Purpose

The overall purpose of the proposed project is to establish a major research university in eastern Merced County that would ultimately support up to 25,000 FTE students with an associated community needed to support the university. The University's objectives for the project are focused on developing a premier research university in the heretofore underserved San Joaquin Valley in furtherance of the University of California's mission of teaching, research, and public service excellence.

1.4.2 Need for a Research University Campus

In 1988, the University determined that there is a need to build a 10th University of California campus. The UC system is guided by the California Legislature's mandate that each resident of California should have the opportunity to enroll in an institution of higher education. The state is committed "to provide an appropriate place in California public higher education for every student who is willing and able to benefit from attendance" (California Education Code Sec. 66201). This commitment includes the opportunity for qualified California high school graduates to attend a University of California campus. The University made the determination that a new major research university was needed based on a number of reasons, including statewide population projections, growth projections for academic programs, and growth capacity of the then-existing nine UC campuses.

In February 1999, the University submitted a completed "Needs Study" to the California Post-Secondary Education Commission (CPEC). In its formal review of the Needs Study in June 1999, CPEC endorsed the creation of UC Merced and gave its support for an ultimate campus population of 25,000 FTE students. At that time, CPEC also endorsed the general academic goals for the new campus, specifically, to develop UC Merced as a research university with an initial orientation that highlights the sciences and engineering, and over time to develop the complete array of undergraduate and graduate letters, arts, sciences, and engineering programs, together with selected professional programs that characterize a general UC campus.

In enrollment projections prepared in 2008, representing campus enrollment aspirations through 2020, and prepared in response to legislative request, University of California system-wide enrollment is expected to increase by approximately 48,000 FTE students between 2007 and 2020. Total enrollment in 2020 is expected to be approximately 265,000 FTE students, representing a growth rate of 22 percent

between 2007 and 2020. With a projected enrollment of about 11,000 students in 2020, UC Merced's growth of about 9,000 FTE students represents about 19 percent of the total UC system growth. Thus, the UC Merced Campus is a necessary component of the University of California system's ability to accommodate total projected enrollment growth.

1.4.3 Need for an Associated and Contiguous Community

Based on the experience of developing the other nine UC campuses, the University determined that the success of a modern major research university in California depends on a planned associated, contiguous, and supporting community that provides housing and other amenities for faculty, staff, and students. Without such planning, communities tend to develop around a campus in a piecemeal, random fashion, which leads to escalating land values, subsequently forcing employees to locate at increasing distances from the campus. A contiguous community provides for housing, fosters a pedestrian-oriented environment, encourages faculty and student interaction within a shared learning environment, and discourages long commutes. A well-planned community adjacent to a campus also helps preserve the natural habitat and other open space resources by increasing density and focusing development. A University Community consisting of additional housing, commercial, recreational, entertainment, cultural, and public uses would provide the land use types necessary to support a successful UC Merced Campus.

To accommodate the projected population growth directly attributable to the development of UC Merced, a variety of affordable housing options, densities, and types are needed both on and off campus. The 2009 LRDP provides for sufficient on-campus housing to accommodate 50 percent of the student population at full development. An associated University Community is necessary to support the new campus by providing housing options for the remaining students, faculty, and staff who would require off-campus housing.

For recruitment objectives, a campus also should be located within a community offering a high quality of life for faculty and staff. Thus, the University Community must provide a range of services and facilities to accommodate the daily living requirements and activities of students, faculty, staff, and their families. For example, elementary, middle, and high schools would be needed to provide educational facilities to serve the residential development within the University Community. Commercial areas are needed to provide students and other community members with accessibility to goods and services (e.g., food, clothing, sundries, college bookstores, etc.), as well as employment opportunities for students and others. Parks, open space, and other public facilities (e.g., public safety, libraries) are necessary to serve the new population. In addition, the University Community would provide cultural amenities, recreation and entertainment venues, a research park, and opportunities for professional development.

With its proximity to the campus, the University Community would provide a convenient and accessible living environment for students, faculty, and staff. A University Community that is contiguous to the Campus would enable the provision of crucial support services and facilities to the UC Merced campus and the construction of a convenient, accessible living environment that promotes interaction. Integrating a campus with an adjacent community also reduces infrastructure costs. Lower overall cost burdens to the University will enable the University to focus resources on academic programs and other enhancements, while also improving the University Community development's financial feasibility and the University Community's regional competitive position.

The University Community is also expected to enhance the overall educational experience of UC Merced students by providing a geographic location that fosters a university environment and culture. The University Community's proximity to and affiliation with the Campus enhances the unique identity and "sense of place," of the campus. Additionally, as a geographic center of student and faculty life, the University Community, including its infrastructure, open space, recreational, and cultural amenities, would also foster student, faculty, and other University linkages and informal academic exchange. The University, Merced County, and the VST are committed to improving the academic achievement and opportunities for the County's high school students. As a result of its shared ownership in the UCLC, the VST will be able to use funds generated by the supporting University Community to support scholarships for County students. Consequently, the VST's ability to achieve its mission is directly connected to the proximate location of the University Community.

Contiguous location of a campus and its supporting community would also minimize adverse effects of new development, such as sprawl, premature conversion of agricultural land, inefficient delivery of public services, and impacts to endangered species habitat, associated with the project. It would also encourage pedestrian and bicycle transit, which would further reduce the need for automobiles, minimizing transportation and air quality impacts resulting from commuting by staff, students, faculty, and visitors.

1.4.4 Objectives of the Proposed Campus Project

The overarching project objective is to develop a premier research university consistent with the University of California's mission of teaching, research, and service excellence. The purpose of the updated 2009 LRDP is to guide the physical planning and development of a new UC campus in Merced County, as well as to establish a paradigm for the University's character.

The following are the specific project objectives that will facilitate accomplishment of the guiding project objective. Following each project objective are some of the identified ways that each project objective can be achieved.

1. ***Meet Enrollment Demand: Meet anticipated increases in enrollment demand for the University of California system, both short-term and long-term.***

   - Maximize the extent to which the University of California will be able to meet increases in projected long-term enrollment demand.

   - Meet anticipated increased enrollment demand from previously underserved demographic components of the state's population.

2. ***Serve Historically Under-represented Populations: Maximize the University's mission of service excellence by enabling the University to better serve populations that are historically underrepresented in UC enrollments.***

   - Actively promote diversity in all aspects of campus planning and life.

   - Expand the UC campus in the Central Valley to further its mission of serving under-represented communities and the largest population center in California that was not served by an existing UC campus.

   - Implement outreach and recruitment programs targeted to high school and California community college students that convey the University's mission of teaching, research, and service to the Central Valley.

3. ***Model Environmental Stewardship: To the extent practicable, plan and develop the campus to model environmental stewardship.***

   - Promote smart growth by minimizing or avoiding the potential for leapfrog development and, to the extent feasible, by planning and developing a campus and associated contiguous community that do not conflict with the goals and policies of the local jurisdiction's general plan.

   - Develop the campus with sustainable design by incorporating energy efficiency, water conservation, protection of biological resources, waste reduction and minimization, and on-site stormwater management.

   - Develop the campus as a walkable campus to minimize unnecessary vehicle trips between campus facilities.

   - Designate substantial acreage as permanent open space.

   - Minimize potential future incompatibility with adjacent land uses.

   - Preserve and enhance diverse biological resources.

- Provide research opportunities for students and faculty in all aspects of environmental stewardship.

4. ***Minimize Costs*: Develop the campus at a reasonable cost.**

   - Make use of sustainable design and life-cycle costing to develop the campus in a way that maximizes reuse potential and minimizes its ecological footprint.

   - Design and locate buildings in a manner that will avoid construction cost multipliers, additional maintenance costs, and other economic inefficiencies.

   - Locate the campus within a reasonable distance from existing infrastructure, amenities, utilities, and public services, including the Phase 1.1 Campus.

   - Provide sufficient space for on-campus infrastructure and related support facilities.

   - Maximize the efficiency of resource output by optimizing economies of scale in building and planning.

5. ***Maximize Academic Distinction*: Plan and develop the campus as a research university of the same academic quality as the other UC campuses, consistent with contemporary research campus needs.**

   - Develop the full range of programs that characterize a mature general campus of the University of California.

   - Develop academic and research spaces consistent in size and functionality of those that characterize other UC research campuses.

   - Develop a campus of sufficient enrollment to generate a resource base that allows the recruitment of high-quality faculty, the development of departments of optimal size, and the provision of resources necessary for a premier academic institution.

   - Plan and develop the campus to emphasize an interdisciplinary basis to academic life and create opportunities for joint development with industry.

6. ***Create an Efficient and Vital Teaching and Learning Environment*: Plan and develop the campus to facilitate faculty-student interaction, ease and enjoyment of use of academic facilities, and an environment conducive to learning.**

   - Ensure that lecture halls, laboratories, classrooms, and other academic facilities are designed and located in a manner that will enable students to travel easily between facilities within the time usually allotted for class changes.

   - Integrate student and faculty housing into campus design so that residents are not isolated from academic, research, and recreational facilities, thus promoting interaction between students and faculty, increasing student involvement in campus activities, and otherwise enhancing the educational experience for students.

- Provide sufficient academic and research facilities to maintain a student-to-faculty ratio comparable to other UC campuses.

- Incorporate technology into all aspects of campus life to support individual learning and to facilitate access, collaboration, and information dissemination;

- Provide sufficient affordable and accessible parking.

- Conceive of exterior space as potential academic space and design such space as an extension of the classroom, providing teaching, learning, and co-curricular opportunities.

- Ensure that the relationship between buildings and exterior areas provides safe and well-lit walkways with access, to sun, shade, and open space.

7. ***Attract High-Quality Faculty: Recruit and retain high-quality faculty.***

   - Provide for on-campus faculty housing of sufficient quantity, quality, and variety to minimize the negative impacts of the cost of faculty housing on recruiting efforts.

   - Provide sufficient academic and research facilities at a rate of assignable square feet per faculty member comparable to other prominent research universities nationwide.

   - Utilize the maximization of academic distinction as a recruitment tool.

8. ***Provide a High-Quality Campus Setting: Provide an attractive, livable campus in order to attract high-caliber students and faculty.***

   - Create a campus that is aesthetically pleasing with regard to surrounding natural characteristics and the design of buildings and landscaping.

   - Provide a serene setting with high-quality views.

   - Avoid adjacent or proximate land uses that would be incompatible with a research university in terms of exposing students, faculty, and other campus visitors to excessive noise, air pollution, hazardous waste contamination, noxious odors, or other conditions that would detract from the appeal of the campus.

   - Make available sufficient and proximate high-quality amenities necessary for convenient living.

9. ***Accommodate Student Housing Needs: Offer attractive and centrally located on-campus housing, consistent with UC-wide student housing policies.***

   - Be able to offer on-campus housing to all incoming freshmen and sophomores and house 50 percent of all students.

   - Design affordable and sustainable student housing with architectural character that encourages interactive living, provides a safe and supportive learning environment, incorporates sustainable design that reduces construction and operation costs, and is conveniently located to all campus facilities.

- Encourage the design and development of student housing facilities and spaces that promote academic and social interaction.

- Develop housing in a cost-effective manner so that housing costs to students are competitive with the local market.

- Develop housing that is architecturally diverse but with a cohesive overall design.

- Provide different housing amenities for different groups such as graduate students, married students, and international students.

- Maximize security in student housing with regard to design, accessibility, and student conduct.

- Design housing on a human scale to provide a better sense of belonging and to allow easier management for staff.

10. ***Provide Student Support: Offer high-quality, conveniently located student support services.***

    - Construct student support facilities at a ratio comparable to other UC campus LRDPs.

    - Offer the student support services offered at other mature, general UC campuses and comparable universities nationally.

11. ***Provide Athletic and Recreational Opportunities: Provide sufficient athletic facilities to offer high-quality NCAA, recreational, and club athletic programs commensurate with other premier universities.***

    - Provide space to build sufficient athletic facilities to meet NCAA Division I requirements.

    - Accommodate recreational and club sport offerings of a quality comparable to other UC campuses and premier universities nationwide.

    - Centrally locate athletic facilities, to the extent possible, to facilitate use by students, faculty, and staff, and to accommodate the competing academic and athletic obligations of scholar athletes.

12. ***Ensure Community Integration: Ensure that UC Merced is sustained by a strong, unifying sense of community—one founded upon the values, academic principles, and diverse cultural experiences that bind its members together in common commitments. This community should include direct constituents (students, faculty, and staff) and indirect constituents (local, San Joaquin, and Central Valley residents).***

    - Develop joint campus-community programs that involve faculty and students in the local and regional community.

    - Offer programs on campus that will appeal to the community at large.

    - Facilitate local community use of campus facilities for civic, educational, cultural, and sports events.

- Facilitate contiguous residential and commercial development that will provide students, faculty, and members of the local community with services, social outlets, and employment opportunities.

13. ***Promote Regional Harmony: Reflect the landscape, history, resources, and diverse cultures of the San Joaquin Valley in both physical development and in unique features of the curriculum.***

    - Construct a campus that is compatible with prevailing architectural styles in the San Joaquin Valley.

    - Minimize adverse visual impacts by designing the campus in a manner that is compatible with the surrounding landscape.

    - Construct buildings that share a common expression of relation to the campus as a whole and the environmental values it represents.

    - Ensure that the architectural character of the campus will reinforce a specific understanding of the particular environmental conditions of the site.

    - Ensure that various campus precincts will respond specifically to their local conditions—e.g., park edge, main street, near and distant views.

    - Through campus design and location, facilitate the development of unique curriculum features and varied research opportunities for students and faculty.

1.4.5 Objectives of the Proposed University Community

The purpose of the proposed UCP is to provide a planning framework for how lands are to be developed and important resources protected and conserved in anticipation of the growth and development associated with the proposed development of University Community. The specific objectives of the approved UCP are as follows:

- To support the successful development of the UC Merced Campus by providing for a community that is physically contiguous to and integrated with the Campus and includes appropriate and sufficient housing, commercial, industrial/business park, civic and open space uses to meet the long-term needs of the campus and its population.

- To provide adequate land and development opportunities to absorb the equivalent of 100 percent of the new growth generated by UC Merced over time in close proximity to the Campus to encourage alternate transportation and to avoid adverse effects of new development, such as sprawl, premature conversion of agricultural land, inefficient delivery of public services, and impacts to endangered species' habitat.

- To provide a community that can be developed in an integrated fashion rather than through fragmented subdivision processes.

- To provide a community with patterns of land use and urban form that support principles of livable communities and environmental sustainability.
- To provide adequate circulation and utility infrastructure that supports the long-term sustainability of the UC Merced Campus and University Community.
- To establish and support linkages and transitions that will integrate the University Community with greater Merced.
- To complement and support the economy of the City of Merced and the greater Merced region.
- To support the educational goals of VST by enhancing its scholarship fund.
- To support regional programs to conserve and protect the County's important agricultural and natural resources as development of UC Merced and the University Community proceeds.
- To be configured and planned so that environmental permitting allows community development to proceed at the pace necessary to support campus development.
- To be affordable and financially feasible.
- To support implementation of the Merced County General Plan.

1.5 LEAD, COOPERATING, RESPONSIBLE, AND TRUSTEE AGENCIES

1.5.1 Federal Agencies

US Army Corps of Engineers

The USACE is the federal lead agency for the Proposed Action for compliance with NEPA. The primary federal action is the proposed issuance of a permit authorizing the discharge of fill in Waters of the United States (US), as well as related impacts to the aquatic environment; work and structures in navigable and other Waters of the US; and potential significant indirect and cumulative impacts on the human environment from these activities. The approval of a permit under Section 404 of the CWA for fill activities associated with the Proposed Action or the alternatives is an action that could result in significant effects on the environment, thus constituting a major federal action requiring NEPA review (42 USC Sec. 4341 et seq.). In accordance with NEPA, the USACE is requiring the preparation of an EIS prior to rendering a final decision on the University's and UCLC's permit application. The USACE ultimately may decide to permit or deny the project, or modified versions of the project. The EIS will also provide the technical basis for the USACE to use in its Record of Decision (ROD) and its determination of the Proposed Action's compliance with the Section 404(b)(1) Guidelines.

US Fish and Wildlife Service

Although the USFWS has declined to be a cooperating agency under NEPA for the Proposed Action, the USACE will consult with the USFWS with respect to the Proposed Action. The USACE will reinitiate consultation with the USFWS, pursuant to Section 7 of the Federal Endangered Species Act and the previously issued Biological Opinion for the Proposed Action and its decisions, regarding take authorization.

State Historic Preservation Officer

Similarly, the USACE will reinitiate consultation with the State Historic Preservation Officer, pursuant to Section 106 of the Historic Preservation Act, for confirmation of the previously issued conclusion of no adverse impact on cultural resources.

US Environmental Protection Agency

The US EPA will provide public comments on the adequacy of this EIS under NEPA, consistent with its responsibility under Section 309 of the Clean Air Act. The US EPA is also a cooperating agency under NEPA for the Proposed Action and has provided preliminary review and comments on administrative sections of this DEIS, as well as provided input on consistency with EPA program requirements, including Section 404 of the CWA.

1.5.2 State Agencies

University of California

The Regents is the lead agency for compliance with CEQA and has determined that an EIR must be prepared to evaluate the environmental impacts from the adoption of the proposed amended UC Merced LRDP as well as other actions necessary for the development o f the campus. Before approving the UC Merced 2009 LRDP which updates the UC Merced 2002 LRDP, The Regents must certify that the EIR is adequate and complete. If the 2009 LRDP is approved, the University will review each specific development project proposed at the Campus and determine whether additional environmental review of the specific development project is required, or whether the project is adequately addressed by the analysis in the joint EIS/EIR. If additional review is warranted, an environmental document will be prepared, circulated for agency and public review, and then adopted or certified before the project is approved for development.

Volume 3 of the joint EIS/EIR includes a detailed project-level evaluation of the next phase of campus development (UCM2020 Project). This evaluation has been developed to a level that if the EIR is certified,

new buildings and other improvements within project area could proceed for construction without additional environmental review if none of the conditions in *State CEQA Guidelines* Section 15162 apply; in addition, subsequent projects could be tiered from the analysis in that volume in the future.

California Department of Fish and Game

The CDFG is a responsible agency that will review the EIR for the Proposed Action's potential impacts on plants and wildlife. Authorizations pursuant to the Fish and Game Code will be requested from the CDFG for the Proposed Action.

California Department of Transportation

The California Department of Transportation (Caltrans) is also a state agency that will review the EIR for the Proposed Action's potential impact on state-owned transportation facilities. No permits from Caltrans are needed at this time.

California Regional Water Quality Control Board

The California State Regional Water Quality Control Board, Central Valley Region (RWQCB) is a responsible agency that will review the EIR for the Proposed Action's potential impact on surface and groundwater resources. A Section 401 Water Quality Certification is needed from the RWQCB before the USACE can issue a Section 404 permit. Furthermore, the Campus and UCLC will require coverage under the statewide National Pollutant Discharge Elimination System (NPDES) Permit for stormwater discharges associated with Construction Activities from the RWQCB when specific development projects are proposed for construction.

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is a state agency that will review the EIR for the Proposed Action's potential impact on regional and local air quality. Subsequently, if any stationary emission sources are proposed on the Campus or the University Community, those specific projects would likely require an Authority to Construct/Permit to Operate from the SJVAPCD.

1.5.3 Regional and Local Agencies

Regional and local agencies that may be involved in approving certain aspects of the Proposed Action include the following:

Merced County

The Merced County Board of Supervisors will consider approval of an amendment to the Merced County General Plan that would recognize the revised campus location and accommodate the revised University Community within the planning framework of the County. In 1996, following the selection of the Lake Yosemite site for the establishment of the proposed UC Campus, Merced County amended its general plan to designate a UC Merced Specific Urban Development Plan (SUDP) area to include all the VST property, the adjacent CST property, and a County-owned parcel located between Lake Yosemite Regional Park, and the parcel that contained the former Merced Hills Golf Course. In 2004, the County certified the EIR for the UCP General Plan Amendment and adopted the UCP. Following the approval of the UCP, the County expanded the UC Merced/University Community SUDP to include the UCP area south of the former Merced Hills Golf Course down to Yosemite Avenue. In addition, the 2004 General Plan Amendment resulted in two new urban designations within the UC Merced SUDP: "UC Merced" for the campus site and "Multiple Use Urban Development" for the UCP area. As noted earlier, changes to the locations of both the Campus and the University Community are proposed, with the Campus shifting south of its previous location and the University Community site proposed to be expanded in the easterly direction by about 222 acres to compensate for the lands that would now be used for the campus. After preparation of its own EIR, the County Board of Supervisors will consider another amendment to the UC Merced/University Community SUDP boundary to reflect the reduced campus size and to include the additional 222 acres of land to the east of the University Community that are proposed for inclusion in the University Community.

Merced County Local Agency Formation Commission

Approval from the Merced County LAFCO will be required under two alternate scenarios, one of which must be implemented in order to provide utilities and public services to the Campus and University Community. The scenarios are described below.

Under one scenario, the Campus and/or University Community would remain in unincorporated Merced County and would be provided urban services by the County. LAFCO approvals would be necessary for the formation of special districts to provide urban services to the Campus and University Community. At a broad level, these might include, for example, a County Service Area, a Community Services District, or a California Water District. For capital construction, one or more Community Facilities Districts (CFDs) might be established as well as Landscaping and Lighting Districts (LLDs) or other mechanisms for maintenance purposes.

Under another scenario, the Campus and the University Community would be annexed into the City of Merced. Although the City has been providing services to the Campus under a service agreement on an interim basis, eventually the area would need to be annexed to the City in order to receive services from the City. LAFCO procedures require that the affected area must be within a City's sphere of influence (SOI) before it can be annexed. The City is currently preparing an update to its General Plan and, in that process, has developed a revised SOI boundary which includes the portion of the Campus that is not within the SOI currently and the entire University Community. Upon completion of its general plan update, the City would apply for and obtain an approval of the revised SOI from Merced County LAFCO. Once the SOI is approved, Merced County LAFCO would consider the annexation of the Campus and the University Community into the City of Merced. In anticipation of these subsequent actions, the City has proposed to incorporate revised land uses proposed for the Campus and the University Community into its Draft General Plan Update. The University has already committed to the annexation of the Phase 1.1 Campus to the City of Merced which is served by the City pursuant to a pre-annexation agreement.

In the event that the City does not initiate the process to annex the Campus and the University Community as part of its General Plan Update process that is underway, the Campus and UCLC could submit an application to the Merced County LAFCO to annex the lands into the City of Merced.

City of Merced

The City of Merced may be required to consider a number of discretionary actions relative to the Campus and the University Community. In addition to revising its general plan to recognize the Campus and University Community as revised, the City may be asked to enter into service arrangements for all or a portion of these properties and, in the event of annexation, would be required by LAFCO to pre-zone any property proposed for annexation. Additional, post-annexation land use, subdivision, infrastructure-related or other discretionary approvals may also be required from the City depending upon the terms and timing of annexation. The original location of the UC Merced campus and the University Community was within the City's SOI. When the Campus and University Community locations were shifted in 1999, the Campus and a small portion of the University Community remained in the City SOI. The Campus and UCLC, LLC, have stated public support for inclusion in the City SOI and for eventual annexation.

Other Entities

Additional approvals may be needed from the Merced Irrigation District.

1.6 AGENCY COORDINATION AND SCOPING PROCESS

The USACE and the University have been consulting with the USFWS, US EPA, and the RWQCB for purposes of scoping the issues and topics presented in this EIS/EIR. The scoping process included multiple meetings with these agencies that are listed below in **Table 1.0-1, Consultation Meetings Related to the Proposed Action.**

Table 1.0-1
Consultation Meetings Related to the Proposed Action

Date	Other Attendee Groups*	Major Subjects Covered
6/20/06	USFWS, DFG, NGOs	Biological Opinion requirements, project mitigation
9/27/06	USFWS, NGOs	Conservation Strategy, habitat mitigation lands
12/12/06	USFWS, DFG, US EPA, NGOs	Conservation Strategy, Draft EIS, and 404 permit status
1/3/07	USFWS, DFG, NGOs	Conservation Strategy, Draft EIS, Management Plan
5/17/07	USFWS, DFG, NGOs	Campus planning, Conservation Strategy, Management Plan, Draft EIS, and 404 permit process
6/1/07	USFWS, US EPA, NGOs, Merced County	404 Permit Application
6/13/07	USFWS, US EPA, NGOs, Merced County	Campus planning requirements
7/2/07	USFWS, US EPA	Campus Footprint
8/30/07	USFWS, DFG, NGOs	Regulatory process, Management Plan
10/25/07	USFWS, DFG, NGOs	Proposed cooperative agreement, project schedule
1/8/08	USFWS, DFG, NGOs	NEPA process, schedule, Management Plan, Conservation Strategy
3/4/08	USFWS	ESA consultation schedule, Biological Assessment outline, Conservation Strategy, Mitigation Lands
3/4/08	USFWS, DFG, NGOs	Campus and community planning, compliance schedule

Notes:
Numerous additional meetings were held during 2003 through mid-2006 involving the Conservation Strategy and Compensatory Wetlands Mitigation Plan.
ESA = Endangered Species Act

**Key to attendees:*
USFWS = US Fish and Wildlife Service staff
DFG = California Department of Fish and Game
US EPA = US Environmental Protection Agency
NGOs = Nongovernmental organizations (The Nature Conservancy, California Native Plant Society, VernalPools.org, San Joaquin Raptor-Wildlife Rescue Center, Defenders of Wildlife, San Joaquin Valley Conservancy, Protect Our Water, and/or Butte Environmental Council)

In addition, a public scoping meeting was held on April 23, 2008, at the UC Merced Campus to solicit input from local agencies and the public on the scope and contents of the EIS/EIR.

1.7 PURPOSE OF THIS EIS/EIR

This document is a joint EIS/EIR that has been prepared to satisfy the requirements of both NEPA and CEQA.

Under NEPA and associated regulations (40 CFR Sec. 1500 et seq.), federal agencies are required to evaluate a proposed action (including feasible and reasonable alternatives), and identify mitigation measures to minimize adverse effects when federal agencies propose to carry out, approve, or fund a proposed action that may have a significant effect on the environment. When a federal agency determines that a proposed action could result in significant environmental effects, an EIS that provides full and fair discussion of anticipated significant environmental effects is prepared. As noted earlier, the USACE has completed a preliminary evaluation of the Proposed Action, based upon which it has determined that the Proposed Action could potentially result in significant environmental effects and, therefore, an EIS must be prepared. An EIS is not only a disclosure document; it is also a decision-making aid that is used by federal agencies in conjunction with other materials. The USACE will consider the information in this EIS to determine whether or not to certify the EIS, approve the Proposed Action, and issue a Section 404 Permit to authorize the filling of wetlands in conjunction with the construction of the Campus and Community North.

Similarly, CEQA requires public agency decision makers to consider the environmental effects of their actions. When a state or local agency in California determines that a proposed project has the potential to significantly affect the environment, an EIR is prepared. The University has determined that the Proposed Project has the potential to result in significant environmental impacts and, therefore, an EIR must be prepared. Like an EIS, an EIR is a disclosure document and tool to be used in making a decision whether or not to approve a proposed project. The purpose of an EIR is to identify significant impacts of a proposed project, and identify alternatives and mitigation measures that would avoid or mitigate the significant environmental effects of the project. In instances where all significant impacts cannot be avoided or mitigated to a less than significant level, the project can still be carried out if economic, social, technological, or other benefits from the proposed project outweigh the significant and unavoidable impacts of the project. The Regents will consider the information in the EIR to determine whether or not to certify this EIR and approve the 2009 LRDP, approve land acquisition or other agreements with the UCLC relative to Community North, and authorize the University to execute an MOU with UCLC and LWH Farms, LLC, for the coordinated development of the Campus, Community North, and Community South.

As noted earlier, Volume 3 of this joint EIS/EIR includes a detailed project-level evaluation of the impacts from the development of the next phase of the campus. The Regents will consider the information in Volume 3 to determine whether or not to approve the development of the UCM2020 Project.

Other responsible agencies may also use this EIR to issue permits and approvals including, among others, the RWQCB in conjunction with the issuance of a Section 401 Water Quality certification, the California Department of Fish and Game relative to the issuance of permits for the incidental take of state-listed species, Merced County LAFCO in conjunction with the possible annexation of the Campus and University Community, and the City of Merced relative to any service agreements or other discretionary approvals that may be needed either with or without annexation.

1.8 ISSUES OF KNOWN CONTROVERSY/CONCERN

A scoping report has been prepared for this Darft EIS/EIR and is on file with the USACE to this Draft EIS/EIR. Issues that were raised during the public scoping meeting and/or in written scoping comments include potential impacts related to

- conversion of prime farmland
- wetlands, aquatic resources, and other biological resources
- groundwater and surface water quality
- water supply and water supply infrastructure
- stormwater drainage
- energy use, air quality, and climate change
- traffic and road safety
- growth inducement
- project location

Commenters also requested that the Draft EIR/EIS examine off-site alternatives that would reduce impacts to aquatic resources, and that it discuss differences between the proposed project and the County's previously approved plan for the University Community area.

1.9 AVAILABILITY OF THE DRAFT EIS/EIR

This Draft EIS/EIR is being made available to agencies and the public for review and comment for a 60-day formal review period, in accordance with Section 15087 of the *State CEQA Guidelines* and 40 CFR

Section 1506.10 of the CEQ NEPA regulations. During this period, which begins on November 7, 2008, and ends on January 5, 2009, the Draft EIS/EIR is available for general public review at the following locations:

United States Army Corps of Engineers, Sacramento District Technical Library
1325 J Street
Sacramento, California 95814
(916) 557-7490

Merced County Library – Main Branch
2100 O Street
Merced, California 95340
(209) 385-7643

Merced College Library
3600 M Street
Merced, California 95348
(209) 384-6083

University of California Merced Kolligian Library
5200 N. Lake Road
Merced, California 95340
(209) 724-4444

In addition to printed copies of the Draft EIS/EIR, members of the public can request a compact disc (CD) that contains the Draft EIS/EIR. To request a CD, please contact Brad Samuelson at UC Merced (209-228-4333) or Nancy Haley at USACE (916-557-7731). The Draft EIS/EIR is also available on the USACE Web site at http://www.spk.usace.army.mil, and on UC Merced's Web site at http://lrdp.ucmerced.edu. Due to time limits mandated by state and federal law, please provide your comments at the earliest date possible, but not later than 5:00 PM on January 9, 2008. Please send comments to:

NEPA-Related Comments

US Army Corps of Engineers, Sacramento District
Attn: Nancy Haley
1325 J Street, Room 1480
Sacramento, California 95814-2922
E-mail: ucmerced@usace.army.mil.

CEQA-Related Comments

Regents of the University of California
Attn: Brad Samuelson
Physical Planning, Design and Construction
University of California, Merced
P.O. Box 2039
Merced, California 95344
E-mail: bsamuelson@ucmerced.edu

1.10 DRAFT EIS/EIR ORGANIZATION

Table 1.0-2, Organization of the Draft EIS/EIR, presents a list of Draft EIS/EIR sections that are required under NEPA and CEQA. Where pertinent, the *State CEQA Guidelines* section that requires the information is also cited.

Table 1.0-2
Organization of the Draft EIS/EIR

Draft EIS/EIR Section	Description
Executive Summary (*State CEQA Guidelines*, Section 15123)	Summary of the Proposed Action and alternatives, potential significant impacts and mitigation measures, and the identification of the environmentally superior alternative in accordance with CEQA.
Section 1.0, Introduction	Describes the purpose and need and the objectives of the proposed project, the intended uses of the document and authorizing actions, the relationship to previous CEQA documents, public comments and concerns, the scope and content of the document, and the organization of the document.
Section 2.0, Project Description (*State CEQA Guidelines*, Section 15124)	Describes the project location, project background, project purpose and need, project objectives, and description of the Proposed Action.
Section 3.0, Alternatives (*State CEQA Guidelines*, Section 15126.2d)	Describes the alternatives evaluated in this document and alternatives initially considered but eliminated from further consideration.
Section 4.0, Affected Environment and Environmental Consequences (*State CEQA Guidelines*, Sections 15125 and 15126)	For each environmental resource topic, describes the baseline conditions as of 2008, criteria for judging whether an impact is significant, impact assessment methodology, impacts that would result from the Proposed Action and each alternative, applicable mitigation measures that would eliminate or reduce significant impacts, and any remaining significant and unavoidable impacts.

Draft EIS/EIR Section	Description
Section 5.0, Cumulative Impacts (*State CEQA Guidelines*, Section 15130)	Describes the cumulative environmental impacts of the Proposed Action, in conjunction with other approved, pending, or reasonably foreseeable near-term and long-term development in the project area.
Section 6.0, Growth-Inducing Impacts (*State CEQA Guidelines*, Sections 15126.2d)	Describes the potential for the Proposed Action to result in direct and indirect growth-inducing impacts.
Section 7.0, Other CEQA Considerations (*State CEQA Guidelines*, Section 15126.2)	Documents irreversible changes that could result from the implementation of the Proposed Action.
Section 8.0, List of Preparers/Organizations Consulted	Provides a list of the individuals involved in the preparation of this Draft EIS/EIR. Lists persons and organizations consulted during the preparation of the Draft EIS/EIR.
Section 9.0, Acronyms and Abbreviations	Provides a list of acronyms and abbreviations used in this Draft EIS/EIR.
Appendices (on CD; Volume 2 back cover)	Presents additional background information and technical detail for several of the resource topics including NOI/NOP, traffic data, biological resources, and air quality data.

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

As stated in **Section 1.0, Introduction**, the Proposed Action consists of the development of a major research university in Merced County that would ultimately support up to 25,000 full-time equivalent (FTE) students and a contiguous and associated community needed to support the university.

In 2002, The Regents of the University of California (The Regents) approved the development of the UC Merced Campus on a 910-acre site and began the construction of the first phase of the campus on a portion of the site that did not contain any wetlands. The University continued to work with the US Army Corps of Engineers (USACE), US Environmental Protection Agency (EPA), other resource agencies, and concerned citizen groups to develop a campus footprint that would reduce potential impacts on wetlands to the maximum extent possible. As a result of this consultation process, the location and footprint of the campus are proposed to be changed from those evaluated in 2002. The University has therefore prepared an updated UC Merced 2009 Long Range Development Plan (2009 LRDP) that addresses the changes in campus location and footprint. The University must evaluate and disclose the environmental impacts of the 2009 LRDP in compliance with the California Environmental Quality Act (CEQA) before The Regents can adopt the UC Merced 2009 LRDP.

In 2004, the County of Merced amended its General Plan to designate a 3,043-acre area for the development of a 910-acre UC Merced Campus and a 2,133-acre University Community adjacent to and south of the campus (UC Merced/University Community Special Urban Development Plan [SUDP]. Since then, in response to the proposed changes in the location and footprint of the campus, the proposed location and the footprint of the University Community have also changed.

In 2002, the northern portion of the University Community (the former Flying M Ranch) was acquired by the University Community Land Company, LLC (UCLC), a not-for-profit independently incorporated entity jointly owned by the University of California and the Virginia Smith Trust (VST). Because the proposed changes to the footprint of the campus would extend the campus south into what was originally a part of the University Community, the University must acquire from the UCLC those portions of the former Flying M Ranch needed to accommodate the campus. The contractual arrangements needed to accomplish this transaction will be premised on a plan for the development of the remainder of the Flying M Ranch (hereafter Community North) that has been prepared by the University in coordination with the UCLC, and which will be presented to the County of Merced for its consideration as an amendment to the UCP. Before The Regents can enter into these contractual

arrangements with the UCLC, these arrangements must be reviewed for their environmental impacts in compliance with CEQA.

Lastly, because the development of the southern portion of the University Community (Community South) is important for the development of the campus, the University proposes to execute a memorandum of understanding (MOU) with the owners of the Community South (LWH Farms, LLC) that would help facilitate the development of the Community South area in support of the campus. This MOU, which would also include the UCLC, would provide for the coordinated planning and development of the Campus and University Community.

Therefore, the Proposed Project (UC Merced Project) for this Environmental Impact Report consists of the following actions by The Regents: (1) the adoption of an updated LRDP for the UC Merced Campus; (2) the execution of an agreement or agreements with the UCLC for the acquisition of land needed for the campus in a manner consistent with the agreed upon plan for development for Community North; and (3) the execution of an MOU between the University, UCLC, and LWH Farms, LLC, to facilitate the coordinated development of the University Community, including Community South.

For National Environmental Policy Act (NEPA) purposes, this Environmental Impact Statement and Environmental Impact Report (EIS/EIR) considers the federal actions associated with the development of the Campus and University Community. These federal actions are referred to under NEPA as the "Proposed Action." The development of the UC Merced Campus and the associated University Community as proposed would affect Waters of the United States.

Acting as co-applicants, the University and the UCLC have submitted a Clean Water Act (CWA) Section 404 permit application to the USACE for permission to fill 76.7 acres[1] of wetlands present on the proposed campus site and in Community North in conjunction with the development of the Campus and Community North. Section 404 permit applications have not yet been filed for Community South. Nonetheless, consistent with the federal statement of purpose discussed in **Section 1.0** and the USACE's conclusion that the Campus and University Community are connected actions, the impacts associated with all fills required for the Campus and University Community will be addressed in this EIS. Thus, for purposes of evaluation in this EIS under NEPA, the "Proposed Action" encompasses the Campus, Community North, and Community South.

In summary, for evaluation under both NEPA and CEQA, the Proposed Action (under NEPA) and the Proposed Project (under CEQA) encompass the development of the proposed Campus, Community

1 This is the total wetland acreage present within the Campus and Community North and does not include the wetlands present on the Community South area of the project site.

North, and Community South. For ease of reading, the term "Proposed Action" is used throughout this EIS/EIR to refer to both the proposed federal action under NEPA and the proposed project under CEQA.

This section describes the updated plans for the Campus and the University Community that are now proposed to guide the development of both areas.

2.2 PROJECT LOCATION

The project site is located in an unincorporated area of eastern Merced County, approximately 2 miles northeast of the limits of the City of Merced (see **Figure 2.0-1, Regional Location of the Proposed Action**). The project site occupies portions of Sections 26, 27, 34, and 35, Township 6 South, Range 14 East; and Sections 3 and 2, Township 7 South, Range 14 East. The site is south-southeast of Lake Yosemite Regional Park and east of Lake Road. Yosemite Avenue forms the southern project site boundary.

As noted above, the Proposed Action consists of the development of two major areas: the UC Merced Campus and the University Community (see **Figure 2.0-2, Campus and University Community Planning Areas)**. The UC Merced Campus consists of the approximately 815[2]-acre campus (including a 104-acre Phase 1.1 campus area,[3] which is under development) and the approximately 1,307-acre Campus Natural Reserve (CNR). The University controls the land that comprises the campus and the CNR. The University Community comprises the 833-acre[4] Community North and the 1,118-acre[5] Community South. UCLC owns the land that comprises Community North. LWH Farms, LLC, owns the land that comprises Community South.

2.3 PROJECT SITE AND SURROUNDING USES

Figure 2.0-2 shows existing conditions on and adjacent to the project site. The project site consists of three existing land uses: the developed Phase 1.1 Campus, grasslands used for seasonal grazing, and lands under other agricultural uses. The Phase 1.1 Campus, which was established on the 197-acre site of the former Merced Hills Golf Course and encompasses about 104 acres, is located in the central portion of the campus site northeast of Bellevue Road and east of Lake Road. The Phase 1.1 Campus is developed with a classroom and office building, a library, a science and engineering building, student housing consisting of

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2 This is net acreage, which excludes the 150-foot canal easements.

3 In the 2002 LRDP EIR, the 104-acre campus was termed Phase 1 Campus. In the current EIS/EIR, the same area is termed Phase 1.1 Campus to distinguish it from the next sub-phase of campus development Phase 1.2. For a description of the phases of campus development, see **Section 2.4.4** below.

4 This is net acreage, which excludes the 150-foot canal easements.

5 Ibid.

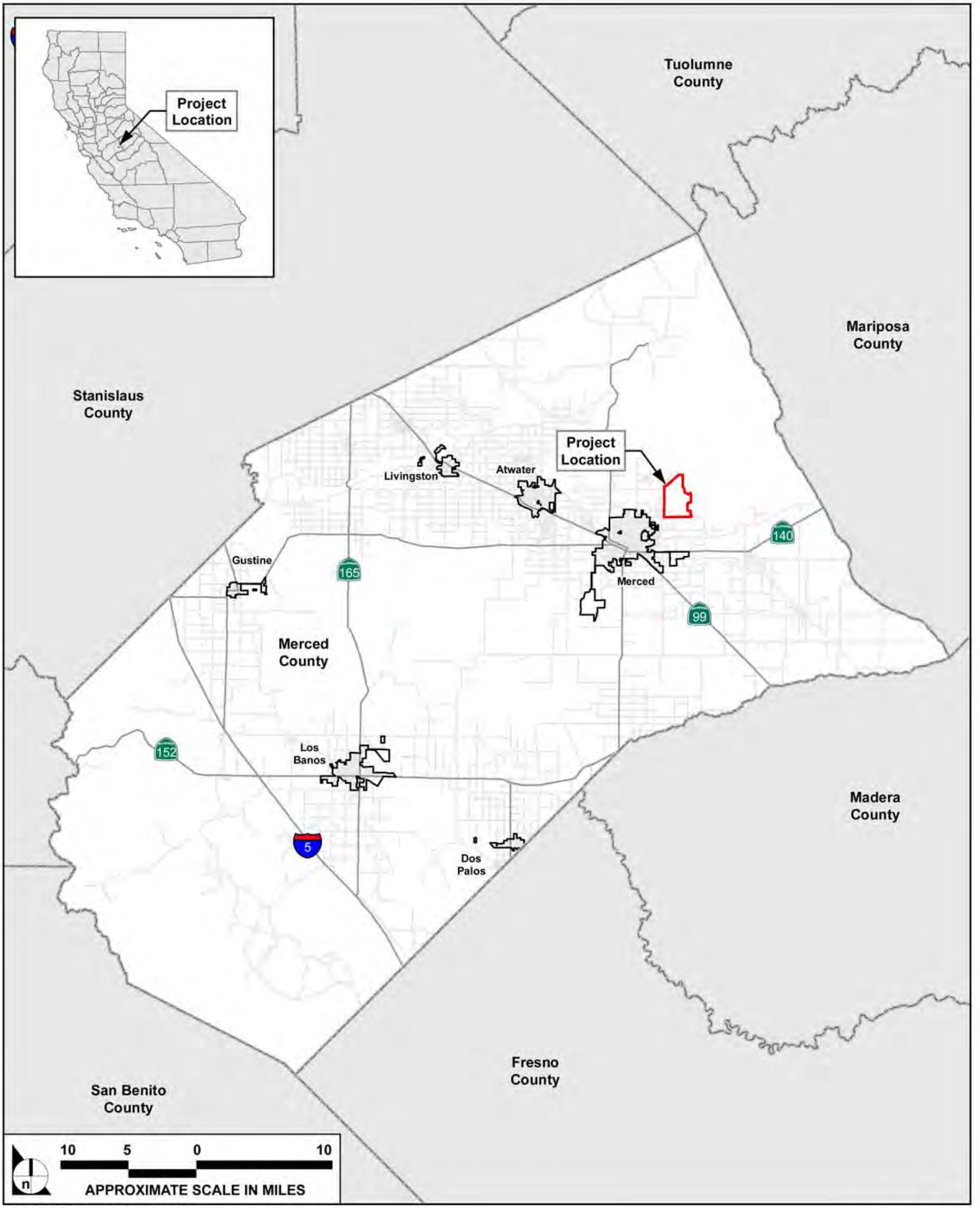
two developments of residence and multiple unit housing clusters, a dining facility, a recreation and wellness center, two recreation fields, a logistical support/service building, an academic social sciences and management building that is under construction, telecom building, and trailers housing the UC Merced police department. Parking is provided in permanent and temporary parking lots near the entrance to the campus as well as in the northeastern portion of the Phase 1.1 Campus. Additional facilities planned for the Phase 1.1 Campus include a second science and engineering building, an early childhood education center, additional student housing, and modular facilities to provide temporary office space. A small lake and two ponds are present on the Phase 1.1 Campus site, which receive runoff from the developed campus.

Gently rolling grasslands used for seasonal grazing occupy lands to the north, northeast, and east of the Phase 1.1 Campus. A barn and a corral are located to the northeast of the Phase 1.1 Campus. Agricultural lands lie to the south of the Phase 1.1 Campus. Agricultural lands within the Campus and Community North are used as a grazing pasture, and within Community South are used for cultivated crops.

The project site is situated south-southeast of Lake Yosemite, which is a regulating reservoir owned and operated by the Merced Irrigation District (MID). Two approximately 50-foot-wide irrigation canals[6] also owned by MID, Le Grand Canal and the Fairfield Canal, convey water from the lake to agricultural areas to the south. Both canals meander through the project site, generally following the contours of the land. The campus was sited in part to take advantage of the significant nearby amenity of Lake Yosemite and to utilize the strong visual identity and environmental amenity provided by the lake. It is also sited to maximize vistas within the valley and to the Sierra Nevada Range.

Lake Yosemite Regional Park, owned by MID and managed by Merced County under an easement, is located to the north of the campus. Grazing pastures located on gently rolling grasslands occupy the lands to the north and east of the campus. Lands to the east of the University Community are under either under row and field crops or under grasslands or irrigated pastures. Lands immediately south of the University Community are under cultivation. West of the University Community adjacent to Lake Road the area is partially developed with and zoned for rural residential land uses.

6 Each canal is about 50 feet wide within a 150-foot easement.



SOURCE: UC Merced – February 2008

FIGURE **2.0-1**

Regional Location of the Proposed Action

974-001•08/08

Lake Yosemite Regional Park
Campus Barn
UC Merced Campus 815 Acres
Le Grand Canal
Campus Natural Reserve
Fairfield Canal
Bellevue Road
Community North 833 Acres
Cardella Road
Dunn Road
Lake Road
East Yosemite Avenue
Community South 1118 Acres

Legend:
- Project Boundary
- Phase 1.1 Campus
- Rural Residential

2000 1000 0 2000
APPROXIMATE SCALE IN FEET

SOURCE: UC Merced – June 2008

FIGURE **2.0-2**

Campus and University Community Planning Areas

974-001•10/08

In 1996, following the selection of the Lake Yosemite site for the establishment of the proposed UC Campus, Merced County amended its General Plan to designate a SUDP area to include all the VST property, the adjacent Cyril Smith Trust (CST) property, and the County-owned parcels between Lake Yosemite Regional Park and the Merced Hills Golf Course. In addition, the Sphere of Influence (SOI) boundary, adopted by the City of Merced in 1997, was made coterminous with the County SUDP. The Campus and the University Community were planned to be located within this SUDP and SOI. In 2004, following the certification of the University Community Plan EIR, the County amended the Merced County General Plan to designate the area of the University Community as Multi-Use Urban Development. The County also revised the boundaries of the original 1996 UC Merced SUDP to include the University Community and to exclude VST and CST lands north and east of the campus. The resulting UC Merced/University Community SUDP consists of 3,043 acres.

2.4 PROPOSED ACTION

This section presents details of the Proposed Action, which is the development of the Campus and the associated University Community.

The campus would encompass 815 acres, approximately 104 acres of which are already developed with Phase 1.1 Campus facilities in accordance with the 2002 LRDP. The rest of the campus would be developed with academic and research buildings up to four to six stories high, academic support buildings, student housing, dining facilities, roadways, parking lots, athletics and recreational facilities, and open space areas. The 1,307-acre CNR, adjacent to the campus, would be placed under a new conservation easement and dedicated to scientific research and education. The campus would be developed in accordance with an updated LRDP. Information summarizing the updated LRDP (hereinafter 2009 LRDP) is presented below.

The University Community would occupy approximately 1,951 acres of land and would be developed with high-, medium-, and low-density housing, commercial buildings, buildings to house research and development, parking, parks, schools, and open space for passive and active recreation. The development of the University Community would occur in accordance with the University Community Plan (UCP), a component of the Merced County General Plan intended to guide the systematic development of the University Community. In 2004, Merced County approved a General Plan amendment based on the UCP to facilitate the development of the University Community.

Since 2004, changes to the location and footprint of the proposed University Community have been proposed. In connection with the proposed shift of the campus south into what was formerly a part of the University Community, a land acquisition agreement between the University and the UCLC will be

executed based on a plan for development of Community North that have been developed by them and which will be submitted to Merced County for approval in the form of revisions to the UCP. The environmental effects of these proposed arrangements are evaluated in this EIS/EIR as required by CEQA. The University is also evaluating in this EIS/EIR the environmental effects of the execution of a MOU with the UCLC and the owners of the Community South property to guide the development of the University Community in support of the campus.

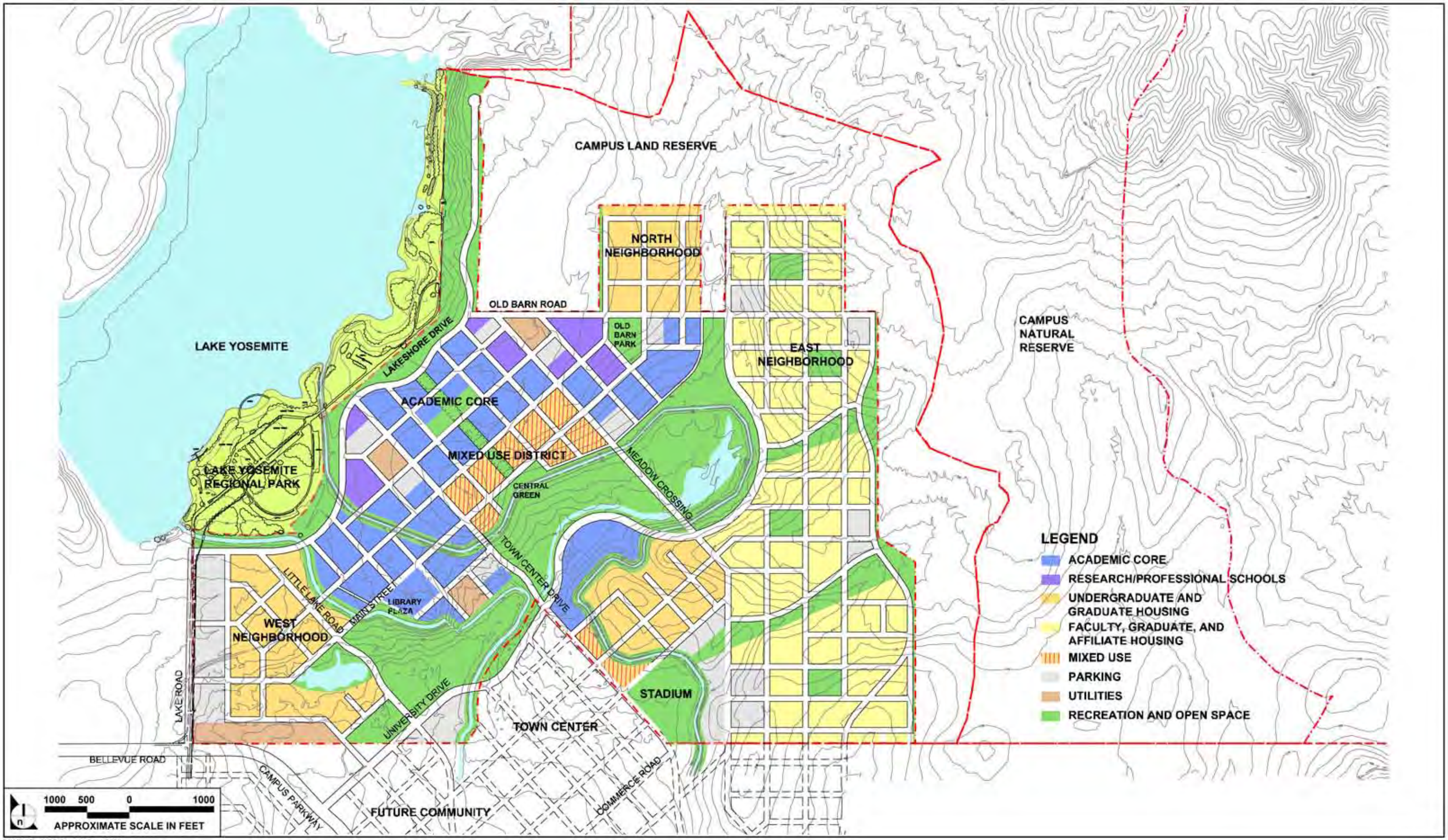
Although this EIS/EIR will evaluate the changes to the University Community to support the decisions of The Regents' required in connection therewith, the County will prepare its own EIR to support its consideration of proposed revisions to the UCP. Information summarizing the revisions proposed to the UCP (hereinafter revised UCP), which would be submitted to the County for consideration following action by The Regents, is presented below.

In compliance with NEPA, the USACE is evaluating the environmental effects from development of the Campus and the University Community in this joint EIS/EIR.

Much of the information presented below is derived from the two previously certified EIRs and has been updated to reflect the updated LRDP and the proposed changes to the 2004 UCP. Changes in key parameters of both plans are summarized in **Table 2.0-1, Proposed Changes to the UC Merced LRDP and UCP,** below. **Figure 2.0-3, 2002 LRDP Campus Land Use Map,** shows the previously approved Campus Land Use Plan and **Figure 2.0-4, 2009 LRDP Campus Land Use Map,** shows the land use plan as currently proposed.

2.4.1 UC Merced 2009 Long Range Development Plan

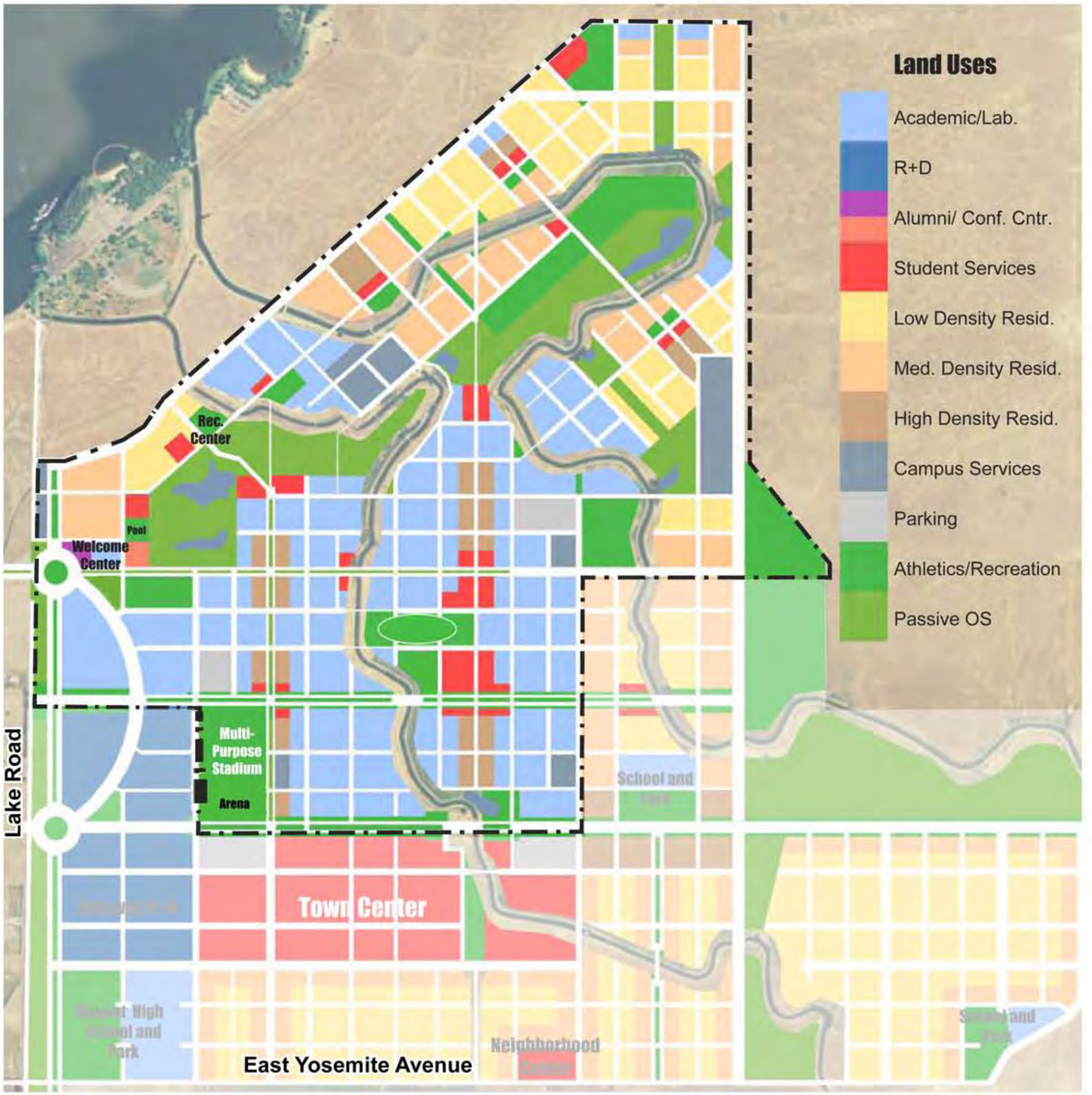
An LRDP is defined by statute (Public Resources Code Section 21080.09) as a "physical development and land use plan to meet the academic and institutional objectives for a particular campus or medical center of public higher education." In 2002, the University of California adopted an LRDP that provided the physical planning framework to achieve the academic needs and goals of a new 25,000 FTE student campus in Merced County. As noted above, the University has proposed revisions to the previously adopted LRDP to account for the revised location and footprint of the campus. The main features of the updated 2009 LRDP are presented below.



SOURCE: URS Corporation - 2002

FIGURE **2.0-3**

2002 LRDP Campus Land Use Map



NOT TO SCALE

SOURCE: UC Merced – May 2008

FIGURE **2.0-4**

2009 LRDP Campus Land Use Map

974-001•10/08

Table 2.0-1
Proposed Changes to the UC Merced LRDP and UCP

Parameter	Previous Proposal	Current Proposal
UC Merced LRDP		
Campus Land Area	910 acres	815 acres
Campus Land Reserve Land Area	340 acres	0 acre
Campus Natural Reserve Land Area	750 acres	1,307 acres
Total Enrollment at Buildout	25,000 FTE	25,000 FTE
Total Faculty and Staff at Buildout	6,248 FTE	6,560 FTE
Total Students Housed on Campus	12,500 (50%)	12,500 (50%)
Total Faculty Housed on Campus	710 (50%)	0
Total Academic Building Space	3,560,000 gsf	6,250,000 gsf
University Community		
Total Land Area	2,133 acres	1,951 acres
Total Residential Area	1,132 acres	1,024 acres
Total Number of Residential Units	11,616	11,616
Total Mixed Use/Retail/Office/R&D Acreage	96 acres	129 acres
Total Mixed Use/Retail/Office/R&D Building Space	2,023,000 gsf	3,696,700 gsf
Total Residential Population (head count)	30,782	30,782
Total Employment (head count)	5,524	10,244

gsf= gross square feet

Proposed Campus Land Uses

The revised Campus Land Use Map designates major land use areas to guide the siting of the future physical development. Each of the major land use designations is described below. The distribution of the designated land uses is presented in **Figure 2.0-4.** The total acreage assigned to each major land use is listed in **Table 2.0-2, Major Land Uses Proposed in 2009 LRDP**. The acreage for each land use on the campus is approximate and is likely to be adjusted and redistributed over time as the campus develops; however, the overall acreage of the campus would remain at 815 acres. This proposed size reflects the aggregate land needs of a major research campus. The CNR area would remain at approximately 1,307 acres regardless of changes to land uses within the campus.

Table 2.0-2
Major Land Uses Proposed in 2009 LRDP

Land Use	Approximate Acreage	Building Space/Units
Campus		
Academic Core	200[1]	6,250,000 sf
Academic/Laboratory	115	
Research and Development	75	
Alumni/Conference Center	10	
Student Services	30	1,000,000 sf
Student Housing	195	12,500 beds
Campus Services	40	1,250,000 sf
Parking	110	15,500 spaces
Athletics and Recreation	140	400,000 sf
Passive Open Space	100	N/A
Subtotal	**815**	
Campus Natural Reserve	1,307	N/A
Total	**2,124**	

Notes:
[1] *This acreage includes administrative space*
sf = square feet.

As shown in **Figure 2.0-4**, the campus plan would be organized in a grid pattern. The northern-most portion would be organized on a northeast-southwest bias which reflects the organization of the Phase 1.1 Campus, parallel to the northwestern property line, the southeastern shore of Lake Yosemite, and the general topography. The development of the subsequent phases to the northeast would continue this development pattern to enable the most efficient use of land between the property line and Le Grand Canal and take maximum advantage of cooling summer breezes that come in from the northwest across the lake.

Future development to the east and south of the Phase 1.1 Campus would be on a north-south orthogonal grid to utilize land in the most effective manner, minimize overall development impacts, and optimize solar orientation for future development of a sustainable campus. This grid pattern provides flexibility in the buildout and organization of the campus, allowing pedestrians and bicycle or vehicular circulation to follow the grid corridors, where needed. The grid corridors would be designed to be narrow to encourage pedestrian activity and to provide shading by buildings and plantings. Another benefit of the grid pattern is that it can be implemented incrementally and flexibly, block by block, while providing a rational backbone for infrastructure siting and layout.

Each of the major land use types included in the 2009 LRDP is described below.

Academic Core

Approximately 200 acres of the campus are designated as Academic Core and would be developed with buildings for academic use, academic support, administrative uses, laboratories, campus research and development, and mixed-use academic functions (including student housing, services, and recreation) at full development. The academic core is located in the center of the campus site, north and south of the main entrance at Bellevue Road.

Approximately 115 acres within the academic core would be developed with academic and administrative buildings at full campus development. This acreage is based on data from UC campuses and numerous research universities from across the United States. This acreage would support instructional, research, academic support, and administrative uses, including classrooms, laboratories, libraries, and academic offices.

The academic core would grow to the south of the current Phase 1.1 Campus. Two mixed-use main streets are planned for the campus. The first one is on the western side of the core and will serve the development of the next phase of campus development (Phase 1.2 and Phase 2). The second main street would be developed in later phases and would serve the eastern side of the academic core. Facilities on these two main streets would be designed to encourage mixed uses such as cafes, student services, recreation, academic support, and other campus services in support of these primary uses, etc.

The academic core would also include a 40-acre block that would be located near the intersection of Bellevue Road and Lake Road and used to site facilities for nonprofit or grant-based research programs. This area may also include a research park that would be used for research collaboration with outside entities, including for-profit organizations, similar to research parks at Stanford University and UC Irvine. This area is shown on **Figure 2.0-4** as Research and Development. Generally, on-campus research areas are required for research that needs to be near the central campus but does not absolutely require, or is unsuitable for, contiguity with the academic area. Such research may be under the aegis of UC, but could be funded independently or managed by a private for-profit or non-profit entity. Some UC campuses host research entities that are wholly or partially independent of the University. Many businesses and industries look for opportunities to locate near research universities to improve access to future employees with advanced training and access to new knowledge. Campus research parks also are incubators for new companies that benefit from the increasing rate of technology transfer from basic to applied research and on to real-world applications. The on-campus location enriches the research environment by offering opportunities for extramural research collaborations and graduate student and

undergraduate employment and internships. It is also an important factor in attracting top-quality faculty to the new campus and generating informal, spontaneous interactions, which contribute to successful research partnerships. Additional research and development land uses would be distributed within the academic core in clusters of interdisciplinary research facilities, which would facilitate cross-disciplinary collaborations within the academy.

Approximately 10 acres within the academic core near the intersection of Lake Road and Bellevue Road are assigned for an alumni/conference center.

Student Services

Student services facilities would occupy approximately 30 acres of land on the campus. These include the student union, administration, registration, financial aid, common areas, food service, and student health. The student services areas are generally provided in the central parts of the campus to provide students ready access to food and health services. Student services areas are also located within or adjacent to areas designated for student housing, including the residential main streets that run north and south through the academic core, linking on-campus student neighborhoods to the Town Center and the University Community (see **Figure 2.0-4**).

Student Housing (Low, Medium, and High Density Residential)

Student housing is basic to the educational mission of the University of California. The University has determined that provision of on-campus housing for freshmen and undergraduate transfer students can be correlated to successful retention rates, and all UC campuses give priority in housing to these groups. Currently, UC campuses guarantee housing to all freshmen and sophomores. About 85 percent of freshmen actually occupy campus housing on other UC campuses. Similarly, graduate and family housing is considered an essential factor in bringing highly qualified graduate students to UC campuses.

An integrated student-housing component is a critical element of the LRDP. Approximately 195 acres of the campus would be developed with student housing, located mainly in the northwestern and northeastern portions of the campus (see **Figure 2.0-4**). The assigned acreage would be adequate to provide about 12,500 student beds in a mix of housing types, which include high-, medium-, and low-density apartments and residence halls. Additional housing would be provided along two main streets in the academic core to bring life to the campus throughout the day and into the weekends, offering a distinctive on-campus urban living environment to upper division undergraduates, international and/or graduate students, or other specific student populations. This housing would serve about 50 percent of the total student population of the campus at full development. Three neighborhoods would provide undergraduate housing immediately adjacent to the academic area. Student housing would be composed

of residence halls, apartments, or other housing structures, along with associated facilities such as dining commons, recreational space, study and meeting rooms, and high-speed data lines. Passive and active recreation and open space would be integrated into each student neighborhood, as would connections to the distant views to the north and east, and the recreational open space amenities within the North and South Bowls, open space areas within the campus.

A range of housing densities is assumed in the plan, which would be refined over the development life of the campus to best fit the student population needs. Mixed-use main street housing is proposed to be developed at a density of 180 to 320 students beds per acre, and would be the highest density housing on the campus. Other housing would involve densities between 48 to 180 student beds per acre. Areas with the lowest density of housing on campus would provide between 36 and 60 student beds per acre.

Campus Support Services

Campus support facilities include two or more central plants, a logistical center for centralized receiving and maintenance shops, corporation yard functions, mail services, police stations, electrical substations, water storage facilities, and energy plants. These facilities would be constructed on about 40 acres (see **Figure 2.0-4**). The land designated for campus support services is strategically located at the edge of the academic core of the campus or at the edges of the campus footprint to facilitate perimeter service access. Additional facilities may be located within other districts to support their functions and utility or service requirements as necessary.

Athletics and Recreation

Athletic and recreation facilities would occupy about 140 acres (see **Figure 2.0-4**). This is the estimated minimum acreage needed to provide facilities for a National Collegiate Athletics Association (NCAA) Division I athletics program. In the UC system, all undergraduate campuses offer an array of physical education course work, both on a credit or noncredit basis. Athletic and recreational programs include a broad array of intramural, intercollegiate, extracurricular, co-curricular, administrative, and social activities. Approximately 40 acres of this land use would be developed as indoor facilities, resulting in about 400,000 square foot of indoor space.

The UC system offers physical education classes in fitness, CPR, aquatic instruction, first aid, sports, and dance. In addition to curricular offerings in fitness and recreation, intramural athletic activities are an essential part of the undergraduate (and often graduate) programs. Virtually every university provides athletic fields, gymnasiums, swimming pools, and tennis and racquetball courts for student use outside the classroom. At the UC campuses as well as at other universities, undergraduate participation in

intramural athletic programs is very high. Faculty and staff also utilize campus athletic facilities for personal physical activity or participation in classes.

At major universities like those in the UC system, field houses and stadiums are often used for non-athletic purposes, but in ways that facilitate or enhance the educational experience of students. These facilities often provide for graduations, academic convocations, speeches by major national/international figures, multicultural festivals, dance troupe performances, live music performances, crafts fairs, marching band and cheerleader competitions, etc. These facilities also provide student and parent education programs at the beginning of each term; large job and internship fairs for students; and large workshops and meetings with K–12 students, teachers, administrators, and parents that are important to the success of UC's intensive outreach programs.

Athletic facilities at the UC Merced campus would include soccer fields, an aquatic center, baseball/softball fields, a gymnasium, a multi-use stadium, and an arena. These facilities would be used daily by a large number of students, faculty, and staff. Therefore, locations that are central and easily accessible are important. Students must be able to easily get to course locations during the school day, and in order to maximize student participation rates and co-curricular and extracurricular activities, intramural athletic fields should be located near both the central campus and student housing. Facilities would be centrally located for academic convocations and graduations, and to provide an easily accessible location for nonacademic social events that enhance the student experience. Many of these facilities will be available to the community for use.

Passive Open Space

About 100 acres of the campus would be developed for passive open space uses. Passive open space would be provided throughout the campus and include commons, plazas, informal recreational areas, neighborhood parks, planted malls, buffer areas, water features, and associated landscaped areas (**Figure 2.0-4**). Additionally, courtyards, lawns, landscaping, and other open space would be established in association with the buildings, based upon established floor area ratios for academic and residential areas. Neighborhood parks would be established in the northern and eastern housing areas. Open space corridors, which would include pedestrian and bicycle routes, are proposed along Fairfield and Le Grand canals, extending from Lake Yosemite Regional Park through the center of the campus and to the southern border of the campus. Open space would also be provided along the campus streets.

Campus Natural Reserve

The CNR lands (about 1,307 acres) would consist of open space to the northeast of the campus. The CNR would be placed under a conservation easement, maintained permanently in an undeveloped state, and

dedicated to scientific research and education. It would be managed in a manner consistent with the management practices of the UC Natural Reserve System pursuant to a management plan for conservation lands (**Appendix 2.0-1**).

On-Campus Circulation and Parking

As described earlier, campus land uses have been planned predominantly in a street and block grid pattern. The circulation system consists of a grid-pattern network of principal roads, connecting all major academic portions of the campus and campus periphery (see **Figure 2.0-5, Campus and University Community Circulation and Parking Diagram**). The main access to the campus is at Bellevue Road. However, multiple entry points into the campus are planned to allow easy access to the campus as it grows and to accommodate the expected numbers of students, faculty, staff, and visitors. The circulation system would also include a network of lateral and feeder roads, service alleys and driveways, sidewalks, paths, and paved ways for bikes and pedestrians. It would provide for the movement of automobiles, service trucks, emergency vehicles, maintenance vehicles, buses, bicyclists, and pedestrians. The acreage for the circulation system is not distinguished from other campus land uses, but it is accounted for within their assigned acreages.

Secondary streets would surround the development blocks within the campus area. The layout would vary depending on design conditions, but is likely to include a bike path and pedestrian/landscape areas adjacent to the roads. Some corridors, such as the canal corridors, would consist of dedicated pedestrian/bike paths or service ways only. All roadways and pathways would include appropriate lighting systems for safety and irrigation for landscaped areas.

The campus circulation system is specifically designed to fit within the larger City and regional system. It integrates with the approved Campus Parkway. It provides for specific linkages to potential transit systems and patterns of transit access. Within the campus, bus/trolley systems are currently being run and will be expanded to support internal movement and minimize the use of automobiles within the campus core. At full development of the campus, approximately 110 acres would be used for parking lots and parking structures to provide a total of 15,500 parking spaces. About 30 percent of these spaces would be in residential areas and about 70 percent of these spaces in campus parking lots and structures (see **Figure 2.0-5**). The estimate of campus parking needs is based on parking supply factors from other UC campuses such as UC Davis and UC Riverside and a consideration of the effects of transportation demand management (TDM) programs. Parking would be provided with a combination of facilities located at the campus perimeter and within more proximate locations. Parking is planned to minimize intrusion by vehicles into the academic core. Parking near and within the academic core is expected to be

provided in parking garages. Similar to other UC campuses, permits would be necessary to park in on-campus facilities.

It is anticipated that during the initial phases of campus development (including Phases 1, 1.2, and 2), parking would be provided on surface lots due to their low construction and maintenance costs. As the campus is built out, parking structures would be constructed to centralize parking, conserve land, and be consistent with the LRDP land use designations. During early phases of the campus, interim parking land use may differ from the final land use designation in some areas. Over the long term, these interim parking lots would be redeveloped consistent with the LRDP designation of the land.

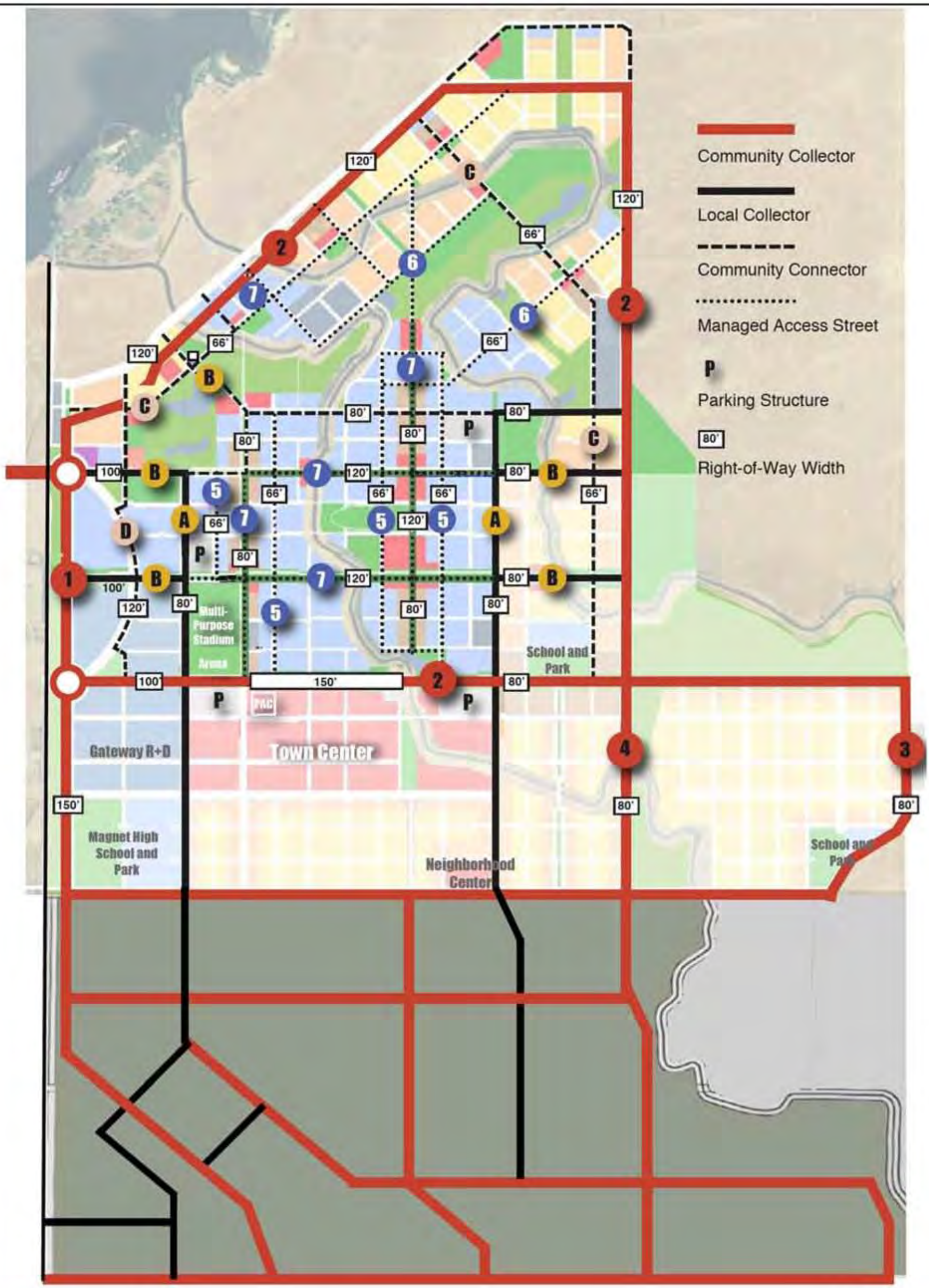
Campus Population

UC Merced opened in 2005 with 865 FTE students, 67 faculty, and about 450 staff. As of Fall 2008, the campus's student population is about 2,700 FTE students and the campus has approximately 117 faculty and 613 staff.

The campus is projected to add approximately 600 students per year between 2007–08[7] and 2020–21. By 2020–21, the campus is expected to reach approximately 11,000 FTE students (**Table 2.0-3, UC Merced Projections of Students, Faculty, and Staff**). The Campus would ultimately serve 25,000 FTE students and an associated faculty of 1,420, 4,828 staff, and about 312 postdoctoral researchers (total 6,560 FTE employees). The total UC Merced student population is unchanged from the 2002 LRDP. The average number of other persons including visitors, non-UC employees, and construction workers expected to be on the campus each day are also reported in the table.

The projections provided in **Table 2.0-3** represent the best information available at the time that this EIS/EIR was prepared. The numbers reported for each year in the table are current projections. Actual enrollment levels that are achieved each year could differ from these numbers depending on demographics and the state of the economy, among other factors. These numbers are provided primarily to show the manner in which campus population is projected to grow.

7 2007-08 numbers in **Table 2.0-4** are an estimated average for the year as a whole. The 2008 numbers reported in the paragraph above are for one semester.



UCP Framework Concepts

7-12-08 draft

Circulation: Vehicular Access

Community Collector
1. Parkway (Regional Facility)
2. Campus Loop Drive
3. Community Loop Drive
4. Community Central Drive

Local Collector
A. Campus-Town Center Loop
B. Town Center Access
C. University Community Neighborhood Collectors

Local Connector
D. Neighborhood Access
E. Gateway Access
F. Boulevard Street

Managed Access Street
5. Event Street

NOT TO SCALE

UC Merced 2008 LRDP

SOURCE: UC Merced – October 2008

FIGURE **2.0-5**

Campus and University Community Circulation and Parking Diagram

Table 2.0-3
UC Merced Campus Population Projections

Population	Years						
	2007–08 (Estimated)	2008–09	2009–10	2014–15	2019–20	2020–21	Full Development
Undergraduate	1,885	2,573	3,183	5,770	8,288	8,815	22,250
Graduate	124	163	235	860	2,042	2,249	2,750
Subtotal	*2,009*	*2,736*	*3,418*	*6,630*	*10,330*	*11,094*	*25,000*
Faculty	136	146	183	350	533	573	1,420
Staff	605	644	804	1,541	2,344	2,520	4,828
Postdoctoral Researchers	30	32	40	77	117	126	312
Subtotal	*771*	*822*	*1,027*	*1,968*	*2,994*	*3,219*	*6,560*
Other Daily Population[1]	50	70	85	165	250	270	625
Total	**2,830**	**3,628**	**4,530**	**8,683**	**13,574**	**14,583**	**32,185**

Notes:

[1] *Includes visitors, food service employees, and construction workers that may be present on the campus on a daily basis. Numbers estimated assuming this population is about 2.5 percent of the total enrollment. This population ranges from 2 to 3 percent of the campus student population at UC Davis and UC Santa Cruz respectively.*

Public Services

Public services would be provided to the campus as described below.

Fire Protection

The campus currently receives fire protection services from existing fire stations under an informal agreement between the Campus, the County, and City of Merced. As the campus develops, a fire station would be provided at a nearby location in Community North. It may be managed by the County or City. Such a facility would be sited within the University Community, but would likely serve both campus and community. The Campus is currently negotiating with the County of Merced to establish an instant aid agreement between the City and County with respect to University fire services.

Police Services

The University of California has its own police force, which has been serving the campus since it opened in 2005. The campus area is within the jurisdiction of the Merced County Sheriff's Department. The campus, County, and City police forces have established cooperative working relationships and the campus police frequently assist in local law enforcement activities, particularly related to traffic within the vicinity of the campus. The UC Merced Police Department will expand over time to meet the growing needs of the campus. In subsequent phases, a separate police/public safety facility will be required. Eventually, the campus may be within the City of Merced jurisdiction and appropriate agreements will need to be executed.

Child Care Facilities

The updated LRDP allows for the siting of childcare facilities on campus in two land use areas: within the academic core and within the residential areas. A childcare facility is under construction on the Phase 1.1 Campus.

Utilities

Except for the Phase 1.1 Campus, the campus site is largely undeveloped. The campus site is located in unincorporated Merced County and is not within the service area of the utilities provided by the City of Merced. The Phase 1.1 Campus area is, however, provided water and wastewater service by the City of Merced under a pre-annexation agreement. The existing infrastructure connections for water and sanitary sewer, constructed to serve the Phase 1.1 Campus, have the capacity to accommodate the remainder of campus growth. The pre-annexation agreement with the City limits the service to the Phase 1.1 Campus. In order for the City to provide sewer and water service to the developing campus, the area of the campus must be annexed to the City or an expansion of the area covered by the current special agreement must be executed for this purpose and approved by Local Agency Formation Commission.

At this time, the Campus anticipates that the next phase of campus development will also be served by the City under another special agreement. Eventually, the entire campus may be annexed to the City or only that portion of the campus that is already served by the City may be annexed and the rest of the campus may remain in unincorporated Merced County.

Table 2.0-4, Campus Utility Demand, presents the current (2007–08) utility demand estimates for the campus and the demand at full campus development under the updated LRDP. Water usage estimates are based on high water conservation factors since the campus is using approximately 40 percent less water than is typical for such uses. The demand for potable and irrigation water would be lower if even

greater conservation is achieved. Because wastewater flows are dependent on water usage, these flows would also be lower if greater water conservation is achieved.

Table 2.0-4
Campus Utility Demand

Utility	Demand	
	2008	Full Development
Potable/Fire Water	159 acre-feet/year[1]	1,611 acre-feet/year
Irrigation Water	-	776 acre-feet/year
Wastewater	209,700 gallons per day	1.13 million gallons/day(mgd)
Solid Waste	618 tons/year	8,368 tons/year
Electricity	1.7 megawatts[2]	18.0 megawatts[3]
Natural Gas	100 therms/hour	1,020 therms/hour

Source: Stantec 2008, UC Merced 2008.
Notes:
[1] *Includes irrigation water*
[2] *Current electricity demand is approximately 1.7 megawatts during the peak window period and approximately 3 Kilowatts in the middle of the night.*
[3] *Predicted peak demand for full development of campus.*

Potable Water/Fire Water

Potable water is provided to Phase 1.1 of the Campus by the City of Merced via its distribution system. The water is primarily supplied by a 16-inch water line that was constructed within the roadway alignment of Bellevue Road. A water supply well was constructed on the Phase 1.1 Campus as a secondary source of water because the 16-inch line is not sufficient to meet fire flow requirements. This design also assures that water supply to the campus would be uninterrupted in the event that the campus well is taken off line for any reason.

An on-campus distribution system has been developed to deliver potable water to each building within Phase 1.1 Campus. This system will be expanded to serve areas outside the Phase 1.1 Campus. Water mains would be placed under the secondary roads, with branch lines for fire hydrants and future building sites. Water mains would be sized to accommodate long-range development of the campus.

To accommodate fire flow requirements, a 250,000-gallon water storage tank has been constructed on the Phase 1.1 Campus near the campus well. Additional tanks would be constructed on campus support land as needed to serve the growing campus.

Irrigation Water

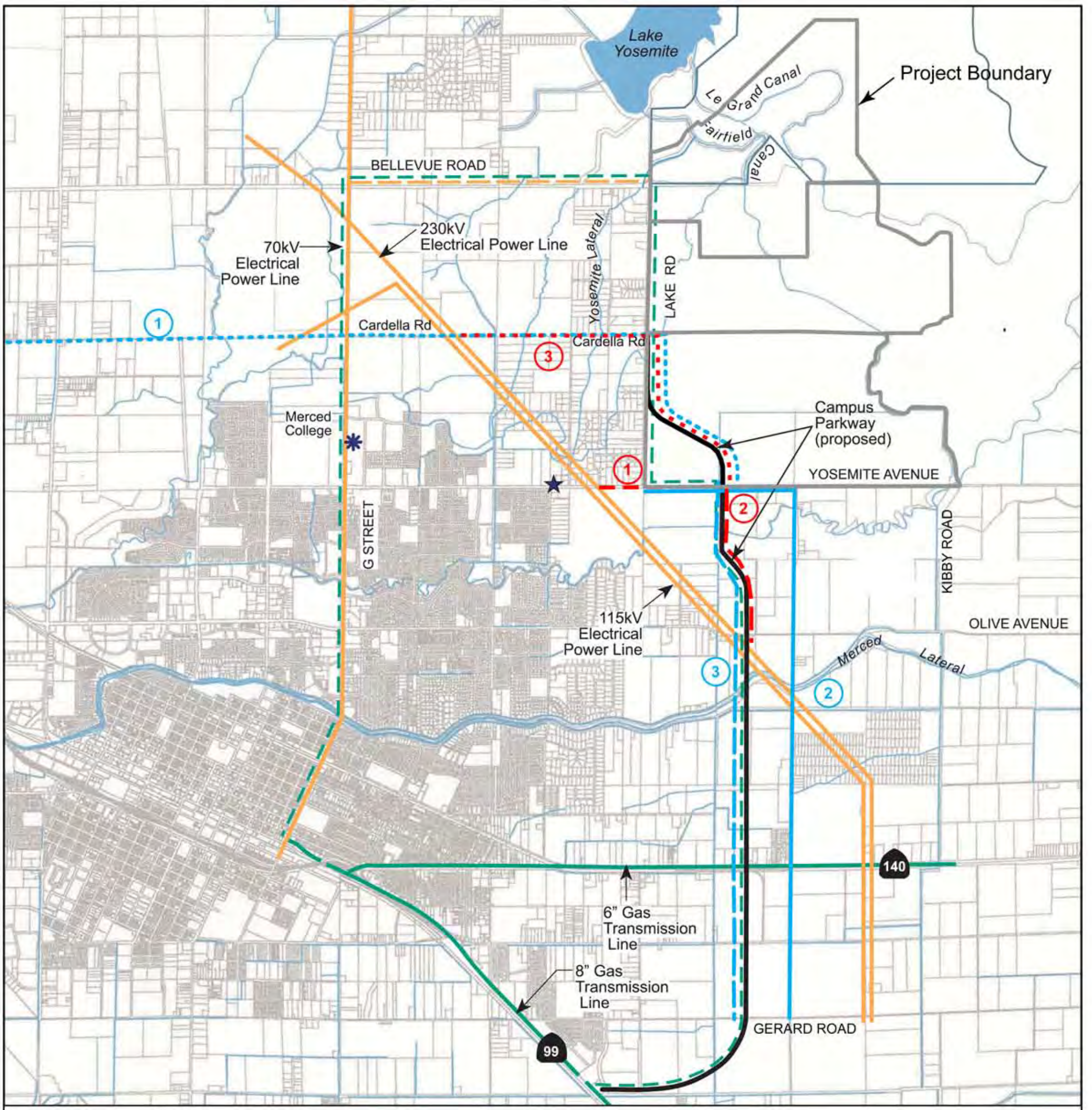
Approximately 293 acres[8] of the 815-acre campus would require irrigation. Additional areas would be landscaped with drought-resistant landscaping that would require minimal irrigation. At full development, the campus would require approximately 776 acre-feet per year. For Phase 1.1 Campus, water for irrigation is obtained from the City of Merced. Non-potable water might be obtained from the MID canals, pursuant to appropriate agreements. The campus is not located with the service area of MID therefore an extra-territorial service agreement with MID would likely be needed to obtain irrigation water from the two MID canals. The University will also evaluate a wastewater treatment and recycling plant that would generate recycled water that could be used for irrigation. This is described in further detail below under **Wastewater**.

Wastewater

Wastewater Conveyance

Phase 1.1 of the campus currently connects to the City of Merced wastewater collection and treatment system. To serve the Phase 1.1 Campus, a new 27-inch sanitary sewer line was installed in Bellevue Road that connects to the City of Merced's sewer system at an existing 27-inch trunk line on G Street near Merced College (**Figure 2.0-6, Off-Site Utility Connections**). Although the sewer pipeline under Bellevue Road is sized to serve the full development of the campus, the existing 27-inch sewer pipeline on G Street has the remaining capacity to only serve up to 10,000 FTE students and associated faculty and staff (City of Merced 2008). For campus growth up to 10,000 FTE students, no off-site improvements to the wastewater collection system are needed. Because of the elevation difference between Phase 1.1 Campus and the portion of the campus south of Bellevue Road and the sewer pipeline in Bellevue Road, a pump station would be required in the interim that would pump wastewater to the sewer pipeline in Bellevue Road. Once a long-term solution is in place (see below), the interim pump system would be removed or employed as back up.

8 Includes turf and non-turf areas.



SOURCE: UC Merced - 2008, Impact Sciences, Inc. - October 2008

FIGURE **2.0-6**

Off-Site Utility Connections

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To serve the campus beyond the 10,000-student level, an off-site upgrade to the City's wastewater conveyance system would be required. Several scenarios, as summarized below, are being considered for the long-term solution to provide adequate wastewater conveyance for a portion of the campus. Furthermore, because the University Community may also be served by the City's wastewater collection and treatment system, these solutions would apply to the University Community as well.

- **New Cardella Road Trunk Sewer**. A new sewer pipeline under Cardella Road west of the project site would be installed to service the remainder of the Campus and its associated Community. This upgrade would also serve the portion of the campus between Cardella Road and Bellevue Road that under the interim solution would pump wastewater to the Bellevue Road sewer line. The new sewer pipeline would be extended along Cardella Road in a westerly direction from the campus to Thornton Road. A new sewer pipeline along the Thornton Road alignment would be installed between Bellevue Road and the WWTP at 10260 Gove Road. These improvements would be constructed within the existing right-of-way of Cardella Road and Thornton Road. However, portions of the pipeline alignment south of Dickenson Ferry Road would parallel the existing trunk through agricultural land as it enters the Gove Road Plant.

- **Yosemite Avenue Parallel Pipeline.** An 18-inch gravity sewer pipeline is located under Yosemite Avenue. This sewer main is at full capacity and would not be able to handle flows from land uses associated with the University Community. Under this scenario, a parallel pipe would be installed next to the existing 18-inch sewer pipeline between Lake Road and Kibby Road. The sewer pipeline under Kibby Road would need to be upgraded from Yosemite Avenue to Gerard Road. All improvements would be conducted within the existing right-of-way of these roads.

- **Campus Parkway Alignment.** A new gravity sewer pipeline would be installed in the Campus Parkway right of way and would extend from the campus to Gerard Road.

Wastewater Treatment

Wastewater generated on the Phase 1.1 Campus is treated at the City of Merced wastewater treatment plant (WWTP). The City of Merced WWTP currently has a capacity for secondary treatment of 12 million gallons per day (mgd), but is only permitted to treat up to 10 mgd. The WWTP currently treats an average flow of 8 mgd. In 2006, the City certified an EIR (SCH# 2005101135) for the expansion of the WWTP to a design capacity of 20 mgd. The additional capacity would be installed in phases and would include several facility upgrades, such as tertiary filtration and solids dewatering and stabilization. With the completion of the first phase of upgrades (2010), the WWTP's permitted capacity will increase by 1.5 mgd to 11.5 mgd. The City has indicated that it is interested in providing sewer service to the campus on a long-term basis. Eventual annexation of the campus to the City of Merced is required in order to serve the campus with City sewer service.

In the event that the Campus (and the University Community) is not annexed into the City of Merced, the Campus would need to seek alternative methods to treat and dispose the wastewater generated on site. Under such a scenario, a local wastewater treatment plant would be developed to handle the flows from

the Campus and the University Community. It is anticipated that the effluent would tertiary treated to Title 22 requirements and piped to nearby agricultural fields, or used for on-site irrigation and for recharge of the groundwater aquifer. The ultimate decision would be based on the ability of the Campus (or the County/Special District if such a facility is located in the University Community) to obtain a National Pollutant Discharge System (NPDES) permit from the Central Valley Regional Water Quality Control Board.

The Campus would also explore other emerging technologies for treatment of wastewater. Modular, small-scale treatment systems have recently been developed that allow for the treatment and recycling of wastewater streams. Recent industrial-scale applications of these technologies show water recycle rates of up to 95 percent of the wastewater flow volume. The recycled water in these applications is treated to better than potable water standards. Depending on the level of treatment, the Campus and University Community could use the recycled water for irrigation, industrial water (e.g., cooling tower water makeup) or as an additional potable water supply. With up to 95 percent of the recycled water used for irrigation and industrial water uses, the remaining 5 percent would be discharged to the sanitary sewer system and therefore unlike conventional WWTPs, such a system would require no land or stream discharge of treated effluent. The modular treatment systems consist of water intake and solids concentrating equipment, a modular digester unit with an integrated methane collection system, methane gas scrubbers and various filters and polishers as required by the recycled water system. The methane that is generated in the digester is collected and scrubbed and can be used to power on-site electrical generation equipment or sold to market using the natural gas distribution piping. The power generation equipment is selected to meet all of the local air emission regulations and typically is designed to be able to burn both the methane from the digester as well as pipeline natural gas. Dual fuel capability is useful to maintain a constant electrical output with varying methane production rates. The University will also evaluate a Zero Liquid Discharge (ZLD) system to eliminate discharge of the remaining 5 percent of wastewater from the wastewater treatment system.

Further studies of the available technologies will be conducted by the Campus as the demands on the wastewater system increase. Future cost/benefit analyses will determine the optimum configuration of any on-site water treatment and recycling system. As and when the University determines that such a system would be feasible, it will develop detailed design information and will evaluate the project-specific impacts of constructing and operating such a system in a project-level CEQA document.

Stormwater

A stormwater collection and conveyance system has been installed on Phase 1.1 Campus. The stormwater conveyance system is designed to convey runoff from a 10-year, 24-hour storm and consists of a network

of grassy swales, detention basins, storm drain inlets, and underground pipes. This stormwater system would be expanded to cover additional areas of the campus as they are developed. Storm mains would be located within the primary and secondary road systems. Wherever possible, grassy swales, filter strips, and natural drainage paths would be utilized to reduce times of concentration and to improve stormwater quality.

MID has jurisdiction and control over the Fairfield and Le Grand Canals, which traverse the campus site. Discharge of stormwater to Le Grand Canal is not permitted because of the possibility that the canal may serve domestic water needs of the town of Le Grand. In 2005, MID and the Campus executed an agreement that allows the campus to discharge stormwater from the Phase 1.1 Campus into the Fairfield Canal, provided stormwater is appropriately detained before discharge into the canal and that the discharge into the canal does not exceed 225 gallons per minute. The agreement limits the permitted discharge to stormwater generated within the Phase 1.1 Campus. For the future phases of campus development, the agreement with MID would be modified or a new agreement will be executed.

MID has indicated that in order to ensure the safety of the canals and to allow for other properties to discharge into Fairfield Canal south of the campus, the University would need to regulate stormwater flows into Fairfield Canal. The University would be allowed to release no more than the volume of runoff from a 10-year event over a minimum period of 48 hours. MID has also stated that in the event that Fairfield Canal is full, the University would be required to hold stormwater until capacity in the canal becomes available. To address this contingency, adequate on-site detention facilities would be designed for the campus.

To ensure that urban runoff from the campus does not affect sensitive habitat adjacent to the site, all stormwater drainage facilities would be designed to convey water away from the campus boundaries. Stormwater runoff from the campus and existing off-site drainage within the watershed boundary would be directed to on-site retention and detention ponds. From the detention ponds, stormwater would be discharged into Fairfield Canal, if needed.

Table 2.0-5, Pre- and Post-Development Storm Water Runoff Volumes, includes a summary of the projected 10-year, 24-hour storm runoff volume; and 100-year, 24-hour storm runoff volume for pre-development and post-development conditions. It also presents the required storage volume for the 10-year, 24-hour storm and the 100-year, 24-hour storm for the post-development condition. The detention ponds would be designed to hold runoff from a 100-year, 24 - hour storm. Based on the total runoff projected for the campus at full development, the total detention capacity needed on-site for a 100-year, 24-hour storm is approximately 251 acre-feet.

Figure 2.0-7, Campus Stormwater Drainage Plan, presents the proposed locations where stormwater facilities would be located on the campus and in the adjacent Community North.

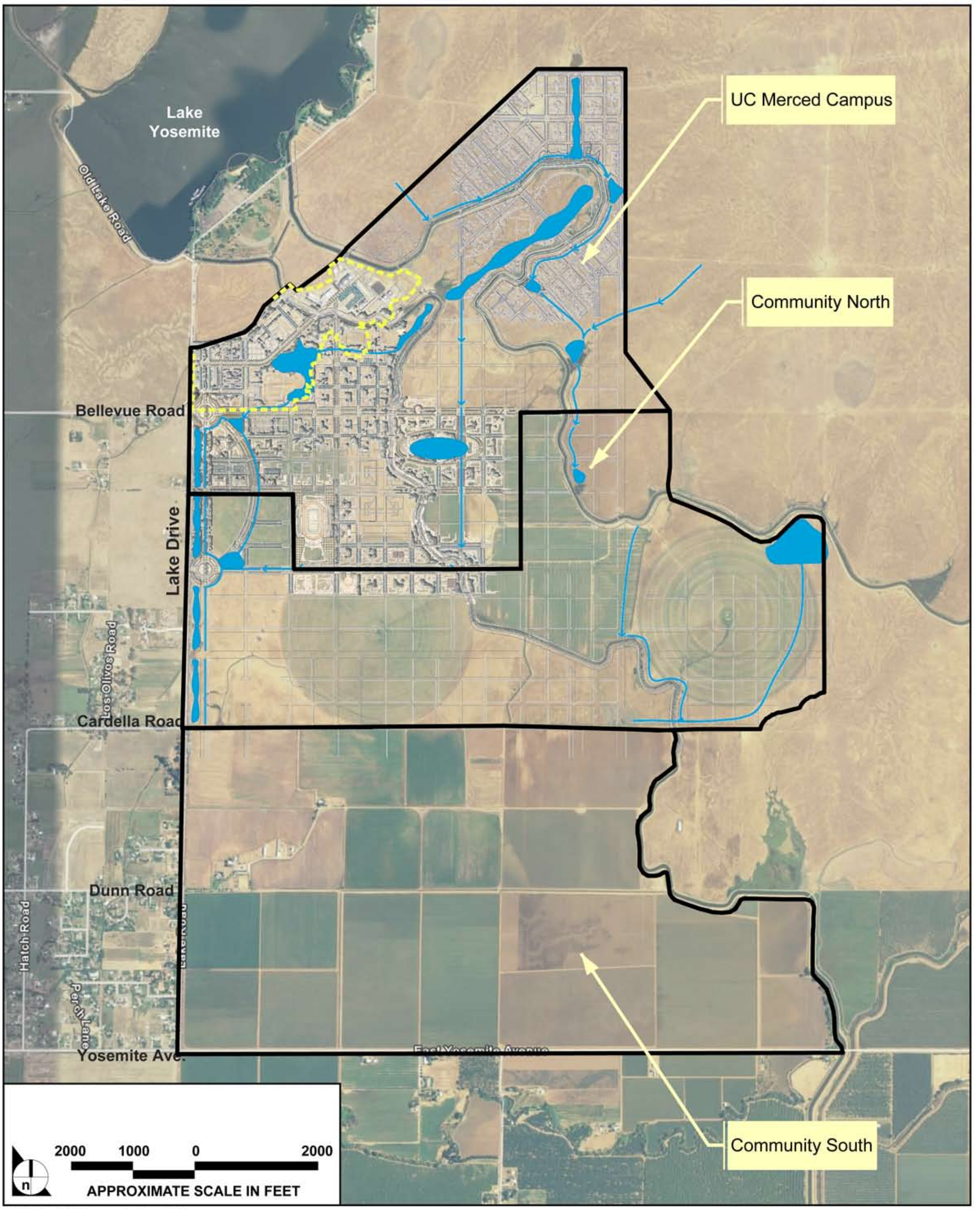
Table 2.0-5
Pre and Post-Development Storm Water Runoff Volumes

	10-Year, 24 Hour Storm Runoff Volume (acre feet)	100-Year, 24-Hour Storm Runoff Volume (acre feet)
Pre-Development Total Runoff	137.3	223.7
Post-Development Total Runoff	161.3	250.9
Difference in Runoff	24	27.2
Park/Open Space (in acres)	100	100
Basin Depth (in feet)	1.6	2.5

In order to develop the campus in a sustainable manner, a number of Low Impact Development (LID) practices related to stormwater are included in the plan. These include the use of bio-retention areas, grass swales, and permeable pavement throughout the campus development. Curbs will eliminated to allow stormwater to run off into bio-swales and bio-retention areas, with consideration given to the clay soils underlying the campus site. Permeable pavement would be used judiciously. Roadway surfaces will be minimized and buildings will be clustered.

Solid Waste

In 2007, the campus generated approximately 618 tons of municipal solid waste, of which approximately 69 percent was recycled or otherwise diverted and about 31 percent was disposed off at the Merced County Highway 59 Landfill. If the current patterns continued, at full development, the campus would generate approximately 8,368 tons of municipal solid waste per year, of which about 2,600 tons would be disposed of at the Highway 59 Landfill. In 2007, the University of California adopted the Policy on Sustainable Practices, which sets waste diversion goals of 75 percent by June 2012 and zero waste by 2020.



SOURCE: UC Merced – October 2008

FIGURE **2.0-7**

Campus Stormwater Drainage Plan

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Hazardous Waste

As a research campus, UC Merced would include various teaching and research programs that would involve the transport and use of hazardous materials similar in type and use to other existing research campuses. Some of the hazardous substances that could be involved include chemical reagents, radioisotopes, solvents, fuels, paints, cleaning chemicals, pesticides, and biohazardous substances. Inherent in some of the research activities is the generation of hazardous chemical, biological, and low-level radioactive wastes that require disposal in compliance with state and federal law. As part of the Phase 1.1 Campus, an on-campus environmental safety facility is under construction to facilitate the collection, analysis, and short-term storage of hazardous waste until it is shipped off site for disposal. This facility is adequate in size to serve the campus for 10 to 15 years. Adequate square footage for a future expansion of this facility or development of a second facility is included in the 2009 LRDP under the Campus Support land use designation. No on-site incineration or disposal of hazardous waste is proposed.

Telecommunications

AT&T is the telephone and communications provider in the Merced area. Duct banks have been installed within or adjacent to major roads on campus to carry fiber optic lines to individual buildings. The initial communications hub is located in the central plant node, allowing cabling distribution to the initial core buildings to run in the utility tunnel (see description below), and in underground duct banks. Additional buildings would be served by duct banks.

Electricity

The maximum electric demand at full development of the campus is estimated at 18m megawatts (MW). This estimate is based on an "energy efficient scenario," in which building designs substantially exceed the minimum requirements of Title 24 Energy Code and thermal energy storage is used for campus cooling. The UC Policy on Sustainable Practices sets a goal for all new building projects, other than acute-care facilities, to outperform the required provisions of Title 24 energy-efficiency standards by at least 20 percent. At UC Merced, a more ambitious goal has been set of both outperforming Title 24 energy efficiency standards by 30 percent and consuming 50 percent of the energy and demand of other university buildings in California. Standards for energy efficiency for acute-care facilities will be developed in consultation with campuses and medical centers.

Because the Campus intends to comply with UC Policy on Sustainable Practices and a goal of the 2009 LRDP is to achieve zero net energy, additional power generation using renewable energy will be pursued. Power that will be needed by the campus at buildout will be generated on site using a number

of renewable and alternative energy technologies, including wind turbines, fuel cells, and photovoltaic systems supplemented as needed by power obtained from the grid. The Campus is planning to install a solar panel facility in the eastern portion of the campus as part of the next phase of campus development (UCM 20202 project), and the environmental impacts of that project are evaluated in Volume 3 of this EIS/EIR. As other alternate energy projects are proposed on the campus, they will be evaluated for their environmental impacts in project-level environmental documents.

Service from the grid would be the primary source of electricity while on-site alternate energy sources are being developed and would still be maintained after substantial build-out of renewable power generation for redundancy and reliability. Therefore, it is anticipated that a new 115-kilovolt (kV) transmission line would be installed to serve the Campus and the University Community as the demand for power increases. Currently there are two high voltage PG&E transmission lines located near the site: a 230-kilovolt kV line and a 115-kV line. These lines run in a northwest-southeast direction within the City of Merced from the intersection of Bellevue Road and G Street to Highway 140. The new power line could follow one of three possible routes listed below.

- The first route could be from the existing high voltage power line in an easterly direction along Yosemite Avenue up to the Campus Parkway alignment and then in a northerly direction along the future Campus Parkway.
- The second route could be from the south (from Highway 140) in a northerly direction along the future Campus Parkway.
- The third route would be a new transmission line from the existing high voltage power line in an easterly direction along Cardella Road up to the Campus Parkway alignment.

Once on the project site, the power line would continue in a northerly direction along the west side of the Campus Parkway within the project site to terminate at a new substation. The location of the substation is not determined at this time. The Campus or PG&E may decide to install a substation either north of Cardella Road within Community North or on the campus. The power line would be supported on electrical poles made of either wood or metal and would be approximately 90 feet in height from the ground surface. City of Merced policy requires all new utility lines to be underground within City limits, unless it is unfeasible to do so.

Natural Gas

Phase 1.1 Campus is connected to the regional natural gas distribution system via a pipeline aligned along Lake Road. In 2007, the annual campus demand for natural gas was 100 therms/hour. The maximum gas demand is projected to be approximately 1,020 therms/hour when the campus is fully developed. As and when additional supply pipelines are needed to serve the campus, it is anticipated

that the natural gas pipelines would be installed within the alignment of the future Campus Parkway or existing roadways.

Heating, Cooling, and Process Steam Systems

Phase 1.1 Campus buildings are heated through the use of high-temperature hot water and cooled through the use of chilled water, both of which are supplied by the Campus central plant or independent boilers. The existing campus has the following equipment to provide steam for building heating, hot water, and standby electrical power:

- Two steam boilers each with a maximum heat input rating of 7.14 million British thermal units per hour (MMBtu/hr)
- Two hot water boilers each with a maximum heat input rating of 14.7 MMBtu/hr
- One hot water boiler with a maximum heat input rating of 8.4 MMBtu/hr
- Two 1,000 kilowatt (kW) diesel-powered emergency generators
- One 400 kW diesel-powered emergency generator serving the potable water station

The boilers provide steam or hot water as needed such that they operate annually at approximately 25 percent of their rated capacity. The emergency generators are operated approximately 20 hours per year for maintenance and testing and as needed during power outages.

The central plant is also equipped with three electric chillers to cool water and a thermal energy storage (TES) tank with a capacity to store 2 million gallons of chilled water. Distribution lines have been installed within road right-of ways to deliver hot water and chilled water to the buildings associated with the central plant. Chilled water is produced during off-peak hours and managed with the thermal energy storage tank.

Additional central plants or plant nodes would be developed in a manner that suits the evolving needs of the growing campus. Options for the development of the full campus include up to three plant nodes in different parts of the campus or expansion of nodes for more centralization. The distributed nodes would be interconnected to allow enhancement of service availability. Plant node equipment would be expandable to accommodate the growing campus. To meet future demands, the campus will add more boilers and emergency generators. While the number of units and their specific ratings are not known at this time, it is expected that 2,000 kW of standby generator capacity will be added (assumed to be provided by two 1,000 kW emergency generators). Additional steam and/or hot water capacity would be provided by 15 to 20 boilers, each with a nominal heat input rating of 10 MMBtu/hr.

Utility Tunnel

A utility tunnel to feed utilities to the campus core has been constructed within the Phase 1.1 Campus, and it is expected that, with realignment, the tunnel would be extended south to serve future phases of campus development. The utility tunnel extension would hold potable water service lines, chilled and hot water lines, recycled "gray" water lines, steam lines if required, electrical power bus ducts, telecommunications cables, and other signal cables. Where utility tunnel access is not available, lateral lines would lead to each individual building/facility by direct burial.

Physical Plant Support Facilities

Physical plant support facilities include buildings for campus facilities operations and maintenance, including shops, material management, campus vehicle maintenance, and general storage, as well as paved areas for buses and service vehicles, and outdoor areas for maintenance materials handling and storage.

Sustainability

UC Merced has been committed to sustainability from its inception. The 2009 LRDP continues the campus' commitment to sustainable practices. Creating and maintaining a campus that demonstrates sustainability is the first central mandate of the 2009 LRDP. Its objective is to establish a foundation that requires leading edge use of sustainable practices in all aspects of campus development and operation. In support of this objective, the 2009 LRDP includes the following 12 sustainability policies to direct the design, construction, and operation of the campus.

SUST-1: Adhere to principles of sustainable environmental stewardship, conservation, and habitat protection in the planning, design and construction of the campus and individual projects, adopting an approach of continuous improvement in the sustainability of campus development, operations, and management.

Architecture

SUST-2: Design campus facilities to achieve a minimum of USGBC Leadership in Energy and Environmental Design (LEED) Gold certification, when employing all campus base credits. Establish a minimum of 20-25 LEED campus base credits by creating and implementing planning and design standards for all campus facilities. Temporary facilities (less than fifteen years life expectancy) shall strive

for LEED Silver equivalence, unless recommended for exemption from policy by the Campus Physical Planning Committee and approved by the Chancellor.

SUST-3: Create a unique architectural identity for the campus by employing passive environmental systems, such as shading, orientation, and roof configuration, as design features on campus buildings; employing sustainable materials; and designing campus buildings to employ renewable energy production systems.

SUST-4: Design buildings to maximize day lighting, occupant control over the interior environment, indoor air quality, and general indoor environmental quality. Wherever feasible and programmatically compatible, occupied building interiors should be naturally lit and naturally ventilated, as a priority in facility design.

SUST-5: Design buildings to utilize exterior shading to reduce building cooling loads, and utilize circulation systems such as arcades, loggias, or porches to protect major entries to ground floor functions, reducing the need for environmentally conditioned space in areas of high traffic.

SUST-6: Minimize energy consumption by designing all new buildings to meet energy targets that represent approximately a 40 percent improvement on 2007 energy codes or their successors, and shifting electricity from cooling load (approximately 25 percent of total) away from peak electricity demand periods through chilled water thermal storage, gas or cogeneration-driven cooling, solar power.

SUST-7: Install campus energy performance monitoring systems in all new buildings and other monitoring equipment to foster continuous improvement in indoor environmental quality and performance. These systems will enable optimization of campus operations, inform improved design of future phases of the campus, and make the campus a "Living Laboratory" for study of engineering and resource conservation.

SUST-8: Minimize consumption of water in facilities by employing state of the art technologies, and modeling new and cost-effective approaches in design and product selection.

Landscapes and Infrastructure

SUST-9: Minimize consumption of potable water resources through the design of landscapes that minimize the use of irrigation water after the plants' initial growing phase, providing for use of recycled water for all irrigation, and allowing for future on-site or nearby wastewater treatment should localized systems become feasible.

SUST-10: Design campus landscaping to emphasize regional natives, avoid invasive or allergenic species, and select plantings that are compatible with campus infrastructure, developing a palette of approved plant, ground cover and tree lists, as well as landscape design guidelines.

SUST-11: Utilize tree planting and other methods to shade buildings, walking and open activity areas, and reduce to heat island effects of roads and surface parking lots.

SUST-12: Design roadways, parking lots and circulation pathways to minimize, detain and filter storm water run off.

The 2009 LRDP also creates a development framework – land use, circulation, and open space – that is specifically designed to minimize campus development impacts. The 2009 LRDP establishes directions and policies on design that mandate the use of broad-based leading edge sustainable techniques in facility and infrastructure design and construction. It includes integration with the research initiatives and innovations that are part of the overall campus research program.

The 2009 LRDP establishes directions and policies for operational systems to support the on-going practices of sustainability in campus life. The 2009 LRDP establishes a significant sustainability goal for the campus: to have no energy, carbon, or waste footprint (triple zero goal) by 2020.

2.4.2 University Community Plan

As noted earlier, Merced County approved the UCP in 2004. Following adoption of the UCP, Merced County revised the UC Merced SUDP boundary to include the University Community and amended the County General Plan to designate the site of the University Community for Multiple Use Urban Development. In response to the proposed shift in the location of the campus, the County is considering shifting the location of the University Community. Furthermore, to make up for some of the University Community land that is now proposed to be used for the campus, the northern portion of the University Community area is proposed to be extended to the east.

UCP Amendment and Development Approval Process

In view of the proposed changes to the University Community location and footprint, it is anticipated that the processes described below will be required to amend the UCP and County General Plan and authorize the development of the revised University Community. Approval of the revised University Community by the County would involve review of the proposed changes to the UCP and the UC Merced/University Community SUDP by the Planning Commission and the Board of Supervisors. If an amended UCP is adopted, the County would then prepare infrastructure Master Plans. Once those plans are in place, the County would consider specific plans for individual development projects within the University Community, in conjunction with, or followed by rezoning and subdivision approvals. A rezone is first reviewed by the County Planning Commission, which then makes a recommendation to the County Board of Supervisors. A major subdivision approval would require approval of both a tentative subdivision map and a final map and the approval of the County Planning Commission. In addition to the above, if some or all of the University Community parcels remain within the County, then LAFCO approvals would be necessary for the formation of special districts to provide urban services to those parcels. At a broad level, these might include, for example, a County Service Area, a Community Services District, or a California Water District. For capital construction, one or more Community Facilities Districts (CFDs) might be established as well as Landscaping and Lighting Districts (LLDs) or other mechanisms for maintenance purposes.

In the event that some or all of the University Community parcels are annexed to the City of Merced, development of the Proposed Action would require certain land use approvals from the City, including annexation. Most annexations involve a 12- to 18-month-long process administered by Merced LAFCO, which would require in connection with its approval of any annexation that, among other things, the annexing property be "prezoned" by the City of Merced. Any such prezoning would have to be consistent with City-approved general plan land use designations permitting the uses proposed for the property to be annexed. The required general plan designations could occur through the City's pending general plan update process or through a separate general plan amendment specifically relating to the property being annexed. Following any annexation to the City, the City of Merced would consider any further zoning, use, subdivision, infrastructure-related or other approvals or agreements, such as development agreements. Some of these approvals or agreements could be issued or entered into prior to annexation in accordance with the requirements of California law.

UCP General Planning Concepts and Land Use Designations

The UCP was adopted in 2004 by resolution as a component of the County of Merced General Plan. The UCP encompasses goals, objectives, policies, and implementation programs that address each of the

elements required by State of California Planning Law, Government Code Section 65300 et seq., as well as a number of non-mandatory elements. The UCP as adopted included two primary components: (1) Diagrams, goals, objectives, and policies pertaining to the UCP area, and (2) an Area Plan with goals, objectives and policies pertaining primarily to addressing issues related to the edges of the UCP area or other off-site consequences of the University Community. The UCP is organized according to six principal chapters: Community Development, Community Infrastructure and Services, Environmental Resources, Public Safety, Area Plan, and Implementation. The UCP is supplemented by a Technical Background Report, which presents information about the existing conditions and factors influencing development of the UCP planning area. The UCP also applies relevant County of Merced General Plan goals, objectives, and policies, and supplements them to reflect the unique issues and planning visions and objectives associated with development of the University Community (Merced County 2004).

The UCP would provide for the development of an integrated community of housing, business, commercial, cultural, civic, and open space uses and infrastructure systems to support the successful development and growth of the UC Merced Campus. The University Community is conceptually designed to place a high value on livability in balance with stewardship of the region's natural and agricultural resources, and would offer choices in housing, business, recreation, and social and cultural activity (Merced County 2004).

As stated in the 2004 UCP EIR, the University Community would incorporate a range of land uses and activities including:

- Housing, commercial and retail uses, industries, schools, recreation, and other support uses to serve the UC Merced and community population;
- A variety of housing types to reflect diverse student, faculty, and resident needs based on household characteristics, income, job needs, culture, lifestyle, and residency tenure;
- Commercial enterprises that would support students, faculty, and staff of UC Merced, community residents, businesses, and visitors. These would be phased with the community's growth, with initial reliance on commercial services available outside of the University Community;
- A broad and economically diverse base of businesses that would capitalize upon the academic and research resources of UC Merced; and
- Cultural, educational, and social activities that would enrich the quality of the Community.

Facilities such as sports/recreation facilities, museums, arts exhibition and performance venues, and conference facilities would be developed within the University Community that could be jointly shared by the campus, community residents, and businesses and would also serve the greater region, (Merced County 2004).

The UCP was developed by the County primarily as a policy document to guide the development of the University Community. Although the 2004 UCP included a land use diagram (**Figure 2.0-8, 2004 UCP Illustrative Land Use Plan**) showing the approximate locations of all major land uses within the University Community, the County noted in the UCP that the diagram was illustrative and that it did not designate any areas within the University Community specifically for any particular uses. At the time of the General Plan amendment, the County adopted a broad land use designation of Multiple Use Urban Development for University Community lands.

Proposed Revised University Community Plan

Although the footprint of the community has been proposed to be changed, the proposed revised University Community continues to include adequate land area to accommodate the same level of residential growth as was planned and analyzed in 2004 and provides the same level of services needed to support the 25,000-student campus. Therefore, as proposed the revised University Community would provide 11,616 housing units and house approximately 30,780 persons. It would provide approximately 3.7 million square feet of retail, office, and research and development space, as well as supporting schools, parks, and civic and cultural facilities. While some of the campus-induced population might choose to live outside the University Community, it would also be expected that non-campus affiliated population would be attracted to the Community because of its proximity to the campus (as is the case in other communities around UC campuses) (Merced County 2004).

Under the revised UCP as proposed, the development of the University Community would be organized into two distinct subareas: Community North and Community South.[9] Additional land use planning has been undertaken for Community North and the UCLC, in coordination with the University's submittal of a permit application for the Campus, has submitted a Section 404 permit application to the USACE to allow for the filling of the wetlands within Community North. Landowners of Community South have not submitted an application to the USACE for placement of fill in wetlands nor an application to the County for the development of Community South area. Nonetheless, because the USACE considers the Campus and the entire University Community connected and part of the same overall project purpose, the impacts of fill associated with all of this development is evaluated in this Draft EIS/EIR for purposes of NEPA.

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9 The County is treating the entire UCP as one planning unit and intends to adopt only one revision to the entire UCP. However, because a Section 404 permit application has been submitted by the UCLC for only the northern portion of the UCP, in this EIS/EIR, the two subareas of the UCP are described separately in this project description and are also evaluated separately for their impacts.

Table 2.0-6, Major Land Uses in the University Community, presents Community North land uses and proposed development based on the land use plan prepared by UCLC and Community South land uses based on the previously approved UCP. Additional details about the land use plans of each subarea are presented in the subsections that follow.

Community North Land Uses

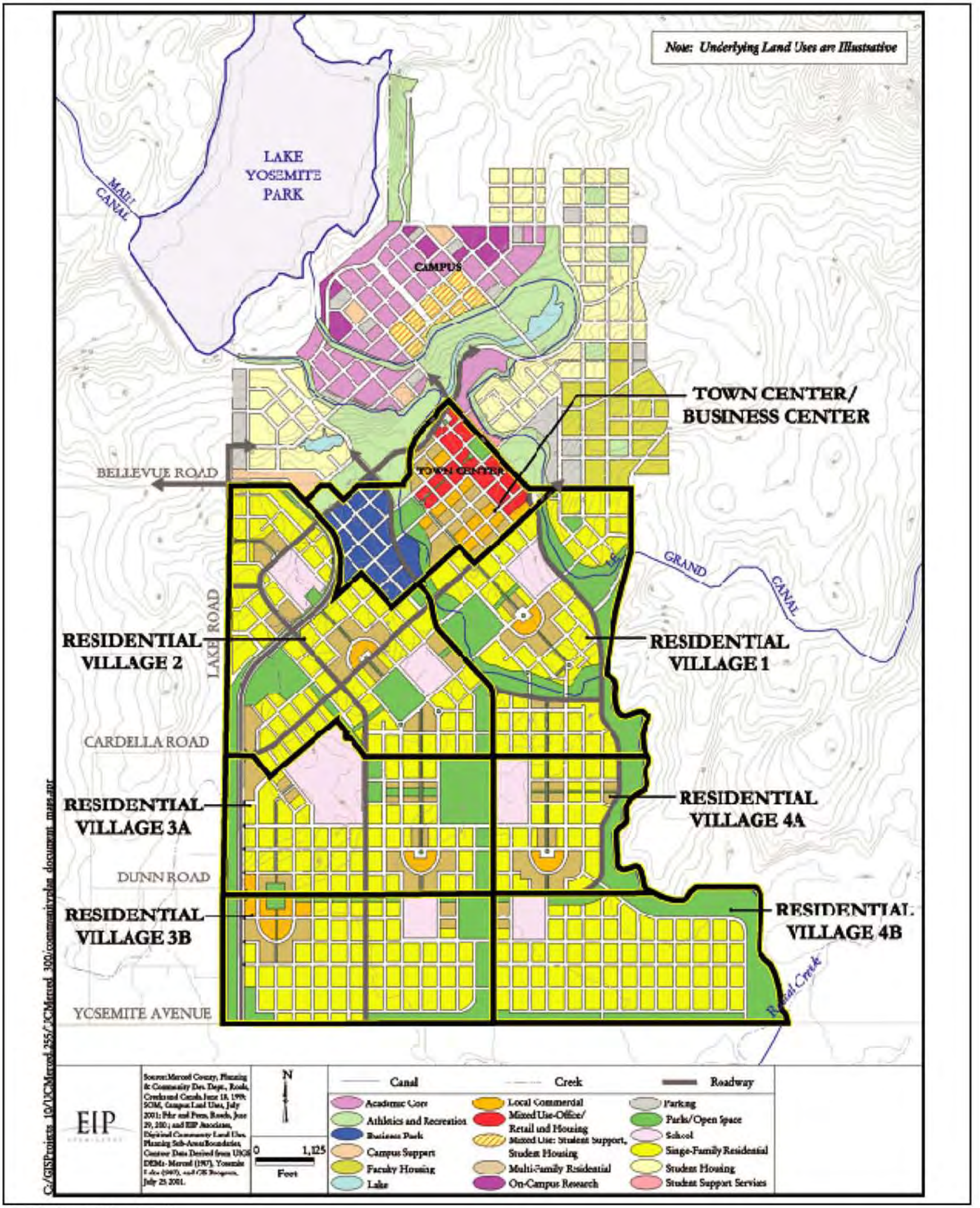
The northern 833 acres of the revised University Community are designated Community North. The land use plan for this area has been developed in additional detail and has been closely integrated with the land use plan of the campus. **Table 2.0-7** presents the approximate acres of land designated for various land uses in the Community North. Each land use is described in detail below:

Residential Neighborhoods

Community North includes approximately 559 acres of land for the development of high-, medium-, and low-density residential neighborhoods to house faculty and staff of the campus and also students who would not live on campus (note that additional acreage for housing in the University Community would be located in Community South). Approximately 3,836 single-family and multi-family units would be developed in the residential neighborhoods. The residential neighborhoods would also include about 78,400 square feet of neighborhood-serving retail space that would be located in a neighborhood center.

Non-Residential Land Uses

The non-residential areas of Community North include a Town Center and a Gateway District, which are described below.



SOURCE: County of Merced - 2004

FIGURE **2.0-8**

2004 UCP Illustrative Land Use Plan

Table 2.0-6
Major Land Uses in the 2009 Proposed University Community

Land Use	Community North		Community South	Total
	Town Center [6]	Residential Neighborhoods	Villages	
Residential				
Single Family				
Acres	45	330	560	935
Units	1,418[1]	3,356[2]	4,029	8,803
Multi Family				
Acres	4	10	75	89
Units		480	1,794	2,274
Mixed Use				
Total Acres	15			15
Retail (sf)	183,000[3]			183,000
Office (sf)	313,600[4]			313,600
Housing Units	540			540
Retail				
Acres	8	6	15	29
Square Feet	130,700	78,400	250,000	459,100
Office				
Acres	5		9	14
Square Feet	292,700		140,000	432,700
Research and Development				
Acres	71			71
Square Feet	2,308,300			2,308,300
Schools				
Acres		43	80	123
Parks and Open Space				
Acres	5[5]	76	148	229
Shared Parking				
Acres	9			9

Land Use	Community North		Community South	Total
	Town Center [6]	Residential Neighborhoods	Villages	
Total Development				
Acres	162	465	887	1,514
Streets				
Acres	52	154	231[8]	437
Total Acres[7]	214	619	1,118	1,951

Notes:

[1] *all townhouse/rowhouse units at 30 du/acre average*

[2] *includes 1,900 townhouse/rowhouse units at 25 du/acre average*

[3] *assumes 0.20 FAR of mixed-use site area is retail*

[4] *assumes upper floors of commercial mixed-use is office*

[5] *includes 2 acres for future performing arts center*

[6] *added the Gateway R+D to the Town Center for comparison purposes, even though we are considering it a separate district*

[7] *net acres without 43 acres of MID Canal easements*

[8] *the acreage for streets is reduced from the 2004 UCP land use plan due to reduction in the size of the community.*

Table 2.0-7
University Community Population

Total Population	Community North	Community South
Residential Population	15,351	15,431
Employment	9,219	1,025
Total	**24,570**	**16,456**

Town Center

The UCP, as previously adopted, proposed the development of a 120-acre mixed-use Town Center in the northernmost portion of the University Community area as a transition into the campus. In the view of the University, the land use plan for Community North continues and advances this concept. A Town Center would be built on about 120 acres in the north-central portion of Community North, directly adjacent to and south of the Academic Core of the campus. This Town Center would include commercial office, general commercial, mixed-use commercial, mixed-use residential, medium-density residential space, entertainment venues, parks, performing arts facilities, and parking (both distributed and structured). Approximately 862,500 square feet of commercial and office space and about 3,270 parking spaces in lots and parking structures are planned for the Town Center. The development of buildings and sites with a mix of uses, such as the vertical integration of housing with retail, office, or other uses would be encouraged. Residential development in the Town Center would consist of 1,418 units in a

combination of single-family townhouse/rowhouse units, multi-family units located in mixed-use buildings with emphasis on occupancy by the campus-related uses and residents.

Gateway District

The UCP, as previously adopted, included 22 acres of land for the development of 400,000 square feet of research and development (R&D) space. The revised land use plan for Community North provides about 100 acres in the northwestern portion of Community North for the development of the Gateway District, which would focus on R&D and would be adjacent to similar R&D land uses on the campus. This area would be developed with approximately 2.3 million square feet of building space that would house research laboratories and industrial R&D.

Other Land Uses

Other land uses that would be developed within Community North include schools, parks and community open space, streets, and parking facilities.

Community Open Space

Community North includes approximately 100 acres of land that would be developed with playing fields to be used by both campus and community residents, as well as with facilities for passive recreation.

Schools and Neighborhood Parks

Community North includes about 60 acres of land that would be developed with two elementary schools, a high school, and neighborhood parks within or adjacent to the residential neighborhoods.

Community South Land Uses

The 1,118 acres that constitute Community South are designated Multi-Use Urban Development in the County General Plan. Likely land uses that may be established in this area based on the UCP illustrative land use diagram are listed above in **Table 2.0-6, Major Land Uses in the University Community**. **Figure 2.0-8** shows that this area would be developed into residential villages.[10]

University Community Population

Table 2.0-7, University Community Population, presents the estimated residential and non-residential population that would occupy or use the University Community area. The data are broken down in terms of Community North and Community South.

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10 This graphic is from the previous 2004 UCP EIR and is used here to show the types of land uses that may be developed in Community South.

University Community Transportation Infrastructure

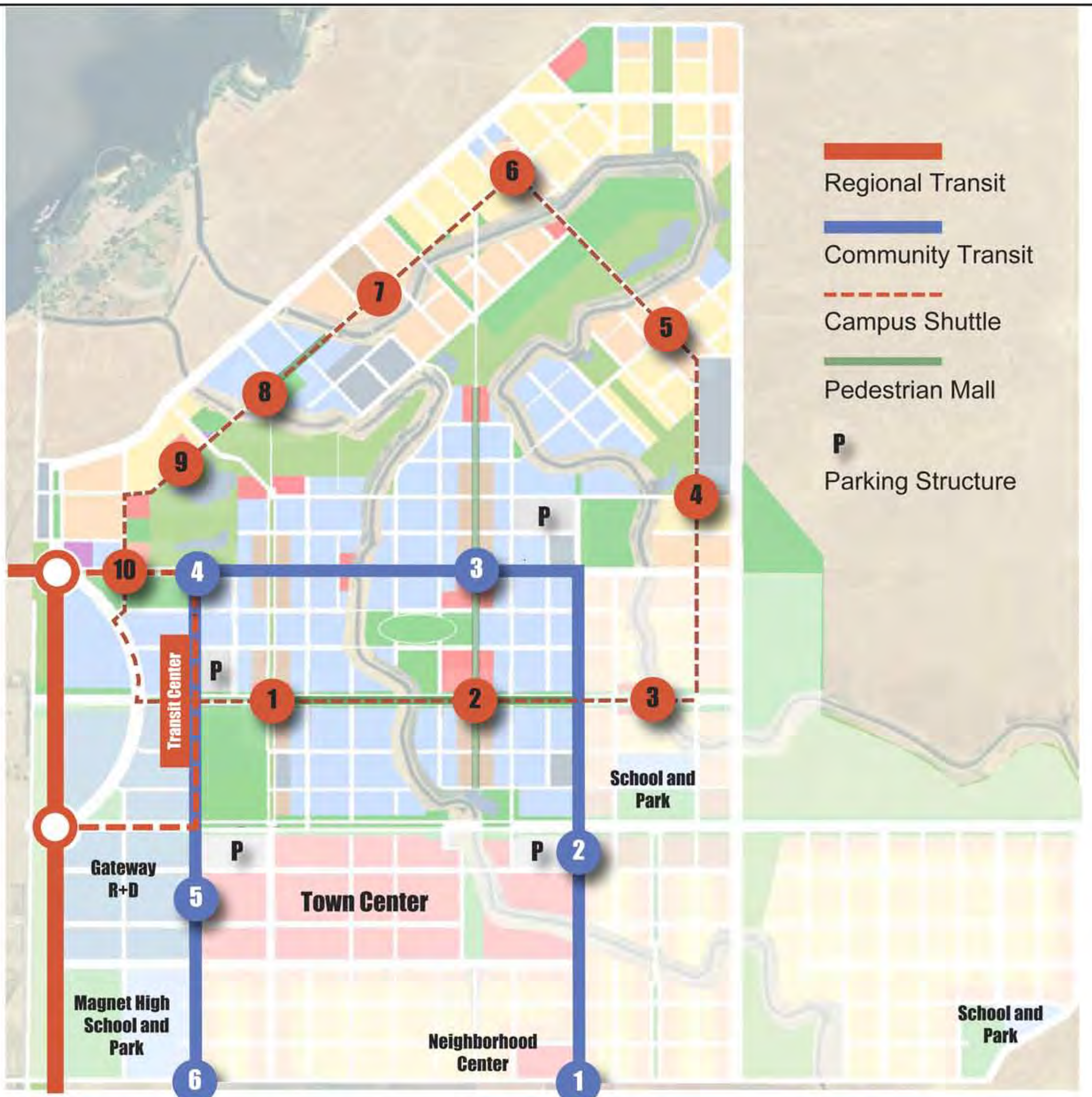
Vehicular Circulation

Planning for the circulation system of the University Community focuses on integrating land use and transportation to minimize reliance on the automobile and impacts to adjoining land uses. For the University Community as a whole, the diversity of the land use mix is one of the primary means of minimizing transportation capacity requirements and designing a community that relies less on single-occupant automobile travel that would traditionally occur. A secondary but important factor is land use density and design, including population and employment density, density of the transportation network, walkability, transit orientation, and amenities for bicyclists and pedestrians.

The proposed vehicular circulation system for both areas of the community is shown in **Figure 2.0-5**. The vehicular circulation system of the community has been designed to integrate with the campus road network and circulation. The circulation system would consist of a parkway aligned generally parallel to Lake Road and serving the western portion of the community, a community central drive that would be aligned north south and would traverse the eastern portion of the community, and a community loop drive along the eastern boundary of the University Community. In addition, there would be local collector roads and local connector roads to connect the neighborhoods to the main community collector facilities. Final alignments and design of these road networks between the northern and southern portions of the University Community would be undertaken as more detailed planning for the Community South proceeds.

Transit Access

An integrated system of transit facilities is planned for Community North (see **Figure 2.0-9, Community North Transit Facilities**). This would consist of a transit center located near the intersection of Lake and Bellevue Road at the northern end of the Gateway District, with regional transit service aligned along the parkway. In addition, a community transit bus service would run between the Campus and the University Community along the main collector roads making a loop through both the Campus and the University Community. Because the precise location of land uses within Community South would be determined by future specific plans, the supporting transit circulation system shown in the figure for Community South is illustrative.



Circulation: Transit Access

Transit Center
- Intermodal Station for Regional, Community and Campus Transit
- Serves Gateway District employment, stadium/arena and adjacent to public parking structure

Community Transit : Major Stops
1. Neighborhood Center
2. Town Center, Public Parking
3. Main Street, Public Parking
4. Gateway North
5. Gateway South
6. High School Campus

Campus Shuttle : Major Stops
1. Central Campus 1 (Main Street)
2. Central Campus 2 (Central Park)
3. UCLC Neighborhood
4. Logistics Center
5. Valley View Neighborhood
6. Sierra View/North Neighborhood
7. North Neighborhood
8. North Campus
9. Lake View Neighborhood
10. Welcome Center

NOT TO SCALE

UCM LRDP Draft

SOURCE: UC Merced – May 2008

FIGURE **2.0-9**

Community North Transit Facilities

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University Community Utilities

The University Community site is located in unincorporated Merced County, generally outside the sphere of influence of the City of Merced. The site is currently not served by any municipal utility systems. On-site irrigation wells on the Community North property are used for pasture irrigation, and additional wells located within Community South are used by LWH Farms, LLC, to irrigate crops and for domestic use in the farm residences on the site. The nearest City of Merced water mains are located at the intersection of Yosemite Avenue and McKee Road and at the Bellevue/Lake Road intersection. No wastewater service is available on the site, although City of Merced sewer lines are located in Bellevue Road and Yosemite Road south of the University Community. Water, wastewater, and storm drainage systems would need to be developed to serve the community. These three utilities would be provided to the community either by annexing the University Community to the City of Merced or creating a new County service district. The establishment of a new service district boundary is evaluated in this document, but would also require approval from Merced County LAFCO. The estimated total demand for water and wastewater generation within the Community North and Community South are presented in **Table 2.0-8, University Community Projected Water and Wastewater Demand**. The physical improvements needed to provide these utilities to the community are described below.

Table 2.0-8
University Community Projected Water and Wastewater Demand

Water/Wastewater	Community North	Community South	Total
Potable Water	1,141 acre-feet/year[1]	1,289 acre-feet/year[2]	2,430 acre-feet/year
Irrigation Water[3, 4]	786 acre-feet/year	1,563 acre-feet/year	2,349 acre-feet/year
Existing Water Use[5]	946 acre-feet/year	1,939 acre-feet/year[2]	2,885 acre-feet/year
Net Increase in Water Demand	981 acre-feet/year	913 acre-feet/year	1,894 acre-feet/year
Wastewater	0.92 mgd	1.04 mgd	1.96 mgd

Source: Stantec 2008

[1] *Based on 15 gpd per employee, 55 gpd per resident and 10 gpd per elementary, middle and high school student,*

[2] *Based on 20 gpd per employee, 70 gpd per resident and 10 gpd per elementary, middle and high school student,*

[3] *Percent of acreage that is irrigated is based on land coverage percentage projections by Clascape, May 30, 2008,*

[4] *Based on an irrigation rate of 4.0 feet per year for turf and 3.0 feet per year for non-turf uses.*

[5] *Existing water use based on 2004 UCP EIR.*

[7] *The existing water use within Community South ranges from 1,939 to 5,284 acre-feet/year. The lower number in the range is used for the purposes of this analysis. This water includes both groundwater obtained from on-site wells and surface water obtained from MID.*

Water Supply

If annexed into the City, the University Community would connect to the City of Merced water supply system. Groundwater would be the source of potable water in the University Community. According to the City of Merced, three groundwater wells would need to be constructed within the University Community, with one well for every 1 square mile. Wellhead treatment would be provided. Water storage tanks would also be constructed, along with a water distribution system. If the site remains within the County, then the County would provide water supply infrastructure to the community, including up to three groundwater wells (and an additional well to serve as backup), a distribution and treatment system, and other water supply infrastructure necessary to provide potable water to the community. Regardless of annexation, the assessment of groundwater impacts from on-site pumping is included in this Draft EIS/EIR.

Irrigation Water

Approximately 518 acres[11] of the 1,951-acre community would require irrigation. Community North would include approximately 288 acres of irrigated land and Community South would include approximately 230 acres of irrigated land. Additional areas would be landscaped with drought-resistant landscaping that would require minimal irrigation. At full development, the community would require approximately 2,017 acre-feet per year of water (786 acre-feet per year for Community North and 1,231 acre-feet for Community South). Non-potable water for irrigation might be obtained from the MID canals, pursuant to appropriate agreements.

Wastewater

The University Community would generate 1.96 million gallons per day of effluent. As noted earlier, two alternate scenarios are under consideration for provision of urban services, including wastewater collection, treatment, and disposal. Under one scenario, the University Community would remain in unincorporated County and Merced County would develop on-site wastewater collection, treatment, and disposal facilities. The types of on-site wastewater treatment facilities that would be considered for development on the University Community site are described above under the discussion about wastewater for the Campus.

Under another scenario, the University Community would be annexed to the City and the community would be connected to the City's sanitary sewer system for treatment and disposal of wastewater. An 18-inch gravity sewer pipeline is located under Yosemite Avenue. This sewer main is at full capacity and

11 Includes turf and non-turf areas.

would not be able to facilitate flows from land uses associated with the University Community. In the short term, wastewater generated by any land uses south of Bellevue Road would be pumped into the sewer pipeline in Bellevue Road. In the long term, off-site improvements to the City's wastewater conveyance system would need to implemented, as described above for the Campus.

Stormwater

In the University Community, stormwater runoff would be managed in a way to maximize the use of stormwater as a valuable resource and to minimize the public investment in expensive water conveyance facilities. Building lots would be graded and landscaped areas would be designed to capture and store rain runoff at the lot, reducing peak runoff and the size of stormwater conveyance facilities in the community. Where conveyance facilities are necessary, they would be designed as natural features to support natural habitat and to serve as visual amenities within park and open spaces of the community. Stormwater to be conveyed from the University Community would be discharged into the MID Fairfield Canal. A stormwater collection system would be implemented that would include Best Management Practices (BMPs) to minimize water quality impacts to the Fairfield Canal. Similar to the campus, stormwater would be detained and discharged at a rate specified by MID.

The storm drainage system in the community would consist of stormwater conveyance facilities, including underground storm drains and open channels that would perform like bioswales; multi-use detention basins sized to hold runoff from a 10-year, 24-hour storm event; potentially a retention basin; and pump stations to pump stored stormwater from detention basins into Fairfield Canal.

University Community Public Facilities

Development of the University Community would likely necessitate the development of new facilities, such as police and fire stations, to assure acceptable levels of service and response times. However, specific locations of stations are not known, though it is anticipated that fire service facilities that serve the campus would also serve the University Community and vice versa. The 2004 UCP contains a standard for police service of 1.32 officers per 1,000 residents and a fire policy to maintain a 5-minute response time within the University Community.

University Community Area Plan

Development of the University Community could influence and impact the uses and character of surrounding lands. The area plan adopted by the County establishes goals, objectives, and policies to address three critical concerns: impacts on the use of adjoining lands for agriculture; impacts on the use of Lake Yosemite Regional Park as a major recreational asset that serves the population of the greater

Merced region; and the appropriate relationship of the University Community to the City of Merced, its designated growth boundary, and intervening lands. Key policies of the area plan include:

- Protection of nearby agricultural lands through (1) the targeting of voluntary conservation easements for the lands south of the University Community and east of the City of Merced; (2) establishment of the University Community boundary as an urban limit line; (3) establishment of an agricultural greenbelt agreement with the City of Merced; and (4) limitations on the sizing of the University Community infrastructure to avoid inducement of nearby growth.

- Protection and enhancement of the Lake Yosemite Regional Park through measures that require the County and the University of California to collaborate on the provision and development of additional parklands around Lake Yosemite.

- Collaboration with the City of Merced on joint land use planning for the lands between the University Community area and the City of Merced, as well as on a long-term strategy to address urban growth and protection/management of agricultural lands in the region.

2.4.3 Integration of the Campus and University Community

Because the Campus and Community North are immediately adjacent to each other, the land use planning of these two areas has been closely integrated. The proposed Campus and Community North would be organized into the following five districts: Academic Core, Gateway District, Student Neighborhoods, University Community Town Center, and University Community Neighborhoods. A brief description of each district is provided below.

- **Academic Core (AC).** The approximately 345-acre Academic Core district would be the core of the campus and would link the student neighborhoods proposed northwest, north, and east of this district to the Town Center, proposed south of this district. This Academic Core would include mixed uses, such as institutional, research, administration student services, parking, recreation and other services, and a main street of on-campus student, staff, and faculty services mixed with housing. The Academic Core (AC-1) and Academic Main Street (AC-2) block types are proposed for this district.

- **Gateway District (G).** An approximately 150-acre Gateway District (G) is proposed west of the Town Center and the Academic Core, within the campus and the community. This district would include privately and publicly funded research, visitor-serving facilities, sports venues, parking, and other regional attractors. A transit hub would be located with this district that would connect to the local transit system, and providing walking opportunities to most sections of each central district. The Gateway District Academic Lab (G-1) and Industrial-Research (G-2) block types are proposed for this District.

- **Student Neighborhoods (SN).** The approximately 395-acre Student Neighborhood district would surround the Academic Core to the northwest, north, and east, and would be located within walking distance to the core of the campus. This district would include residence halls and apartments supported by student services (food and recreation), park space, and shared parking. The student neighborhoods would house up to 12,500 students. Two Student Neighborhood Walk-Up Apartments (SN-1) and Residence Hall/Dorm (SN-2) are proposed for this District.

- **University Community Town Center (TC):** The Town Center district would be located in Community North, and would serve as the "downtown" for the campus and the community. This district would include mixed-use commercial and residential activities, cultural facilities, and parking. The Town Center Commercial Mixed Use (TC-1), Residential Mixed-Use (TC-2), and Residential Townhouse/Rowhouse (TC-3) blocks are proposed for this District.

- **University Community Neighborhood (NHD).** The approximately 690-acre University Community Neighborhood district would be located within the Community North. This high-density district would include a multiple mixed-use neighborhood district with an extensive network of transit, bike, and pedestrian paths. The Community North Center (NHD-1), Residential Townhouse (NHD-2), Small Lot Single-Family (NHD-3), and Large Lot Single-Family (NHD-4) are proposed for this district.

2.4.4 Campus and Community North Development Phases

The Campus and Community North would be developed in phases that would complement each other. The development phasing of each area is described below. The acronym "UCM" is used in this section to refer to UC Merced, and "CN" is used to refer to Community North.

Campus

The 2009 LRDP envisions that the development of the 815-acre campus would occur in four phases. **Table 2.0-9, UC Merced Development Phases,** summarizes key data with respect to each phase of campus development. **Figure 2.0-10, Campus Development Phases**, presents the areas encompassed by each development phase. A brief description of each phase follows the table.

Table 2.0-9
UC Merced Development Phases

Phase	Acres developed at Buildout of Phase (cumulative)	Enrollment Level at Buildout of Phase	Academic Space at Buildout of Phase (in million square feet)	Total Student Beds at Buildout of Phase	Approximate Year of Completion
1	162	5,000	1.25	2,500	2013
2	355	10,000	2.5	5,000	2020
3	740	20,000	5.0	10,000	2030
4	815	25,000	6.25	12,500	After 2030

UCM Phase 1

In 2002, in conjunction with the 2002 LRDP EIR, the University evaluated the environmental impacts from the development of Phase 1 Campus. The Phase 1 Campus as defined in the 2002 LRDP EIR consisted of the development of campus facilities on a 104-acre portion of a 197-acre site that was at that time occupied by the Merced Hill Golf Course. The Phase 1 Campus was evaluated for an enrollment level of about 3,600 FTE students. Following the certification of the 2002 LRDP EIR, the University began construction of the first phase of the Campus and numerous facilities have been constructed on the 104-acre site.

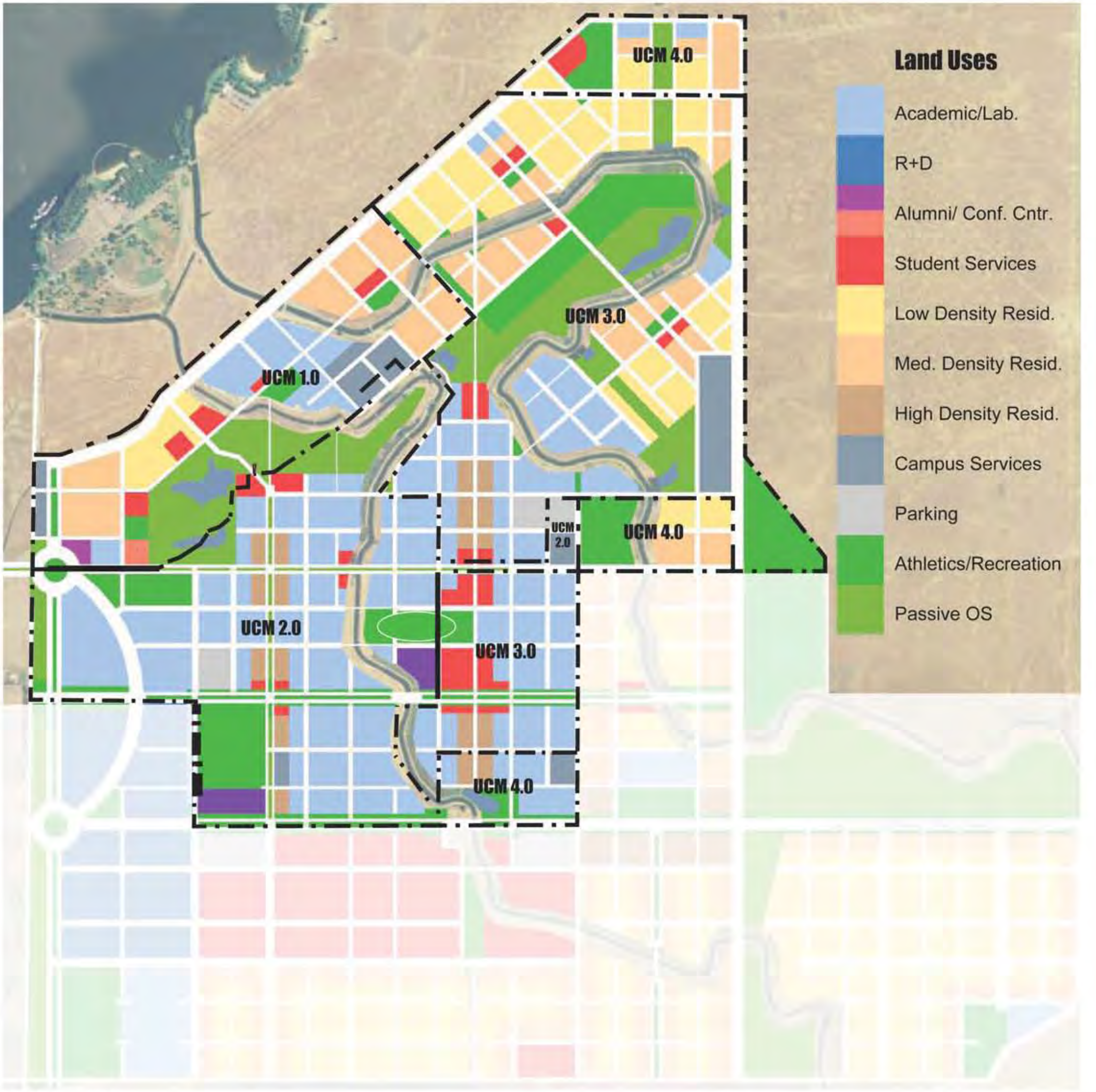
UCM Phase 1 as defined now under the 2009 LRDP encompasses 162 acres. UCM Phase 1 is broken down into two sub-phases: Phase 1.1, which is the 104-acre currently developed campus, and Phase 1.2, which is a 58-acre area to the north of Phase 1.1. Much of Phase 1.1 area has been already built and with the completion of some approved but not yet constructed projects, this portion of the campus will be fully built out. Once both sub-phases are fully developed per the 2009 LRDP land use plan, they would provide adequate facilities for an enrollment level of 5,000 FTE students and would house up to 2,500 students on campus. As shown in the table above, completion of this phase is projected to occur by 2013. The 58-acre Phase 1.2 has not been previously evaluated at a project level or approved. Phase 1.2 is an element of the UCM 2020 Project, which is evaluated in Volume 3 of this EIS/EIR for its project-level environmental impacts under CEQA.

UCM Phase 2

This is the next major phase of campus development and encompasses approximately 193 acres of the land to the south and southeast of the Phase 1.1 Campus. This phase involves three sub-phases and when completed, the combined development within UCM Phases 1 and 2 would support an enrollment level of 10,000 FTE students. UCM Phase 2 is an element of the UCM 2020 Project evaluated at a project level in Volume 3 for its project-level environmental impacts.

UCM Phase 3

The third major phase of campus development involves the development of approximately 385 acres of campus land with facilities, which, in conjunction with facilities developed under UCM Phases 1 and 2, would support an enrollment level of 20,000 FTE students and provide approximately 10,000 student beds on the campus. Completion of this phase is expected sometime after 2020. UCM Phase 3 is not an element of the UCM 2020 Project. Impacts associated with this phase are evaluated as part of the overall development program addressed in Volume 1 and 2 of this EIS/EIR.



UC Merced
Framework Concepts

Land Use: Phasing (DRAFT)

Phase 1.0	162 acres	Phase 2.0	324 acres	Phase 3.0	648 acres	Phase 4.0	815 acres
5,000 Students		10,000 Students		20,000 Students		25,000 Students	
1.25 MSF Academic Core		2.50 MSF Academic Core		5.00 MSF Academic Core		6.25 MSF Academic Core	
2,500 Beds		5,000 Beds		10,000 Beds		12,500 Beds	

NOT TO SCALE

SOURCE: UC Merced and UCP Administrative Draft EIS/EIR, Volume 3 – 2008

FIGURE **2.0-10**

Campus Development Phases

974-001•10/08

UCM Phase 4

The last major phase of campus development under the 2009 LRDP encompasses the remaining 70 acres of campus land. With the completion of this phase, which would occur sometime after 2030, the campus would contain adequate facilities to support an enrollment level of 25,000 FTE students and house approximately 12,500 students on the campus. UCM Phase 4 is not an element of the UCM 2020 Project. Impacts associated with this phase are evaluated as part of the overall development program addressed in Volume 1 and 2 of this EIS/EIR.

2.4.4.2 Community North Development Phases

The Land Use Plan for Community North (CN) is organized into three development phases, which begin with Phase 2 (The label "Phase 1" is not used in order to keep the phases of UCM and CN in step). **Table 2.0-10, Community North Development Phases**, presents the phases of CN development as planned at this time. **Figure 2.0-10** presents the areas encompassed by each development phase. A brief description of each phase follows the table.

Table 2.0-10
Community North Development Phases

Phase	Acres developed at Buildout of Phase (cumulative)	Building Space at Buildout of Phase (in million square feet)	Total Housing Units at Buildout of Phase	Total Residential Population at Buildout of Phase	Approximate Year of Completion
2	92	762,800	337	890	2020
3	388	1,780,000	3,200	8,480	2030
4	870	3,228,000	5,800	15,351	Beyond 2030

CN Phase 2

This phase would entail the development of two areas located in the central and western portions of the Community North site for a total of 92 acres of land.

CN Phase 3

This phase would entail the development of approximately 300 acres of land in the western, central, and northeastern portions of Community North.

CN Phase 4

This last phase would develop all of the remaining land (approximately 480 acres) located in the southern and eastern portion of Community North.

2.4.5 Environmental Commitments included in the Proposed Action

Numerous measures and plans have been incorporated into the Proposed Action to reduce the potential for impacts primarily to biological resources on and adjacent to the project site. As these environmental measures and plans are existing commitments or requirements and therefore constitute a part of the Proposed Action, they are described below, and the Proposed Action as mitigated by these measures is evaluated in this Draft EIS/EIR.

Conservation Strategy

In conjunction with the processing of the Section 404 permit application submitted by UC Merced and the County in 2002, in February 2002, the USACE requested formal consultation with USFWS under Section 7 of the Endangered Species Act (ESA). USFWS completed consultation in August 2002 with the issuance of the *Final Biological Opinion on the Proposed University of California Merced Campus, Phase 1 and Campus Buildout and Infrastructure Project* (1-1-02-I-2926) (hereinafter 2002 BO). The full text of the 2002 BO is presented in **Appendix 2.0-2**. In its 2002 BO, USFWS concluded that, contingent upon implementation of and compliance with all the conservation measures and conditions set forth in the BO, the UC Merced project would not result in jeopardy to federally listed threatened and endangered species (US Fish and Wildlife Service 2002). In issuing the 2002 BO, USFWS recognized that the CWA Section 404 permit and the environmental review process under the National Environmental Policy Act could result in modification of the proposed campus and community configuration. Therefore, the USFWS considered the potential effects resulting from the development of a Campus and University Community within a broader study area that included the University's 2002 Proposed Project site. In order to provide sufficient specificity for consultation, the parties agreed to a set of project "Parameters," a set of project conditions that were incorporated into the BO and would be implemented or satisfied in connection with the selected alternative that would obtain CWA Section 404 authorization. The BO specified that the parameters would be achieved "in many instances" by complying with a set of Conservation Measures, which were initially proposed by the University as environmental commitments in the 2002 BA and carried forward into the BO. Parameter 1 of the 2002 BO required the development of a Conservation Strategy approved by USFWS that addresses applicable requirements of the Federal ESA.

In compliance with Parameter 1, the University has prepared a Conservation Strategy. The full text of the *Conservation Strategy* is included in **Appendix 2.0-3**. The Conservation Strategy was included as part of the previous Proposed Actions covered by the 2002 BO, and the University and the County agreed to prepare and implement the Conservation Strategy as part of the development of the Campus and the University Community. Therefore, this strategy is considered a part of the Proposed Action in this EIR/EIS. The *Conservation Strategy* focuses on the ecology, distribution of, and threats to 13 species of highest conservation concern in the project region. These 13 species are Succulent owl's-clover; Hoover's spurge; Colusa grass; San Joaquin Valley Orcutt grass; Hairy Orcutt grass; Hartweg's golden sunburst;

Greene's tuctoria; Conservancy fairy shrimp; Vernal pool fairy shrimp; Midvalley fairy shrimp; Vernal pool tadpole shrimp; California tiger salamander; and San Joaquin kit fox. The *Conservation Strategy* consists of 13 individual conservation strategies that are focused on avoidance and minimization, land acquisition, and adaptive management as it relates to the 13 species. The strategies are summarized in **Table 2.0-11, Summary Description of Conservation Strategies,** below. It is expected that the requirements of this Conservation Strategy will be incorporated into the terms of the biological opinion issued for any 404 permit issued for the Campus or University Community.

Table 2.0-11
Summary Description of Conservation Strategies

Strategy	Description
Conservation Strategies for All Species	
Strategy 1: Avoid and Minimize Losses of Habitats Supporting Target Species.	This strategy requires that to the extent practicable, development projects in the UC Merced study area should be located to minimize loss and degradation of natural vegetation, and to minimize cumulative and growth-inducing effects causing loss or degradation of natural vegetation. These types of effects should be addressed through the permitting and approval processes.
Strategy 2: Incorporate Site-Specific Measures into Development Projects.	This strategy requires that the permitting and approval processes for new development in the study area should identify avoidance and minimization measures to be implemented to address each of the mechanisms by which development can affect wetlands and special-status species on adjacent lands during and after construction. Examples include: stormwater and irrigation systems that are designed so that no unnatural runoff is delivered to surrounding lands, and discharges to streams mimic the natural pattern of runoff into these systems; construction of perimeter fencing to discourage human and pet disturbance of adjacent habitat areas; design lighting to minimize escape of light into habitat areas; incorporate species protection obligations into construction contracts; conduct environmental sensitivity training; implement best management practices (BMPs) such as dust-control measures; erosion reduction and sediment control (e.g., use of silt screens, sediment fences, weed-free straw bales, sand bags, water bars); restricted equipment refueling and maintenance practices, and a spill-response plan during construction; implement preconstruction surveys and mitigation to minimize take of listed species, particularly San Joaquin kit fox and California tiger salamander; install temporary or permanent fences along project boundaries and sensitive resources to prevent construction vehicles from straying into the adjacent habitats; discourage introduction and establishment of invasive species; reduce human disturbance in protected areas through the use of signage and interpretive displays and trails; reduce disturbance caused by pets by implementing leash laws and animal control programs; discourage or limit the spread of invasive species; discourage or limit the application of herbicides, pesticides, and rodenticides on developed lands adjacent to habitat for special-status species, particularly the use of those compounds with the potential for greater effects; minimize habitat for predators and competitors of target species.

Strategy	Description
Conservation Strategies for All Species (continued)	
Strategy 3: Protect and Manage Large Contiguous Areas in the Project Region.	This strategy requires that lands be conserved using one of three potential tools: (1) acquiring lands in fee title and dedicating them to conservation purposes which provides the highest level of protection and conservation value; (2) imposing conservation easements which are particularly appropriate given the value of cattle grazing as a management tool; and (3) protecting lands through General Plan and zoning designations.
Strategy 4: Secure Conservation Easements that Provide for Effective Management.	This strategy recommends acquisition of conservation easements to establish conserved areas, including compensation lands, because they are cost effective and compatible with traditional land uses (e.g., grazing). To provide for effective management, these easements must prohibit incompatible land uses and allow for the retention, enhancement, restoration, and monitoring of conservation values.
Strategy 5: Develop and Implement Management Plans for Conserved Lands.	This strategy requires that the conserved lands adjacent to UC Merced (VST, CST, and CNR) should have a management plan prepared and implemented to ensure that their conservation values are maintained. The plans should provide a description of and restrictions on recreational, educational, and scientific activities that will be permitted and protocols for approving specific research and educational uses; methods for controlling/eliminating unwanted or illegal uses of the property; details regarding planned habitat restoration/enhancement measures; grazing management practices; fuel management practices; and practices for controlling nonnative plants and animals.
Strategy 6: Develop and Implement Adaptive Management Measures to Attain Measurable Objectives.	This strategy requires that adaptive management measures shall be implemented on conserved lands.
Strategy 7: Develop and Implement a Monitoring Program Sufficient to Support Adaptive Management.	This strategy requires that a monitoring program shall be implemented to provide data in support of the adaptive management program.
Strategy 8: Incorporate Studies to Address Key Uncertainties into Adaptive Management.	This strategy requires that adaptive management should identify key uncertainties affecting management decisions and develop monitoring procedures and experiments as needed to reduce or eliminate those uncertainties.
Strategies Specific to San Joaquin Kit Fox	
Strategy 9: Manage a Corridor across the Project Region to Allow the Potential for Continuous Residence and Dispersal of San Joaquin Kit Fox.	Parameter 1b of the BO requires that the Conservation Strategy be consistent with and contribute to implementation of the Recovery Plan for Upland Species in the San Joaquin Valley, California as well as any future federal recovery planning efforts. Parameter 2b, in accordance with the recovery plan, calls for the University to protect a corridor north and east of the project area and to ensure that such acquisitions are "consistent with the establishment of a connection to the Sandy Mush Road area."

Strategy	Description
Strategies Specific to Vernal Pool Grasslands and Associated Special-Status Species	
Strategy 10: Represent all Geomorphic Surfaces and Habitats Occupied by Target Species on These Surfaces.	This strategy requires that the lands that are conserved should protect biologically meaningful examples of the full range of geomorphic surfaces that are present in the project region. The selection of these lands should also ensure that examples of the full range of surfaces that each target species occupies are conserved.
Strategies Specific to Vernal Pool Grasslands and Associated Special-Status Species (continued)	
Strategy 11: Sustain Populations of the Rarer and More Specialized Target Species at Occupied Sites.	This strategy requires that to ensure their long-term persistence in the project region, all populations of the rarer vernal pool species should be sustained—Hoover's spurge, San Joaquin Valley Orcutt grass, hairy Orcutt grass, Greene's tuctoria, and Conservancy fairy shrimp.
Strategy 12: Compensate for Losses of Wetlands and Target Species with Comparable Habitat that Contributes to Land Conservation Strategies.	This strategy requires development projects in the project region that result in unavoidable loss of habitat supporting target species to implement measures to acquire, maintain, restore, and enhance conservation values on lands that support the affected species in accordance with existing permitting and approval processes. Compensation lands should be managed to ensure that they provide wetland functions and values and species habitats comparable to the habitat for which they provide compensation. Compensation wetlands should be located in areas that are protected in perpetuity and should be evaluated for a period of at least 5 years to ensure conformance with success criteria (e.g., target habitat characteristics, success of plantings).
Other Sensitive Habitats and Special-Status Species	
Strategy 13: Conserve Habitat Essential to the Survival and Preservation of Other Special-Status Species.	This strategy requires that habitat essential to the survival and preservation of other special-status species (other than the 13 target species) should be conserved to the greatest extent possible.

Other Environmental Commitments

In addition to the development and implementation of a Conservation Strategy, the 2002 BO requires the development and implementation of the specific mitigation and management plans that are listed and briefly described below.

Compensatory Wetland Mitigation and Monitoring Plan

The University has prepared and submitted to USFWS, DFG, and the USACE for their review and approval a detailed Compensatory Wetland Mitigation and Monitoring Plan (CWMMP) for on-site and off-site wetland preservation, enhancement, and restoration efforts. The full text of the CWMMP is included in **Appendix 2.0-4** and the plan is summarized below.

The CWMMP is based on a holistic watershed-level approach involving a wide range of aquatic habitats and their surrounding upland environments. The goal of the CWMMP is to ensure that the Campus and Community North development will result in no net loss of wetland functions and to ensure that take and other effects on listed species dependent on these habitats are fully offset. The CWMMP includes measures to meet the following objectives.

- Ensure that UC Merced will preserve a minimum of 10 acres of vernal pool grassland for each acre of vernal pool grassland developed or filled.
- Evaluate and incorporate existing easement protections and other enhancement activities on preserved lands as needed to achieve the requirement for no net loss of wetland functions.
- Restore wetlands by reestablishing or enhancing areas where the vernal pool signature is still present, to achieve a minimum acreage ratio of 1:1 replacement for vernal pools and other seasonal wetlands that would be filled by the project.
- If the 1:1 replacement ratio cannot be met through restoration of degraded seasonal wetland habitats, meet the ratio through creation of such habitats in other suitable areas.

In accordance with the conservation requirements specified in the CWMMP, the University will subsequently prepare a Wetland Restoration/Creation Site Design Plan for each restored or created wetland conservation site; each such plan will include a wetland delineation, and any necessary permits under CWA Section 404 will be applied for and received prior to work initiation.

Resource Mitigation Plan (RMP) for the Campus and Management Plan for Conservation Lands

The University prepared the *Resource Mitigation Plan for Federally Listed Species that May be Affected by the Establishment of the University of California, Merced* dated February 2002 and the *Management Plan for Conservation Lands and the Adjacent Campus Buildout for the University of California, Merced*. The full text of the Resource Mitigation Plan (RMP) and the Management Plan for Conservation Lands are included in **Appendices 2.0-5** and **2.0-1,** respectively.

In accordance with the RMP, the University has committed to preserve vernal pool-dominated grasslands in eastern Merced County at a 10 to 1 mitigation ratio. As of this writing, more than 26,000 acres of vernal-pool dominated grasslands have been acquired and preserved in eastern Merced County that also provide habitat for vernal pool species and other special status species (e.g., San Joaquin kit fox). These conservation lands (shown on **Figure 2.0-11 Conservation Lands for the UC Merced Campus and University Community** and **Table 2.0-12, Conservation Lands**) are generally divided into two categories: Tier 1 properties (the VST Preserve, Cyril Smith Trust [CST] property, Myers Easterly, and CNR) and Tier 2 properties (Robinson, Chance, Cunningham, Carlson, and Nelson properties). Tier 1 properties are

owned in fee title by UC Merced, The Nature Conservancy (TNC), and the UCLC, respectively and are adjacent to the proposed UC Merced Campus. Tier 2 properties have been placed under conservation easements held by either the California Rangeland Trust (CRT) or TNC.

Table 2.0-12
Conservation Lands

Land	Acres
Tier 1	
Virginia Smith Trust	5,030
Cyril Smith Trust	3,070
Myers Easterly	97
Campus Natural Reserve	1,307
Subtotal	*9,504*
Tier 2	
Robinson	3,595
Chance	7,619
Cunningham	1,761
Carlson	305
Nelson	3,861
Subtotal	*17,141*
TOTAL ACREAGE	**26,645**

Additionally, the University has committed to conservation management and enhancement, restoration, and creation activities on the conservation lands as required under the RMP and specified in the *Management Plan for Conservation Lands*. The text of the management plan is included in **Appendix 2.0-1.** The University has also committed to implement certain avoidance, minimization, management, and monitoring measures as set forth in the RMP, and the 2002 BO.

UCP Policies

In accordance with the adopted UCP, Merced County has committed to the avoidance, minimization, and mitigation measures for future development within the University Community area (including Community South) that are listed below.

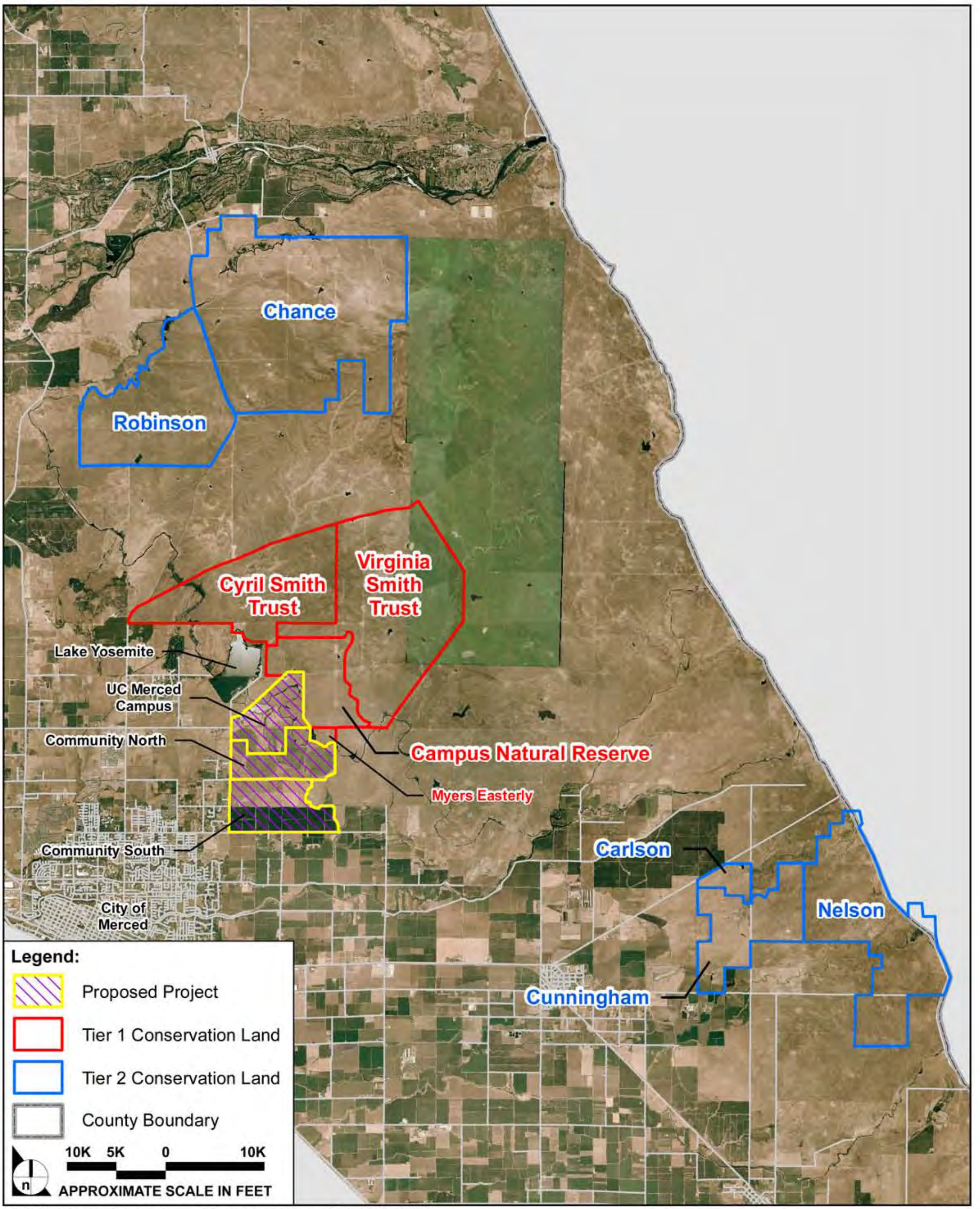
- Impact avoidance and minimization through project design and construction-related BMPs.
- Habitat preservation, creation, restoration, and/or enhancement to achieve no net loss of value or function, including habitat value for Colusa grass, at a ratio of 3:1.

- Habitat preservation, creation, restoration, and/or enhancement to achieve no net loss of value or function, including habitat value for San Joaquin Valley Orcutt grass, at a ratio of 3:1.

- Habitat preservation, creation, restoration, and/or enhancement to achieve no net loss of value or function, including habitat value for vernal pool tadpole shrimp, at a ratio of 3:1.

- Habitat preservation for grasslands, in association with conserved wetlands, at a ratio of no less than 9 acres of upland preserved for each acre of wetland preserved. In addition, the County will require conservation easements for individual development projects covered by the UCP at a 1:1 mitigation ratio to mitigate for the loss of agricultural land resulting from the development of the University Community. While this agricultural land mitigation program addresses the conversion of agricultural land to urban uses, it also would provide for the preservation of land that may be considered suitable for San Joaquin kit fox.

The significance of environmental impacts of the Proposed Action are evaluated in this Draft EIS/EIR after taking these environmental commitments into account. Furthermore, the secondary environmental impacts from the implementation of these conservation measures are also evaluated in this Draft EIS/EIR.



SOURCE: ICF Jones & Stokes - August 2008; Aerial Photo Source: NAIP2006, DFG2003

FIGURE **2.0-11**

Conservation Lands for UC Merced Campus and University Community

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3.0 ALTERNATIVES

3.1 INTRODUCTION

This section identifies and describes alternatives to the Proposed Action pursuant to National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) requirements. The University and the US Army Corps of Engineers (USACE) considered a reasonable range of alternatives. Those alternatives that (1) were consistent with the stated purpose of the Proposed Action and met most of the project objectives, (2) were practicable or feasible, and (3) would reduce the significant adverse environmental impacts of the Proposed Action were carried forward for further detailed evaluation. The environmental impacts of the Proposed Action and its alternatives are described by resource topic in **Section 4.0** of this Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

3.2 REQUIREMENTS WITH RESPECT TO ALTERNATIVES ANALYSIS

3.2.1 NEPA

Under NEPA, the range of alternatives required in an EIS is governed by the rule of reason, which requires that an EIS evaluate only those alternatives necessary to permit a reasoned choice. An EIS must consider a reasonable range of alternatives as defined by the specific facts and circumstances of a Proposed Action. First, alternatives must fulfill the basic requirements of a project's statement of purpose and need. Second, alternatives to be analyzed should not have more significant impacts on the environment than the Proposed Action or result in impacts that are indistinguishable from those of the Proposed Action. NEPA also requires that alternatives be feasibly carried out in the context of technical, economic, environmental, and other factors. If alternatives have been eliminated from detailed study, the EIS must briefly discuss the reasons for their elimination. In short, alternatives should be practicable and feasible, have environmental impacts less than those of the Proposed Action, and meet the basic project purpose and need.

The "No Action" alternative, which maintains existing conditions and practices on a project site in the absence of a federal action, must be included among the alternatives analyzed. Under NEPA, feasible alternatives must be addressed at a level of detail equivalent to that of the Proposed Action. NEPA also requires that the federal lead agency identify its preferred alternative, either in the Draft EIS or in the Final EIS.

In addition to the NEPA alternatives analysis, the United States Army Corps of Engineers (USACE) is required to analyze alternatives pursuant to the Section 404(b)(1) guidelines (40 CFR Part 230). Under that

analysis, the USACE determines the Least Environmentally Damaging Practicable Alternative (LEDPA). The Section 404(b)(1) alternatives analysis is being completed concurrently with the EIS/EIR and will be provided as an appendix in the Final EIS/EIR.

3.2.2 CEQA

The range of alternatives under CEQA is similarly governed by the rule of reason. The *State CEQA Guidelines* Section 15126.6 states that an EIR must describe a "range of reasonable alternatives" to the project or its location, which would feasibly attain most of the project objectives while avoiding or substantially lessening the significant effects of a proposed project, and evaluate the comparative merits of each alternative. An EIR must consider a reasonable range of alternatives that will foster informed decision making and public participation. The EIR should also identify any alternatives that were considered but rejected as infeasible and briefly explain the reasons underlying the lead agency's determination. Among the factors that may be used to eliminate alternatives from further detailed consideration in an EIR are: (1) failure to meet most of the basic project objectives; (2) infeasibility; or (3) inability to avoid significant environmental impacts.

An EIR must include a No Project alternative, similar to the No Action alternative required under NEPA. The description of each alternative must be sufficient to allow meaningful evaluation and comparison with the proposed project. The lead agency must also identify the environmentally superior alternative in the Draft EIR.

3.3 PURPOSE AND NEED/OBJECTIVES OF THE PROPOSED ACTION

As noted above, NEPA requires that alternatives should be practicable and feasible, have environmental impacts that are less than those of the Proposed Action, and meet the basic project purpose and need. Similarly, CEQA requires that an EIR must describe a "range of reasonable alternatives" to the project or its location, which would feasibly attain most of the project objectives while avoiding or substantially lessening the significant effects of a proposed project. The purpose and need of the Proposed Action and its objectives are summarized below.

The overall purpose of the Proposed Action is to establish a major research university in Merced County that would ultimately support up to 25,000 full-time equivalent (FTE) students with a contiguous associated community needed to support the university.

The University's objectives for the project are focused on developing a premier research university in the heretofore-underserved San Joaquin Valley in furtherance of the University of California's mission of teaching, research, and public service excellence. Specifically, the objectives of the Campus are to:

- Meet Enrollment Demand: Meet anticipated increases in enrollment demand for the University of California system, both short term and long term.

- Serve Historically Underrepresented Populations: Maximize the University's mission of service excellence by enabling the University to better serve populations that are historically underrepresented in UC enrollments.

- Model Environmental Stewardship: To the extent practicable, plan and develop the campus to model environmental stewardship.

- Avoid Unnecessary Costs: Develop the campus at a reasonable cost, avoiding unnecessary expenses.

- Maximize Academic Distinction: Plan and develop the campus as a research university of the same academic quality as the other UC campuses, consistent with contemporary research campus needs.

- Create an Efficient and Vital Teaching and Learning Environment: Plan and develop the campus to facilitate faculty-student interaction, ease and enjoyment of use of academic facilities, and an environment conducive to learning.

- Attract High-Quality Faculty: Recruit and retain high-quality faculty.

- Provide a High-Quality Campus Setting: Provide an attractive, livable campus in order to attract high-caliber students and faculty.

- Accommodate Student Housing Needs: Offer attractive and centrally located on-campus housing, consistent with UC-wide student housing policies.

- Provide Student Support: Offer high quality, convenient student support services.

- Provide Athletic and Recreational Opportunities: Provide sufficient athletic facilities to offer high-quality NCAA, recreational, and club athletic programs commensurate with other premier universities.

- Ensure Community Integration: Ensure that UC Merced is sustained by a strong, unifying sense of community—one founded upon the values, academic principles, and diverse cultural experiences that bind its members together in common commitments. This community should include direct constituents (students, faculty, and staff) and indirect constituents (local, San Joaquin, and Central Valley residents).

- Promote Regional Harmony: Reflect the landscape, history, resources, and diverse cultures of the San Joaquin Valley in both physical development and in unique features of the curriculum.

The specific objectives with respect to the University Community are summarized below:

- To support the successful development of the UC Merced Campus by providing for a community that is physically contiguous to and integrated with the Campus

- To provide adequate land and development opportunities to absorb the equivalent of 100 percent of the new growth generated by UC Merced over time in close proximity to the Campus to avoid adverse effects of new development
- To provide a community that can be developed in an integrated fashion rather than through fragmented subdivision processes
- To provide a community with patterns of land use and urban form that support principles of livable communities and environmental sustainability
- To provide adequate circulation and utility infrastructure that supports the long-term sustainability of the UC Merced Campus and University Community
- To establish and support linkages and transitions that will integrate the University Community with greater Merced
- To complement and support the economy of the City of Merced and the greater Merced region
- To support the educational goals of VST by enhancing its scholarship fund
- To support regional programs to conserve and protect the County's important agricultural and natural resources as development of UC Merced and the University Community proceeds
- To be configured and planned so that environmental permitting allows community development to proceed at the pace necessary to support campus development
- To be affordable and financially feasible
- To support implementation of the Merced County General Plan

3.4 HISTORY OF ALTERNATIVES

In 1988, The Regents of the University of California (The Regents) authorized the President of the University to initiate planning for additional campuses to accommodate the student population expected in the latter part of the 20th century and into the 21st century. In 1990, The Regents further determined that the search for the site of the first new campus should focus on the central portion of the Central Valley, specifically the San Joaquin Valley, which was not served by a University of California (UC) campus and where the average university attendance rates for high school graduates were much lower than the state average. More than 85 sites in the Central Valley were considered and, based on a number of factors including but not limited to demographics, transportation, and access to amenities, the University narrowed the list to 20 candidate sites in 1990. In the same year, based on additional evaluation the University further narrowed the potential locations to eight proposed sites. In 1991, three of the eight sites were selected for further analysis and environmental review.

A programmatic EIR was then prepared that presented the impacts from the development of a campus at any of the three sites. This EIR, titled the Site Selection EIR (SCH # 1994022033), was certified by The Regents in 1995, and the Lake Yosemite site in eastern Merced County was selected by The Regents as the potential location for the development of the UC Merced Campus and the associated, contiguous, and supporting community. This location was selected for three primary reasons: a reliable source of potable water was available to serve the Campus; the Lake Yosemite site was offered as a gift to the University at a time when very limited funds were available for acquisition of land for a new campus; and the eastern Merced County site brought with it a unique attribute which was the generation of student scholarships through the Virginia Smith Trust (VST) from revenues associated with operation of the supporting University Community.

This site was located within a 7,000-acre property owned by the VST. Within the VST property, the campus site was identified in the Site Selection EIR as 2,000 acres in the northwestern portion of the property and consisted of rolling hills and grasslands. In 2000–01, the University and Merced County commenced the planning and environmental review of the development of the campus and associated community at the Lake Yosemite site. Concurrent with the planning process, the University initiated early consultation with state and federal regulatory agencies to help expedite the permitting of the proposed campus project. In response to input from the agencies and public concern regarding the potential impact on vernal pools and biological resources from siting the campus at the original 2,000-acre site, in late 2000, the University adjusted the campus site to occupy the southwestern portion of the VST property. This shift in the location of the campus also entailed the relocation of the adjacent community to the south of and outside of the VST property. This shift reduced impacts to vernal pools and biological resources by approximately 90 percent and resulted in a 750-acre reduction in the size of the associated, contiguous, and supporting University Community. The relocation also resulted in a significant reduction in the size of both the Campus and the University Community.

In 2001 and 2002, the University prepared a Long Range Development Plan (LRDP) to guide the development of the Campus at this site, which was located immediately adjacent to Lake Yosemite Regional Park. At the same time, Merced County commenced the preparation of a University Community Plan (UCP) to guide the development of the University Community and designate the site in its General Plan for this use. Two EIRs were prepared in support of these plans.

The UC Merced 2002 LRDP EIR evaluated the development of the proposed campus at this site. That EIR evaluated 10 on-site alternatives and 8 off-site alternatives to the proposed project. It also provided updated information regarding five alternatives that were previously evaluated in the Site Selection EIR and demonstrated that even with more information available at that time regarding the proposed campus, none of those previously considered alternative locations for the campus were feasible. In 2002,

The Regents approved the location of the campus on a 2,000-acre site adjacent to Lake Yosemite Regional Park.

3.5 ALTERNATIVES CONSIDERED AND WITHDRAWN

In 2004, the University prepared a Section 404(b)(1) alternatives analysis (*2004 Alternatives Analysis*) in support of its application to the USACE for a Section 404 permit. A copy of the *2004 Alternatives Analysis* for the proposed project is presented in its entirety in **Appendix 3.0** of this Draft EIS/EIR. That analysis evaluated 18 off-site alternatives for the proposed campus, using practicability screening criteria based on the Clean Water Act Section 404(b)(1) Guidelines, which specify that an alternative is considered "practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes."

Based on this guidance, the screening criteria used in the *2004 Alternatives Analysis* included an analysis of whether the alternative met the overall project purpose of establishing a major research university in Merced County that would ultimately support 25,000 full-time-equivalent students with a contiguous, associated community needed to support the university. The alternatives analysis also evaluated whether the alternative was available and practicable. The practicability-screening criterion includes three elements: logistical, technological, and cost considerations. Logistical considerations included, for example, an analysis of whether the project site's size was adequate to accommodate the proposed project and a contiguous, associated community. Technological considerations included, for example, an analysis of whether a sufficient and reliable supply of power and natural gas was available for an alternative site. Finally, cost considerations included an analysis of whether an alternative would result in an unreasonable expense to the University. In addition to practicability considerations, each alternative was also evaluated under the Section 404(b)(1) Guidelines to determine whether it would have less adverse impact on the aquatic ecosystem and whether it would have any other, significant adverse environmental consequences.

Table 3.0-1, **Off-Site Alternatives Screening Analysis**, taken from the *2004 Alternatives Analysis*, summarizes the University's findings regarding the screening of these 17 off-site alternatives and the Proposed Action. As **Table 3.0-1** indicates, the University found that eight of the off-site alternatives meet the project purpose. However, all eight alternatives were found not to be available and failed the practicability criterion. A variant of one of the 18 off-site alternatives identified in the 2004 Alternatives Analysis, Off-Site Alternative 2: North Merced/Bellevue Ranch Site "A," is carried forward in this Draft EIS/EIR as Alternative 3, Bellevue Ranch Alternative**,** because this variant alternative meets the project purpose, is representative of off-site alternatives considered in the 2004 Alternatives Analysis that would reduce impacts to aquatic resources, and was requested by US EPA for inclusion in the EIS/EIR. Although the remaining off-site alternatives, including the Castle Airport alternative, are not included in this EIS/EIR for detailed evaluation, they can be reviewed in the *2004 Alternatives Analysis*.

Table 3.0-1
Off-Site Alternatives Screening Analysis

No.	Alternative	Project Purpose	Availability	Logistics/ Technology	Cost	Aquatic Resources Impacts (acres)[1]	Other Environmental Impacts
1	Proposed Site: Campus on VST; Community in UCP Area	❍	❍	❍	❍	127	❍
2	North Merced/Bellevue Ranch Site "A"	❍	●	●	●	25	●
3	Castle Airport	●	●	●	●	4	●
4	South Merced City Infill	❍	●	●	●	12	●
5	North Merced Rangeland	❍	❍	●	●	154	●
6	Southern Highway 99	❍	●	●	●	11	●
7	Highway 140 Campus Only	●	❍	●	●	4	●
8	East Livingston Campus Only	●	●	●	●	0	●
9	Southwest Campus Only	●	❍	□	●	91[2]	●
10	Delhi Area Campus and Community	●	●	●	●	5	●
11	Distributed Learning Center	●	●	●	●	0	●
12	Expansion of Tri-College Center	●	●	●	●	0	●
13	South of Canal Alternative "A"	●	●	●	●	80.34	●
14	South of Canal Alternative "B"	❍	●	●	●	76.97	●
15	East Merced/Campus Parkway	❍	●	●	●	25	●
16	Southwest Atwater	❍	●	●	●	3	●
17	South of Canal Alternative "C"	●	●	●	●	76.78	●
18	South of Canal Alternative "D"	●	●	●	●	77.22	□

● = *fails criterion* ❍ = *passes criterion* □ = *partially passes criterion*

[1] *Combined impacts for Campus and Community. Acreages are approximate.*

[2] *The 91 acres includes combined impacts from the Campus and Infrastructure Project.*

Additionally, the *2004 Alternatives Analysis* evaluated nine on-site alternatives plus the Proposed Action. These on-site alternatives included: On-Site Alternative 1: Proposed Site; On-Site Alternative 2: Relocated Campus Design; On-Site Alternative 3: Smaller Campus – Decreased Population; On-Site Alternative 4: Smaller Campus – Increased Density; On-Site Alternative 5: Smaller Campus – Fewer On-Site Programs; On-Site Alternative 6: Larger Main Campus – On-Site Avoidance; On-Site Alternative 7: Refined Concept Plan; On-Site Alternative 8: Two Villages; and On-Site Alternative 9: Smaller Campus – Shift Campus South and West. One of the nine on-site alternatives identified in the *2004 Alternatives Analysis*, On-Site Alternative 1: Proposed Site is carried forward in this Draft EIS/EIR as **Alternative 4, 2002 Proposed Project**. Although the remaining on-site alternatives are not included in this EIS/EIR for detailed evaluation, they can be reviewed in the *2004 Alternatives Analysis*.

Following submittal of the Section 404 permit application in 2002 and the *2004 Alternatives Analysis*, the USACE initiated the NEPA process to evaluate the 2002 Proposed Project and three other alternatives to the 2002 Proposed Project. In scoping the alternatives to be evaluated during the NEPA process, the USACE, USFWS, and US Environmental Protection Agency (US EPA) reviewed the *2004 Alternatives Analysis* and, using a Federal interagency team approach, recommended which alternatives should be considered further and which should be eliminated from further consideration. Through this interagency process, the USACE determined that most of the alternatives evaluated in the *2004 Alternatives Analysis* should be eliminated from further consideration, but retained the 2002 Proposed Project and a modified Alternative 8 (an off-site location in Livingston), and added two new additional alternatives (referred to by the USACE as Alternatives 19 and 20). Alternative 19 and Alternative 20 each included a 958-acre campus site but located the campus either partially or completely to the south of the 2002 Proposed Project. Alternative 19 and Alternative 20 were included because they would be located in the same general area as the 2002 Proposed Project, but would have substantially fewer wetlands impacts.

Prior to completion of a Draft EIS evaluating these alternatives, the University held a series of meetings with the USACE, US EPA, USFWS, and Merced County to determine whether an additional alternative could be developed that avoids wetlands while addressing the University's concerns about the practicability of Alternatives 19 and 20. These meetings resulted in the development of a revised footprint for the Campus and University Community, which underwent additional refinement in coordination with a coalition of environmental groups. This refined footprint is now reflected in the the Proposed Action evaluated in this Draft EIR/EIR. The Proposed Action incorporates some of the basic tenets of Alternative 19 in that it retains a portion of the campus on the former VST property but minimizes impacts to wetlands by reducing the amount of development allowed on that property.

The primary difference between the Proposed Action and Alternative 19 is that the Proposed Action includes an increased amount of development around the thumb formed by Le Grande Canal, which addressed the practicability concerns that were raised about Alternative 19. The area to the north and west of the thumb require at least two blocks of land between the campus boundary and the canal to be

feasibly developed. If this area were further compressed in order to further reduce the development footprint for the campus, it would effectively result in the elimination of approximately 200 acres of developable land on this site for two reasons. First, development on the outside of the thumb to the west and north of the Le Grand Canal would be infeasible because of the need for at least two blocks of land in order to accommodate campus buildings and facilities that are a critical part of the academic core. This would result in the loss of approximately 100 acres. Second, development cannot be relocated to the interior of the thumb because this area consists of a natural bowl-shaped depression that will remain open space in order to accommodate drainage and surface runoff from the project site. This land consists of approximately 100 acres. Thus, further compression of developable land around the thumb created by Le Grand Canal would result in a campus size of approximately 600 acres, which would compromise the University's ability to provide academic core programs and/or result in unreasonable densification of the campus site. Moreover, further compression of the developable land between the campus boundary and the canal would not result in a corresponding appreciable avoidance of aquatic resources or listed species habitat because most of the resources that would be avoided would not be pristine vernal pool habitat.

Because of the similarity of the Proposed Action to Alternative 19, and the inability of Alternative 19 practicably to satisfy the overall purpose of the Proposed Action, Alternative 19 has not been carried forward for further evaluation in this Draft EIS/EIR. An alternative similar to Alternative 20 has been carried forward for analysis in this Draft EIS/EIR, and is referred to as **Alternative 2, Yosemite Avenue Alternative** in this document. Alternative 2 (Yosemite Avenue Alternative) and former Alternative 20 reflect essentially the same basic footprint, but Alternative 2 eliminates the split-campus design that would have rendered Alternative 20 impracticable. Although the former Alternative 8 (Livingston) was eliminated from further consideration (due to, among other things, the impracticability of acquiring the many parcels needed to assemble land for a Campus and Community at this site), the USACE gave additional consideration to three other off-site alternatives (Downtown Merced, Bellevue Ranch, and Infill alternatives), ultimately concluding that only the Bellevue Ranch Alternative should be carried forward for further consideration as an off-site alternative.

In response to the change in the location and footprint of the Campus and University Community, the University prepared a Supplemental Section 404(b)(1) Alternatives Analysis (*Supplemental Alternatives Analysis in* ***Appendix 3.0***). This analysis supplements the *2004 Alternatives Analysis* by evaluating the revised Campus and University Community project and reevaluating some of the previously considered alternatives in light of the revised Campus and University Community footprint for compliance with the Section 404(b)(1) Guidelines. It also evaluates some additional alternatives that were previously not included in the *2004 Alternatives Analysis* and were identified by the USEPA for consideration by the USACE. The *Supplemental Alternatives Analysis* includes a total of eight alternatives, including the Proposed Action, many of which are also evaluated in this Draft EIS/EIR. **Table 3.0-2, Summary of Alternatives evaluated for the Proposed Action,** presents the alternatives analyzed in the *2004*

Alternatives Analysis, *Supplemental Alternatives Analysis*, and the ones that are analyzed in detail in this EIS/EIR. Based on the analysis in the *Supplemental Alternatives Analysis*, the Downtown Merced (Supplemental Off-Site Alternative 2) and the Infill Alternatives (Supplemental On-Site Alternative 6) were determined by the USACE as not practicable and therefore were not carried forth in the Draft EIS/EIR for detailed evaluation. A brief discussion of these two alternatives is presented below along with the reasons why these alternatives were found to be not practicable.

As noted earlier in this section, CEQA requires an evaluation of a reasonable range of alternatives that would meet most of the basic objectives of the proposed project as well as avoid or reduce its significant environmental impacts. An evaluation of a reduced project alternative is generally included in CEQA documents. The purpose of such an alternative is to reduce the magnitude of a project's significant impacts by reducing its size. A brief summary of the prior evaluations of a reduced project alternative is presented below and an explanation is provided as to why a reduced project alternative was not carried forward for detailed environmental review.

Table 3.0-2
Summary of Alternatives Evaluated for the Proposed Action

Alternative	2004 Alternatives Analysis	Supplemental Alternatives Analysis	Draft EIS/EIR
Proposed Action	Not included	Supplemental On-site Alternative 1	Alternative 1
Yosemite Avenue	Not included	Supplemental On-site Alternative 4	Alternative 2
Bellevue Ranch Alternative	Off-site Alternative 2, North Merced/Bellevue Ranch Site A	Supplemental Off-site Alternative 3	Alternative 3
2002 Proposed Project	On-site Alternative 1, Proposed Site	Supplemental On-site Alternative 3	Alternative 4
No Action Alternative	NA	Supplemental On-site Alternative 2	Alternative 5
No Build Alternative	NA	Supplemental On-site Alternative 5	Alternative 6
Downtown Merced Alternative	Not included	Supplemental Off-site Alternative 2	Considered but withdrawn in EIS/EIR
Infill Alternative	Not included	Supplemental Off-site Alternative 6	Considered but withdrawn in EIS/EIR

Sources: 2004 Alternatives Analysis; Supplemental Alternatives Analysis
Note: The concept of a No Action Alternative is primarily a NEPA concept and a No Build Alternative is primarily a NEPA/CEQA concept and therefore was not evaluated in the 2004 Alternatives Analysis.

3.5.1 Downtown Merced Alternative

With the intent of further reducing impacts to aquatic resources, the University developed the concept of a Downtown Merced Alternative that would locate an 814-acre Campus and an approximately 2,000-acre University Community in an area on both sides of Highway 99 in downtown Merced. Under this alternative, the Phase 1 Campus would no longer be part of the UC Merced Campus and would be leased to others for non-campus uses such as research and development or for use by the local community college.

Although the Downtown Merced Alternative meets the statement of overall project purpose and would avoid the aquatic and species impacts of the Proposed Action, it was determined by the USACE as not practicable due to cost, logistics, and existing technology. The alternate site was determined not to be available due to the substantial number of parcels that would need to be acquired and assembled. Even if the University decided to lease rather than acquire these parcels, this alternative site is not available because ground leases or other forms of leasing arrangements do not provide assurance that the leased space would be available in the long term, which is inconsistent with the project's basic purpose of establishing a long-term campus. Additionally, this alternative does not satisfy the logistical criterion due to traffic safety concerns related to the presence of Highway 99 within the site, or the technological criterion as this alternative would involve substantial displacement of homes and businesses and substantial effort associated with redevelopment of an already developed and established area. The alternative does not satisfy the cost criterion because of the high costs of property acquisition, relocation costs, and redevelopment costs.

With respect to aquatic resources and other environmental impacts, this alternative would potentially result in numerous other significant environmental impacts. For example, although it would result in potentially no impact to aquatic resources, and specifically, to vernal pool habitat and other wetlands due to the developed nature of this site, the Downtown Merced Alternative would result in direct and indirect impacts to Bear Creek and its riparian corridor, which bisects the western portion of this alternative site. Development in this portion of the alternative site likely would require either culverting or rechanneling of at least some portions of Bear Creek, which could result in impacts to the creek itself and its riparian corridor, particularly with respect to those portions of Bear Creek that flow near Applegate Park and between State Route 99 and State Route 59.

The Downtown Merced Alternative would result in other significant environmental impacts. Redevelopment and retrofitting of this alternative site would require substantial demolition and construction work. The amount of demolition debris generated by this work would be millions of tons worth of material. This additional work would result in significant air quality impacts related to

demolition activities and off-haul truck traffic. Demolition or retrofitting work associated with this alternative would also result in impacts to historical resources. For example, several historic resources listed on the National Register of Historic Places are located within the site under this alternative. These listed or potential historic resources could be affected by the work required to redevelop this alternative site.

Further, the redevelopment and retrofitting of existing structures and infrastructure likely would require at least some subsurface excavation work within this alternative site. This excavation work would include the replacement and rerouting of water, electrical, gas, and sewer lines. Given that structures and uses have occupied the area for several years, and perhaps since the City of Merced's incorporation in 1889, it is likely that construction workers would encounter potentially hazardous materials from aboveground uses, particularly with respect to those portions of the alternative site that are designated as industrial land uses or zoned industrial. Exposure of these materials could result in impacts to both the construction workers and the general public. Prior to any such excavation work, monitoring or cleanup related to hazardous materials may be required, which substantially increases time delays and costs associated with the project.

This alternative would also result in significant traffic impacts given that State Route 99 bisects the site. Additional traffic generated by the UC Merced Campus and University Community would likely significantly increase levels of service on this segment of State Route 99, the highway interchanges, and arterial streets which would be used for access between State Route 99 and downtown Merced. This increase in traffic and the proximity of student classrooms and residential buildings to State Route 99 would also result in significant noise impacts.

This alternative site is also located near the Merced Municipal Airport Macready Field. The airport is a 450-acre publicly owned facility that serves the aviation needs of the City of Merced and surrounding areas of Merced County. Locating the UC Merced Campus and University Community near the airport would result in land use incompatibility impacts, because the airport's proximity to the UC Merced Campus and the University Community could result in noise, safety, traffic, air quality, and other impacts to students, faculty, and staff.

In addition, this alternative includes a variety of sensitive natural resources, including Bear Creek and its associated riparian corridor, large trees suitable for nesting raptors, and small plots of undeveloped land that provide potential habitat for burrowing owl and foraging habitat for raptors. Special status species with the potential to occur within this alternative site include Swainson's hawk (a known nesting site is approximately 1 mile southeast of the site), white-tailed kite, red-tailed hawk, American kestrel, burrowing owl, giant garter snake (historic record of occurrence in Merced), mastiff bat (historic record of

occurrence in Merced), and valley elderberry longhorn beetle. The portion of Bear Creek flowing through this alternative site may contain hardhead, a fish species of special concern in California.

Based on information provided by the City, establishing a campus and community within downtown Merced would displace several thousand people, residential units, and commercial businesses. As such, this alternative would result in significant environmental and growth-inducing impacts related to new development on currently undeveloped land within and outside the City of Merced to accommodate residents and businesses forced to relocate. This new development could generate significant biological resources, traffic, air quality and other impacts related to the conversion of raw land to urban uses.

For additional details on the Downtown Merced Alternative, see *Supplemental Alternatives Analysis*, which is contained in **Appendix 3.0**.

3.5.2 Infill Alternative

With the intent of further reducing impacts to aquatic resources, the University and the USACE developed the concept of an Infill Alternative, which would include the development of a UC Merced Campus and University Community at a portion of the proposed site and at locations within the City of Merced. This alternative consists of removing approximately 266 acres of proposed Campus uses that would be located north and east of Le Grand Canal and approximately 66 acres of proposed development within the University Community that is proposed to the east of Le Grand Canal and relocating that development to available infill sites within the City of Merced. The University determined that the relocation of project elements proposed for these 266 acres of Campus uses and 66 acres of Community uses was feasible based on the configuration of developable land on the project Site. The objective would be to avoid the high quality, intact vernal pool complexes that currently exist on the eastern side of the canal. Moreover, if these acres are removed from the development plans, the Le Grand Canal would serve as a natural boundary between campus and community development on the west side and preserved vernal pool complexes and other aquatic resources on the east side.

The Infill Alternative, as defined above, would result in fewer impacts on aquatic resources and associated vernal pool species. However, the Infill Alternative does not satisfy the University's project purpose because it would result in a partial contiguous associated University Community needed to support the campus. This alternative is also not considered practicable because it will require the acquisition of approximately 20 separate infill parcels to accommodate development relocated from the project site. Additionally, this alternative is not practicable because it does not meet the logistics criterion as it involves a dispersed campus and community, resulting in excessive travel between the various locations and related inefficiencies. It does not meet the technological or cost criteria, as it would involve

a higher operational cost due to dispersed facilities, high land acquisition costs, and high construction costs from the additional densification of the campus at the proposed site.

Even though this alternative would result in fewer impacts to aquatic resources, it would result in other significant environmental impacts. A dispersed campus design generates a variety of inefficiencies related to the need for students, faculty, and staff to travel between the main campus site and the campus infill sites. These inefficiencies would, in turn, create significant environmental impacts related to increased traffic generation, air quality degradation from increased automobile emissions, and increases in noise levels from additional traffic.

This alternative could result in significant growth-inducing impacts by requiring students, faculty, and staff to travel between these dispersed infill development elements and the UC Merced Campus or the main University Community site, which could, in turn, require road widenings or increased infrastructure at the interface between the City and the project site. Moreover, non-University development that would otherwise occur on these vacant infill parcels could be pushed out to the fringes of the City where additional vacant land is available, which would result in sprawl.

Additionally, although the potential infill parcels identified by the University do not include industrial, manufacturing, or other such land uses, subsurface excavation and other development activities on these infill properties may nonetheless require environmental site testing or remediation for contamination. Any pre-existing soil or groundwater contamination would put construction workers and the public at risk of exposure.

For all of the above reasons, the USACE determined that this alternative was not practicable. Although the Infill Alternative is not evaluated further in this Draft EIS/EIR, the alternative is described in detail in the *Supplemental Alternatives Analysis*, which is contained in **Appendix 3.0** of this Draft EIS/EIR.

3.5.3 Reduced Project Alternative

Significant environmental impacts of any project typically stem from the size of its footprint (e.g., biological resource impacts) or the population and activities associated with the project (e.g., traffic and traffic-related air quality impacts). The proposed size of the campus in terms of its student population was determined by the University based on projected growth in demand for higher education in the state and the University's commitment to provide its share of the necessary educational facilities to meet the demand.

To determine the size of the campus in terms of acres of land, the University considered a number of factors, including projected enrollment demand, student population size necessary to support a wide

range of academic programs, the appropriate number of faculty to support state of the art research, and the sizes of other major research universities. The University determined that a campus size range of approximately 800 to 1,000 acres could accommodate typical campus programming, including an appropriate range of undergraduate programs, graduate programs through the doctoral level, professional programs that confer advanced degrees, research facilities appropriate for state-of-the-art science, and public service programs. Similarly based on campus-related population that would require housing and other services, the University and the County determined that a 2,000-acre University Community would be adequate to accommodate this population and its needs.

As described earlier, alternatives to the Proposed Action have been evaluated in numerous documents since the time that a 10th UC campus was proposed, and these previous documents have evaluated variations of a reduced project alternative. Most of the reduced project alternatives have focused on ways to reduce the Proposed Action's footprint impacts without necessarily reducing the size of the associated population. Such alternatives are further evaluated in this Draft EIR/EIS. However, some alternatives that would reduce the size of the campus (and related University Community) population were also evaluated with a view to avoid or reduce other potentially significant impacts such as traffic and air quality.

For example, the 2002 LRDP EIR evaluated a "Smaller Main Campus/Decreased Population Alternative" (see Section 5.1.1.1 of the 2002 Final LRDP EIR, pages 5-3 through 5-9) which included a reduced enrollment level of 15,000 FTE students (and an associated proportional decrease in faculty and staff and the population of the University Community). Since the size of the campus in terms of the ultimate student enrollment level under the Proposed Action is the same as evaluated before in the 2002 LRDP EIR, that previous analysis is applicable and incorporated by reference into this Draft EIS/EIR.

As explained in the 2002 LRDP EIR, a reduced project alternative that reduced the maximum enrollment level for the campus, would fail to meet numerous project objectives, including meeting enrollment demand, serving historically underrepresented populations, maximizing academic distinction, modeling environmental stewardship, attracting high-quality faculty, and creating an efficient and vital teaching and learning environment. Each of these failings are described in detail in the 2002 LRDP EIR (see pages 5-7 through 5-9).

With respect to environmental impacts, a reduced project alternative such as the "Smaller Main Campus/Decreased Population Alternative" evaluated in the 2002 LRDP EIR would result in decreased footprint impacts related to the physical size and location of the proposed project, including effects on sensitive habitat, wetlands, site hydrology, and visual quality. For example, the 2002 LRDP EIR alternatives analysis found that the Smaller Main Campus/Decreased Population Alternative would

reduce the project's traffic, air quality, and water supply impacts (among other impacts) by 30 to 40 percent and thereby avoided some significant impacts and reduced but would not fully avoid other significant impacts (e.g., air quality impacts, biological resources) (UC Merced 2002).

Other impacts associated with a reduced project alternative could be somewhat reduced because of a reduction in the size of the campus. If fewer buildings were constructed, the amount of light and glare would be reduced. The amount of site grading would be reduced; thus, dust emissions from construction activities would be reduced in comparison to the Proposed Action. Other construction activities, and corresponding emissions of pollutants, also could be decreased in comparison to the Proposed Action. However, because grading and other construction activities are not expected to occur all at once, construction-related emissions in a given year likely would be similar to the emissions generated by the Proposed Action.

In terms of operational impacts, a reduced project alternative would result in a commensurate reduction in impacts. For example, a reduced campus population would necessarily reduce the number of vehicle trips to and from the campus. Traffic modeling used in the 2002 LRDP EIR for the "Smaller Main Campus/Decreased Population Alternative" indicated that the reduced project alternative would reduce the number and magnitude of significant road impacts. Notably, however, this alternative would also contribute to significant cumulative impacts on certain road segments. Emissions of pollutants associated with vehicle trips would be reduced by the same proportion as vehicle miles traveled. However, other sources of emissions would not change substantially because of decreased population levels. While fewer vehicle trips would result in proportionately fewer emissions, emissions of criteria pollutants would still be substantial, and operation of the campus, together with cumulative growth in the region, would hinder the San Joaquin Valley Unified Air Pollution Control District in achieving the requirements of the State Implementation Plan.

As discussed in the 2002 LRDP EIR, other impacts associated with a reduced project alternative would be somewhat reduced because of a reduction in the campus population, but not in a quantifiable amount. Area sources of air pollutant emissions such as wood-burning stoves and fireplaces could be reduced because of a smaller campus population. Hazardous material use and transport, and generation of hazardous waste, would be reduced if the campus population were smaller. Solid waste generation would also decrease if the campus population were smaller.

Nevertheless, as discussed above and as discussed in more detail in the 2002 LRDP EIR, a reduced project alternative would not meet several of the key objectives of the proposed project. A reduced project alternative would also not meet the purpose of the Proposed Action. Therefore, a reduced project

alternative based on a reduction in the campus enrollment or community population was not carried forward for additional review in this Draft EIS/EIR.

3.6 ALTERNATIVES EVALUATED IN THIS DRAFT EIS/EIR

Six alternatives were carried forward for detailed study in this Draft EIS/EIR: (1) Proposed Action; (2) Yosemite Avenue Alternative; (3) Bellevue Ranch Alternative; (4) 2002 Proposed Project; (5) No Action Alternative; and (6) No Build Alternative. These alternatives are described below. As stated above in **Subsection 3.5** and shown in **Table 3.0-3, Summary Comparison of Alternatives**, (at the end of this section), some of the alternatives presented below were formerly evaluated as specific alternatives in the *2004 Alternatives Analysis* prepared by UC Merced and submitted as part of the Section 404 permit application for the original campus footprint. To the extent that these alternatives are carried forward in this Draft EIR/EIS analysis, the description of the alternative notes the prior alternative reference.

3.6.1 Alternative 1 – Proposed Action

As described in more detail in **Section 2.0, Project Description**, the Proposed Action Alternative consists of the development of a major research university in Merced County that will support up to 25,000 FTE students and an associated community. The Proposed Action encompasses two major areas: the UC Merced Campus and the University Community. The Campus includes the 815-acre Campus that would be developed with facilities including academic buildings, student housing, recreational facilities, open space, campus support and infrastructure, and a 1,307-acre Campus Natural Reserve that would not be developed. The 1,950-acre University Community would comprise the 833-acre Community North and the 1,118-acre Community South. Community North would be developed with a town center, research park area, residential neighborhoods, parks, open space, schools, and other amenities. With respect to Community South, it is anticipated that this approximately 1,118-acre area would be developed in accordance with the previously adopted UCP. The University Community would contain 11,616 housing units and a residential population of 30,480 approximately persons.

Access to the Proposed Action site would be via Bellevue Road, Lake Road, and Yosemite Avenue. The current land uses on the site are the 104-acre Phase 1.1 Campus, grazing pastures (both irrigated and non-irrigated), and cropland. The proposed site is not located within a 100-year flood hazard area as mapped by Federal Emergency Management Agency (FEMA).

3.6.2 Alternative 2 – Yosemite Avenue Alternative

The Yosemite Avenue Alternative site is located in the same general area as the Proposed Action. **Figure 3.0-1, Alternative 2 – Yosemite Avenue Alternative Location Map,** shows the location of this alternative.

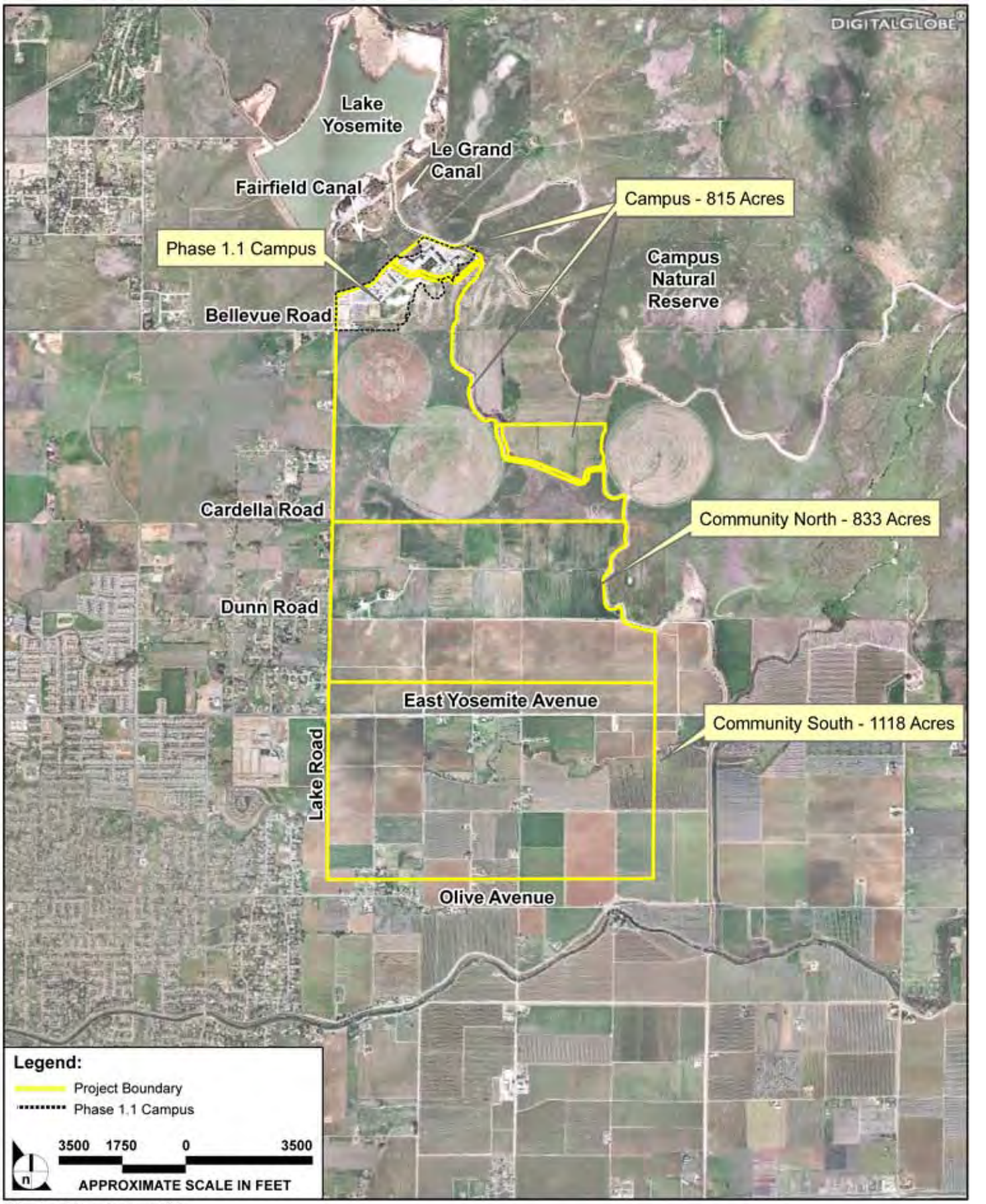
Under this alternative, campus development would occur in two areas: the already developed 104-acre Phase 1.1 Campus and a 706-acre campus area bordered on the west by Lake Road and located south of the Phase 1.1 Campus up to Cardella Road. The University Community under this alternative includes a total of approximately 1,950 acres and is organized into a Community North and Community South. The Community North includes about 833 acres and is bordered on the west by Lake Road and located south of the campus approximately between Cardella Road and Yosemite Avenue. The Community South includes 1,118 acres, is bordered on the west by Lake Road, and would be located approximately between East Yosemite Avenue and Olive Avenue. All other attributes of the Campus and University Community under this alternative, including total campus and community population, would be the same as under **Alternative 1, Proposed Action**.

Access to the Yosemite Avenue Alternative site would be via the same roadways as the Proposed Action. The current land use of this alternative site is agriculture with approximately 91 percent in cropland. Although the campus area is not within the 100-year floodplain, a portion of the University Community would be located within the 100-year floodplain.

3.6.3 Alternative 3 – Bellevue Ranch Alternative

The Bellevue Ranch Alternative is located primarily on land commonly identified as the Bellevue Ranch in the northern portion of the City of Merced. **Figure 3.0-2, Alternative 34 – Bellevue Ranch Location Map,** shows the location of this alternative. Under this alternative, campus development would occur in two areas: the already developed 104-acre Phase 1.1 Campus and a 710-acre Campus that would be located on Bellevue Road, about 2 miles west of the Phase 1.1 Campus. The 710-acre Campus area is generally bounded by Nevada Street on the north, G Street on the east, and Bellevue Road on the south. The western boundary is approximately 0.25 mile east of State Route 59. All other attributes of the campus would be the same as under **Alternative 1, Proposed Action**.

The University Community would be located immediately to the west and south of the campus site. The University Community site is generally bounded by State Route 59 on the west, Cardella Road on the south, and G Street on the east. The University Community would include about 1,950 acres and would be organized into a Community North and a Community South. Community North would involve 833 acres and would be located west of the Main Campus. Community South would encompass about 1,118 acres and would be located on lands south of Bellevue Road. All other attributes of the Campus and University Community, including total population, would be the same as under **Alternative 1, Proposed Action**.



SOURCE: UC Merced – August 2008

FIGURE **3.0-1**

Alternative 2 - Yosemite Avenue Alternative Location Map

SOURCE: Digital Globe - 2008, Impact Sciences Inc. - August 2008

FIGURE **3.0-2**

Alternative 3 - Bellevue Ranch Location Map

The site is located approximately 2 miles south of the County landfill located on Highway 59. This alternative would be located near an existing transportation system for local and regional student access, and would provide on-site circulation. Access to the site would likely be from State Route 99 via Highway 59 or G Street. The site is within the existing boundaries of an area planned for development under the City's general plan, and is currently designated as open space/recreation, low- and low-to-medium density residential uses. Approximately 2,550 acres of the site are presently utilized for irrigated pasture and row and field crop production. Development on the site would require the demolition of 39 existing ranch complex structures, some of which may exhibit historic significance. In addition, this alternative would displace newly developed residential developments. Approximately 600 acres of this alternative site lies within a floodplain identified on FEMA's Flood Insurance Rate Maps, including 277 acres of the Campus and 324 acres of the University Community.

3.6.4 Alternative 4 – 2002 Proposed Project

The 2002 Proposed Project Alternative consists of a 2,000-acre UC Merced Campus and an adjacent 2,133-acre University Community located at the same site as the Proposed Action. This alternative site is generally east and south of Lake Yosemite regional park and bounded by Lake Road on the west and Yosemite Avenue on the south. The Fairfield Canal forms a portion of the site's eastern boundary. **Figure 3.0-3, Alternative 4 – 2002 Proposed Project Alternative Location Map,** shows the location of this alternative.

The Campus would include a 910-acre Main Campus, a 340-acre Campus Land Reserve, and a 750-acre Campus Natural Reserve. The 910-acre Main Campus includes the already developed 104-acre Phase 1.1 Campus, and at full development would consist of an approximately 157-acre academic core, 23 acres of student support services, 250 acres of student housing, 90 acres of faculty housing, 56 acres of campus support, 39 acres of on-campus research, 148 acres of athletics and recreation, and 147 acres of parking. The 340-acre Campus Land Reserve would remain undeveloped and available to meet potential future needs of the campus. The 750-acre Campus Natural Reserve would remain in an undeveloped state, and would be dedicated to conservation and limited controlled research and educational activities.

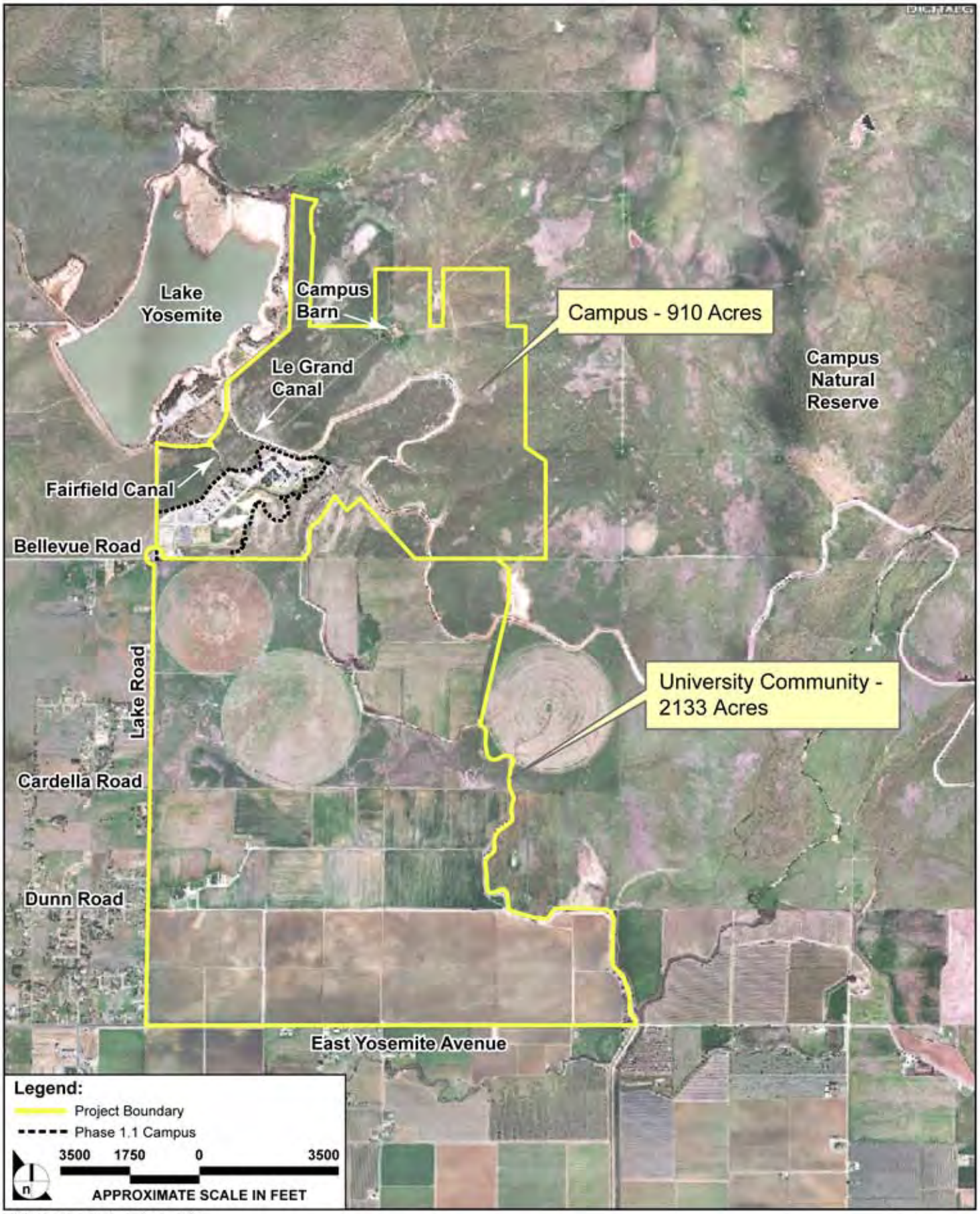
The approximately 2,133-acre University Community would be located directly south of the campus, and would include development of a mixed-use Town Center comprised of retail, office, civic, cultural, and residential uses. The University Community would also consist of residential villages with a mix of housing types and varying densities, a research park, community services and local retail, schools, recreation and park space, and a system of open space amenities. The University Community would accommodate the growth that would be generated by the Campus, and therefore would include 11,616 housing units and house about 30,780 persons, the same as under the Proposed Action. The University Community would provide about 2 million square feet of non-residential building space, which is less than the non-residential space under the Proposed Action.

The Campus and the University Community under this alternative are not located within a 100-year flood hazard area as mapped by FEMA.

3.6.5 Alternative 5 – No Action Alternative

From the USACE's perspective, the No Action Alternative would result from denying the permit that has been requested by the University and UCLC to fill waters of the United States including wetlands to build the Campus and Community North. From the perspective of the applicants, the No Action Alternative would mean that the full buildout of the Campus and Community North would not occur at the requested location, except for the 104-acre Phase 1.1 Campus that opened in the Fall of 2005 and has already been largely developed. The denial of the Section 404 permit would mean that the Campus and Community North could develop so long as filling of wetlands or any other adverse changes to the hydrology of the wetlands are avoided. Given the distribution and density of wetlands, very limited areas could be developed on the campus site under this alternative. Approximately 815 acres are needed to build the facilities needed for a campus for up to 25,000 FTE students. With the avoidance of wetland areas, the acreage of the campus site would be substantially reduced which would make the campus infeasible. Because the density of wetlands on the Community North site is lower as compared to the campus site, more of Community North site could potentially be developed. However, in the event that the Campus does not develop at the proposed site, neither Community North nor Community South would be developed in support of the campus. Therefore, under this alternative the Campus and the University Community developments would be abandoned altogether or built in a manner that does not fully meet the project purpose. In any case, the San Joaquin Valley would continue to be underserved by the University of California system until an acceptable solution could be implemented.

Under this alternative, the Phase 1.1 Campus development would remain on the site; however because no further development of the campus would occur, UC Merced would not be established as a new campus beyond the 104-acre existing Phase 1.1 Campus. Also under this alternative, Community South could still proceed with development that would be unrelated to the Campus based on development plans proposed by the owners of that land, if a permit from the USACE is not required. Because Community South is part of the SUDP and is zoned for Multi-Use Urban Development, land development of any portion of the Community South could occur under the No Action alternative. Although it is acknowledged that any such development would unlikely, go forward as it would be found to be inconsistent with the UCP. However to be conservative, the analysis in this EIS/EIR assume that Community South would be developed under the No Action Alternative. The nature and scale of development that could be proposed by the landowners cannot be predicted. However, for purposes of this EIS/EIR, it is assumed that the LWH Farms, LLC, property would be developed similar to other ongoing development in eastern Merced County, and would consist largely of residential development with some limited commercial uses. The amount of development that was included for this portion of the University Community (Villages 3 and 4) in the University Community Plan is used in this Draft EIS/EIR to evaluate the environmental impacts from the Community South portion of the No Action Alternative.



SOURCE: UC Merced – September 2008

FIGURE **3.0-3**

Alternative 4 - 2002 Proposed Project Alternative Location Map

3.6.6 Alternative 6 – No Build Alternative

Unlike the No Action Alternative, the No Build Alternative assumes no construction at all would occur on the project site, regardless of whether the USACE issues a permit for the fill of waters of the United States. Under this alternative, the project site would not be developed with the Campus or its contiguous associated Community. The Phase 1.1 Campus development would remain on the site. However because no further development of the campus would occur, UC Merced would not be established as a new campus beyond the 104-acre existing Phase 1.1 Campus. In the short term, the remainder of the campus and the community site would likely remain rural in character with continued agricultural and pasture operations dominating the land uses. On-site wetlands would remain mostly intact with continued disturbance and some degradation from ranching and other agricultural activities. In the long term however, the project site could be subject to some form of development in the future as the City of Merced and the San Joaquin Valley continue to increase in population. The site may receive pressure to become more urbanized, as other properties in the area are being subdivided and developed for residential and commercial uses.

3.7 COMPARISON OF ALTERNATIVES

The environmental impacts of each of these alternatives described above are evaluated in detail in **Section 4.0** of this Draft EIS/EIR. **Table 3.0-3** presents the environmental impacts of each alternative to allow the decision makers, agencies and the public to compare and contrast these alternatives and to weigh their relative merits and demerits.

3.8 ENVIRONMENTALLY SUPERIOR ALTERNATIVE/ ENVIRONMENTALLY PREFERABLE ALTERNATIVE

Table 3.0-3 presents a summary comparison of the alternatives evaluated in detail. The table is designed to allow a reader to compare the impacts of the Proposed Project with that of the alternatives, so that the reader can determine whether the alternative would result in similar, greater, or lesser environmental impacts than the proposed project. Section 15126.6 of the *State CEQA Guidelines* requires that "if the environmentally superior alternative is the 'No Project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." This section presents the analysis used in determining whether an environmentally superior alternative exists. Section 1505.2(b) of the Council on Environmental Quality's NEPA regulations requires that the lead federal agency include in its Record of Decision "the alternative or alternatives to be environmentally preferable" and this section will assist the USACE in making this determination.

As the table shows, the No Build Alternative (Alternative 6) would avoid all of the significant environmental impacts of the proposed project. This alternative would therefore be the environmentally superior alternative, as well as the environmentally preferable alternative. It would not, however, meet any of the proposed project's objectives.

However, because the No Build Alternative (i.e., a "No Project Alternative") is the environmentally superior alternative, CEQA requires identification of another alternative as environmentally superior. Of the other alternatives evaluated in this EIS/EIR, the No Action Alternative (Alternative 5) would result in no impacts to wetland areas or functions and reduced impacts on important farmland, wildlife habitat, visual impacts, traffic, and all other resources because only a portion of the project site would be developed. Therefore, it would be the environmentally superior alternative. However, similar to the No Build alternative, this alternative would not meet most of the objectives of the proposed project and would not allow for the construction of the Proposed Action

Of the remaining alternatives evaluated in this Draft EIS/EIR, each has varying levels of impacts on different environmental resources and none can be determined as being superior to the others for CEQA purposes. The 2002 Proposed Project Alternative (Alternative 4) would have greater impacts than the Proposed Action with respect to the impacts to wetland areas or functions, impacts on vernal pool species critical habitat, impacts on Swainson's hawk and special-status avian species' suitable foraging habitat, and impacts to San Joaquin kit fox suitable residence and dispersal habitat.

The Yosemite Avenue Alternative (Alternative 2) would result in fewer impacts to wetland areas or functions, and fewer impacts on Swainson's hawk and special-status avian species' suitable foraging habitat, but it would result in greater impacts related to the conversion of Important Farmland and impacts to San Joaquin kit fox suitable residence and dispersal habitat. This alternative would also result in impacts related to conflicts with the 2000 Merced County General Plan. Moreover, this alternative would expose people or structures to a risk of loss, injury, or death involving flooding, including flooding as a failure of a levee or dam.

The Bellevue Ranch Alternative (Alternative 3) would result in fewer impacts to wetland areas or functions, impacts related to the conversion of Important Farmland, and fewer impacts on Swainson's hawk and special-status avian species' suitable foraging habitat, and fewer impacts to San Joaquin kit fox suitable residence and dispersal habitat. It would also result in fewer impacts on scenic vistas. However, like the Yosemite Avenue Alternative, this alternative would expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a failure of a levee or dam. In comparison to the Proposed Action, this alternative could also result in an impact related to physically dividing a community and displacing existing and planned uses. Finally, in comparison to the Proposed

Action, this alternative would result in greater traffic impacts, as traffic added by this alternative would exceed the thresholds along four roadway segments.

3.9 LEAST ENVIRONMENTALLY DAMAGING PRACTICABLE ALTERNATIVE

As stated previously, the USACE is required to analyze alternatives, in compliance with EPA's Section 404(b)(1) Guidelines (40 CFR Part 230). This Draft EIS/EIR and other information in the administrative record, including the *2004 Alternatives* Analysis and the *Supplemental Alternatives* Analysis prepared by the University will be used to evaluate compliance with the Section 404(b)(1) requirements, i.e., determination of the least environmentally damaging practicable alternative (LEDPA).

Table 3.0-3
Summary Comparison of Alternatives (NEPA/CEQA)

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
AES-1: Affect scenic vistas.	Significant (SU following mitigation)	Significant (SU following mitigation)	Less than Significant	Significant (SU following mitigation)	Significant (SU following mitigation)	No Impact
AES-2: Adversely affect scenic resources.	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
AES-3: Substantially alter the visual quality and character of the site and its surroundings.	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	No Impact
AES-4: Create a new source of nighttime light and glare in the vicinity.	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	No Impact
AG-1: Result in the conversion of Important Farmland, including Prime Farmland, Farmland of Statewide Importance and Unique Farmland.	Significant Prime – 609 acres Statewide – 109 acres Unique – 434 acres Total – 1,152 acres	Significant Prime – 1,227 acres Statewide – 110 acres Unique – 545 acres Total – 1,882 acres	Significant Prime – 230 acres Statewide – 195 acres Unique –587 acres Total – 1,012 acres	Significant Prime – 619 acres Statewide – 110 acres Unique – 435 acres Total – 1,164 acres	Significant Prime – 589 acres Unique – 429 acres Statewide – 55 acres Total – 1,073 acres (SU following mitigation)	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
AG-2: Expose residents to agricultural nuisance, substantially conflict with existing general plan policies or zoning for agricultural use, or involve other changes that could result in the conversion of Important Farmland to non-agricultural uses.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
AQ-1: Result in construction emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation.	Significant Exceeds Thresholds for ROG and NOx (SU following mitigation)	Significant Exceeds Thresholds for ROG and NOx (SU following mitigation)	Significant Exceeds Thresholds for ROG and NOx (SU following mitigation)	Significant Exceeds Thresholds for ROG and NOx (SU following mitigation)	Less than Significant (SU following mitigation)	No Impact
AQ-2: Result in operational emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation.	Significant Exceeds Thresholds for ROG, NOx, and PM (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM (SU following mitigation)	Less than Significant Exceeds Thresholds for ROG, NOx, and PM (SU following mitigation)	No Impact
AQ-3: Expose sensitive receptors to substantial pollutant concentrations of carbon monoxide.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Significant Exceeds thresholds for ROG and NOx.

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
AQ-4: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).	Significant Exceeds Thresholds for ROG, NOx, and PM10 (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM10 (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM10 (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM10 (SU following mitigation)	Significant Exceeds Thresholds for ROG, NOx, and PM10 (SU following mitigation)	Less than Significant
AQ-5: Conflict with or obstruct implementation of the applicable air quality plan.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Significant
AQ-6: Create objectionable odors affecting a substantial number of people.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
BIO-1: Result in a net loss of wetland area or functions through direct removal, filling, hydrological interruption, or other means because of the environmental commitments included in the project.	Less than Significant* 85 acres Direct Loss	Less than Significant* 29 acres Direct Loss	Less than Significant* 25 acres Direct Loss	Significant 127 acres Direct Loss	No Impact (United States Army Corps of Engineers would deny 404 permit)	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
BIO-2: Result in adverse impacts on special-status plant species.	Less than Significant* 9 vernal pools and 21 stands	Less than Significant* 3 vernal pools and 7 stands	Less than Significant* None	Less than Significant* 18 vernal pools and 39 stands	Less than Significant None	No Impact None
BIO-3: Result in a substantial adverse impact on vernal pool species critical habitat.	Less than Significant 0 acres	Less than Significant 0 acres	Less than Significant 0 acres	Significant Loss of 38 acres of critical habitat	Less than Significant 0 acres	No Impact
BIO-4: Result in a substantial adverse impact on special-status invertebrate species due to the loss of vernal pool ecosystems.	Less than Significant* <57 acres direct loss	Less than Significant* 13 acres direct loss	Less than Significant* 6 acres direct loss	Less than Significant* 120 acres direct loss	Less than Significant 0 acres direct loss	No Impact
BIO-5: Result in a substantial adverse impact on special-status amphibians dependent on vernal pool ecosystems, annual grasslands, and stock ponds due to the loss of these habitats.	Less than Significant* 1,648 acres direct loss	Less than Significant* 812 acres direct loss	Less than Significant* N/A	Less than Significant* 1,988 acres direct loss	Less than Significant 0 acres direct loss	No Impact
BIO-6: Result in a substantial adverse impact on western pond turtle from the loss or disturbance of ponds and seasonal freshwater marsh communities.	Less than Significant* 44.02 acres direct loss	Less than Significant* 30.34 acres direct loss	Less than Significant* 7.16 acres direct loss	Less than Significant* 44.7 acres direct loss	Less than Significant 4.64 acres direct loss	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
BIO-7: Result in a substantial adverse impact on Swainson's hawk from the loss of suitable foraging habitat.	Less than Significant* Loss of 2,614 acres of suitable foraging habitat	Less than Significant* Loss of 1,563 acres of suitable foraging habitat	Less than Significant* Loss of 2,268 acres of suitable foraging habitat	Less than Significant* Loss of 2,854 acres of suitable foraging habitat	Less than Significant 0 acres direct loss	No Impact
BIO-8: Result in a substantial adverse impact on special-status avian species from the loss of foraging habitat.	Less than Significant* Loss of 2,614 acres of suitable foraging habitat	Less than Significant* Loss of 1,563 acres of suitable foraging habitat	Less than Significant* Loss of 2,2268 acres of suitable foraging habitat	Less than Significant* Loss of 2,854 acres of suitable foraging habitat	Less than Significant	No Impact
BIO-9: Result in potentially significant adverse impacts on nesting special-status bird species and non-special-status migratory birds and raptors.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
BIO-10: Result in substantial adverse impacts to San Joaquin kit fox due to the loss of suitable residence and dispersal habitat.	Less than Significant* Direct impact to 2,444 acres	Less than Significant* Direct impact to 2,477 acres	Less than Significant* Direct impact to 2,376 acres	Less than Significant* Direct impact to 2,741 acres	Less than Significant Direct impact to 1,030 acres	No Impact
BIO-11: Diversions from the Merced River to recharge the groundwater basin would not adversely affect fish species.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
CUL-1: Damage or destroy significant historic resources located within the project footprint.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
CUL-2: Cause damage to unidentified or buried cultural resources.	Potentially Significant (LTS following mitigation)	Less than Significant	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
CUL-3: Cause damage to previously unidentified human remains.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
CUL-4: Have the potential to disturb or destroy paleontological resources.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
GEO-1: Expose people or structures to increased risk from fault rupture.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
GEO-2: Expose people or structures to increased risk of structural damage and injury from ground shaking and related hazards.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
GEO-3: Expose people or structures to increased risk of structural damage and injury from slope failure.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
GEO-4: Result in substantial soil erosion or the loss of topsoil from grading activities.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
GEO-5: Create substantial risks to life or property from development on expansive soils.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
GEO-6: Involve construction on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems.	No Impact	No Impact	No Impact	No Impact	Less than Significant	No Impact
HAZ-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HAZ-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HAZ-3: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
HAZ-4: Be located on a site that contains hazardous materials and, could create a significant hazard to the public or the environment.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
HAZ-5: Be located within an airport land use plan or within 2 miles of a public airport or public use airport.	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
HAZ-6: Result in a safety hazard for people residing or working in the project area due to the project's proximity of a private airstrip.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HAZ-7: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HAZ-8: Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
HYD-1: Implementation would not result in discharges that would cause the City's Wastewater Treatment Plant to violate water quality standards or waste discharge requirements.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HYD-2: Construction-related earth disturbing activities would result in soil erosion and sedimentation, but water quality would not be adversely affected.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HYD-3: Dewatering activities performed during construction would not result in the discharge of sediments or pollutants into receiving waters, potentially affecting water quality.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HYD-4: Implementation would not substantially deplete groundwater supplies such that the production of existing nearby wells would drop to levels that would not support the uses.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
HYD-5: The new impervious surfaces would not substantially interfere with groundwater recharge such that there would be a net deficit in aquifer volume.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HYD-6: Increase the amount of storm runoff and alter existing drainage patterns, but would not increase the risk of flooding downstream and flooding to Cottonwood Creek and Fairfield Canal.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
HYD-7: Substantially increase the amount of sediment and urban pollutants in the site runoff and therefore would not result in water quality degradation.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
HYD-8: Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.	Less than Significant	Significant (SU following mitigation)	Significant (SU following mitigation)	Less than Significant	Less than Significant	No Impact
LU-1: Physically divide a community.	No Impact	No Impact	Less than Significant	No Impact	No Impact	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
LU-2: Conflict with the 2000 Merced County General Plan.	Less than Significant	Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
LU-3: Conflict with the City of Merced General Plan.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
NOI-1: Result in increased vehicular traffic on the regional road network, which would increase ambient traffic noise levels at existing off-site noise-sensitive uses.	Significant >60 dbA on Cardella Road and Kibby Road (SU following mitigation)	Significant >60 dbA on Cardella Road and Kibby Road (SU following mitigation)	Significant and Unavoidable >60 dbA on Bellevue Road (SU following mitigation)	Significant and Unavoidable >60 dbA on Yosemite Avenue (SU following mitigation)	Significant and Unavoidable >60 dbA on Kibby Road (SU following mitigation)	No Impact
NOI-2: Expose existing off-site and future on-site noise-sensitive receptors to elevated noise levels.	Potentially Significant (SU following mitigation)	Potentially Significant (SU following mitigation)	Potentially Significant (SU following mitigation)	Potentially Significant (SU following mitigation)	No Impact	No Impact
NOI-3: Expose existing off-site and future on-site noise-sensitive receptors to elevated noise levels.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
NOI-4: Expose nearby receptors to perceptible levels of groundborne vibration.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
NOI-5: expose new on-site noise-sensitive land uses, such as Campus and University Community residences, to noise levels exceeding noise thresholds.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
PUB-1: Increase demand for law enforcement services and require the construction of new facilities.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
PUB-2: Increase demand for fire protection services and require the construction of a new facility.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
PUB-3: Increase enrollment in local public schools, which would require construction of new facilities.	Less than Significant 8,251 school-age children	Less than Significant 8,251 school-age children	Less than Significant 8,251 school-age children	Less than Significant 8,251 school-age children	Less than Significant fewer school-age children than under Alt. 1	No Impact
PUB-4: Increase demand for public libraries in Merced County.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
PUB-5: Result in an increased demand for parks and recreational facilities, but would not require the construction of new recreational facilities off site.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
PUB-6: Increase the use of Lake Yosemite Regional Park, which could accelerate physical deterioration of park facilities.	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	Potentially Significant (LTS following mitigation)	No Impact
SOC-1: Directly induce substantial population growth in Merced City and Merced County.	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Significant (SU following mitigation)	Less than Significant	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
SOC-2: Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
SOC-3: Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
SOC-4: Result in disproportionate, adverse environmental effects on minority or low-income populations.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
TRANS-1: Contribute 1 percent or more to the traffic projected for 18 roadway segments, planned to be widened in the future, cause the LOS of two study intersections to deteriorate to unacceptable levels, and cause significant increase in delay at one intersection.	Significant	Significant	Significant	Significant	Significant	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
TRANS-2: Place additional demand on local and regional transit service being deployed to connect the Campus and Community with major destinations with Merced County.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
TRANS-3: Generate pedestrian and bicycle travel in higher concentrations and amounts than found in many other parts of the County.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
TRANS-4: Generate off-site "spillover" parking that would affect nearby areas.	Less that Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
TRANS-5: The Campus and University Community road network system would be adequately sized and designed to facilitate emergency access vehicles.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
UTILS-1:Generate demand for potable water for indoor and outdoor uses that would increase water drawn from the aquifer.	Less than Significant Total demand: 7,166 afy	Less than Significant Total demand: 7,166 afy	Less than Significant Total demand: 7,166 afy	Less than Significant Total demand: 7,166 afy	Less than Significant Total demand: 2,852 afy	No Impact

Impact	Proposed Action	Yosemite Avenue	Bellevue Ranch	2002 Proposed Project	No Action	No Build
UTILS-2: Generate wastewater flows that would not require construction of new conveyance or treatment facilities.	Less than Significant Total wastewater flows: 3.09 mgd	Less than Significant Total wastewater flows: 3.09 mgd	Less than Significant Total wastewater flows: 3.09 mgd	Less than Significant Total wastewater flows: 3.09 mgd	Less than Significant Total wastewater flows: 1.04 mgd	No Impact
UTILS-3: Generate solid waste that would not require the expansion of the regional landfill.	Less than Significant Total solid waste: 55,145 tons per year	Less than Significant Total solid waste: 55,145 tons per year	Less than Significant Total solid waste: 55,145 tons per year	Less than Significant Total solid waste: 55,145 tons per year	Less than Significant Total solid waste: Less than 55,145 tons per year	No Impact
UTILS-4: Require on- and off-site improvements, including an extension of electric transmission lines.	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	No Impact
GCC-1: Impede or conflict with the emissions reduction targets and strategies prescribed in or developed to implement AB 32.	Significant (SU following mitigation)	Significant Same as Proposed Action Impact (SU following mitigation)	Significant Same as Proposed Action Impact (SU following mitigation)	Significant Greater than Proposed Action Impact (SU following mitigation)	Significant Less than Proposed Action Impact (SU following mitigation)	Less than Significant

Table reports impact conclusions pre-mitigation; post-mitigation impact conclusions are reported in parentheses.
LTS – Less than Significant; SU – Significant and Unavoidable
** Less than significant due to environmental commitments included in the Proposed Action/alternative.*

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.0.1 INTRODUCTION

This section presents an analysis of each resource topic that was identified through preliminary environmental analysis and the public scoping process as likely to be affected by the Proposed Action. Each section describes the environmental setting as it relates to that specific resource topic; the effects that could result from implementation of the Proposed Action or its alternatives; and mitigation measures that would avoid, reduce, or compensate for the significant adverse effects of the Proposed Action or an alternative. The subsections below summarize the approach to the impact analysis, including key assumptions and data used in the analysis, to assist the reader in better understanding the analyses contained in this Draft Environmental Impact Statement/Environmental Impact Report (Draft EIS/EIR).

4.0.2 SCOPE OF THE EIS/EIR

Although Council on Environmental Quality (CEQ) regulations (40 CFR 1508.27) provide guidance as to the requirement to evaluate impacts in an EIS/EIR, CEQ guidance generally does not identify the specific categories of impacts that must be evaluated. The National Environmental Policy Act (NEPA) generally refers to the following as issues of concern: public health and safety; historical and cultural resources; parklands; prime farmlands; wetlands; wild and scenic rivers; ecologically critical areas; Endangered or Threatened species or their habitat. The *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines*, on the other hand, include the CEQA Environmental Checklist (Appendix G), which is used by most lead agencies in the state to identify the specific categories of impacts that are evaluated and disclosed in an EIR.

Based on the input received during the EIR scoping process, as described in **Section 1.0, Introduction**, this EIS/EIR addresses the following resource topics or categories of impact in detail:

- Aesthetics
- Agricultural Resources (including Prime Farmlands
- Air Quality
- Biological Resources (including wetlands, ecologically critical areas, endangered and threatened species)
- Cultural Resources (historical and archaeological resources)
- Geology and Soils
- Hazardous Materials and Public Safety
- Hydrology and Water Quality
- Land Use and Planning

- Noise
- Socioeconomics (including Environmental Justice)
- Public Services and Recreation (including Parklands)
- Transportation and Traffic
- Utilities and Service Systems
- Other Resources (mineral resources, public health and safety, navigation, and wild and scenic rivers)

4.0.3 RELATIONSHIP TO PREVIOUS ENVIRONMENTAL DOCUMENTS

No NEPA documents have been previously approved for the Proposed Action. On the other hand, two EIRs pursuant to CEQA have been previously prepared and certified for the area encompassed by the Proposed Action. As noted in **Section 1.0, Introduction**, in 2002 the University certified a Program EIR for the 2002 LRDP and in 2004 the County certified an EIR for the University Community Plan (UCP). Although the Campus project is the same as before in terms of intent and purpose, the University is proposing substantial changes to the location and footprint of the campus as well as to the LRDP that will guide the development of the Campus in the long term. Therefore, the current EIR is a subsequent EIR for the Campus project as defined by CEQA. As a subsequent EIR, it incorporates all of the analysis contained in the UC Merced 2002 LRDP EIR and the 2004 UCP EIR, and updates the previous analysis as necessary in light of the changed locations of both the Campus and the University Community, as well as the changed land use plans for the Campus and Community North. It also evaluates any impacts stemming from substantial change in the circumstances under which the proposed project would now be undertaken or from new information of substantial importance that has become available since the certification of the previous EIRs.

4.0.4 DEFINITION OF BASELINE

Both NEPA and CEQA require a clear identification of the baseline against which environmental impacts of the Proposed Action must be evaluated. Under NEPA, baseline conditions include the full range of construction and operational activities the applicant could implement, and is likely to implement, absent permits from the federal lead agency. Therefore, under NEPA, impacts are evaluated against the No Action alternative, and the NEPA baseline does not necessarily correspond to conditions that exist when the EIS is prepared. Unlike the CEQA baseline, which is defined by conditions that exist at a point in time (see below), the NEPA baseline is not necessarily equivalent to the no-development scenario.

Section 15125 of the *State CEQA Guidelines*, on the other hand, requires EIRs to include a description of the physical environmental conditions in the area of a project that exist at the time that the Notice of Preparation (NOP) is circulated. These environmental conditions normally constitute the baseline physical conditions relative to which the CEQA lead agency evaluates the change in conditions that

would result from project implementation. The NOP for this Draft EIR was issued on March 31, 2008. Therefore, environmental conditions as of March 2008 represent the baseline for CEQA purposes. To evaluate the footprint impacts of the Proposed Action (e.g., effects on agricultural lands or biological resources), the conditions in 2008 are considered to be the baseline. Buildout of the Campus and the University Community is then added to existing conditions in order to determine whether project implementation would substantially remove or impact the resources, thereby resulting in a significant impact on the environment. Because the Proposed Action consists of two development programs that will be implemented over a long period of time and buildout would not occur for several decades, future No Action conditions are used as baseline for some resource topics in order to evaluate the impact. For instance, even though the existing transportation conditions are described in the transportation and traffic section, the transportation effects of the Proposed Action are evaluated relative to conditions that would exist in 2030 without the Proposed Action. Similarly, 2030 conditions are also used to evaluate the Proposed Action's effects on air quality and noise.

4.0.5 HORIZON YEAR

As stated in **Section 2.0, Project Description**, the UC Merced Campus has been planned to ultimately grow to accommodate an enrollment of 25,000 full-time equivalent (FTE) students, and the University Community has been planned to serve a campus of this size. At this time, the University has reliable yearly projections of enrollment growth through 2020–21. While it is anticipated that enrollment levels will continue to increase, it is uncertain as to the year by which the Campus will attain an enrollment level of 25,000 FTE students because a number of demographic and economic factors affect actual enrollment. For purposes of the impact analysis, this EIS/EIR conservatively assumes that the Campus would attain an enrollment level of 25,000 FTE students by 2030, and that both the Campus and the University Community would be fully developed by 2030. This year was selected for analysis because this is the farthest future year for which regional traffic forecasts are available from the Merced County Council of Government regional travel demand model. As a result of this assumption, the estimated impacts are conservative and likely overstate the actual impacts that would occur in 2030.

4.0.6 TREATMENT OF PHASE 1.1 CAMPUS

As discussed in **Section 2.0, Project Description**, following the certification of the UC Merced 2002 LRDP EIR, which included a project-level evaluation of the environmental impacts associated with the development of the first phase of the campus, the University proceeded with the development of the Phase 1.1 Campus on a 104-acre portion of a 197-acre former golf course. Even though the vast majority of the Phase 1.1 Campus is already developed and UC Merced has attained a current enrollment level of about 2,700 FTE students, this Draft EIS/EIR conservatively presents the full impacts of a 25,000 FTE

campus. For instance, in evaluating traffic impacts, the existing vehicle trips to the Campus associated with the Phase 1.1 Campus are not considered a part of existing traffic but are included in the new trips that would be generated by the Proposed Action. This approach was taken in order to disclose the impacts of the entire Campus and the related University Community.

4.0.7 FORMAT OF RESOURCE TOPIC SECTIONS

Each resource topic considered in this section of the EIS/EIR is addressed under seven primary subsections: **Introduction**; **Affected Environment**; **Applicable Laws, Regulations, Plans and Policies**; **Significance Criteria for Evaluating Effects**; **Methodology for Evaluating Effects**; **Environmental Consequences of Proposed Action and Alternatives**; and **References**. An overview of the information included in these sections is provided below.

4.0.7.1 Introduction

The introduction section describes the topic to be analyzed and the contents of the analysis. It also provides the sources used to evaluate the potential impacts of the project, and lists issues and concerns relative to the resource topic identified by agencies and the public during the Draft EIS/EIR scoping process.

4.0.7.2 Affected Environment

This section describes the existing conditions in the area of the Proposed Action and the build alternatives for each resource topic. The section provides a description of the applicable physical setting of the project area and its surroundings (e.g., existing land uses, existing soil conditions, existing traffic conditions). Because the proposed Long-Range Development Plan (LRDP) and the UCP are long-term development plans for the Campus and the University Community—and the full development of the Campus or the University Community would not occur until 2030 (or even later) for certain resource topics, such as traffic,—future No Project conditions are also projected in order to accurately evaluate the impacts of the proposed LRDP and UCP.

4.0.7.3 Applicable Laws, Regulations, Plans, and Policies

This section presents relevant federal, state, and local laws, regulations, plans, and policies, including policies contained in the UC Merced 2009 LRDP and in the UCP. Only those laws, regulations, and policies that are pertinent to the impact analysis are included. With respect to 2009 LRDP or UCP policies, because the policies would be binding on all future Campus projects or University Community projects,

they are considered a part of the Proposed Action and the significance of the impact is evaluated after considering the mitigating effect of the policies.

4.0.7.4 Significance Criteria for Evaluating Effects

Each resource topic included in this section identifies significance criteria used to evaluate impacts. Although CEQ regulations (40 CFR 1508.27) provide guidance as to the requirement to evaluate impacts in an EIS, CEQ guidance generally does not specify the significance criteria to be used to evaluate the significance of the specific impacts of the proposed action. Under NEPA, impacts must be identified based on the potential environmental consequences of the proposed action. Further, "significantly" as used in NEPA, requires considerations of both context and intensity. "Context" means that the significance must be analyzed in several contexts, such as the human environment, affected region, affected interests, and the local setting. Additionally, "intensity" refers to the severity of the impact. Impacts must be evaluated that may be both beneficial and adverse.

For purposes of this analysis, this Draft EIS/EIR conservatively uses significance criteria derived from Appendix G of the *State CEQA Guidelines* and the CEQ guidelines regarding the determination of environmental consequences to identify impacts and underlying statutory authority to the extent applicable.

In accordance with NEPA, the EIS also must provide an evaluation of potential effects on the human environment, which includes an analysis of the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14). For potential impacts, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact.

4.0.7.5 Methodology for Evaluating Effects

This section summarizes the methodology used to evaluate effects. Impacts are evaluated quantitatively where possible and qualitatively where quantification is not feasible. Depending on the resource topic, as noted above, some impacts are evaluated relative to No Action conditions that would exist if the permits were denied by the US Army Corps of Engineers (USACE), whereas others are evaluated relative to existing conditions.

4.0.7.6 Environmental Consequences of Proposed Action and Alternatives

This section presents the environmental effects from the construction and operation of the Proposed Action and its alternatives, using the CEQA checklist to identify each impact. Impacts from the full development of the Campus are presented first, followed by the impacts from the full development of the

University Community. A conclusion that presents the combined impacts of the Campus and the University Community is presented at the end of the discussion.

All impacts are numbered (for instance, Impact AES-1 refers to the first impact under **Aesthetics**) and shown in bold type. For each impact, a summary statement of the impact is presented along with a conclusion with respect to the impact's significance before mitigation and its significance after mitigation (in ***bold italics***). Mitigation measures are numbered to correspond to the impact. Impacts and mitigation measures are numbered consecutively within each topic. Following the presentation of the impacts of the Proposed Action, impacts of each of the build and No Build alternatives are presented.

As described in **Section 2.0, Project Description**, the University and the County have already committed to numerous conservation measures and other environmental commitments to reduce the Proposed Action's impacts on biological resources. In the analysis that follows, the significance of each impact from the development of the Campus and Community North is determined after taking environmental commitments made by the University and/or the County into account. Similarly, the significance of the impacts of the development of the entire University Community is determined after taking the mitigating effects of the UCP policies into account.

4.0.7.7 Summary Comparison of Alternatives

This section presents a comparison of all the alternatives in text or table as appropriate.

4.0.7.8 References

This section lists the references used to prepare the environmental setting and impact analysis for each section of the Draft EIS/EIR.

4.0.8 LEVEL OF SIGNIFICANCE TERMINOLOGY

The following terms, as defined below, are used to describe the levels of significance of adverse impacts presented in this Draft EIS/EIR.

- **Significant and Unavoidable Impact.** An impact that exceeds the defined standards of significance and cannot be avoided or reduced to a less than significant level through implementation of feasible mitigation measures.
- **Significant Impact.** An impact that exceeds the defined standards of significance and that can be avoided or reduced to a less than significant level through implementation of feasible mitigation measures.

- **Potentially Significant Impact.** A significant impact that may ultimately be determined to be less than significant; the level of significance may be reduced through implementation of policies or guidelines (that are not required by statute or ordinance), or through further definition of the project detail in the future. Potentially significant impacts may also be impacts for which there is not enough information to draw a firm conclusion; however, for the purpose of this EIR, they are considered significant. Such impacts are equivalent to Significant Impacts and require the identification of feasible mitigation measures.

- **Less Than Significant Impact.** Impacts that are adverse but that do not exceed the specified standards of significance.

- **No Impact.** There would be no impact from project implementation.

4.0.9 DEMOGRAPHIC DATA AND ASSUMPTIONS USED IN IMPACT ANALYSIS

The analysis of impacts in several of the resource topics that follow is based the following data and assumptions with respect to Campus and University Community population.

4.0.9.1 Total Campus Population

Table 4.0-1, UC Merced Campus Population Projections, presents the projected increases in Campus enrollment from the school year 2007–08 through full development under the 2009 LRDP. The Campus is projected to reach an enrollment level of about 10,330 students in 2019–20 at the end of the second phase of campus development. The Campus would ultimately serve 25,000 FTE students. Faculty and staff growth would accompany the growth in enrollment. The faculty at UC Merced is projected to increase from approximately 136 in 2007 to 533 by 2019–20 (end of Phase 2). At 25,000 FTE enrollment level, the Campus would have a faculty of approximately 1,420, a staff of 4,828, and 312 postdoctoral researchers for a total of 6,560 FTE employees.

In addition to students and University employees, other persons would be present on the Campus on a daily basis during working hours. These include visitors, food service employees, and construction workers. Based on estimates of these populations from other UC campuses, such as UC Davis and UC Santa Cruz, it is estimated that at full campus development, on average, approximately 625 visitors, other non-University employees, and construction workers would be present on the campus each day.

Table 4.0-1
UC Merced Campus Population Projections

Population	Years						
	2007–08 (Estimated)	2008–09	2009–10	2014–15	2019–20	2020–21	Full Development
Undergraduate	1,885	2,573	3,183	5,770	8,288	8,815	22,250
Graduate	124	163	235	860	2,042	2,249	2,750
Subtotal	*2,009*	*2,736*	*3,418*	*6,630*	*10,330*	*11,094*	*25,000*
Faculty	136	146	183	350	533	573	1,420
Staff	605	644	804	1,541	2,344	2,520	4,828
Postdoctoral Researchers	30	32	40	77	117	126	312
Subtotal	*771*	*822*	*1,027*	*1,968*	*2,994*	*3,219*	*6,560*
Other Daily Population[1]	50	70	85	165	250	270	625
Total	**2,830**	**3,628**	**4,530**	**8,683**	**13,574**	**14,583**	**32,185**

1. Includes visitors, food service employees, and construction workers that may be present on the Campus on a daily basis. Numbers estimated assuming this population is about 2.5% of the total enrollment. This population ranges from 2–3% of the campus student population at UC Davis and UC Santa Cruz respectively.

4.0.9.2 On-Campus Residential Population

Based on experience at other UC campuses, living on campus is very important to the educational experience. The 2009 LRDP states that the campus is designed to provide on-campus housing to 50 percent of the students at full development. If this goal is achieved, 12,500 students would reside on the campus at full development. At this time, on-campus housing for students with families is not anticipated to be developed until after 2019–20. When this housing is developed, it is expected to constitute about 10 percent of the total student beds on the campus. Dependents are expected to accompany these students with families. Assuming an average household size[1] of 2.5 for students with families, at full development a total of 1,875 dependents would also reside on the campus. **Table 4.0-2, On-Campus Population Estimates**, presents the total number of students and dependents expected to live on the campus.

1 This Draft EIS/EIR uses a household size of 2.5 persons for all student families. This is an average based on surveys of family student housing at UC Davis and UC Santa Cruz. Student family sizes ranged from an average of 2.37 persons at UC Davis to an average of 2.6 persons at UC Santa Cruz.

Table 4.0-2
On-Campus Population Estimates

	Years						
	2007–08 (estimated)	**2008–09**	**2009–10**	**2014–15**	**2019–20**	**2020–21**	**Full Development**
Total Students	2,009	2,736	3,418	6,630	10,330	11,094	25,000
Students in On-Campus Housing							
Single Students	1,004	1,368	1,709	3,315	5,165	5,547	11,250
Student with families	0	0	0	0	0	0	1,250
Dependents of students with families	0	0	0	0	0	0	1,875
Total Persons Living on Campus	**1,004**	**1,368**	**1,709**	**3,315**	**5,165**	**5,547**	**14,375**

Note: Assumes 50% of student population residing on campus and an average student household size of 2.5 persons.

4.0.9.3 Off-Campus Residential Population

If the University's goal of housing 50 percent of students on campus is attained, the remainder of the 12,500 students would reside off campus at full development. The analysis in this Draft EIS/EIR assumes that about 10 percent of the total number of students would be existing residents of the area; the remaining would be non-local and would move into available housing in the area. All of the faculty and staff are expected to reside off campus. This analysis assumes that 30 percent of all faculty and staff would be already living in the Merced area at the time that they are hired by the University, and 70 percent would be non-local or "new" to the Merced area. This assumption is based on data from the UC Santa Cruz campus. An analysis of UC Santa Cruz hiring data for a period of 10 years revealed that between 31 and 34 percent of the persons hired by that campus were already living within Santa Cruz County at the time that they were hired.

Table 4.0-3, Off-Campus Population, presents the total off-campus population, assuming that the LRDP goal for on-campus student housing is achieved. A household size of 2.65 persons per household was used to estimate the dependents of the campus faculty, staff, and postdoctoral researchers.

Table 4.0-3
Off-Campus Population

Population	Number of Persons (2008–09)	Number of Persons (2014–15)	Number of Persons (Full Development)
Students in Off-Campus Housing			
Total Off-Campus Students	1,368	3,275	12,500
Commuters	274	655	2,500
Single Students	985	2,358	9,000
Students with families	109	262	1,000
Dependents	164	393	1,500
Subtotal	**1,258**	**3,013**	**11,500**
Faculty and Staff in Off-Campus Housing			
Total Faculty, Staff and Postdoctoral Researchers	822	1,968	6,560
Commuters	247	590	1,968
Non-local Faculty and Staff			
Dependents	949	2273	7,577
Subtotal	**1,524**	**3,651**	**12,169**
Total Off-Campus Population[1]	2,782	6,661	23,669
Total On-Campus Population[2]	1,368	3,315	14,375
Total Campus-Related Non-local Population[1]	4,150	9,979	38,044
Total Campus-Related Population[3]	4,671	11,224	42,512

[1] *Does not include commuters (students, staff, and faculty already living in the Merced area)*
[2] *Numbers from **Table 4.0-1, On-Campus Population Estimates***
[3] *Includes commuters (students, faculty, and staff already living in the Merced area)*

4.0.9.4 Off-Campus Demand for Housing

Table 4.0-4, Off-Campus Housing Demand at Full Development, presents the demand for housing associated with UC Merced students and employees living off campus. This demand is estimated based on the following assumptions with respect to the student population:

- At least 10 percent of the total students (2,500) would already be living in the Merced area (and, therefore, would not require new housing); about 12,500 students would live on campus, and 10,000 students would require off-campus housing.

- Of the 10,000 students requiring off-campus housing, 9,000 would be single students and there would be three single students living in each dwelling unit.
- There would be 1,000 students with families and each student family would require one dwelling unit.

With respect to faculty, staff, and postdoctoral researchers, the following assumptions were used to estimate the number of off-campus housing units that would be needed:

- Of the 6,560 faculty, staff, and postdoctoral researchers, about 30 percent would already be residing in the area at full development of the Campus and, therefore, would not require new housing.
- There would be 1.1 employees per dwelling unit.

Based on these assumptions, as shown in **Table 4.0-4** below, a total of 8,175 dwelling units would be required to house the non-local off-campus population.

Table 4.0-4
Off-Campus Housing Demand at Full Development

Population Group	Number of Non-Local Persons	Number of Dwelling Units
Single Students	9,000	3,000
Students with Families	1,000	1,000
Faculty and Staff	4,592	4,175
Total	**14,592**	**8,175**

4.0.9.5 Total University Community Population and Housing

The total number of housing units planned for Community North and Community South are presented in **Table 4.0-5, University Community Housing and Population**. At buildout, the proposed University Community would provide approximately 2,814 multifamily units and 8,802 single-family units for a total of 11,616 dwelling units. As shown above, approximately 8,175 of these dwelling units would be needed to house the Campus-related students, faculty, staff, and postdoctoral researchers. There would be approximately 3,441 dwelling units available in the University Community to house households associated with the retail, office, and research and development (R&D) jobs located within the University Community.

Table 4.0-5
University Community Housing and Population

Housing Type	CN No. of Dwelling Units	CN Population	CS No. of Dwelling Units	CS Population	Total Dwelling Units	Total Population
Single-family units	4,774	12,651	4,028	10,676	8,802	23,327
Multifamily units	1,020	2,703	1,794	4,754	2,814	7,457
Total	5,794	15,354	5,823	15,430	11,616	30,782

Note: Assumes 2.65 persons per dwelling unit
CN = Community North
CS = Community South

Assuming an average household size of 2.65 persons per dwelling unit, the proposed University Community is anticipated to accommodate a total population of approximately 30,782 persons.

4.0.9.6 University Community Employment

Employment that would be generated within the University Community was estimated based on the projected building space for each type of land use multiplied by an employment generation factor of 350 square feet (sq ft) per employee for office and R&D, and 400 sq ft per employee for retail. The number of jobs that would be generated within the University Community is presented in **Table 4.0-6, University Community Employee Population,** below.

Table 4.0-6
University Community Employee Population

	University Community			Square Feet per Employee	Employees
	Community North	Community South	Total Square Footage		
Retail	392,100	250,000	642,100	400	1,605
Office	606,300	140,000	746,300	350	2,132
Research and Development	2,308,300	0	2,308,300	350	6,595
				Total Employees	**10,332**

The evaluation of impacts in the resource sections that follow is based on the data presented above.

4.1 AESTHETICS

4.1.1 INTRODUCTION

This section describes the visual character of the project site and alternative locations and views from surrounding public areas to these areas. This section also evaluates the change to visual resources in the area, including change in visual character, view obstruction, and night lighting, as a result of the development of the Campus and University Community. A site visit was conducted to identify the public viewpoints that provide the most direct views of the project site and to describe the existing setting and surrounding land uses in the area.

No public or agency comments related to visual resources were received in response to the Notice of Preparation or the Notice of Intent issued for this Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

4.1.2 AFFECTED ENVIRONMENT

4.1.2.1 Regional Setting

Merced County is located in the San Joaquin Valley, a broad plain that lies between the Sierra Nevada Foothills and the Coastal Range. The project site is located in eastern Merced County, approximately 2 miles northeast of the limits of the City of Merced. Development predominates the visual setting of the city. The city is surrounded by agricultural lands that are sparsely developed.

The Merced County General Plan considers major scenic vistas to be views of the Coastal and Sierra mountain ranges. State Highway 152 west of Interstate 5 (I-5) and I-5 from the Stanislaus County line south to State Highway 152 have been designated State Scenic Highways (Merced County 1990). The City of Merced General Plan designates the portion of Lake Road from Yosemite Avenue to Lake Yosemite Regional Park, located within the project area, as a scenic corridor. The designated scenic corridors and routes identified in the City's general plan historically were subject to special development review by the City of Merced.

4.1.2.2 Alternative 1 – Proposed Action

Visual Character of the Project Site

The project site is composed of two major areas proposed for development: the UC Merced Campus and the University Community. A description of the visual setting for each of these areas is provided below.

UC Merced Campus

The campus site is situated southeast of Lake Yosemite and comprises the 815-acre area that would be developed with campus facilities and the 1,307-acre Campus Natural Reserve (CNR) that would be maintained permanently in an undeveloped state and would be dedicated to conservation. Two approximately 50-foot-wide irrigation canals, the Le Grand Canal and the Fairfield Canal, convey water from the lake to agricultural areas to the south. Both canals meander through the campus site, generally following the contours of the land.

The campus site consists of three existing land uses: the developed Phase 1.1 Campus, grasslands used for seasonal grazing, and areas under irrigated pasture. The Phase 1.1 Campus, which is approximately 104 acres, is located in the central portion of the Campus site northeast of Bellevue Road and Lake Road. The main entrance to the campus is from Lake Road, north of the Bellevue intersection. Phase 1.1 Campus is developed with 3 major academic buildings, a recreation and wellness building, 10 student housing structures, a recreational field, a central utilities plant and related structures, a water well and storage tank, and a number of paved or gravel parking lots. A small lake and two ponds are located in the western portion of the Phase 1.1 Campus, and the Fairfield Canal traverses the Phase 1.1 Campus in a general east/west direction. The residential buildings on campus are located east of the Fairfield Canal. Academic buildings and other student facilities are located on both sides of the Fairfield Canal. The buildings on the Phase 1.1 Campus are two- to four-stories high and have exterior earth tone colors, such as brown, beige, dark orange, and gray. Larger structures on site are accented with decorative metal siding and large windows. Landscaping is present throughout the Phase 1.1 Campus.

The remainder of the campus site surrounding the Phase 1.1 Campus area to the northeast, east, and south consists of undeveloped land that contains annual grasses or is under irrigated pasture use. The grasslands on the site are typical of the San Joaquin Valley. During the course of a year, the color of the grasslands changes from green in late winter and spring to gold and golden brown during the summer and early fall. In years of extended heat, the grass turns to straw. Vernal pools are the prominent feature within the grasslands. Vernal pools are topographic depressions that fill with water in the rainy season and support distinct plant communities, including flowering plants that bloom in the spring. Mima mounds are also visible on the site. Mima mounds are small hills up to about 3 feet in height. A barn and associated corrals are located in the northern portion of the campus site.

University Community

The University Community site is rural in character, appearing as a large, mostly flat, expansive open area with just a few farm-related structures located in the south central portion of the site. Structures

within the site include stables, two large barns, and three one-story single-family homes on the LWH Farms, LLC, property south of Cardella Road. The site consists of cultivated agricultural land and grazing land where cattle can be found throughout the year. The northern portion of the University Community (Community North) is mostly irrigated pasture, while the southern portion (Community South) consists of cropland. A few mature trees, averaging approximately 15 feet in height, are located within the University Community site. A cluster of shade trees, along the eastern border of the site, are located at the LWH Farms, LLC, farmhouse in the southern portion of the site, along the Fairfield and Le Grand Canals. A row of mature eucalyptus trees is located along Lake Road south of Cardella Road.

Surrounding Land Uses

Lake Yosemite Regional Park is located to the northwest of the project site. Rolling grasslands occupy the lands to the north and east of the Campus and the University Community sites, whereas lands to the southeast of the University Community are under agricultural uses. South of the University Community, lands are under crops, whereas to the west of the community adjacent to Lake Road, the area is developed with rural residential land uses.

Existing Views of the Project Site

Based on a reconnaissance of the project site, two primary types of public views of the project site were identified (1) those observed from adjacent roadways and (2) those as seen from Lake Yosemite Regional Park. In order to document the existing visual character of the project site and its surroundings, photographs were taken from locations where public views of the site are most attainable. Vantage points in the southeastern portion of Lake Yosemite Regional Park were selected due to the public use of the park and the proximity of the park to the campus site. Two vantage points along Lake Road were selected to show the views of the Campus and University Community sites from local roadways and residential areas west of the site. Lastly, a vantage point from Yosemite Avenue was selected to consider the views of the project site from the south. **Figure 4.1-1, Key to Viewpoint Locations**, identifies the locations from where the photographs were taken.

Figure 4.1-2, View 1: Existing Conditions, shows a view looking southeast toward the site from Lake Yosemite Regional Park. The most predominant feature in the foreground and middle ground of this view is the grassland and the Fairfield Canal. A mature tree growing adjacent to the canal is also visible in the middle ground of this view. Phase 1.1 Campus buildings, including residential buildings, the recreation center, a surface parking, and academic buildings are visible in the background of this view.

Figure 4.1-3, View 2: Existing Conditions, shows a view from Lake Road (at the boundary of the Campus and University Community) looking east across the site. Open undeveloped grassland is the most prominent feature in the foreground, middle ground, and background of this view. An irrigation pivot is

visible in the middle ground towards the south. A few mature trees are scattered and can be seen in the background to the north.

Figure 4.1-4, View 3: Existing Conditions, shows a view looking southeast toward Community South from the west side of Lake Road. A large mature tree and bicycle path are visible in the foreground of this view location. The bicycle path traverses along the western boundary of the project site on the east side of Lake Road. Agricultural land is the most prominent feature in the middle ground and background of this view. A farm-related structure on the LWH Farms, LLC, property can be seen in the background to the south, and mature trees can be seen in the background to the north.

Figure 4.1-5, View 4: Existing Conditions, shows a view looking north from Yosemite Avenue. Cropland is the most predominant feature in the foreground and middle ground of this view. Building outlines of the farm-related structures on the LWH Farms, LLC, property and the Campus are visible in the background. Mature trees are also visible in the background along Lake Road and on the project site.

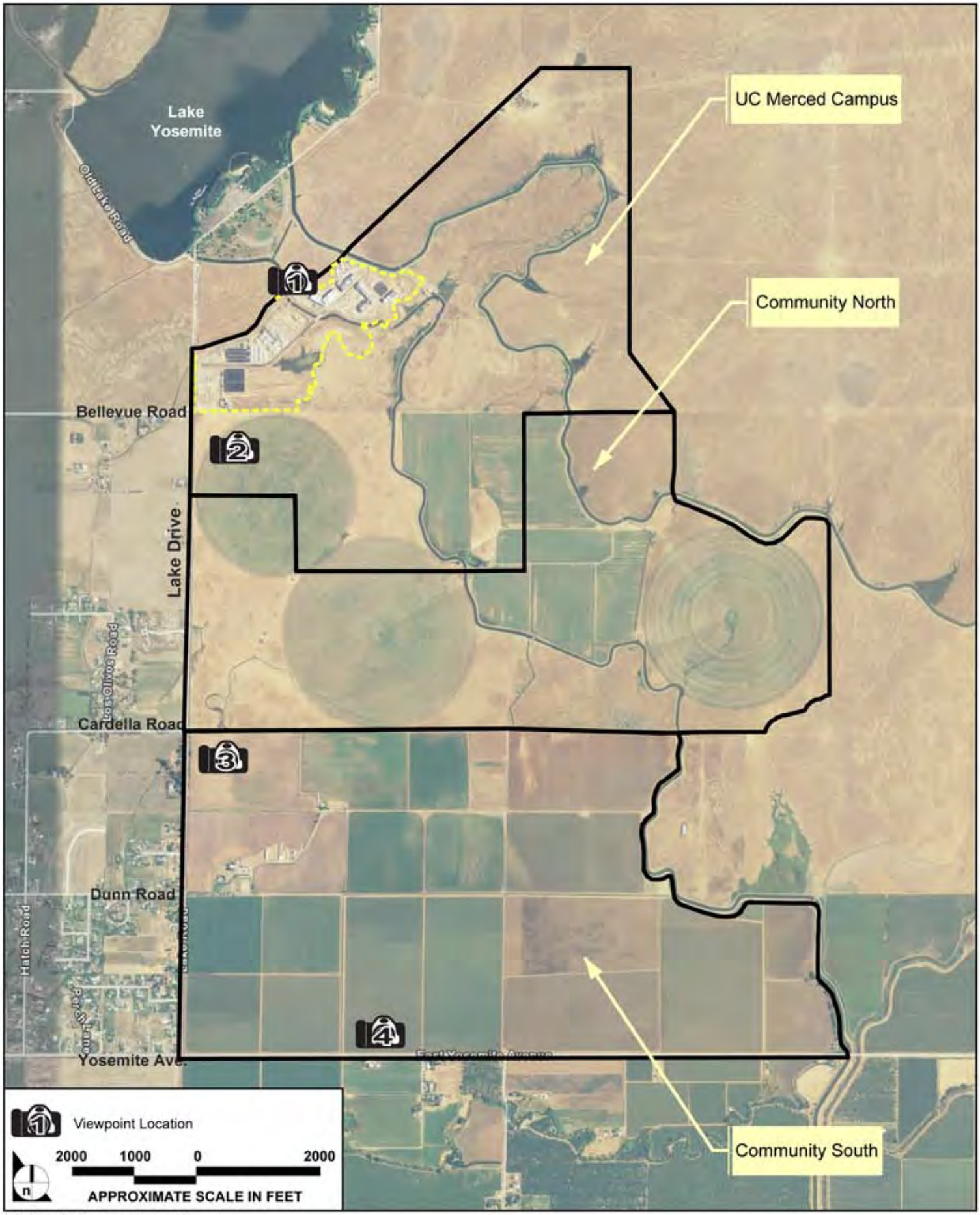
Existing Light and Glare Conditions in the Project Vicinity

There are currently several sources of light and glare on the project site in the Phase 1.1 Campus area. These light and glare sources include streetlights, existing residential and educational building uses, impervious surfaces, and vehicles, and are mainly located along in the northern portion of the project site. Other sources of light and glare on the project site include the existing residential and farm-related structures east of Lake Road. However, the majority of the project site is undeveloped with no source of light and glare.

Limited sources of light and glare occur immediately adjacent to the project site. Residential homes west of Lake Road and south of Bellevue Road would produce minimal light at night. Vehicles using the roadways near the site produce some glare during the day. The greatest existing source of nighttime lighting in the project vicinity is the urban development within the City of Merced.

Existing Electrical Lines

The residential units west of Lake Road across from the project site are served by two existing 15 kilovolt (kV) electrical utility lines. One power line extends in a west-east direction along Yosemite Avenue and then continues in a northerly direction along Lake Road until it connects to another power line traveling in a west-east direction along Bellevue Road. The existing Phase 1.1 Campus receives electricity from the 15kV lines situated along Bellevue Road. Standard height utility poles, approximately 90 feet in height, are located along the eastern side of Lake Road and its associated bicycle path, as seen in **Figure 4.1-4**. Residents looking east toward the area of the proposed University Community South, have clear views of the existing power lines



SOURCE: UC Merced – February 2008

FIGURE **4.1-1**

Key to Viewpoint Locations

SOURCE: Impact Sciences, Inc. - May 2008

FIGURE **4.1-2**

View 1: Existing Conditions

SOURCE: Impact Sciences, Inc. - May 2008

FIGURE **4.1-3**

View 2: Existing Conditions

SOURCE: Impact Sciences, Inc. - May 2008

FIGURE 4.1-4

View 3: Existing Conditions

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SOURCE: Impact Sciences, Inc. - May 2008

FIGURE **4.1-5**

View 4: Existing Conditions

4.1.2.3 Alternative 2, Yosemite Avenue – Visual Setting

Under Alternative 2, the Campus and Community North would be located on the University Land Company, LLC, (UCLC) and LWH Farms, LLC, lands. The visual setting of these areas is described above under Alternative 1, Proposed Action. Under this alternative, Community South would be located south of Yosemite Avenue. The visual characteristics of this area south of Yosemite Avenue are similar to the southern portion of the University Community identified under Alternative 1, consisting of cropland and a few farm-related structures.

4.1.2.4 Alternative 3, Bellevue Ranch – Visual Setting

The Bellevue Ranch Alternative location is approximately 2 miles west of the Phase 1.1 Campus area. The relatively flat site consists mainly of grasslands used for grazing with some rural residential development. Newly developed residential land uses exist on the site adjacent to G Street south of Bellevue Road, with scattered farmsteads in the western and central portions of the site. The remainder of the site is undeveloped. The main sources of light and glare on the site are the residential land uses, specifically lighting from the structures and vehicles using the site. The surrounding land is mostly undeveloped, with urban development south of the site. Views of the site are available mainly from the local roadways, including Bellevue Road, G Street, and Cardella Road.

4.1.2.5 Alternative 4, 2002 Proposed Project – Visual Setting

The visual setting of the Alternative 5 site (identified as the 2002 Proposed Project) is similar to that under Alternative 1, Proposed Action. The site is mostly undeveloped with the exception of the Phase I Campus area and scattered farm-related structures on the LWH Farms, LLC, property.

4.1.3 APPLICABLE LAWS, REGULATIONS, PLANS, AND POLICIES

4.1.3.1 Merced County General Plan

The Merced County Year 2000 General Plan outlines the County's goals and desires concerning land use and is designed to serve as the basis for development decision-making. The plan directs the physical growth and development of the County through the Year 2000. It contains policies that are relevant to development of the UC Merced Campus. Policies that are intended to guide the aesthetic aspects of campus development are listed below.

Land Use Policies

Objective 11.C: Access routes serving the University and adjacent land uses are appropriately classified to ensure adequate capacity.

Policy 6: Development projects along possible access routes shall be located and designated in a manner which preserves the future capacity and aesthetics of the route to adequately serve the University Community SUDP.

Open Space/Conservation Policies

Objective 3.B: Lands with high aesthetic value are properly managed.

Policy 7: Stream corridors should be maintained in a natural condition and retain the general character of natural slopes and formations.

Policy 8: Regional parks should be used to preserve areas of natural scenic beauty.

Policy 10: Power transmission and distribution facilities should be underground whenever possible.

Policy 11: Structures and activities located adjacent to state designated scenic highways should receive special review to ensure that scenic vistas and local scenic values are not significantly degraded.

4.1.3.2 UC Merced 2009 Long Range Development Plan

The UC Merced 2009 Long Range Development Plan (LRDP) contains policies that are intended to serve as a guide to future development of the UC Merced Campus. Policies that are intended to guide the aesthetic aspects of campus development are listed below.

Community/Land Use Policies

COM-2: Develop streetscapes within the campus with ample amenities such as landscaping and shade trees, generous sidewalks, street furniture, signage, lighting and art to promote pedestrian movement, community attractiveness, and informal meeting spaces.

Environments Policies

ENV-8: Working with the Merced Irrigation District (MID) to ensure the ongoing viability of the canals for agricultural irrigation, while using landscaping, paths and bike trails, and other elements to assure visual quality. When feasible, work with the MID to develop irrigation bypasses to allow the canals to become passive waterways in the North and South Bowl areas.

ENV-11: Prepare detailed design standards to guide urban design and master planning issues, way-finding, building design, sidewalk design, and landscape design.

ENV-14: Whenever parking occurs adjacent to principal roads, pedestrian or bicycle pathways, active recreation or passive open space areas, it shall be screened from direct view with plant material or screen walls design for maximum aesthetic effect, while maintaining a safe environment. Interim parking lots within street rights of way or on future development sites shall be landscaped at a minimum with anticipated street trees for surrounding streets, and screen plantings at the edges adjacent to pedestrian pathways.

Sustainability Policies

SUST-10: Design campus landscaping to emphasize regional natives, avoid invasive or allergenic species, and select plantings that are compatible with campus infrastructure, developing a palette of approved plant, ground cover and tree lists, as well as landscape design guidelines.

4.1.3.3 University Community Plan

The University Community Plan (UCP) that was adopted in 2004 contains policies that are intended to create visual interest and retain the existing topographic character, as well as to locate and design many parts of the University Community so as to retain key views of the Sierra Nevada. The following visual UCP policies apply to the Proposed Action and are considered part of the Proposed Action. These would also apply to all alternatives. The policies are listed in **Table 4.1-1, UCP Policies,** below.

Table 4.1-1
UCP Policies

Topography	
T 1.1	Require that the development of the University Community site reflect the character of its underlying topography, retaining basic forms, contours, and elevations.
T 1.2	Require that the University Community site be graded to ensure appropriate and continuous transitions with adjoining properties. Abrupt changes of topography and the use of retaining walls shall be discouraged.
T 1.3	Require that development be located and designed to mimic the natural topography in areas characterized by topographic diversity and preclude the use of extensive flat pads and cut-and-fill slopes, providing that this does not result in extraordinary costs that impact financial feasibility.
Viewsheds	
V 1.1	Locate and design principal transportation corridors to provide public views of the Sierra Nevada and, where appropriate, the UC Merced campus core.
V 1.2	Incorporate plazas and squares at the confluence and termination of streets and pedestrian paths, in the principal Community activity centers (Town Center and Residential Village Neighborhood Centers), and other public places and design them to provide views of the Sierra Nevada, surrounding grasslands, and, where appropriate, the UC Merced campus core.
V 1.3	Locate and design sites and buildings to serve as visual landmarks within the University Community (e.g., siting of buildings and parks as visual termini of streets, neighborhood areas, etc.; use of towers and architectural elements; and so on.)
V 1.4	Design principal entry corridors to the University Community as landscaped amenities that provide views of the Town Center, UC Merced campus core, Sierra Nevada, and other visual assets.
Lighting	
V 2.1	Require that outdoor lighting fixtures be located and designed to minimize ambient levels of illumination and glare, while providing adequate illumination for public safety.
V 2.2	Require that outdoor lighting fixtures be located and designed to prevent spillover and impacts on adjoining properties (e.g., use of fixtures that cast their illumination downward and in a contained area).
V 2.3	Require that buildings in the University Community minimize the use of surface materials and glazing that are highly reflective of sunlight and nighttime outdoor lighting and/or place such materials in locations that will not impact adjoining uses.
V 2.4	Establish standards to minimize the levels of illumination of outdoor signs in the University Community.
Land Use	
LU 2.3	Site and design land uses to reflect and incorporate the property's natural drainage courses, to the extent feasible, in consideration of public safety and habitat preservation.

Design and Development	
LU 5.10	Integrate the Town Center's land uses into a cohesive urban pattern that provides the sense of complete and identifiable place. Establish an urban form that ties together individual parcels and uses into a cohesive whole, addressing the location and massing of buildings, architecture, landscape, connective pedestrian paths and walkways, streets and transit, use of key landmarks, and similar elements.
LU 5.12	Work with UC Merced during the preparation of the Town Center Specific Plan to ensure the blending and continuity of uses, the street grid, and open spaces along the Town Center and campus core boundary.
LU 5.14	Require that buildings be located to front onto public sidewalks and plazas forming a semi-continuous "building wall" (with parking located to the rear or in structures with ground level retail uses), that the ground floor of buildings be restricted to uses that have a high level of customer activity, and that buildings be designed to open onto the sidewalk/plaza and provoke visual interest (e.g., visual transparency, façade modulation/fenestration, etc.)
LU 5.20	Promote the use of high quality and distinctive architecture that avoids the use of clichéd styles and idioms, is reflective of adjoining campus buildings, and considers the region's history, landscape, and materials.
LU 6.7	Site and design Business Center development to achieve a cohesive and integrated district including the use of unifying streetscape and signage, location of buildings in proximity to street frontages, and incorporation of retail shops and restaurants in the ground floor of buildings, inclusion of architectural and landscape elements that unify sites, and comparable techniques.
LU 6.8	Develop a network of streets, sidewalks, bicycle trails, infrastructure, and open spaces that connect with and continue the basic pattern established in abutting University campus, the Town Center, commercial districts, and Residential Villages.
LU 6.9	Promote the use of high quality and distinctive architecture that avoids the use of clichéd styles and idioms, is reflective of adjoining University Community Town Center and campus buildings, and considers the region's history, landscape, and materials.
LU 7.15	Integrate housing, parks, schools, commercial, public, and other uses into a cohesive urban pattern that provides the sense of a complete and identifiable neighborhood, in accordance with other policies in this section of the Plan. Establish an urban form that ties together individual parcels and uses into a cohesive whole, addressing the location and massing of buildings, architecture, landscape, connective pedestrian paths and walkways, use of key landmarks, and similar elements (as illustrated in Figure 12 of the UCP).
LU 7.18	Site and design development to enhance neighborhood quality of life by: • Establishing a pattern of blocks that promotes access and neighborhood activity; • Minimizing the width of streets to slow traffic and promote intimacy, while maintaining acceptable fire protection and traffic flows; • Integration of a diversity of housing types within a neighborhood and on individual blocks, ensuring their compatibility with adjoining units; • Use of variable setbacks and parcel sizes to accommodate diverse housing types; • Physically and visually relating the unit to the street frontage; • Locating and designing garages to minimize their visual dominance from the street; • Incorporating sidewalks and parkways to foster pedestrian activity; • Promoting architectural diversity; and • Other appropriate techniques.

LU 7.23	Design structures that integrate housing with commercial, office, and other uses to protect residents from adverse impacts of the non-residential use such as noise, odors, vibration, and lighting. Parking and access to the different uses should be separated and secured. Housing units should be designed to maximize their day lighting and air circulation.
LU 7.24	Establish landscaped buffers and berms adjacent to major transportation corridors to protect adjoining residential neighborhoods from vehicular noise and traffic. Housing may be set back from the buffer with vehicular access from rear alleys or streets or located to face the interior of a neighborhood with their backyards located along the corridor and buffer. The use of walls along the transportation corridor should be discouraged, unless there is no feasible alternative that effectively protects the housing.
LU 9.1	Design open spaces as amenities that contribute to the quality of life, image, and economic value of the University Community.
LU 9.2	Develop open spaces for the purposes of active and passive recreation, habitat preservation, education and research, flood control/public safety, agricultural production, and similar functions.
LU 9.3	Use natural drainages, trails, recreation areas, and similar techniques to link the University Community's land use districts and open space elements, the UC Merced campus, Lake Yosemite Regional Park, and surrounding open spaces.
LU 9.4	Develop a continuous greenbelt corridor/park system as the centerpiece of the University Community ("Village Green/Central Park"), which will be linked with each Village Center and Community open spaces by a network of connecting trails. Accommodate parklands and open spaces within the greenbelt system that provide residents with a diversity of open space experiences, ranging from active urban spaces to passive open lands. This may encompass landscaped urban squares, neighborhood and community-serving parks, mini-parks, linear greenways, landscaped hiking and bikeway trails, and similar elements (as illustrated on Figure 13 in the UCP). At a minimum, the greenbelts and parks developed for active recreational use shall encompass 150 acres, based on standard of 5 acres per 1,000 residents. However, to create the amenity and economic and social values that are essential to uniquely define and differentiate the University Community, developers shall be encouraged to exceed this minimum for habitat and native grassland preserves, open space buffers, and other purposes.
LU 9.7	Integrate the Le Grand and Fairfield canals into the University Community's open space network, preserving and protecting their primary function as a conduit of agricultural water, consistent with the requirements and to the satisfaction of the Merced Irrigation District (MID).
LU 9.9	Incorporate barriers, such as fencing, and other elements to ensure public safety and prevent public access to the canal, to the satisfaction of MID. Collaborate with the MID in the use of landscape, fencing, and other elements that assure a high level of public safety and visual quality that complements the open space system.
LU 10.4	Promote architectural diversity and interest creating consistency through building location, massing, scale, height, materials, fenestration, modulation, signage, lighting, and comparable elements, rather than a specific design idiom or style.
LU 10.6	Consider the use of building and landscape materials that reflect the region's history such as stone, aggregate, and wood.
LU 10.7	Promote architectural design of unique merit and quality, particularly in the Town Center, Business Center, and public buildings, while ensuring their compatibility with the overall quality and character of the Community.
Police and Fire	
PS 2.2	Require the incorporation of appropriate lighting that provides adequate exterior illumination around commercial, business center, public, parking, and multifamily structures.

4.1.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

The President's Council on Environmental Quality (CEQ) guidance for evaluating the types and significance of impacts under NEPA is summarized in **Section 4.0, Affected Environment and Environmental Consequences.** For purposes of this analysis, this Draft EIS/EIR conservatively uses significance criteria derived from Appendix G of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* and the CEQ guidelines regarding the determination of environmental consequences to identify impacts for both CEQA and NEPA. For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. In accordance with NEPA, the EIS also must evaluate potential effects on the human environment which includes an analysis of the natural and physical environment and the relationship of people with that environment (40 C.F.R. Sec. 1508.14).

For the purpose of this Draft EIS/EIR, impacts related to visual resources would be significant if implementation of the Proposed Action or its alternatives would

- have a substantial adverse effect on a scenic vista;
- substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- substantially degrade the existing visual character or quality of the site and its surroundings; or
- create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

4.1.5 METHODOLOGY FOR EVALUATING EFFECTS

Project conditions were evaluated against the existing visual character of the project site and off-site alternative locations in the context of topography, vegetation, existing uses, and visual character. The potential impacts to the visual character of the site and surroundings were evaluated in terms of massing, size or scale of development, and type of land use. The potential for each alternative to introduce substantial new lighting and/or create new sources of glare that could affect nearby existing uses was also evaluated in order to determine potential impacts to visual resources.

4.1.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.1.6.1 Alternative 1 – Proposed Action

Alt 1 – Impact AES-1: The Proposed Action would result in a substantial adverse effect on scenic vistas. (*Significant; Significant and Unavoidable*)

A scenic vista is generally defined as an expansive view of a highly valued landscape as observable from a publicly accessible vantage point. The project site is located to the northeast of the City of Merced in an area that is generally not developed and, therefore, provides expansive views of open rangeland and agricultural fields in the foreground and middle ground, and rolling foothills and the Sierra Nevada range in the far background, as viewed from practically all locations on the project site or in its vicinity. Although all elements, such as the open agricultural lands, contribute to these views, it is the view of the Sierra Nevada range in the background that distinguishes these views; the agricultural lands can be viewed in other parts of the region as well. Publicly accessible areas within the project vicinity include Lake and Bellevue Roads, Yosemite Avenue, Lake Yosemite Regional Park, and the Phase 1.1 Campus. Other lands in the project vicinity are privately owned and not publicly accessible. Descriptions of the scenic vistas as available from these publicly accessible areas are presented below and impacts to these views as a result of the Proposed Action are evaluated.

For viewers traveling northbound, Lake Road generally provides expansive views to the east of open rangeland and farmland in the foreground and middle ground, and the Sierra Nevada range in the distant background; although, in some places the views are interrupted by trees and undulating topography. Lake Road is a City-designated scenic corridor. Bellevue Road approaches the project site from the west, and persons on this road have views of expansive open rangeland interspersed by rural residences as they travel east. At the Lake Road and Bellevue Road intersection, the views are expansive; Phase 1.1 facilities, Lake Yosemite Regional Park, and open grazing lands are visible in the foreground and middle ground, and the Sierra Nevada range in the far background. Lake Yosemite Regional Park borders Lake Yosemite and expansive views are available from the park area looking north, west, and south. Views from the park use areas looking to the east and southeast in the direction of the Campus and the University Community are interrupted by trees that are planted throughout the park; although, uninterrupted views to the east and southeast are available from the park's parking lots and access road. As stated in the Merced County General Plan under Policy 8 of the Open Space/Conservation Element, regional parks should be used to preserve areas of natural scenic beauty. Phase 1.1 Campus, another publicly accessible area, also provides expansive views of open rangeland and farmlands to the east, south, and southwest of the Campus and of open rangeland and the Sierra Nevada range to the north and

northeast. Expansive views are also available from Yosemite Avenue looking north and northeast, **View 4**, with a distant view of Phase 1.1 Campus in the far background and the Sierra Nevada range beyond that.

Campus

Development of the Campus would introduce structures to the campus site which would alter the current views of both the Campus site as viewed from off-site, publicly accessible areas, as well as views from within the Campus site looking out. Long-range views of the Sierra Nevada are currently available from various locations throughout the campus site. With the construction of campus facilities, it is likely that these views would be interrupted in some, although not all, locations. The loss of the view of the Sierra Nevada range from campus vantage points is not considered a significant adverse impact because views would still be available from other campus vantage points.

The campus would be located to the southeast of Lake Yosemite Regional Park. The County-owned parcel between the park and the campus is no longer included in the proposed campus and would not be developed as part of the Proposed Action. Therefore, although the developed Campus would be visible from the nearby park, due to the distance between the park and the nearest campus facilities, the Proposed Action would not result in the obstruction of views of the Sierra Nevada Range from the park looking east or northeast. However, with the development of campus facilities in the middle ground, the scenic vistas as currently available from the regional park would be impaired. This is considered potentially significant impact. **Mitigation Measure AES-1a** is proposed to address this impact.

Long-range views of the Sierra Nevada are currently available from locations on Lake Road west of the southern portion of the Campus and from Lake Yosemite Regional Park, **View 2**. Campus development would not result in a loss of the views of scenic vistas from these locations because only a small portion of the Campus adjoins the portion of Lake Road south of Bellevue Road. Furthermore, there is a drop in elevation between Lake Road and where campus facilities would be located; therefore, a significant interruption of views of the Sierra Nevada due to campus development would not occur. In addition, the view blockage for persons traveling along Lake Road or using the bike path adjacent to it to access the regional park would be transitory. Therefore, the impact is considered less than significant. To further reduce this less than significant impact, **Mitigation Measure AES-1b**, as described below, will be implemented.

University Community

Views from the University Community site include a long-range view of the Sierra Nevada to the east, and short-range views of the Fairfield and Le Grand canals along the eastern border of the University

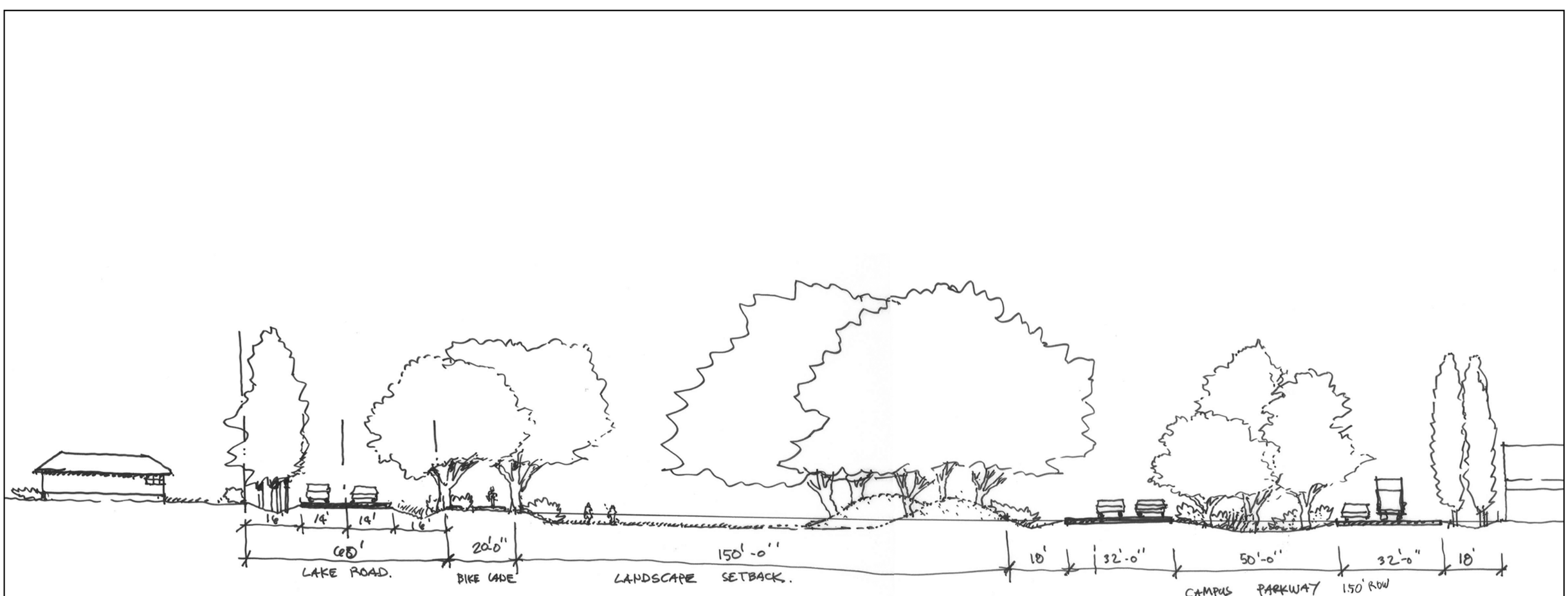
Community area. The development of the University Community, as part of the Proposed Action, would result in large-scale development projects that would interrupt these views by placing buildings within these view corridors. The UCP calls for an open space corridor along the Fairfield and Le Grand canals, which would preserve this corridor as a short-range aesthetics viewshed. Long-range views of the Sierra Nevada would also be available from this open space area.

However, views of the Sierra Nevada that are currently available from the western portion of the University Community area, Lake Road, and the adjacent rural residential area could be impaired. The existing view of the mountain range from Lake Road would be modified because the open space nature of project site, that makes the existing views of the scenic vista expansive, would be developed with structures as part of the project. Although no proposed buildings are immediately adjacent to Lake Road and a 150-foot landscaped buffer is planned between Lake Road and Campus Parkway alignment within the University Community (see **Figure 4.1-6, Representative Lake Road and Campus Parkway Cross Section**), this Draft EIS/EIR conservatively concludes that there could be some locations on Lake Road where scenic vistas would no longer be available. Furthermore, due to intervening development the scenic vistas would no longer appear expansive.

UCP Policies V 1.1 through 1.4 would help reduce the impact on view corridors to the Sierra Nevada by ensuring public views of the Sierra Nevada from principal transportation and entry corridors and public places within the University Community are maintained; however, views of the Sierra Nevada would no longer be available at some locations with the introduction of developed urban land uses to the currently undeveloped University Community site. A similar impact to scenic vistas would occur for viewers along Yosemite Avenue. The impact is considered significant under CEQA in that scenic vistas from publicly accessible roads would be affected. The impact would also be significant under NEPA because the proposed development of the University Community would impact views from the adjacent rural residential area and, thereby, adversely impact the human environment.

Conclusion

The development of the Campus and the University Community would interrupt view corridors that currently provide views of the Sierra Nevada from Lake Yosemite Regional Park, Lake Road, and Yosemite Avenue. It would also develop the open rangeland and cropland that are contributing elements of the scenic vistas. Furthermore, the development of the University Community would alter currently available scenic views from adjacent rural residences along Lake Road. The proposed high voltage transmission lines and the proposed tree placement would limit the background view of the Sierra Nevada Range at some locations. This is considered a potentially significant impact under both CEQA and NEPA. The following mitigation measures would be implemented to reduce this impact.



1000 500 0 1000

APPROXIMATE SCALE IN FEET

SOURCE: URS Corporation - 2002

FIGURE **4.1-6**

Representative Lake Road and Campus Parkway Cross-Section

974-001•08/08

SOURCE: Impact Sciences, Inc. - May 2008

FIGURE **4.1-7**

View 3: Conditions with Power Lines

974-001•08/08

MM AES-1a: The University will plant tall trees along the campus' western boundary to screen views of the campus facilities from Lake Yosemite Regional Park. (*Applicability – Campus only)*

MM AES-1b: Where possible, major vehicular and pedestrian transportation corridors on the Campus shall be located and designed to provide views of the Sierra Nevada. (*Applicability – Campus only*)

Significance after Mitigation: The mitigation measures proposed above and UCP policies would help avoid the impact where possible, but loss of views of scenic vistas from all potential locations on Lake Road would not be avoided even after mitigation. Therefore, this impact would be significant and unavoidable.

Alt 1 – Impact AES-2: Development under the Proposed Action would not adversely affect scenic resources. (*No Impact*)

Campus

The campus site is not located near any state-designated scenic highways and there are no resources present on the site that would qualify as scenic resources. Although Lake Road is a City-designated scenic route, effects on scenic vistas as viewed from Lake Road are evaluated in Impact AES-1. The only element on site that potentially could be considered a scenic resource is the mima mounds. However, mima mounds are subtle variations in the ground surface and are not visible from off-site locations. Moreover, the mima mounds topography outside of the campus boundaries would not be altered. There would be no impact.

University Community

The proposed University Community site is also not located near any state-designated scenic highways, nor is it designated a scenic area. Furthermore, there are no resources on the University Community site that would qualify as scenic resources. There would be no impact.

Conclusion

For reasons presented above, there would be no impact to scenic resources from the development of the Campus and the University Community under the Proposed Action.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact AES-3: The Proposed Action would substantially adversely alter the visual quality and character of the site and its surroundings. (*Significant; Significant and Unavoidable*)

Campus

At full development, the proposed new Campus would cover approximately 815 acres. The visual characteristics of the site would change from undeveloped grasslands and irrigated pasture to a fully urbanized area, developed with buildings, sidewalks, paved parking lots, telephone poles, and landscaping. Campus buildings would be similar to those present on the Phase 1.1 Campus site, and would be large and multiple stories, up to six stories high in some of the subsequent phases of campus development. Any development of the site would result in a visual landscape different from the existing character of the site. Although the Campus has been carefully designed with attention to placement of appropriate land uses at key Campus entrances and all future projects on the campus would be required to comply with Campus design guidelines, the proposed campus would permanently and substantially alter the visual character of the site, so this impact is considered significant. **Mitigation Measure AES-3a** is proposed to reduce this impact by placing restrictions on the type, placement, and design of aboveground infrastructure that would contribute to this impact.

University Community

The University Community is bordered by a mixture of rural residential and open agricultural areas. The existing rural residential development to the west would be visually consistent with proposed land uses in the University Community area. The proposed Town Center between the UCP area and the Campus would serve as a transitional space and create a visual link between the two areas. Agricultural uses to the east and south do not contain public viewpoints that would be sensitive to the changes in visual character of the University Community site. UCP Policies LU 3.3, 4.2, 5.10, 5.12, 5.14, 6.7, 6.8, 7.15, 7.18, 7.23, 10.5, and 10.7 provide design guidelines for University Community development that would minimize visual incompatibilities within the University Community. Additionally, **Mitigation Measure AES-3b** includes methods for reducing the visual impacts of aboveground infrastructure associated with the UCP (e.g., wells, water tanks, septic tanks, and cellular communication towers) by imposing restrictions on the type, placement, and design of such infrastructure in the University Community area. For these reasons, the University Community would be visually compatible with the surrounding areas.

Although the University Community would be visually compatible with surrounding uses, it would substantially alter the existing visual character of the University Community area. The area is open space

agricultural land that is largely undeveloped. The current visual character of the University Community area is that of rural, agricultural open space. The proposed University Community would change the visual character of the site from open agricultural land to a developed urban area. UCP Policy T 1.1 and Policy LU 9.1 would partially reduce the impact on the visual character of the site by requiring that development reflect the character of its basic topography and include open spaces within the University Community. Nonetheless, the proposed University Community would permanently and substantially alter the visual character of the site, so this impact is considered significant.

As described in **Section 2.0, Project Description**, a proposed high voltage transmission line would be installed to provide electricity to the Campus and University Community in the long run. This power line would be aligned along one of three alternate routes to terminate at a location near Lake Road within Community North. The power line could be aligned along Yosemite Avenue or Cardella Road and then along the future Campus Parkway or would be aligned along the future Campus Parkway from its connection point at the existing power line up through the project site (see **Figure 2.0-6)**. The poles would be approximately 90 feet from grade and would be either wooden or metal. Within the project site, the transmission line would be visible from Lake Road and residences west of Lake Road. Also, the poles would be clearly visible to pedestrian and cyclists using the existing bike path that parallels Lake Road. **Figure 4.1-7, View 3: Conditions with Power Lines,** shows a view of the project site from Lake Road looking east across the Community North site, with the poles approximately 200 feet from the west shoulder of Lake Road. Note that the graphic only shows the transmission line and does not depict any of the other development, roadways, and landscaping that would be constructed or installed in this area. The graphic is provided mainly to provide a sense of the size of the poles and to show how the transmission line would appear from Lake Road. As can be seen, although the transmission line would alter the character of the area, it would not appear as a major element of the landscape and would appear similar to other such power lines in the project area. Should the transmission line be aligned along Yosemite Avenue or Cardella Road, it would appear similar to the power line shown in **Figure 4.1-7**.

Conclusion

At full development, the UC Merced and University Community Project would substantially alter the visual quality of the project site and its surroundings by facilitating the change of rural agricultural lands to urbanized development. Therefore, this impact is significant.

MM AES-3a: The University shall design all new aboveground infrastructure on the Campus to the following standards: (a) Screen aboveground infrastructure from view from public rights-of-way or scenic vistas, via landscaping, fencing, or other architectural screening; (b) Require creative design measures to camouflage structures by integrating them with

existing buildings and among other existing uses; (c) Locate aboveground infrastructure on sites that are not visible from visually sensitive areas, such as residential communities and open space areas; (d) Require providers to co-locate their structure on a single site, where technically feasible and visually desirable; and (e) Locate antennae and equipment on other existing community facility sites, such as water tanks or utility poles. (*Applicability – Campus*)

MM AES-3b: The County or the City should require that new aboveground infrastructure in the University Community be designed to the following standards: (a) Screen aboveground infrastructure from view from public rights-of-way or scenic vistas, via landscaping, fencing, or other architectural screening; (b) Require creative design measures to camouflage structures by integrating them with existing buildings and among other existing uses; (c) Locate aboveground infrastructure on sites that are not visible from visually sensitive areas, such as residential communities and open space areas; (d) Require providers to co-locate their structure on a single site, where technically feasible and visually desirable; and (e) Locate antennae and equipment on other existing community facility sites, such as water tanks or utility poles. (*Applicability – University Community*)

Significance after Mitigation: Although **Mitigation Measure AES-3a** and **-3b** would reduced the visual impact of aboveground infrastructure, buildout of the Campus and University Community areas would substantially change the visual character of the project site, and this impact would be considered significant and unavoidable.

Alt 1 – Impact AES-4: The Proposed Action would create a new source of substantial nighttime light and glare in the vicinity. (*Significant; Significant and Unavoidable*)

Campus

Changes to the character of the campus site would include roads and walkways with street lighting, and buildings with surfaces and windows that may reflect and cause glare. The nighttime lighting of buildings, parking lots, recreational fields, and other University-related facilities would create a new source of glare. Since the only night lighting that exists is on the Phase 1.1 Campus, development of the campus would create a comparatively substantial amount of nighttime light and glare. Lights from additional buildings and cars would illuminate the rural landscape, which is mostly dark at night, and possibly inhibit nighttime views of the sky.

In conjunction with the development of the Phase 1.1 Campus, UC Merced has developed and adopted Campus standards for site lighting, which are included in all applicable design and construction contracts. Those standards were used in installing all site lighting on the Phase 1.1 Campus and these are incorporated into the Proposed Action. The Campus standards include the following:

1. Pedestrian pathways along high activity roadways will be illuminated for safety, but pathways that are not along high activity roadways will not be illuminated.

2. Lighting will be located so as to illuminate both pedestrian pathways and the roadways where possible.

3. Parking lots will be illuminated to meet or exceed Illuminating Engineering Society of North America (IESNA) guidelines.

4. To preserve the dark skies, all site lighting equipment will not emit light at angles greater than 90 degrees above nadir.

5. Light fixtures adjacent to the boundaries of the Campus will be equipped with house side shields to avoid unwanted spillage.

Implementation of these Campus standards would reduce the impact of site lighting, but there would still be a noticeable increase in nighttime lighting on the campus site. This impact is considered significant.

University Community

The University Community area is primarily undeveloped agricultural land. There is currently little night lighting in the University Community area from the existing residences and farm-related structures. The proposed UCP would result in the development of this land for a wide variety of uses, including residential, commercial, and business uses. Night lighting would be required in residential neighborhoods, schools, parks, and recreational facilities, parking lots, and along streets for safety and recreational use. Increased traffic could also result in the need for street lights on Lake Road, subsequently resulting in light spillover onto residences on Lake Road. Therefore, development of the University Community would introduce a substantial amount of nightlight in the area. Additionally, daytime glare would occur as light reflects off pavement, vehicles, and buildings. The addition of this light and glare would alter the rural landscape and nighttime views of the University Community site and its vicinity, and possibly inhibit views of the nighttime sky. UCP Policies V 2.1 through 2.4 would reduce the amount of light and glare in the University Community area by imposing restrictions on the type, placement, and timing of night lighting and use of high-glare building materials; however, the proposed University Community would still substantially increase the amount of artificial light in the area, changing night time views. Therefore, this impact is considered significant.

Conclusion

At full development, the Campus and University Community would introduce a substantial amount of new lighting and glare sources to the project site and surrounding area. Therefore, this impact is considered significant. Because the Campus has already developed lighting standards to address this impact, no further mitigation is necessary. To address the impact of University Community development related to light and glare, **Mitigation Measure AES-4** will be implemented.

MM AES-4: The County or the City shall require developers with projects in the University Community to implement the following:

- All outdoor lighting shall be focused and directed to the specific location (e.g., roads, walkways), be shielded to avoid the production of glare, minimize up-light, and light spill.
- All light fixtures shall be located, aimed, or shielded so as to minimize stray light trespassing across property boundaries and other sensitive areas. (*Applicability – University Community)*

Significance after Mitigation: Implementation of the Campus lighting standard and the mitigation measure above would help reduce the Proposed Action's impact related to light spill and glare in the area, but would not fully reduce the project's impact related to nighttime illumination of an area that would otherwise be dark at night. Therefore, the impact is considered significant and unavoidable.

4.1.6.2 Alternative 2 – Yosemite Avenue

Scenic Vistas

As shown on **Figure 3.0-1, Alternative 2, Yosemite Avenue Alternative Location Map**, under this alternative all of the subsequent phases of the campus would be located south of the Phase 1.1 Campus on lands owned by VST, and the University Community would be south of the campus with the southern portion of the University Community south of Yosemite Avenue. The impact from this location of the campus would place campus buildings to the east of Lake Road, which could result in obstruction of views of the Sierra Nevada from Lake Road. Therefore, construction of the Campus and University Community would obstruct views of the Sierra Nevada from Lake Road. However, under this alternative, campus facilities would not be constructed to the north of the Phase 1.1 Campus. Therefore, the impact on scenic vistas as viewed from Lake Yosemite Regional Park would be avoided.

Scenic Resources

Because the development under this alternative would be substantially the same as that under the Proposed Action, there would be no impact on scenic resources as the Yosemite Avenue site is not located near a state-designated scenic highway or other scenic resource.

Visual Character

Because the development under this alternative would be substantially the same as that under the Proposed Action, impacts on visual character would be significant and unavoidable. Implementation of **Mitigation Measures AES-3a** and **3b** would reduce visual impacts associated with aboveground infrastructure.

Light and Glare

Because the development under this alternative would be substantially the same as that under the Proposed Action, impacts on light and glare would be significant and unavoidable. Implementation of the Campus lighting standard and **Mitigation Measure AES-4** would help reduce light and glare impacts from new lighting sources.

4.1.6.3 Alternative 3 – Bellevue Ranch

Scenic Vistas

The Bellevue Ranch area generally has existing visual conditions that are similar to the project site under the Proposed Action —open rangeland and rural farm-related structures in most portions of this site. The exception is that some single-family homes have been constructed in the southeastern portion of the site and the road systems for additional housing development have been developed. Furthermore, the Bellevue Ranch site is closer to other single-family housing developments. Also, the site is in northern Merced and the Sierra Nevada range does not appear as prominently in the background of views from or adjacent to the site in the same manner as the range can be seen at the site of the Proposed Action. Therefore, development of the Campus and the University Community at this site would avoid the impact related to loss of views of the Sierra Nevada that would occur under the Proposed Action.

Scenic Resources

Because no scenic resources are present on the Bellevue Ranch site similar to that under the Proposed Action, there would be no impact.

Visual Character

Because the development under this alternative would be substantially the same as that under the Proposed Action, impacts on visual character would be the same as under **Alternative 1, Proposed Action,** and would be significant and unavoidable. Implementation of **Mitigation Measures AES-3a** and **3b** would reduce visual impacts associated with aboveground infrastructure.

Light and Glare

Because the development under this alternative would be substantially the same as that under the Proposed Action, impacts on light and glare would be the same as under **Alternative 1, Proposed Action,** and would be significant and unavoidable. Implementation of the Campus lighting standard and **Mitigation Measure AES-4** would help reduce light and glare impacts from new lighting sources.

4.1.6.4 Alternative 4 – 2002 Proposed Project

Impacts under this alternative would be similar to those under **Alternative 1, Proposed Action**. The primary difference is that under this alternative, campus development would affect an additional 166 acres, and in the long run, the 340-acre "Campus Land Reserve" could also be developed. Accordingly, this alternative would result in development of a larger area for the campus. The additional areas that would be developed with campus uses under this alternative would be to the north of the campus area proposed for development under the Proposed Action.

Scenic Vista

Due to the northerly location of the campus, development under this alternative would alter views from the edge of Lake Yosemite Regional Park. Under this alternative, additional mitigation measures such as stepping building mass, decreasing building density, and installing screening vegetation in order to reduce the impact on views from the park, would be needed to address the significant impact.

Scenic Resources

Because no scenic resources are present on the alternative site similar to that under the Proposed Action, there would be no impact.

Visual Character

Because the development under this alternative would be substantially the same as that under the Proposed Action, impacts on visual character would be the same as under **Alternative 1, Proposed**

Action, and would be significant and unavoidable. Implementation of **Mitigation Measures AES-3a** and **3b** would reduce visual impacts associated with aboveground infrastructure.

Light and Glare

Because the development under this alternative would be substantially the same as that under the Proposed Action, impacts on light and glare would be the same as under **Alternative 1, Proposed Action,** and would be significant and unavoidable. Implementation of the campus lighting standard and **Mitigation Measure AES-4** would help reduce light and glare impacts from new lighting sources.

4.1.6.5 Alternative 5 – No Action

Scenic Vista

Under this alternative, the Campus and Community North would not be built. However, Community South could be developed based on development plans not related to the establishment of a UC campus in Merced. The County general plan designates the Sierra Nevada mountain range as a scenic vista. Long-range views of this mountain range are available from Community South as well as public viewing areas off the project site on adjacent local roadways. Development of Community South could impair these views by placing buildings within this view corridor. The impact on scenic vistas would be significant and unavoidable.

Scenic Resources

Because no scenic resources are present on the site similar to that under the Proposed Action, there would be no impact.

Visual Character

Because development under this alternative would be similar to that under the Proposed Action except that it would occur in a smaller area (Community South), impacts on visual character would be the same as under **Alternative 1, Proposed Action,** and would be significant and unavoidable. Implementation of **Mitigation Measures AES-3a** and **3b** would reduce visual impacts associated with aboveground infrastructure.

Light and Glare

Because the development under this alternative would be similar to that under the Proposed Action except that it would occur in a smaller area, impacts on light and glare would be the same as under

Alternative 1, Proposed Action, and would be significant and unavoidable. Implementation of **Mitigation Measure AES-4** would help reduce light and glare impacts from new lighting sources in Community South area.

4.1.6.6 Alternative 6 – No Build

Scenic Vistas

As no new development would occur under the No Build Alternative, there would be no changes to the views of the site or interruption of views of the Sierra Nevada.

Scenic Resources

As no new development would occur under the No Build Alternative, there would be no effect on visual resources.

Visual Character

As no new development would occur under the No Build Alternative, there would be no changes to the visual character of the site.

Light and Glare

As no new development would occur under the No Build Alternative, there would be no introduction of new nighttime light or daytime glare.

4.1.7 SUMMARY COMPARISON OF ALTERNATIVES

All build alternatives would result in a similar impact on scenic vistas. All alternatives would have no impacts on scenic resources as none are present on the sites. All build alternatives would result in significant unavoidable impacts related to change in visual character and light and glare. The No Action alternative would reduce these impacts whereas the No build alternative would totally avoid these impacts.

4.1.8 REFERENCES

Merced County. 1990. *Merced County Year 2000 General Plan.*

4.2 AGRICULTURAL RESOURCES

4.2.1 INTRODUCTION

This section evaluates direct impacts associated with converting existing agricultural and vacant land located within the boundary of the UC Merced Campus and the University Community to urban uses. Potential indirect impacts from the development of the Campus and the University Community on nearby agricultural areas are also addressed. The following sources were used to prepare this section of the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR):

- Merced County Annual Report on Agriculture (2006)
- The State Department of Conservation Farmland Conservation Report (2006)
- The 2006 State Important Farmlands Map
- Merced County General Plan (1989)
- University Community Plan (2004)
- University Community Plan Final Environmental Impact Report (2004)

Public and agency comments related to agricultural resources received in response to the Notice of Intent/Notice of Preparation of this Draft EIS/EIR are summarized below.

- Loss of agricultural land relative to the Merced County agricultural industry should be analyzed.
- Development of the project would result in significant and permanent long-term impacts to the viability of the agricultural industry in Merced County.
- Some commenters expressed their support for the project site as proposed because it balances impacts to wetlands and agricultural resources.

4.2.2 AFFECTED ENVIRONMENT

4.2.2.1 Regional Setting

Merced County is one of the most agriculturally productive counties in California. In terms of total value of agricultural commodities, Merced County ranks as the fifth highest in the state (Merced County 2007). The majority of agricultural activities (73 percent) in the County, based on the monetary value of the product, are related to livestock and poultry production and the products associated with them. Fruit and nut crops comprise about 15 percent of the monetary value of Merced's agricultural products. Field crops comprise about 12 percent and vegetable crops comprise 11 percent.

Milk is Merced County's leading commodity with a value of $1.05 billion, followed by poultry with a value of about $326 million and almonds with a value of about $311 million (Merced County 2007). Merced County's agricultural businesses also produce seeds, nursery products, and support a bee industry and an aquaculture industry.

Table 4.2-1, Highest Acreage Harvested in Merced County 2006, shows the six crops that are most widely planted throughout the county. These are the crops with the most acreage harvested during the 2006 season. **Table 4.2-2, Top Value Crops in Merced County 2006**, indicates the most valuable crops during the 2006 season.

Table 4.2-1
Highest Acreage Harvested in Merced County 2006

Crop	Acres Harvested	Value per Unit
Almonds	97,771	$4,320/ton
Alfalfa	83,508	$131.93/ton
Cotton	56,575	$370.40/500-pound bale
Silage-Corn	83,868	$26.73/ton
Silage-Other	64,715	$20.79/ton

Source: Merced County Department of Agriculture, Annual Report on Agriculture, 2006.

Table 4.2-2
Top Value Crops in Merced County 2006

Agricultural Category	Top Value Crop	Dollar Value for Top Crop	Total Value for Agricultural Category
Field Crops	Alfalfa	$72,912,000	$267,813,000
Vegetable Crops	Sweet Potatoes	$111,686,000	$263,939,000
Fruit and Nut	Almonds	$268,626,000	$388,756,000

Source: Merced County Department of Agriculture, Annual Report on Agriculture, 2006.

Based on the climate and quality of soils, Merced County is recognized as one of the principal agricultural counties in the state, with gross revenues from the sales of agricultural commodities of approximately $3.0 billion in 2007 (Merced County 2007). The value of livestock and poultry products in the county was approximately $1.2 billion in 2007 (Merced County 2007).

Approximately 10,800 jobs were generated in 2005 by agriculture in the county (California Department of Finance 2007). In comparison, the County contained a total of 90,800 jobs in 2006 (California Department of Finance 2007).

Because of the area's climate, soils, and air quality, agriculture has remained economically viable in the county in spite of pressures such as increased agricultural land values, increased water cost, and compatibility problems with urban uses. The total value in constant dollars of Merced County's agricultural production has been increasing steadily over the last several years.

4.2.2.2 Classification of Important Farmland in California

The California Department of Conservation (DOC) and the California Association of Resource Conservation Districts translate soil survey data from the National Resources Conservation Service into maps of "Important Farmland Series" for the state's agricultural counties. The purpose of the DOC's Farmland Mapping and Monitoring Program (FMMP), which updates the maps biennially, is to provide land use conversion information for decision makers to use in the planning for the present and future of California's agricultural land resources. Thus, these classifications focus only on those lands that have been recently farmed. Land not recently farmed does not show up on the FMMP maps. Before removing unfarmed land from the maps, the DOC now waits two mapping cycles (four years) rather than one to make it easier for the DOC to track changes.

The Important Farmland maps and the advisory guidelines for the FMMP identify five agriculture-related categories: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Grazing Land. The mapping also includes "Other Land," which designates land that does not fall in any of the above categories. Each FMMP category is described below. Note that the first three categories of farmland listed below are considered Important Farmland according to the California Environmental Quality Act (CEQA) environmental checklist. All three categories are collectively referred to as "Important Farmland" in this section.

Prime Farmland

Prime Farmland is farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Farmland of Statewide Importance

Farmland of Statewide Importance is similar to Prime Farmland but has minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Unique Farmland

Unique Farmland is farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

Farmland of Local Importance

Farmland of Local Importance is land of importance to the local agricultural economy, as determined by each County's Board of Supervisors and a local advisory committee. According to the *Farmland Conversion Report*, Farmland of Local Importance for Merced County has physical characteristics that would qualify as Prime Farmland or Farmland of Statewide Importance except for the lack of irrigation water. Also, it includes farmlands that produce crops that are not listed under Unique Farmland but are important to the economy of the County or City.

Grazing Land

Grazing land is land on which the existing vegetation is suited to the grazing of livestock. The minimum mapping unit for this category is 40 acres.

Other Land

This is land not included in any of the other mapping categories listed above, for example, low density rural development, brush and timber, wetlands and riparian areas not suitable for livestock grazing, confined livestock, poultry or aquaculture facilities, strip mines and borrow pits, and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

As part of the Rural Land Mapping project, the DOC further divides up Other Land into the following four categories:

- **Rural Residential and Rural Commercial** includes residential areas of one to five structures per 10 acres, farmsteads, small packing sheds, unpaved parking areas, composting facilities, firewood lots, campgrounds, and recreational lakes;
- **Vacant or Disturbed Land** consists of open field areas that do not qualify for an agricultural category, mineral and oil extraction areas, and rural freeway interchanges;
- **Confined Animal Agriculture** includes aquaculture, dairies, feedlots, and poultry facilities; and
- **Nonagricultural and Natural Vegetation** covers heavily wooded, rocky, or barren areas; riparian and wetland areas; grassland areas which do not qualify as Grazing Land due to their size or land management restrictions, and small water bodies. Constructed wetlands are also included in this category. The Rural Land classes are not designed for interpretation as habitat. Geographic data on the extent of habitat for various species may be available from other state and federal entities.

Land that is developed with urban uses is shown as "Urban and Built Up" land on FMMP maps.

4.2.2.3 Conversion of Farmland in Merced County

The amount of agricultural land converted to other uses has been monitored in California since 1984 by the DOC based on information reported by the County Agricultural Commissioner. Merced County has typically not been among the highest-ranking counties for conversion of agricultural land to urban uses. However, increased urban growth is anticipated to occur in the San Joaquin Valley, among other areas of the state. FMMP data from 1992 through the most recent DOC farmland report is presented below in **Table 4.2-3, 1992–2006 Merced County Land Use Summary**.

Based on FMMP data, the total amount of agricultural land within the County declined approximately 1 percent during the 14-year period from 1992 to 2006. During this time, about 16,800 acres of Prime Farmland and about 8,500 acres of Farmland of Statewide Importance were converted to other uses. During the same period, the total amount of Unique Farmland and Farmland of Local Importance increased by about 9,300 and 7,100 acres respectively. Overall, approximately 20,945 acres of farmland were converted, with about one half of this acreage involving grazing lands. The annual rate of farmland conversion during this period was about 1,500 acres each year.

Table 4.2-3
1992–2006 Merced County Land Use Summary

Year	Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Grazing	Subtotal Agriculture	Urban and Built-Up Land	Other Land	Water Area	Total Area
1992	288,920	161,792	95,096	52,782	581,798	1,180,388	28,326	35,759	16,946	1,261,419
1994	288,477	161,189	94,370	49,786	585,110	1,178,932	29,309	36,264	16,914	1,261,419
1996	288,415	159,788	93,580	51,241	583,709	1,176,733	30,183	37,526	16,978	1,261,420
1998	289,057	160,066	96,593	47,929	580,934	1,174,579	30,559	39,304	16,978	1,261,420
2000	287,160	157,936	96,355	47,621	581,729	1,170,801	31,817	41,832	16,970	1,261,420
2002	283,158	159,022	103,008	42,818	578,026	1,166,032	33,091	45,321	16,970	1,261,414
2004	276,575	155,856	103,133	53,762	573,629	1,162,955	34,944	46,548	16,970	1,261,417
2006	272,096	153,249	104,419	59,851	569,828	1,159,443	36,767	48,348	16,859	1,261,417
Net Acreage Changed	-16,824	-8,543	9,323	7,069	-11,970	-20,945	8,441	12,589	-87	-2
Annual Avg.	-1,202	-610	666	505	-855	-1,496	603	899	-6	0

Source: Department of Conservation, Farmland Conversion Report, Merced County, 1992-2006 Land Use Summary, Farmland Mapping and Monitoring Program, Sacramento, California.

4.2.2.4 Alternative 1, Proposed Action - Existing Agricultural Uses

This section presents existing agricultural uses present on the project site and its vicinity. These are described in the 2002 Long Range Development Plan (LRDP) EIR (UC Merced 2002) and the 2004 University Campus Plan (UCP) EIR (Merced County 2004). That information has been updated and summarized below, supplemented by information regarding additional land that was not previously included but is now part of Community North. **Table 4.2-4, Farmland on Proposed Project Site**, presents the acres of Important Farmland and other lands on the proposed project site.

Table 4.2-4
Farmland on Proposed Project Site

FMMP Category	Campus	Community North	Community South	Total
Prime Farmland	8	12	589	609
Farmland of Statewide Importance	16	38	55	109
Unique Farmland	0	0	429	429
Farmland of Local Importance	181	442	23	646
Grazing Land	424	336	2	762
Urban and Built-Up Land	185	5	5	196
Other	0	0	14	15
TOTAL	**815**	**833**	**1,118**	**2,766**

S*ource: Department of Conservation 2008*

Proposed UC Merced Campus Site

The site for the proposed campus is located in the eastern portion of Merced County. According to the County general plan, soil in the eastern side of Merced County consists of a large fertile alluvial fan resulting from centuries of erosion in the Sierras. The County general plan analysis of soil quality in the Specific Urban Development Plan (SUDP) areas notes that most of the soils in these areas are of Prime and Statewide Importance (County General Plan, 1990 VII-14).

Of the 815-acre proposed campus site, about 104 acres are developed with campus facilities (Phase 1.1 Campus) on the former location of a golf course. This area is designated as Urban/Built-Up land on FMMP mapping. The remainder of the proposed campus site is grasslands that are used for cattle grazing. A small portion of the proposed campus site south of the intersection of Bellevue and Lake Roads is under irrigated pasture. Existing developed features within the campus site include irrigation

canals, a barn, a corral, stock ponds, and two irrigation pivots. Based on FMMP mapping, there are approximately 8 acres of Prime Farmland and 16 acres of Farmland of Statewide Importance, and the rest of the site is grazing land. Therefore, the campus portion of the Proposed Action consists of approximately 24 acres of Important Farmland as shown on the Important Farmland map for Merced County. No part of the proposed or existing campus site is under a Williamson Act contract (see **Section 4.2.3, Applicable Laws, Regulations, and Policies,** below for information on the Williamson Act).

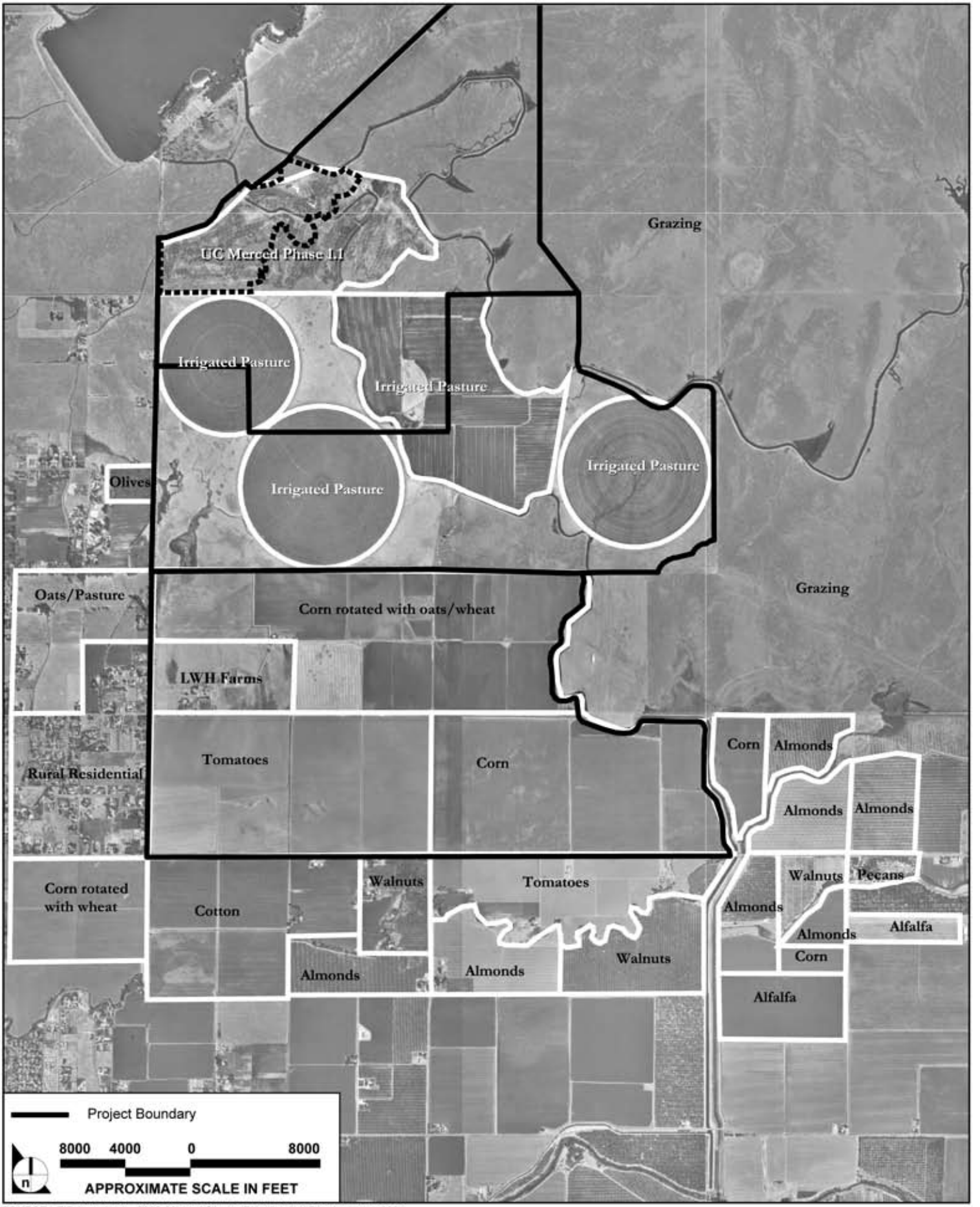
Proposed University Community Site

Agricultural uses within the proposed University Community site include primarily cattle grazing and agricultural row crops. The majority of the northern portion of the site (Community North which is owned by University Community Land Company [UCLC], LLC) consists of irrigated pasture and is used to graze cattle. There are approximately 543 acres of irrigated pasture in this area. Dirt roads traverse the University Community area, providing access to watering troughs and other ranching features. The site is leased for grazing 200 to 400 head of cattle. Based on FMMP mapping, the Community North site consists of 12 acres of Prime Farmland, 38 acres of Farmland of Statewide Importance, 442 acres of Farmland of Local Importance, and 336 acres of Grazing Land. Therefore, the Community North portion of the Proposed Action consists of approximately 50 acres of Important Farmland as shown on the Important Farmland map for Merced County.

The southern half of the site (Community South which is owned by LWH Farms, LLC) is primarily used for agricultural row crops. As shown in **Figure 4.2-1, Agricultural Uses and Crops Near Project Site**, crops grown within the Community South area currently consist of approximately 707 acres of cornfields that are rotated with oats and wheat, and approximately 309 acres of tomatoes. Based on FMMP mapping, the Community South site consists of 589 acres of Prime Farmland, 55 acres of Farmland of Statewide Importance, 429 acres of Unique Farmland, and 23 acres of Farmland of Local Importance. No part of the proposed University Community is under a Williamson Act contract.

Surrounding Farmlands

To the north and east of the project site, grazing land comprises almost the entire area between the proposed campus site and the Merced County line with Stanislaus and Mariposa counties. On the west, beyond Lake Yosemite, are a golf course, other urbanized land, grazing lands, and farmlands. Beginning about 1.5 to 2 miles west of the project site, active farmland is interspersed with rural residential uses. This farmland is cultivated with field crops (such as corn, watermelon, and alfalfa) and orchards, with



SOURCE: EIP Associates - 2006, Merced County, Planning and Development - 2001

FIGURE **4.2-1**

Agricultural Uses and Crops Near Project Site

almonds being the most common orchard tree. Land to the east of Community North consists of grazing land. Land to the east of Community South is a combination of grazing land and crop production, including corn and almond orchards. Farmlands located south of Community South beyond Yosemite Avenue are under a variety of field crops and orchards. Commodities grown in this area consist of cotton, corn, alfalfa, almonds, walnuts, pecans, and tomatoes.

The nearest Williamson Act contracts to the project site are located east of the proposed University Community (see **Figure 4.2-2, Williamson Act Lands Near Project Site**). There are several large parcels, totaling approximately 2,640 acres, currently enrolled in a Williamson Act contract. The County designates the land south of Bellevue Road, including the University Community area, as Williamson Act Agricultural Preserve. This land use designation indicates the area where future Williamson Act contracts may be approved. It does not indicate that the land is currently enrolled in Williamson Act contracts. Therefore, changing the County's land use designation would not require contract cancellation or trigger penalties or a waiting period.

4.2.2.5 Alternative 2, Yosemite Avenue Alternative - Existing Agricultural Uses

Under Alternative 2, the Campus and Community North would be located on UCLC and LWH Farms LLC lands. The existing agricultural uses in these areas are described above under Alternative 1, Proposed Action. Under Alternative 2, Community South would be located south of Yosemite Avenue. The agricultural uses of the lands south of Yosemite Avenue are similar to those of Community South identified under Alternative 1 and consist of the cultivation of primarily row crops. Based on FMMP mapping, the site of this alternative consists of 1,247 acres of Prime Farmland, 165 acres of Farmland of Statewide Importance, and 551 acres of Unique Farmland. Similar to the Proposed Action, the nearest Williamson Act contracts to the project site are located east of the proposed University Community. Land south of Bellevue Road, including the University Community area, is designated by the County as Williamson Act Agricultural Preserve.

4.2.2.6 Alternative 3, Bellevue Ranch Alternative - Existing Agricultural Uses

Alternative 3, Bellevue Ranch Alternative, is located west of the proposed project site. Existing land uses on the site include grazing, row crop cultivation, rural residential development, and single-family residential development. Particularly in the northern portion of this alternative, residences are of a more rural character and are scattered among different farms. In the southwestern portion of this alternative single-family residential uses recently were developed. Based on FMMP mapping, the site of this alternative consists of 230 acres of Prime Farmland, 195 acres of Farmland of Statewide Importance, and 587 acres of Unique Farmland.

4.2.2.7 Alternative 4, 2002 Proposed Project Alternative - Existing Agricultural Uses

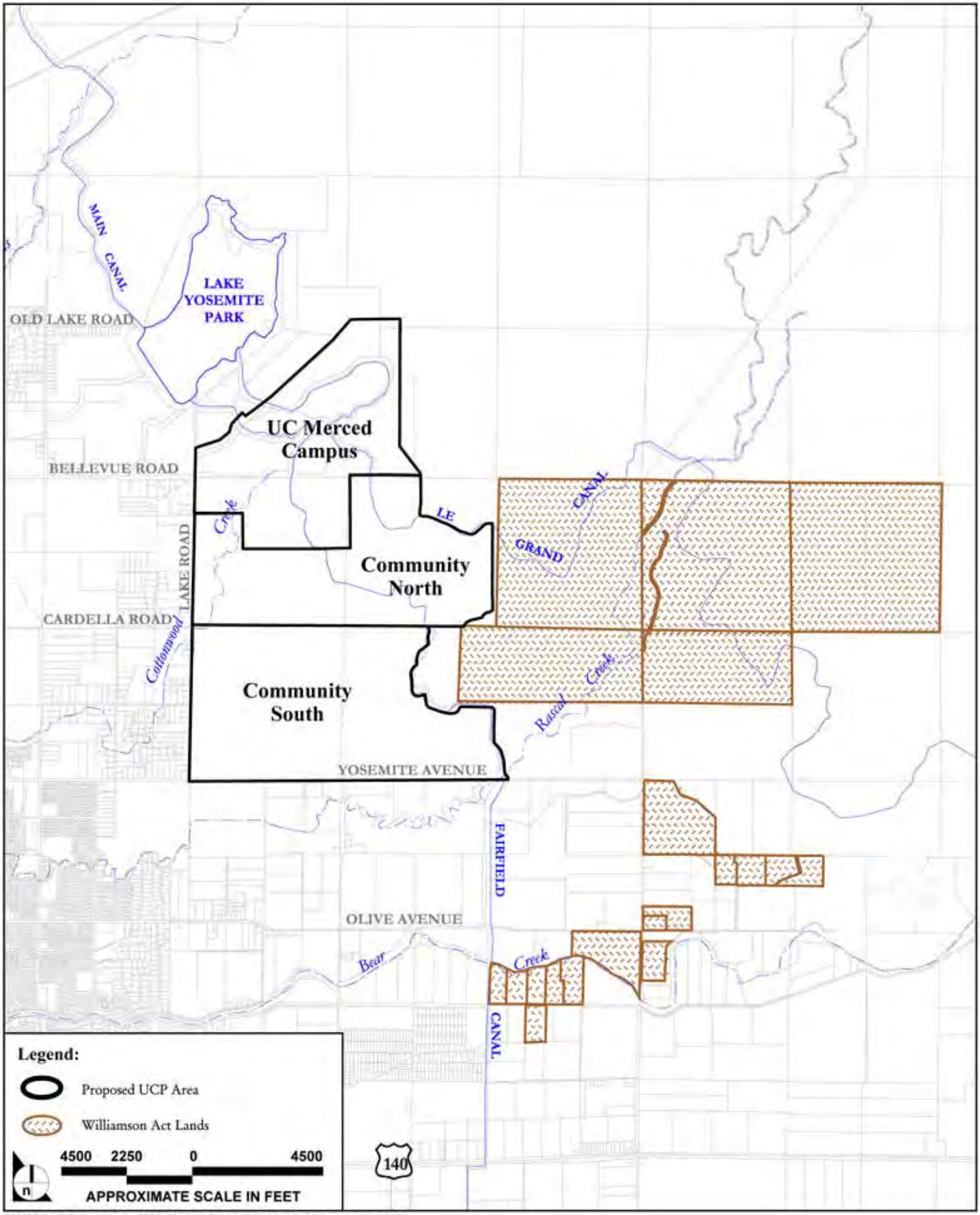
Under Alternative 4, the Campus would be located north of the intersection of Lake and Bellevue Roads, whereas the University Community would extend south from that area to Yosemite Avenue. Under this alternative, all of the lands within the campus boundary are designated by the FMMP as Grazing Land, with the exception of Phase 1.1 Campus, which is designated as Urban and Built-Up Land. Based on FMMP mapping, the site of the University Community under this alternative consists of 619 acres of Prime Farmland, 110 acres of Farmland of Statewide Importance, 435 acres of Unique Farmland, and 1,194 acres of Grazing Land. Similar to the Proposed Action, the nearest Williamson Act contracts to the project site are located east of the proposed University Community. Land south of Bellevue Road, including the University Community area, is designated by the County as Williamson Act Agricultural Preserve, but is not under a Williamson Act contract.

4.2.3 APPLICABLE LAWS, REGULATIONS, PLANS, AND POLICIES

The Proposed Action consists of the development of the Campus and the University Community. Lands on which the campus would be built are owned by the Regents of the University of California. As such, UC Merced is generally exempted by the state constitution from compliance with local laws and regulations. The University Community lands, on the other hand, are privately owned and are subject to local laws, regulations, plans, and policies. This section summarizes relevant state laws, LAFCO policies, City and County regulations, and policies contained in the Merced County General Plan, UC Merced 2009 LRDP, and the UCP related to agricultural resources.

4.2.3.1 Williamson Act

The California Land Conservation Act, also known as the Williamson Act, was enacted in 1965 in order to encourage the preservation of the state's agricultural lands and to prevent its premature conversion to urban uses. In order to preserve these uses, this act established an agricultural preserve contract procedure by which any county or city within the state, taxes landowners at a lower rate using a scale based on the actual use of the land for agricultural purposes, as opposed to its unrestricted market value. In return, the owners guarantee that these properties would remain under agricultural production for a 10-year period. This contract is renewed automatically unless a notice of non-renewal is filed by the owner. In this manner, each agricultural preserve contract (at any given date) is always operable at least nine years into the future.



SOURCE: EIP Associates - 2006, Merced County, Planning and Development - 2001

FIGURE **4.2-2**

Williamson Act Lands Near Project Site

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The owner of the property may file a Notice of Non-Renewal, which would cause the contract to expire in 10 years. After the contract has expired, a landowner may apply to remove that property from an agricultural preserve. The landowner also has the option of petitioning the Board of Supervisors or City Council (following completion of annexation) for the cancellation of the contract. Cancellation of the contract involves payment of substantial cancellation fees. According to Government Code Section 51282, the landowner may petition the board or council for cancellation of any contract for the subject land.

The board or council may grant tentative approval for cancellation of a contract only if it makes one of the following findings:

- that the cancellation is for land on which a notice of non-renewal has been served pursuant to Section 51245;
- that cancellation is not likely to result in the removal of adjacent lands from agricultural use;
- that cancellation is for an alternative use which is consistent with the applicable provisions of the city or county general plan;
- That cancellation will not result in discontiguous patterns of urban development; or
- That there is no proximate non-contracted land which is both available and suitable for the use to which it is proposed the contracted land be put or, that development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.

Another option within the Williamson Act Program is the rescission process to cancel a Williamson Act contract and simultaneously dedicate a permanent agricultural conservation easement on other land.

Government Code 51243.5 requires the Local Agency Formation Commission (LAFCO) to determine whether a City may exercise an option not to succeed to a Williamson Act contract upon annexation if it is determined by the LAFCO that the following items have occurred prior to January 1, 1991:

- The land being annexed was within 1 mile of the city's boundary when the contract was executed.
- The city had filed with the local agency formation commission a resolution protesting the execution of the contract.
- LAFCO had held a hearing to consider the city's protest to the contract.
- LAFCO had found that the contract would be inconsistent with the publicly desirable future use and control of the land.
- LAFCO had approved the city's protest.

If a city annexes land under a Williamson Act contract, a city must succeed to all rights, duties, and powers of the County under the contract. A LAFCO must notify the DOC within 10 days of a city's proposal to annex land under contract. A LAFCO must not approve annexation of contracted land to a city unless conditionally approved.

4.2.3.2 Merced County Local Agency Formation Commission Policies

The Merced County LAFCO has specific policies related the preservation of agricultural lands. These policies apply to annexation of County land to a City and establishment or expansion of service boundaries.

LAFCOs have their own definition of prime agricultural lands. According to Section 56064 of the California Government Code, prime agricultural land means an area of land that has not been developed for a use other than an agricultural use that meets any one of the following qualifications:

- Land that qualifies, if irrigated, for rating as class I or class II in the USDA Natural Resources Conservation Service (NRCS) land use capability classification, whether or not the land is actually irrigated, provided that irrigation is feasible.
- Land that qualifies for rating 80 through 100 Storie Index Rating.
- Land that supports livestock used for the production of food and fiber and that has an annual carrying capacity equivalent to at least one animal unit per acre as defined by the US Department of Agriculture in the National Handbook on Range and Related Grazing Lands, July 1967, developed pursuant to Public Law 46, December 1935.
- Land planted with fruit or nut-bearing trees, vines, bushes, or crops that have a nonbearing period of less than five years and that will return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than $400 per acre.

These qualifications have been adopted by the Merced County LAFCO as policies to protect agricultural land in the county along with the following policy:

Implementation

- The applicant or property owner may submit a soil analysis which demonstrates how soil has been degraded to a less than "prime" classification. The soil analysis should focus on the actual soil rather than the specific crops that may be planted. As an option, the analysis could address the soil and its ability to support crops typically grown in the area on similar soils. The cost of the soil analysis shall be borne by the applicant or property owner.

Policies

- 2. At the time of adoption of a Sphere of Influence for a city or urban service district, efforts to direct growth away from large concentrations of prime agricultural land shall be demonstrated, recognizing that some conversion of prime land may be inevitable.

4.2.3.3 Merced County General Plan Policies

The following is a list of Merced County's goals, objectives, and policies found in the Agricultural Chapter of the Merced County General Plan as they relate to the University Community Plan Area.

Goal 2: Productive agricultural lands are conserved.

Objective 2A: Agricultural areas are protected from conversion to nonagricultural uses.

Policies: (1) Conversion of agricultural land into urban uses shall be allowed only where a clear and immediate need can be demonstrated, based on population projections and lack of land availability for nonagricultural uses.

Implementation: In association with growth where productive agricultural land or other valuable rural land is converted to urban uses, the County may use area plans in order to address regional recourse, agricultural preservation, and conservation issue.

(2) Direct development to less valuable farmland when conversion is justified.

Implementation: Redesignation of land from a rural to an urban designation shall be allowed only where deemed appropriate based on careful consideration of potential agricultural impacts, on-site limitations for development and impacts on open space or conservation values.

(3) Infilling of development in urban areas shall be encouraged.

Implementation: The Planning Department will investigate and recommend Zoning Ordinance and General Plan revisions that will promote infill development.

Objective 2B: The parcelization of large holdings is discouraged.

Policies: (4) Investigate methods and incentives for increasing the minimum parcel sizes for agriculturally zoned land where appropriate using existing parcel sizes, soil quality and other relevant factors as may be determined.

Implementation: The Technical Advisory Committee for Agricultural Land Conservation will undertake a study to devise options and incentives for increasing minimum parcel sizes in the agricultural zones.

(5) Merge or revert to acreage substandard lots in "paper" subdivisions under the same ownership and not being used as separate parcels.

Implementation: The rural subdivisions of five or more lots under one ownership which are currently used for farming are eligible to go through the merger or revision to acreage application process as defined in the State Subdivision Map Act and the County Merger Ordinance. Where the combined area is 20 acres or less, the 20-acre designation will be retained.

(6) Encourage use of a voluntary program for merging adjacent parcels under the same ownership.

Implementation: When appropriate, the Planning Department will notify property owners about use of the "Voluntary Merger" provisions of the County Code.

Objective 2C: Conflicts are reduced through an understanding of the agricultural industry by urban dwellers.

Policies: (7) Implement measures to protect farmers from nuisance claims by urban dwellers.

Implementation: Require application of the County "Right to Farm" ordinance on all subdivision applications for residential development at the fringe of an urban community.

(8) Encourage educational programs to inform children and adults of the importance of protecting farmlands.

Implementation: The County Agricultural Commissioner and the University of California, Cooperative Extension should cooperate with organizations, such as the California Women for Agriculture, which educate the public on agriculture, and will assist in informing residents of the "Right to Farm" ordinance.

(9) Encourage land improvement programs that increase soil productivity.

Implementation: The County shall encourage and cooperate with efforts of the UC Cooperative Extension and the various Resource Conservation Districts to improve soils in the County.

Goal 3: Land uses that are potentially disruptive to the agricultural economy are properly located and operated.

Objective 3A: Clear boundaries between urban and agricultural areas are identified and land use buffers are provided.

Policies:

(1) Provide land use transitions and buffers between urban and agricultural areas, which reduce interference and protect agricultural land from conversion to nonagricultural uses.

Implementation: Continue to utilize transitional land uses around urban areas as buffers between towns and farmland, including Rural Residential Centers, industrial zones, public recreation areas, and natural features such as streams. Implementation of the "Right to Farm" ordinance under Policy 7 of Goal 2 will also serve this policy.

Objective 3B: Agricultural service and convenience centers that serve the daily needs of the farm community are identified and located.

Policies:

(2) Provide centers for agricultural support services and convenience commercial operations, known as Agricultural Services Centers (ASCs).

(3) The County will encourage new agricultural service operations to locate in an ASC.

Implementation: Amend the Zoning Ordinance by creating an ASC zoning classification. This classification will be applied to the existing small SUDPs without public sewer or water service, and which presently act as agricultural centers. Permitted uses, densities and ASC boundaries will be determined with the assistance of the Technical Advisory Committee for Agricultural Land Conservation (TAC/ALC) following the form described in Section 5, "Agricultural Support Services" of this Chapter.

Objective 3C: Activities that support agricultural operations are permitted agriculturally zoned areas.

Policies:

(4) Permit on-farm product handling and selling operations as prescribed in the Zoning Code.

Implementation: Continue to enforce agricultural zoning regulations, which accommodate compatible uses and ban conflicting activities.

4.2.3.4 Merced County Right-to-Farm Ordinance

Right-to-farm ordinances have been adopted by several California counties to protect farmers in established farming areas from legal action that new residents in nearby urban settings may take against nuisances such as odor, noise, and dust associated with normal day-to-day farming activities.

Merced County has adopted a right-to-farm ordinance that states that residents moving into areas where there are existing agricultural activities should be prepared to experience discomfort or inconveniences arising from typical agricultural operations which could include dust, smoke, noise, or odors. The right-to-farm ordinance promotes understanding and cooperation between urban residents and agricultural operators. Section 17.08.090 of the Merced County Code states the following:

1. Where required by this code (Title 17), every final map shall have a certificate placed on the map, or shall record by separate instrument, which notifies future buyers, leasees, or financiers of the following:

   The property described on the final map is in the vicinity of land utilized for agricultural purposes, and residents of this property may be subject to inconveniences or discomfort arising from the use of agricultural chemicals, including, but not limited to, pesticides and fertilizers; and from the pursuit of agricultural operations including, but not limited to, plowing, spraying and burning which occasionally may generate dust, smoke, noise, and odors.

   The County of Merced has established agriculture as a priority use in agricultural zones which are outside or an established Specific Urban Development Plan boundary, Rural Residential Center (RRC) boundary, Highway Interchange Center (HIC) boundary, or Agricultural Service Center (ASC) boundary, and residents of property in the vicinity of such agricultural zones should be prepared to accept inconveniences or discomfort from normal, necessary agricultural operations.

2. This section shall only apply to those properties inside and within 1,000 feet of a SUDP boundary, Rural Residential Center (RRC) boundary, Highway Interchange Center (HIC) boundary, or Agricultural Service Center (ASC) boundary as designated on the General Plan Land Use Map.

4.2.3.5 Merced County Pesticide Ordinance

California Code of Regulations Title 3, Sections 6000–6920 regulate the registration, management, use, and application of pesticides on agricultural lands. These regulations are enforced by the Merced County Agricultural Commissioner. Generally, specific regulations vary for each pesticide, its method of application and use. However, Sections 6600 and 6614 contain general regulations relating to the application of pesticide use as follows:

6600 General Standards of Care.

Each person performing pest control shall:

a. Use only pesticide equipment that is in good condition and safe to operate.

b. Perform all pest control in a careful effective manner.

c. Use methods and equipment suitable to ensure proper application of pesticide.

d. Perform all pest control under climatic conditions suitable to ensure proper application of pesticides.

e. Exercise reasonable precautions to avoid contamination of the environment.

6614 Protection of persons animals property

a. An applicator prior to and while applying pesticide shall evaluate the equipment to be used, meteorological conditions, property to be treated, and surrounding properties to determine the likely hood of harm or damage.

b. Notwithstanding that substantial drift would be prevented, no pest application shall be made or continue when:

    1. There is a reasonable possibility of contamination of the bodies or clothing of persons not involved in [the] application process;

    2. Possibility of damage to nontarget crops, animals or other public private property; or

    3. There is a reasonable possibility of contamination of nontarget public or private property including the creation of a health hazard preventing the normal use of such property. In determining a health hazard, the amount and toxicity of pesticide and type and use of property and related factors shall be considered.

4.2.3.6 UC Merced 2009 Long Range Development Plan

The UC Merced 2009 LRDP does not contain policies specifically related to agricultural land.

4.2.3.7 University Community Plan

The Proposed Action would convert up to 1,951 acres of agricultural land within the University Community to urban uses. The following adopted UCP and Area Plan policies are intended to protect and preserve agricultural resources.

UCP Agricultural Policies

A 1.1: Encourage agricultural production to occur within the University Community planning area, for as long as possible, during development of the site.

A 1.2: Enforce the County of Merced's Right-to-Farm Ordinance for the University Community that requires nonagricultural residents be made aware of local agricultural operations, their practices, and the potential agriculturally related impacts. This may be accomplished through its inclusion in the distribution of annual property tax bills, escrow papers upon sale or lease execution, Title Reports issued at the time of close of any escrow, Department of Real Estate White Papers, or similar documents.

A 1.3: Provide materials such as brochures and pamphlets to all future residents of the University Community informing them about the effects of agricultural activities that states residents within the University Community may be subject to inconveniences or discomfort arising from the use of agricultural chemicals, such as fertilizers and pesticides; and from the pursuit of agricultural operations including but not limited to, plowing, spraying, and burning which occasionally may generate dust, smoke, noise and odor.

A 2.1: Participate in a program, if adopted, that may be established by the County of Merced and the City of Merced for the full mitigation of the loss of agricultural lands in the north Merced area. In the event that such a program is not adopted prior to approval of any subarea specific plan, require implementation of such measures that would achieve the equivalent protection of comparable farmland at a ratio of 1:1 for Important Farmland converted with the subject specific plan area; examples of measures include acquisition of conservation easements, payment of in-lieu fees to the County (or an appropriate third party designated by the County) that would protect such lands through fee title, easement, or other measures.

A 3.1: Establish an adequate open space buffer along the edges of the University Community planning area abutting agricultural lands. This buffer may accommodate passive uses such as open space, parks, certified organic farming, natural preserves, or treated wastewater storage.

UCP Land Use Policies

LU 9.10: Allow for the use of existing prime agricultural land as open space that would be integrated into the final design of the University Community, where possible. Open space uses could include parks, community gardens, and educational/research activities.

4.2.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

CEQ guidance for evaluating the types and significance of impacts under National Environmental Protection Act (NEPA) is summarized in **Section 4.0, Affected Environment and Environmental Consequences.** For purposes of this analysis, this EIS/EIR conservatively uses significance criteria derived from Appendix G of the *State CEQA Guidelines* and the CEQ guidance regarding the determination of environmental consequences to identify impacts. For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. For the purpose of this Draft EIS/EIR, impacts related to agricultural resources would be significant if implementation of the proposed project or its alternatives would

- convert Prime Farmland, Farmland of Statewide Importance, or Unique Farmland, as shown on the State Important Farmlands maps, to non-agricultural use;
- conflict with existing general plan policies or zoning for agricultural use, or with a Williamson Act Contract; or
- involve other changes in the existing environment that could result in the conversion of Prime Farmland, Farmland of Statewide Importance, or Unique Farmland to non-agricultural uses;
- expose future residents to nuisances associated with agricultural operations or expose farmers to nuisances associated with development of the University Community; or
- adversely affect agricultural production.

Based on the significance criteria listed above, Prime Farmland, Farmland of Statewide Importance, or Unique Farmland are considered Important Farmland under CEQA, whereas only Prime Farmland is considered Important Farmland under NEPA. Other farmland categories (Farmland of Local Importance and Grazing Land) are not considered Important Farmland and the conversion of those lands to urban uses would not constitute a significant impact.

All of the standards of significance listed above are addressed in the analysis below. The effects of the Proposed Action on agricultural production are largely economic impacts which are not evaluated on their own. The loss of agricultural production is analyzed in terms of the loss of Important Farmland which support agricultural production.

4.2.5 METHODOLOGY FOR EVALUATING EFFECTS

Impacts were assessed based upon information contained in a variety of sources. Information for Williamson Act lands and acreages was obtained from the Merced County Planning Department, while farmland status was obtained from the California DOC's Department of Land Conservation. As previously discussed, the County has designated land south of Bellevue Road as Williamson Act Preserve, which identifies an area that may be under future Williamson Act Contracts. None of the land is currently under a Williamson Act contract. However, removal of land from this County designation does not involve penalties or waiting periods and does not relate to cancellation of Williamson Act contracts. Although development of the Proposed Action is anticipated to occur over a period of time, this analysis assumes that ultimately all agricultural land within the Campus and the University Community would be converted to non-agricultural uses.

4.2.5.1 California Department of Conservation – LESA Model

Land Evaluation and Site Assessment (LESA) is a term used to define an approach for rating the relative quality of land resources based upon specific measurable factors. The formulation of a California Agricultural LESA Model is the result of Senate Bill 850 (Chapter 812/1993), which charges the Resources Agency, in consultation with the Governor's Office of Planning and Research, with developing an amendment to Appendix G of the *State CEQA Guidelines* concerning agricultural lands in the state of California. Such an amendment is intended, "to provide lead agencies with an optional methodology to ensure that significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process" (Public Resources Code Section 21095).

The California DOC LESA Model is composed of six different factors. Two land evaluation factors are based upon measures of soil resource quality. Four site assessment factors provide measures of a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resources lands. For a given project, each of these factors is separately rated on a 100-point scale. The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum score of 100 points. It is this project's score that becomes the basis for making a determination of a project's potential significance, based upon a range of established scoring thresholds. The California DOC Agricultural Land Evaluation and Site Assessment Model Instruction Manual and analysis prepared for the Proposed Action are included in **Appendix 4.2** of this document.

Land Evaluation Factors

The California DOC LESA Model includes two land evaluation factors that are separately rated:

- **The Land Capability Classification Rating (LCC)** indicates the suitability of soils for most kinds of crops. Groupings are made according to the limitations of the soils when used to grow crops and the risk of damage to soils when they are used in agriculture. Soils are rated from Class I to Class VIII, with soils having the fewest limitations receiving the highest rating (Class I). Specific subclasses are also utilized to further characterize soils. An expanded explanation of the LCC is included in most soil surveys.

- **The Storie Index Rating** provides a numeric rating (based on a 100-point scale) of the relative degree of suitability or value of a given soil for intensive agriculture. The rating is based upon soil characteristics only. Four factors that represent the inherent characteristics and qualities of the soil are considered in the index rating. The factors include: profile characteristics, texture of the surface layer, slope and other factors (e.g., drainage, salinity).

In some situations, only the Land Capability Classification information may be currently available from a given published soil survey. However, Storie Index ratings can be readily calculated from information contained in soil surveys by qualified soil scientists. If limitations of time or resources restrict the derivation of Storie Index ratings for soils within a region, it may be possible to adapt the Land Evaluation by relying solely on upon the LCC rating.

Site Assessment Factors

The California LESA Model includes four site assessment factors that are separately rated, including

- **The Project Size Rating** relies upon acreage figures that were tabulated under the Land Capability Classification Rating. The Project Size Rating is based upon identifying acreage figures for three separate groupings of soil classes within the project site and then determining which grouping generates the highest project size score.

- **The Water Resources Availability Rating** is based upon identifying the various water sources that may supply a given property, and then determining whether different restrictions in supply are likely to take place in years that are characterized as being periods of drought and non-drought.

- **The Surrounding Agricultural Land Rating** is determined based upon identification of a project's Zone of Influence (ZOI), which is defined as that land near a given project both directly adjoining and within a defined distance away, that is likely to influence, and be influenced by the agricultural land use of the subject project site. The Surrounding Agricultural Land Rating is designed to provide a measurement of the level of agricultural land use for lands near a project. The LESA Model rates the potential land in agricultural production. The definition of a ZOI that accounts for surrounding lands up to a minimum of 0.25 miles from the project boundary is the result of several iterations during model development for assessing an area that will generally be a representative sample of surrounding land use.

- **The Surrounding Protected Resource Land Rating** is essentially an extension of the Surrounding Agricultural Land Rating, and is scored in a similar manner. Protected resource lands are those lands with long-term use restrictions that are compatible with or supportive of agricultural uses of land. Included among them are the following:

  – Williamson Act contracted lands

  – Publicly owned lands maintained as park, forest, or watershed resources

  – Lands with agricultural, wildlife habitat, open space, or other natural resource easements that restrict the conversion of such land to urban or industrial uses.

The project size rating segregates acreage figures for groupings of LCC classes, and points are assigned for each grouping on a 100-point scale. The model requires use of the highest value from among the groupings.

4.2.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

Table 4.2-5, Distribution of Important Farmland by Alternative, below presents the estimated acres of Important Farmland and non farmland present within each of the alternative sites under consideration. The data in this table are used in the analysis of impacts below.

Table 4.2-5
Distribution of Important Farmland by Alternative

Alternatives	FMMP Mapping Categories							
	Prime	Statewide	Unique	Local	Grazing	Urban	Other[1]	*TOTAL*
1-Proposed Action	609	109	434	646	762	190	14	***2,765***
2-Yosemite Avenue	1,247	165	551	355	283	148	14	***2,763***
3-Bellevue Ranch	230	195	587	894	511	127	121	***2,665***
4-2002 Proposed Project	619	110	435	511	1,194	214	34	***3,117***

Source: Department of Conservation 2008.

[1] *Other Land includes all categories of the Rural Land Mapping Project, described above.*

4.2.6.1 Alternative 1 – Proposed Action

Alt 1 – Impact AG-1: **The Proposed Action would result in the conversion of Important Farmland, including Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. (*Significant; Significant and Unavoidable*)**

Campus

As shown on **Figure 4.2-3, Proposed Action Farmland Map** and in **Table 4.2-4**, about half of the campus under the Proposed Action is designated by the FMMP as grazing land. Approximately 104 acres of the campus site have been developed with buildings and facilities. Of the remaining available land within the proposed campus boundary, there are 8 acres of Prime Farmland and 16 acres of Farmland of Statewide Importance. The Important Farmlands are concentrated in the southern portion of the campus. As the proposed boundary of the campus has shifted south relative to the campus as it was previously proposed in 2002, the distribution of potentially impacted farmland has changed from previous analyses; the campus as previously evaluated in the 2002 LRDP EIR did not involve any impacts to Important Farmlands (see discussion below regarding the 2002 Proposed Project). Additionally, the FMMP is updated and refined every two years as additional data and soil surveys are performed throughout the state and some shifts in acreages of farmland may have resulted from these updates since 2002.

Development of the campus would result in the conversion of 24 acres of Important Farmland to urban uses. With the development of the campus, 0.005 percent of Important Farmland within the county would be lost. The 24 acres of Important Farmland located on the campus portion of the Proposed Action are used as grazing land, and are not currently utilized in crop production, nor are they used in a manner that would disrupt the local and statewide economy. However, a conversion of Important Farmland is considered a potentially significant impact under CEQA. As NEPA considers the loss of only Prime Farmland significant, the conversion of 8 acres of Prime Farmland would be considered an adverse impact under NEPA, although not a substantial impact given the small number of acres affected.

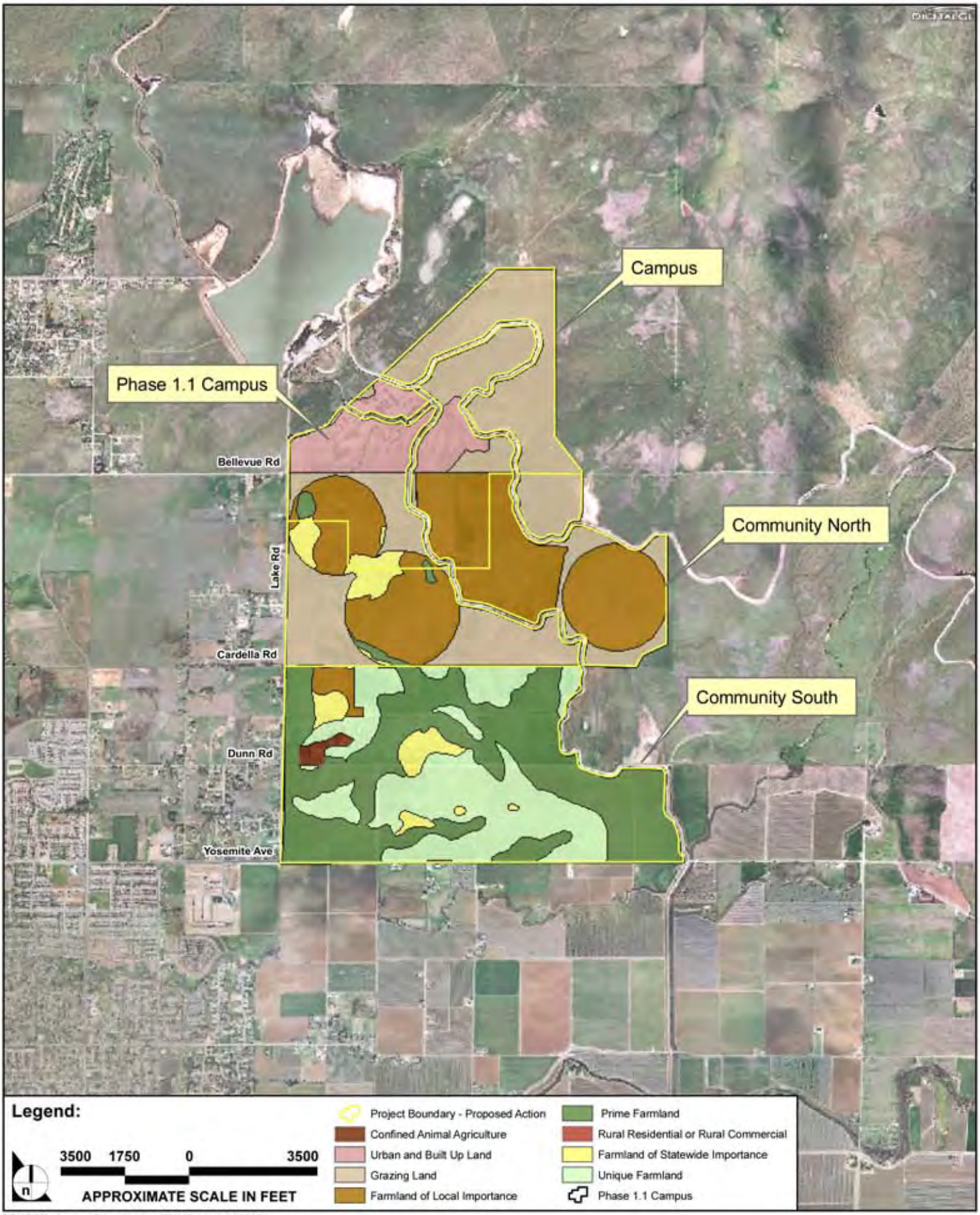
University Community

As indicated in **Table 4.2-3**, the University Community currently contains 601 acres of Prime Farmland, 434 acres of Unique Farmland and 93 acres of Farmland of Statewide Importance, all of which are classified as Important Farmland. However, the agricultural use of the Community North area is very different from the use within Community South. The development of the Community North portion of the Proposed Action would convert 55 acres of Important Farmland to urban uses. This land within the Community North portion is currently used for cattle grazing, and is not utilized for crop production. The Community South portion of the Proposed Action has the majority of the Important Farmlands (1,073 acres) within its boundaries, and approximately 589 acres of these are Prime Farmland. These Important Farmlands are currently under agricultural production and the conversion of these lands to urban uses would result in a significant impact under both CEQA and NEPA.

With the development of the University Community, 0.2 percent of Important Farmland in Merced County would be lost. To address the potential loss of Important Farmland within the University Community, the UCP includes Policy A 2.1 which states that new development that converts Important Farmland within the University Community would "Participate in a program, if adopted, that may be established by the County of Merced and the City of Merced for the full mitigation of the loss of agricultural lands in the north Merced area. In the event that such a program is not adopted prior to approval of any subarea specific plan, require implementation of such measures that would achieve the equivalent protection of comparable farmland at a ratio of 1:1 for Important Farmland converted with the subject specific plan area; examples of measures include acquisition of conservation easements, payment of in-lieu fees to the County (or an appropriate third party designated by the County) that would protect such lands through fee title, easement, or other measures." Implementation of this policy would mitigate for the loss of Important Farmland within the University Community, although the impact would not be reduced to a less than significant level.

Conclusion

Development of both the Campus and the University Community would result in a combined loss of approximately 1,152 acres of Important Farmland, which would represent about 0.2 percent of Important Farmland in the county that would be lost to urban uses. As noted above, the impact related to conversion of 1,152 acres of Important Farmland would be considered a significant impact under CEQA and the loss of 609 acres of Prime Farmland would constitute a significant impact under NEPA. The *State CEQA Guidelines* recommend the use of the LESA model to further evaluate a project's impact on Important Farmlands, especially in instances where there is some uncertainty with respect to the significance of the project's impact. As noted above, the vast majority of the Community South area is Important Farmland based on the FMMP mapping and is used to grow high-value crops such as vegetables. Since the Community South portion of the Proposed Action would convert a much larger amount of Important Farmlands to urban lands, compared to the Campus and Community North portion of the Proposed Action, it was assumed, without the use of the LESA Model, that the conversion of these Important Farmlands would be significant and unavoidable. Although the Campus and Community North areas contain patches of land that are mapped as Important Farmland, these areas are limited in extent and do not and have not historically supported cultivation of high-value crops, therefore a LESA analysis of these two areas was conducted to determine the significance of the loss of this farmland. The result of the LESA model for the Campus/Community North portion of the Proposed Action is shown in **Table 4.2-6, Campus/Community North Final LESA Score**.



SOURCE: Impact Sciences, Inc, FMMP - August 2008

FIGURE **4.2-3**

Proposed Action Farmland Map

Table 4.2-6
Campus/Community North Final LESA Score

	Factor Scores	Factor Weight	Weighted Factor Scores
LE Factors			
Land Capability Classification	52.3	0.25	14.8
Storie Index	34.5	0.25	6.2
LE Subtotal		**0.50**	**20.9**
SA Factors			
Project Size	100	0.15	15.0
Water Resource Availability	100	0.15	15.0
Surrounding Agricultural Land	0	0.15	0
Protected Resource Land	20	0.05	1.0
SA Subtotal		**0.50**	**31.0**
Final LESA Score			**51.9**

With a final LESA score of 51.9, and given that each of the LE and SA subscores is greater than or equal to 20, the loss of Important Farmland that would occur as a result of the Campus and Community North development under the Proposed Action would be considered significant. However, the LE score of 20.9, which is just slightly greater than the threshold of significance of 20, shows that the Important Farmlands within the Campus and Community North areas are marginal and that this final LESA score is primarily a result of the size of the project site, water resource availability, and the land capability classifications of the soils rather than the real value of the two areas for agricultural production.

In summary, although based on FMMP mapping and the final LESA score, the loss of Important Farmland within the Campus and Community North would be considered a significant impact, based on the historical and current uses of the land as well as the fact that the LESA score is just slightly above the threshold, the loss of this land on account of the Campus and Community North development is not considered a significant impact on Important Farmland.

Furthermore, the University has committed to and already placed substantial acres of lands in eastern Merced County under conservation easements for the protection of biological resources. **Figure 2.0-11, Conservation Lands for UC Merced Campus and University Community** and **Table 4.2-7, Important Farmland in the Proposed Conservation Easements,** shows the location of the conservation easements and the amount of land that will be protected within the Conservation Lands. There are approximately 70 acres of Important Farmlands and approximately 26,435 acres of grazing land within these Conservation Lands that will be permanently protected from development. These acreages would more than

adequately compensate for the loss of 24 acres of Important Farmland within the campus site. Therefore, impacts associated with the development of the campus portion of the Proposed Action would be less than significant because of the conservation easements that are already part of the Proposed Action.

Table 4.2-7
Important Farmland in the Proposed Conservation Easements

Conservation Easements	Total Acres of Proposed Easement	Prime Farmland (acres)	Unique Farmland (acres)	Farmland of Statewide Importance (acres)	Total Important Farmland (acres)
Robinson	3,595	0	0	0	**0**
Chance	7,619	0	0	0	**0**
Cyril Smith Trust	3,070	0	0	0	**0**
Virginia Smith Trust Preserve	5,030	0	0	0	**0**
Campus Natural Reserve	1,307	0	0	0	**0**
Myers Easterly	97	0	0	0	**0**
Cunningham	1,761	69	1	0	**70**
Carlson	305	0	0	0	**0**
Nelson	3,861	0	0	0	**0**
Total	**26,645**	**69**	**1**	**0**	**70**

Although for reasons presented above, the impact from the development of Community North would also not be significant, there are no Important Farmlands within the Myers Easterly, Virginia Smith Trust, and Campus Natural Reserve), and therefore protection of comparable quality farmland is not included in the Community North portion of the Proposed Action. With respect to Community South, the impact from the conversion of Important Farmland within Community South would be significant and unavoidable because not only would a large acreage of actively used prime farmland be converted to urban uses, there are no conservation lands associated with Community South. Furthermore, although UCP Policy A 2.1 would require developers to participate in the Countywide farmland mitigation program or protection of comparable quality farmland at a 1:1 mitigation ratio if the program is not developed at the time of project approval, the policy does not assure that an equivalent amount of Important Farmland would be necessarily protected. The following mitigation measure is proposed to address this significant impact.

Mitigation Measure AG-1: Developers with projects within the University Community will mitigate the loss of Important Farmland by securing agricultural easements on comparable farmland at a minimum ratio of 1:1 prior to the development of any portion of the University Community site.

It is also anticipated that the County will evaluate UCP Policy A 2.1 at the time that it considers the revisions to the UCP and will amend the policy as necessary. In the event that a revised policy is adopted that is as stringent as **Mitigation Measure AG-1** above, the developers will comply with revised UCP Policy A 2.1 and no other mitigation will be required.

Significance after Mitigation: The campus has preserved thousands of acres of grazing land in eastern Merced County through the placements of easements. The easements prevent future development of the properties and promote their continued use for agricultural purposes. The easements preserve existing farmland outside the project boundaries. Easements which mitigate their impacts to Important Farmland have not been established for Community North and Community South. Furthermore, it is not practicable to create new Important Farmland to replace the acreage that would be lost due to the development of the University Community. This impact is considered significant and unavoidable pursuant to CEQA and would be an unavoidable adverse impact pursuant to NEPA.

Alt 1 – Impact AG-2: The Proposed Action Alternative would not expose residents to agricultural nuisances, substantially conflict with existing General Plan policies or zoning for agricultural use, or involve other changes that could result in the conversion of Important Farmland to non-agricultural uses. (*Less than Significant*)

Campus

Although the campus site is zoned A-2, an agricultural zone, in the County General Plan, as a state-owned property, the campus is not subject to local zoning. Therefore, construction of facilities to be used for instruction, student housing, and various student-related services would not conflict with any agricultural zoning. No portion of the campus site is under a Williamson Act contract.

It is anticipated that grazing activities and use of irrigated pasture would continue on portions of the campus until specific facilities are proposed for construction. Although students, faculty, and staff would be exposed to ongoing agricultural activities on the campus site and within the adjacent University Community, it is unlikely that these land uses would create conflict because given the campus's agricultural setting, students, faculty, and staff on site would be aware of these potential land use incompatibilities and are not expected to file complaints regarding agricultural activity. In the long run, land uses adjacent to the campus are not expected to raise issues of conflict. Lake Yosemite Regional Park is located to the northwest, the Campus Natural Reserve is located to the north and northeast, and the University Community located to the south would be developed with compatible land uses. Therefore, campus population would not be exposed to agricultural nuisances. In the absence of land use conflicts

between the campus and adjacent grazing lands, the development of the campus would not put pressure on agricultural practices on adjacent lands to be abandoned or for the land to convert to non-agricultural uses.

Development of the proposed campus could result in growth pressure on adjacent lands to convert to non-agricultural uses. However, the off-site lands adjacent to and north and northeast of the campus are not considered Important Farmland. Furthermore, these lands are part of the Campus Natural Reserve and have been placed under conservation easements that would protect these lands from development. Other lands adjacent to the campus are not part of an SUDP and therefore cannot be developed until they are designated for urban uses within an SUDP (see further discussion below). Therefore, this impact is considered less than significant.

University Community

The 1,951-acre University Community area is zoned a combination of A-1 and A-2 agricultural zones. With the exception of 222 acres in the eastern portion of Community North, the University Community is located within a SUDP which, according to the County general plan, is to be maintained in agricultural use until the Comprehensive Campus and Community Planning Process is completed. Since the County general plan identifies agricultural use in SUDP areas as ultimately being converted to urban uses, the Proposed Action would not be in conflict with the general plan. Further, the general plan contemplates that the current agricultural zoning would be amended. No part of the University Community area is under Williamson Act contract. Therefore, the Proposed Action would have less-than-significant direct impacts with regard to existing agricultural zoning and Williamson Act contracts. For impacts related to the inclusion of the additional 222 acres of land in the UC Merced/University Community SUDP, please see **Section 4.9, Land Use and Planning**.

The University Community area would be developed over time. UCP Policy A 1.1 would be implemented to avoid early cessation of agricultural use within the University Community. Incompatibilities could occur within the University Community as it is being built out, because agricultural operations would continue to occur in undeveloped portions, particularly the southern portion of the site. Grazing activity may also continue on the northern portions of the University Community on an interim basis during development of the area. Furthermore, lands adjacent to the southern portion of the University Community are actively cultivated and are expected to stay in agricultural use. As a result, future residents of the University Community could be exposed to nuisances related to agricultural activities, which include dust, odors, pesticide spray drift, and elevated noise levels from continuing agricultural activities both on site and off site. In particular, activities associated with farming, such as tilling, planting, pesticide application, and harvesting often generate these conditions,

which can often result in land use incompatibilities. Crops grown on the southern portion of the University Community generally include tomatoes, corn, oats, and wheat. Crops grown south of Yosemite Avenue, adjacent to the University Community include tomatoes, alfalfa, cotton, almonds, and walnuts. The type of crop grown depends on many variables including the predicted economic value of specific agricultural goods, the viability of the soil, and the abilities of the farmer. Because the type of crop grown varies from year to year, agricultural practices, such as the type and timing of pesticide application, crop planting, harvesting, and tilling, also vary from year to year.

The application of pesticides is regulated by the Merced County's Agricultural Commissioner. Regulations are specific to each pesticide and the method of application so that there are different regulatory requirements for every type of pesticide and method of application. There are several regulations that the Agricultural Commissioner uses to ensure that pesticide drift does not adversely affect adjacent land uses. Regulations found in the California Food and Agricultural Code, Section 12972, which apply to all types of pesticide applications, state that the use of any pesticide by any person must be applied in a manner that prevents drift. In addition, California Code of Regulations, Title 3, Sections 6600 and 661412 govern the application of pesticides by requiring that only pesticide equipment that is in good condition and safe to operate be used, that all pest control activities be conducted under climatic conditions suitable to ensure proper application, and that reasonable precautions are exercised to avoid contamination of the environment. Compliance with the above regulations would ensure that pesticide drift from agricultural lands does not adversely affect adjacent urban development.

Future residents could also hinder agricultural operations occurring on undeveloped land in the University Community as well as on agricultural lands to the south and east of the University Community. Urban development would introduce traffic, domestic pets, and gardening pests that could disrupt standard farming practices. The introduction of homes into a rural area can also result in vandalism, theft, and damage to agricultural property, all of which can adversely affect the farmer. Although future residents of the University Community would be made aware of nearby farming activities through the County's right-to-farm ordinance and through implementation of UCP Policy A 1.2, which states that residents should be prepared to accept nuisances associated with agricultural activities. The ordinance does not however prevent such activities from being perceived as nuisances. Even with the adoption and implementation of the right-to-farm ordinance, residents could file complaints with the Merced County Agricultural Commissioner or Merced County Planning Department.

UCP Policy A 1.3 requires that materials such as brochures and pamphlets be distributed to future residents of the University Community informing the residents about the effects of agricultural activities. This policy is similar to the Merced County right-to-farm ordinance in that it restates that residents (as

well as property owners) should be prepared to accept inconveniences associated with agricultural activities.

The potential incompatibilities associated with noise, odors, and dust from agricultural activities would be intermittent, would occur at some distance away from the University Community, and should be expected in any urban edge area. UCP Policy A 3.1 would implement open space buffers along project boundaries that are adjacent to off-site agricultural uses. In this case, implementation of the right-to-farm ordinance would give every new home buyer the opportunity to evaluate the personal significance of these potential minor nuisances. Furthermore, the right-to-farm ordinance allows existing agricultural operations to continue, unhindered so that farmers do not have to alter their operations in accordance with the desire of future residents. With implementation of this UCP policy and compliance with existing regulations, agricultural conflicts within the University Community would represent a less-than-significant impact.

In summary, adherence to UCP Policies A 1.2, 1.3, and 3.1 would ensure that effects on residents and potential land use conflicts would be minimized and the pressure on adjacent agricultural lands to convert to other uses would be minimized. Therefore this impact is considered less than significant.

Development of the Proposed Action could result in growth pressure on the adjacent agricultural lands to convert to non-agricultural uses. Specifically, the lands to the east of Community South and all land south of the project site across Yosemite Avenue are considered Important Farmland. Lands to the east of the site are under existing Williamson Act contracts. These contracts would help ensure that development of these lands would not occur without proper environmental review by the County and the Merced County LAFCO. With respect to the lands to the south of Yosemite Avenue, although this farmland is not currently under Williamson Act contracts, it is zoned for agricultural use and is not located within a SUDP. This zoning designation along with the County's policy to limit all urban development to SUDPs would not allow this area to develop non-agricultural uses. Additionally, this land is not readily served by essential utilities and services. The only nearby existing municipal utility is a sanitary sewer main within Yosemite Avenue that is at capacity. No additional development could occur in this area until the sanitary sewer capacity issue is addressed. For these reasons, the potential for conversion of adjacent off-site Important Farmland to non-agricultural use as a result of growth pressures is considered to be low, and the impact is considered less than significant.

Conclusion

For reasons presented above, the Proposed Action would not result in a significant impact related to agricultural zoning, cancellation of Williamson Act contracts, exposure of residents to agricultural nuisances, or conflicts with adjacent agricultural land uses, nor would it result in significant adverse effects on adjacent land uses or lead indirectly to the conversion of adjacent off-site farmland to non-agricultural uses.

Mitigation Measure: No mitigation is required.

4.2.6.2 Alternative 2 – Yosemite Avenue

Conversion of Important Farmland

As shown on **Figure 4.2-4, Alternative 2 – Yosemite Avenue Alternative Farmland Map**, under this alternative the campus would be located south of the Phase 1.1 Campus, and the University Community to the south of the campus.

As shown, 20 acres of Prime Farmland, 54 acres of Farmland of Statewide Importance, and 5 acres of Unique Farmland would be converted to campus use under this alternative. With development of the campus in this location, 0.01 percent of Important Farmland in the county would be lost. Similar to Alternative 1, this impact is considered potentially significant. However, because the same conservation lands would be included in this alternative as are part of the Proposed Action, the impact would be less than significant. Because of the change in the location and footprint of the Community North and Community South under this alternative, compared to Alternative 1, this alternative would affect 1,227 acres of Prime Farmland, 110 acres of Farmland of Statewide Importance, and 545 acres of Unique Farmland within the University Community area. Therefore, under this alternative, development of the University Community would result in the conversion of 1,882 acres of Important Farmlands to urban uses. This acreage would be 0.4 percent of Important Farmland lost in the county. This is considered a significant impact. For the same reasons presented for the Proposed Action, this impact would be significant and unavoidable under CEQA and an unavoidable adverse impact under NEPA.

Expose Residents to Agricultural Nuisances, Conflict with Agricultural Zoning or Result in Development Pressures

Similar to the Proposed Action, under Alternative 2, the campus site would be a state-owned property and would not be subject to local zoning. Therefore, construction of facilities to be used for instruction, student housing, and various student related services would not conflict with any local agricultural

zoning. The development of the University Community would place future project residents adjacent to ongoing agricultural activities. However, adherence to UCP Policies A 1.2, 1.3, and 3.1 would ensure that exposure to agricultural nuisances and the land use conflicts would be minimized and therefore this impact is considered less than significant.

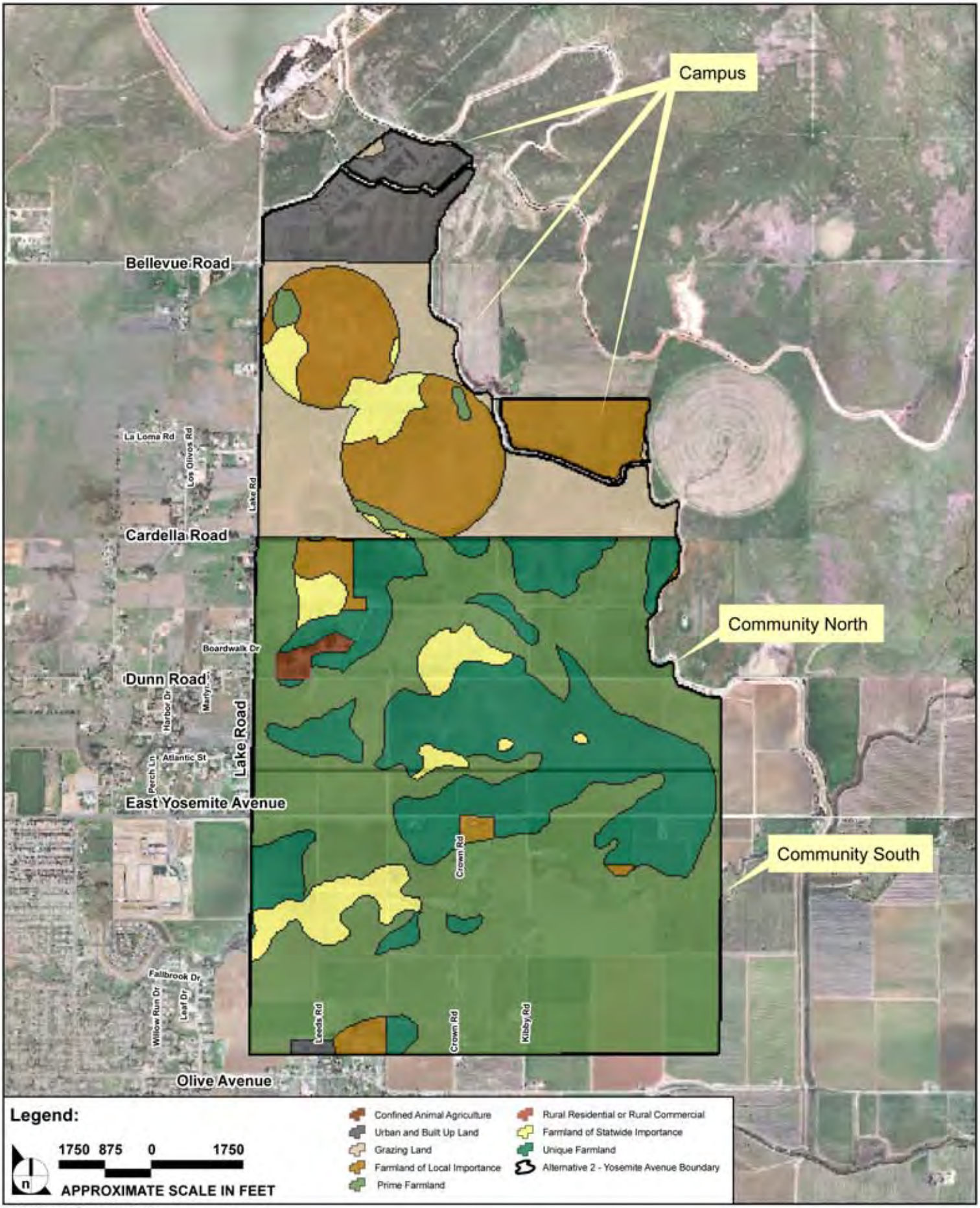
Similar to the Proposed Action, this alternative could exert off-site development pressure on Important Farmlands surrounding the site. Existing farmland to the south and southeast of the alternative site are considered Important Farmland. However, as discussed above, the existing County regulations in combination with the lack of available essential utilities would hinder conversion of these agricultural lands to non-agricultural use, and this impact is considered less than significant.

4.2.6.3 Alternative 3 – Bellevue Ranch

Conversion of Important Farmland

As shown on **Figure 4.2-5, Alternative 3 – Bellevue Ranch Alternative Farmland Map**, a large part of the campus site under this alternative is designated by the FMMP as Prime Farmland. Currently, this land is under a variety of agricultural uses, including grazing and row crop production. There are 123 acres of Prime Farmland, 69 acres of Farmland of Statewide Importance, and 257 acres of Unique Farmland within the campus portion of the Bellevue Ranch site. Development of the Campus would result in the conversion of these Important Farmlands to urban uses, and about 0.08 percent of Important Farmland in the county would be lost to urban uses.

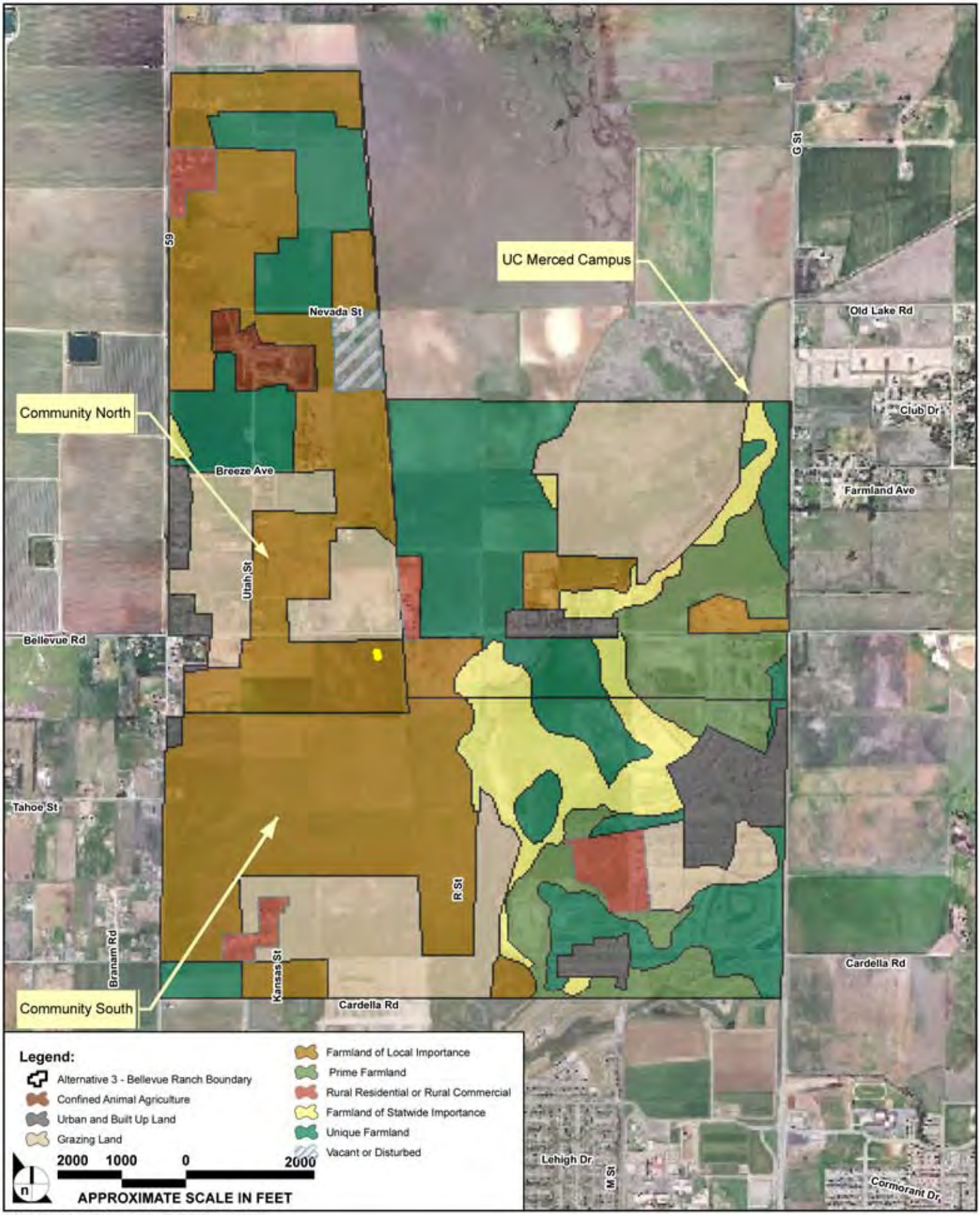
This alternative would affect 107 acres of Prime Farmland, 126 acres of Farmland of Statewide Importance, and 330 acres of Unique Farmland within the University Community area. Therefore, under this alternative, development of the University Community would result in the conversion of 563 acres of Important Farmlands to urban uses. This acreage would be 0.1 percent of Important Farmland lost in the county. This is considered a significant impact. Even with implementation of the UCP policies, development of the Campus and the University Community would result in the loss of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance. Therefore, this impact is considered significant and unavoidable pursuant to CEQA and would be considered an unavoidable adverse impact pursuant to NEPA.



SOURCE: FMMP – August 2008

FIGURE **4.2-4**

Alternative 2 - Yosemite Avenue Alternative Farmland Map



SOURCE: Impact Sciences Inc., FMMP - August 2008

FIGURE **4.2-5**

Alternative 3 - Bellevue Ranch Alternative Farmland Map

Expose Residents to Agricultural Nuisances, Conflict with Agricultural Zoning or Result in Development Pressures

Similar to the Proposed Action, under this alternative, the campus site would be a state-owned property and would not subject to local zoning. Therefore, construction of facilities to be used for instruction, student housing, and various student related services would not conflict with any agricultural zoning. The development of the University Community would place future project residents adjacent to ongoing agricultural activities. However, adherence to UCP Policies A 1.2, 1.3, and 3.1 would ensure that the exposure of residents to agricultural nuisances and land use conflicts with adjacent agricultural uses would be minimized and therefore this impact is considered less than significant.

Similar to the Proposed Action, this alternative could exert off-site development pressure on Important Farmlands surrounding the project site. Existing farmland to the east, south, and west of this alternative location are considered Important Farmland. However, as discussed above, the existing County and City regulations would be implemented to reduce pressure to convert these uses to non-agricultural activities. As this alternative is partially within the City of Merced limits, utilities and services are available near the farmlands south of this site. However, the development pressure exerted on these farmlands would originate from the existing urban uses on the periphery of the City boundaries, rather than the phased development of this alternative. Additionally, the City of Merced has designated a large portion of the land within this alternative as Low Density Residential, and zoned this land as planned development. The conversion of agricultural lands in this area of the City has been anticipated in the City's planning documents. Therefore, this impact is considered less than significant.

4.2.6.4 Alternative 4 – 2002 Proposed Project

Conversion of Important Farmland

Impacts under this alternative would differ from those under Alternative 1, Proposed Action and were previously described in the prior EIRs. The proposed "Campus Land Reserve" and the "Campus Natural Reserve" under Alternative 4 would both remain undeveloped. Accordingly, this alternative would not include any ground disturbing activities that could result in impacts to agricultural resources in these reserve areas. The remaining 910-acre area of the campus under this alternative that would be subject to development is designated Urban and Built Up land (Phase 1.1 Campus) or grazing land in the FMMP. As shown on **Figure 4.2-6, Alternative 4 – 2002 Proposed Project Alternative Farmland Map**, the proposed campus site has not been designated by the state as prime or unique farmland or farmland of statewide importance. Therefore, the development of the campus under this alternative would remove about 789 acres or about 0.1 percent of undeveloped grazing land in the county, but would not affect any

Important Farmland, and the direct impact both under NEPA and CEQA would be less than significant. No mitigation would be required.

As indicated in **Table 4.2-3**, the University Community under this alternative contains 619 acres of Prime Farmland, 435 acres of Unique Farmland, and 110 acres of Farmland of Statewide Importance[1]. Development of the University Community would result in the conversion of these Important Farmlands to urban uses. There would be 0.2 percent of Important Farmland lost in the county with development of the University Community. This is considered a significant impact. Even with implementation of the UCP policies, the University Community would result in the loss of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance. Therefore, this impact is considered significant and unavoidable pursuant to CEQA and would be considered an unavoidable adverse impact pursuant to NEPA.

Expose Residents to Agricultural Nuisances, Conflict with Agricultural Zoning or Result in Development Pressures

Similar to the Proposed Action, the campus site under this alternative would be a state-owned property and would not be subject to local zoning. Therefore, construction of facilities to be used for instruction, student housing, and various student related services would not conflict with any agricultural zoning. The development of the University Community would place future project residents adjacent to on-going agricultural activities. However, adherence to UCP Policies A 1.2, 1.3, and 3.1 would ensure that exposure of residents to agricultural nuisances and land use conflicts would be minimized and therefore this impact is considered less than significant.

Similar to the Proposed Action, this alternative could exert off-site development pressure on Important Farmlands surrounding the project site. Existing farmland to the south and southeast of the project site are considered Important Farmland. However, as discussed above, the existing zoning and County regulations in combination with the lack of available essential utilities would hinder conversion of these agricultural lands to non-agricultural use, and this impact is considered less than significant.

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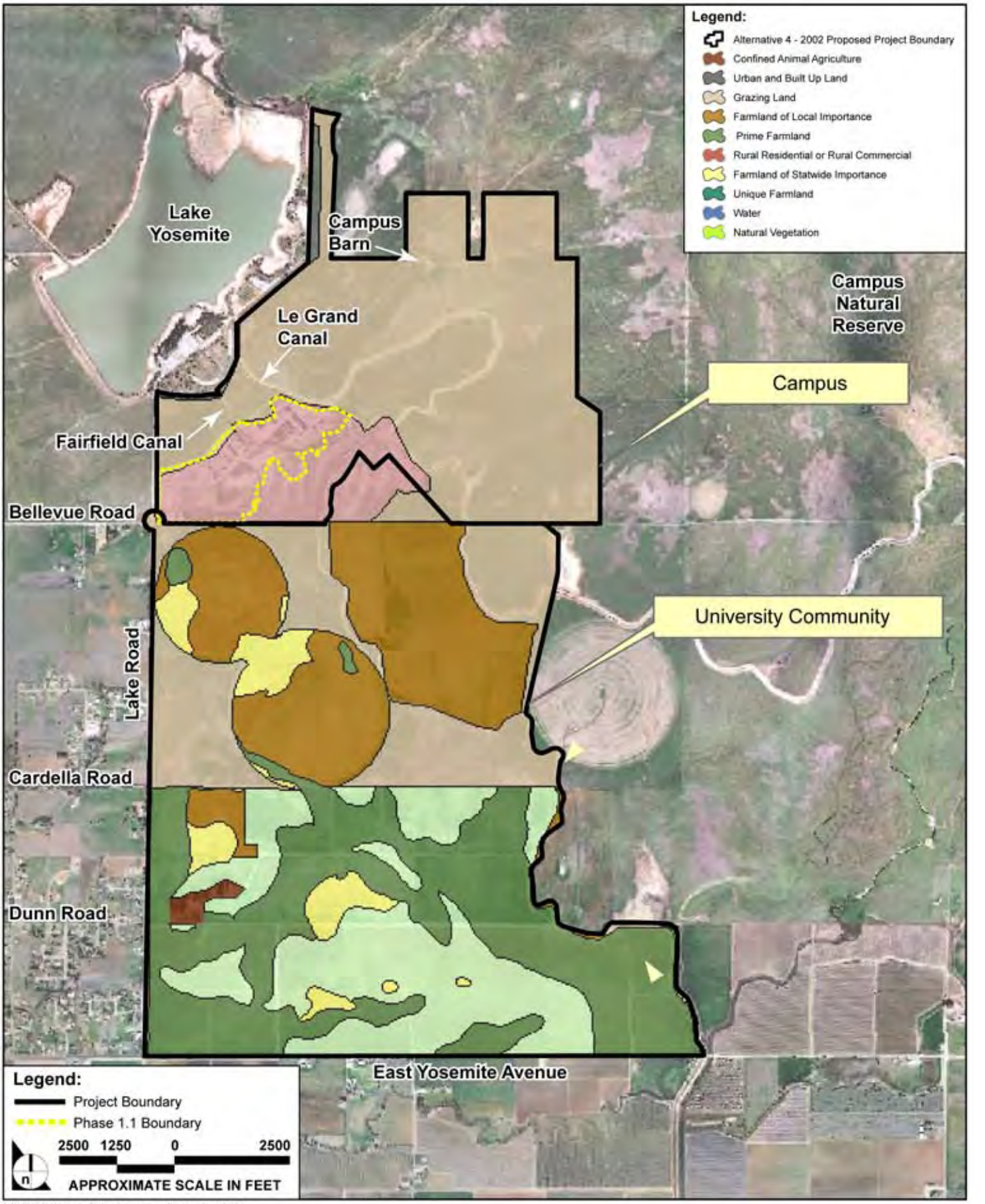
1 The acreage totals for Important Farmland currently differ from what was previously analyzed in the UCP EIR due to the updates in data collection that the Department of Conservation implements every two years. The numbers reported in this EIS/EIR represent the current 2006 FMMP data.



SOURCE: Impact Sciences, Inc. – September 2008

FIGURE **4.2-6**

Alternative 4 - 2002 Proposed Project Alternative Farmland Map

4.2.6.5 Alternative 5 – No Action

Conversion of Important Farmland

Under this alternative, with the exception of the existing Phase 1.1 Campus, the Campus and Community North would not be built. However, Community South could develop based on development plans not related to the establishment of a UC Campus in Merced. All of the impacts from the development of the Community South area under this alternative would generally be similar to the impacts under the Proposed Action from the development of the same area. Therefore, under this alternative, approximately 1,073 acres of Important Farmland would be lost to urban uses. The loss of Important Farmland under Alternative 5 would be considered a significant impact under CEQA and the loss of Prime Farmland would be considered an unavoidable adverse impact under NEPA.

Expose Residents to Agricultural Nuisances, Conflict with Agricultural Zoning or Result in Development Pressures

The 1,118-acre Community South area is designated in the UCP as Multi-use Urban Development and zoned a combination of A-1 and A-2 agricultural zones. The site is also located within the SUDP which, according to the existing County general plan, is to be maintained in agricultural use until the comprehensive campus and community planning process is completed. Since the County general plan identifies agricultural use in SUDP areas as ultimately being converted to more urban uses, the No Action would not be in conflict with the general plan. Further, the County general plan contemplates that the current agricultural zoning would be amended. The Community South area is not under a Williamson Act contract. Therefore, the No Action Alternative would have less-than-significant impacts with regard to existing agricultural zoning and Williamson Act contracts.

As the Community South area develops, future residences could be exposed to nuisances associated with agricultural activities, including dust, odors, pesticide spray drift, and elevated noise levels. In particular, activities associated with farming, such as tilling, planting, pesticide application, and harvesting often generate these conditions, which can often result in land use incompatibilities. The potential incompatibilities associated with noise, odors, and dust from agricultural activities would be intermittent, and should be expected in any urban edge area. Furthermore, development in the Community South area would be required to comply with the right-to-farm ordinance, which would give every new home buyer the opportunity to evaluate the personal significance of these potential minor nuisances. Additionally, the right-to-farm ordinance allows existing agricultural operations to continue, unhindered so that farmers do not have to alter their operations in accordance with the desires of future residents. With compliance

with existing regulations, impacts stemming from agricultural conflicts within the Community South area under the No Action Alternative would be less than significant.

4.2.6.6 Alternative 6 – No Build

Conversion of Important Farmland

The No Build Alternative would not include any development activities that could result directly or indirectly in the conversion of Important Farmland. Therefore, there would be no effect on agricultural resources from the implementation of this alternative.

Expose Residents to Agricultural Nuisances, Conflict with Agricultural Zoning or Result in Development Pressures

The No Build Alternative would not conflict with existing zoning for agricultural use or expose new residents to agricultural nuisances. Therefore, there would be no effect on agricultural resources from the implementation of this alternative.

4.2.7 SUMMARY COMPARISON OF ALTERNATIVES

The implementation of Alternatives 1 through 6 would result in similar types of impacts related to conversion of Important Farmland. The magnitude of these impacts, however, differs with the alternatives. **Table 4.2-8, Comparison of Alternatives**, summarizes the differences in impact under NEPA and CEQA.

Table 4.2-8
Comparison of Alternatives

Alternatives	NEPA	CEQA
	Prime Farmland	Important Farmland
1-Proposed Action	609	1,152
2-Yosemite Avenue	1,231	1,947
3-Bellevue	319	1,080
4-2002 Proposed Project	619	1,164
5 – No Action	589	1,073

Source: Department of Conservation 2008.

Alternative 1, the Proposed Action, would convert approximately 1,152 acres of Important Farmland. Alternative 2 would have a greater impact on Important Farmland than the Proposed Action because of the southerly shift of both the Campus and the University Community. Alternative 3 would place the Campus and the University Community at Bellevue Ranch where the magnitude of the impact from conversion of Important Farmland would be generally be comparable to that of the Proposed Action. Alternative 4 would result in a smaller impact on Important Farmland than the Proposed Action because the campus development would not affect Important Farmland and the total Important Farmland affected by the University Community would be approximately 1,164 acres. The total area included in Alternative 5, No Action Alternative, is smaller as it encompasses development of Community South area only and therefore would have a smaller impact on Important Farmland compared to the Proposed Action. Alternative 6, No Build Alternative, would avoid all impacts to Important Farmland.

4.2.8 REFERENCES

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4.3 AIR QUALITY

4.3.1 INTRODUCTION

This section discusses the existing regional air quality conditions in the northern San Joaquin Valley and evaluates the potential air quality impacts associated with implementation of the Proposed Action and its alternatives. The impacts associated with the Proposed Action are compared with the thresholds of significance and significance criteria established by the San Joaquin Valley Air Pollution Control District (SJVAPCD). A discussion of the applicable federal, state, regional, and local agencies that regulate, monitor, and control air emissions, as well as the applicable SJVAPCD rules and regulations that pertain to the proposed project is also provided. This report has been prepared in accordance with the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* and the SJVAPCD's *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI). Copies of the modeling runs and supporting technical data are found in **Appendix 4.3** of this Draft Environmental Impact Study/Environmental Impact Report (EIS/EIR).

The following sources were used to prepare this section of the Draft EIS/EIR:

- *UC Merced 2002 Long Range Development Plan* (UC Merced 2002)
- *University Community Plan Final Environmental Impact Report* (Merced County 2004)
- SJVAPCD *2004 Extreme Ozone Attainment Demonstration Plan* (SJVAPCD 2004)
- SJVAPCD *2006 PM_{10} Plan; San Joaquin Valley Strategy for Meeting Federal Air Quality Requirements for Particulate Matter 10 Microns and Smaller* (SJVAPCD 2006)
- SJVAPCD *2007 Ozone Plan* (SJVAPCD 2007a)
- SJVAPCD *2007 PM_{10} Maintenance Plan and Request for Redesignation* (SJVAPCD 2007b)
- SJVAPCD *2008 $PM_{2.5}$ Plan* (SJVAPCD 2008)
- SJVAPCD *Air Quality Guidelines for General Plans* (SJVAPCD 2005)
- SJVAPCD *Extreme Ozone Attainment Demonstration Plan; San Joaquin Valley Air Basin Plan Demonstrating Attainment of Federal 1-hour Ozone Standards* (SJVAPCD 2004)
- SJVAPCD *Guide for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2002)

Public and agency comments related to air quality received in response to the Notice of Intent/Notice of Preparation for the Draft EIS/EIR are summarized below.

- Analysis should include estimates of pre- and post-project emissions, total emissions at full operation, and stationary and mobile source emissions.
- Emissions from permitted (stationary sources) and non-permitted sources (mobile sources) should be analyzed separately.
- The EIS/EIR should discuss mitigation measures to reduce air quality impacts from fugitive dust sources and from mobile and stationary sources.
- The EIS/EIR should evaluate whether the project would result in a cumulatively considerable net increase of any criteria pollutant for which SJVAPCD is in nonattainment.
- The EIS/EIR should identify sensitive receptors in the project area.
- The EIS/EIR should describe coordination with the US Environmental Protection Agency (EPA), California Air Resources Board (CARB), and the SJVAPCD to reduce impacts in the air basin.
- The analysis should demonstrate whether the project will meet the general conformity requirements with the State Implementation Plan for the air basin.
- Some comments expressed support for the project site as proposed because an adjacent community will reduce air quality impacts associated with the university.

All of the scoping comments are addressed in this section. An analysis of the Proposed Action's consistency with general conformity requirements is presented in **Appendix 4.3**.

4.3.2 AFFECTED ENVIRONMENT

4.3.2.1 Alternative 1 – Proposed Action

Regional Setting

CARB has divided California into regional air basins according to topographic features. The Proposed Action is located in Merced County, which is within the jurisdiction of the San Joaquin Valley Air Basin (SJVAB). The primary factors that determine air quality are the locations of air pollutant sources, the amount of pollutants emitted, and meteorological and topographical conditions affecting their dispersion. Atmospheric conditions, including wind speed, wind direction, and air temperature gradients, interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. The following paragraphs briefly describe the existing environment as it relates to climate, meteorological conditions, and ambient air quality conditions of the SJVAB.

Regional Topography and Meteorology

The SJVAB, which is approximately 250 miles long and averages 80 miles wide, is the second largest air basin in the state. Air pollution, especially the dispersion of air pollutants, is directly related to a region's topographic features. The SJVAB is defined by the Sierra Nevada to the east (8,000 to 14,000 feet in elevation), the Coast Range to the west (averaging 3,000 feet in elevation), and the Tehachapi Mountains to the south (6,000 to 8,000 feet in elevation). The valley opens to the sea at the Carquinez Strait where the San Joaquin–Sacramento Delta (Delta) empties into San Francisco Bay.

Localized air quality can be greatly affected by elevation and topography. For the majority of the San Joaquin Valley, air movement through and out of the region is restricted by surrounding hills and mountains. Although marine air generally flows into the basin from the Delta, the Coast Range hinders wind access into the SJVAB from the west, the Tehachapi Mountains prevent the southerly passage of airflow, and the Sierra Nevada is a significant barrier to the east. These topographic features result in weak airflow in the valley, which becomes vertically blocked by high barometric pressure over the SJVAB. As a result, the majority of the SJVAB is highly susceptible to pollutant accumulation over time. Most of the surrounding mountains are above the normal height of the summer inversion layer (SJVAPCD 2002).

Wind speed and direction play an important role in the dispersion and transport of air pollutants. Ozone and inhalable particulates (particulate matter 10 microns or less in diameter [PM_{10}] and particulate matter 2.5 microns or less in diameter [$PM_{2.5}$]) are classified as regional pollutants because they can be transported away from the emission source before concentrations peak. In contrast, local pollutants, such as carbon monoxide (CO), tend to have their highest concentrations near the source of emissions. These local pollutants dissipate easily and, therefore, have the highest concentrations during low wind speeds.

During the summer, winds usually originate at the north end of the SJVAB and flow in a south-southeasterly direction through the Tehachapi Pass into the Mojave Desert Air Basin. During the winter, winds occasionally originate from the south end of the SJVAB and flow in a north-northwesterly direction. Also, during winter, the SJVAB experiences light, variable winds, typically less than 10 miles per hour. Low wind speeds, combined with low inversion layers in the winter, create a climate conducive to high CO and inhalable particulate (PM_{10}) concentrations.

The vertical mixing of air pollutants is limited by the presence of persistent temperature inversions. Inversions may be either at ground level or elevated. Ground-level inversions frequently occur during early fall and winter (i.e., October through January). High concentrations of primary pollutants, which are those directly emitted into the atmosphere (e.g., CO), are typically found during ground-level

inversions. Elevated inversions act as a lid over the basin and limit vertical mixing. Severe air stagnation occurs as a result of these inversions. Elevated inversions contribute to the occurrence of high levels of ozone during the summer months.

The SJVAB enjoys an inland Mediterranean climate, averaging more than 260 sunny days per year. The valley floor is characterized by warm, dry summers and cooler winters. Average daily temperatures in the basin range from 44.6 degrees Fahrenheit (°F) in January to 76.7°F in July. Summer highs often exceed 100°F, averaging in the low 90s in the northern valley and high 90s to the south. Maximum temperatures of 90°F or greater occur about 88 days per year. Although the SJVAB enjoys a high frequency of sunshine, a reduction in sunshine occurs during December and January because of fog and intermittent stormy weather. Temperatures of 32°F and below occur about 22 days per year. Nearly 90 percent of the annual precipitation falls in the six months between November and April.

Ambient Air Quality Standards

Both the federal government and the State of California have established ambient air quality standards for several different pollutants. The US EPA sets National Ambient Air Quality Standards (NAAQS) for the following the seven "criteria" pollutants: CO, NO_2, O_3, SO_2, PM_{10}, $PM_{2.5}$, and lead. California Ambient Air Quality Standards (CAAQS) have been adopted for these pollutants, as well as for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. California standards are generally stricter than national standards.

A summary of state and federal ambient air quality standards and their effects on health is shown in **Table 4.3-1, California and National Ambient Air Quality Standards**. For some pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values, such as protection of crops, protection of materials, or avoidance of nuisance conditions.

Table 4.3-1
Ambient Air Quality Standards

Air Pollutant	State Standard	Federal Primary Standard[1]	Most Relevant Health Effects
Ozone	0.070 ppm, 8-hr avg. 0.09 ppm, 1-hr avg.	0.075 ppm, 8-hr avg. (3-year average of annual 4th-highest daily maximum)	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; and (f) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. 20 ppm, 1-hr avg.	9 ppm, 8-hr avg. 35 ppm, 1-hr avg.	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses
Nitrogen Dioxide[1]	0.18 ppm, 1-hr avg. 0.030 ppm, annual arithmetic mean	0.053 ppm, annual arithmetic mean	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg. 0.25 ppm, 1-hr avg.	0.030 ppm, annual arithmetic mean 0.14 ppm, 24-hr avg.	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath, and chest tightness during exercise or physical activity in person with asthma
Respirable Particulate Matter (PM_{10})	20 $\mu g/m^3$, annual arithmetic mean 50 $\mu g/m^3$, 24-hr avg.	150 $\mu g/m^3$, 24-hr avg.	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly
Fine Particulate Matter ($PM_{2.5}$)	12 $\mu g/m^3$, annual arithmetic mean	15 $\mu g/m^3$, annual arithmetic mean (3-year average) 35 $\mu g/m^3$, 24-hr avg. (3-year average of 98th percentile)	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly

Air Pollutant	State Standard	Federal Primary Standard[1]	Most Relevant Health Effects
Sulfates	25 μg/m^3, 24-hr avg.	None	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; and (f) Property damage
Lead[2]	1.5 μg/m^3, 30-day avg.	1.5 μg/m^3, calendar quarterly average	(a) Increased body burden; and (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	Reduction of visual range to less than 10 miles at relative humidity less than 70%, 8-hour avg. (10 AM – 6 PM)	None	Visibility impairment on days when relative humidity is less than 70 percent
Hydrogen Sulfide	0.03 ppm, 1-hr avg.	None	Odor annoyance
Vinyl Chloride[2]	0.01 ppm, 24-hr avg.	None	Known carcinogen

Source: South Coast Air Quality Management District. Final Program Environmental Impact Report for the 2007 Air Quality Management Plan, June 2007, Table 3.1-1, p. 3.1-3. July 2, 2007 http://www.aqmd.gov/ceqa/documents/2007/aqmd/finalEA/07aqmp/aqmp_fpeir.html.

μg/m^3 = microgram per cubic meter.

ppm = parts per million by volume.

[1] The federal primary standard is the level of air quality deemed necessary by the federal government with an adequate margin of safety to protect the public health.

[2] *CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.*

The US EPA and CARB designate air basins as being in "attainment" or "nonattainment" for each of the criteria pollutants. Nonattainment air basins are ranked (marginal, moderate, serious, severe, or extreme) according to the degree of nonattainment. Areas that do not meet the standards shown in **Table 4.3-1** are classified as nonattainment areas (see **Table 4.3-2, San Joaquin Valley Air Basin Attainment Status**). Attainment areas are those with air quality that is better than the standards. The determination of whether an area meets the state and federal standards is based on air quality monitoring data. Some areas are unclassified, which means insufficient monitoring data for determining attainment or nonattainment are available. Unclassified areas are typically treated as being in attainment. Because the attainment/nonattainment designation is pollutant specific, an area may be classified as nonattainment for one pollutant and attainment for another. Similarly, because the state and federal standards differ, an area could be classified as attainment for the federal standards of a pollutant and as nonattainment for the state standards of the same pollutant.

As shown in **Table 4.3-2**, the SJVAB is in nonattainment for the federal standards for ozone (8 hour), PM_{10}, and $PM_{2.5}$. The air basin is in nonattainment for the state standards of ozone (1 hour), ozone (8 hour), PM_{10}, and $PM_{2.5}$.

Table 4.3-2
San Joaquin Valley Air Basin Attainment Status

Pollutant	Federal Standards	State Standards
Ozone-1 hour	No federal standard[1]	Nonattainment[2]
Ozone-8 hour	Nonattainment/Serious	Nonattainment[2]
PM_{10}	Nonattainment/Serious	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment/Unclassifiable	Unclassified/Attainment[3]
Nitrogen dioxide	Attainment/Unclassifiable	Attainment
Sulfur dioxide	Attainment/Unclassifiable	Attainment
Lead	Attainment	Attainment
Hydrogen sulfide	No federal standards	Unclassified
Sulfates	No federal standards	Attainment
Vinyl Chloride[4]	No federal standards	Unclassified
Visibility-Reducing particulates	No federal standards	Unclassified

Source: CARB 2007; US EPA 2008.

[1] *The 1-hour ozone NAAQS was revoked on June 15, 2005.*

[2] *CARB has not issued area classifications based on the new state 8-hour standard. The previous classification for the 1-hour ozone standard was Severe.*

[3] *Kings County, Madera County, and Merced County are classified as Unclassified for Carbon Monoxide (Source: California Code of Regulations, Title 17, Section 60202, http://ccr.oal.ca.gov)*

[4] *CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined.*

Sensitive Receptors

Sensitive populations (sensitive receptors) are more susceptible to the effects of air pollution than is the population at large. The SJVAPCD defines sensitive receptors as "facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants," which include hospitals, schools, convalescent facilities, and residential areas as examples of sensitive receptors (SJVAPCD 2002). Sensitive receptors that are near localized sources of toxic air contaminants and CO are of particular concern. For the purposes of impact assessment, the definition of sensitive receptors is typically expanded to include residences, playgrounds, rehabilitation centers, and athletic facilities.

The 814-acre Campus portion of the project site is largely undeveloped with the exception of 104 acres within the Phase 1.1 Campus. The Phase 1.1 Campus is developed with a classroom building, a library, a science and engineering building, student housing consisting of two halls of residence and student housing units, a dining facility, a recreation and wellness center, a recreation field, a logistical support/service building that is under construction, and a central utilities plant. The University Community portion of the site is also largely undeveloped and is under non-irrigated pasture, irrigated pasture, and row crops. Three rural residences are located in the southern portion of the University Community site.

The Fairfield Canal and the Le Grand Canal, which are approximately 50-foot-wide irrigation canals, meander through the project site. Surrounding the project site are gently rolling grasslands used for seasonal grazing to the north and northeast, agricultural lands to the southeast and south, rural residential uses to the southwest, grasslands to the west, and Yosemite Lake Park to the northwest. Based on site reconnaissance and available information, sensitive receptors (as defined by SJVAPCD) are located within 0.10 mile of the project site. These include rural residential land uses on the west side of Lake Road. Additional residential areas are located along East Bellevue Road. Lake Yosemite Regional Park is located to the northwest of the Campus, but is not considered a sensitive receptor under the SJVAPCD definition.

Ambient Air Monitoring

CARB has established and maintains a network of sampling stations in conjunction with local air pollution control districts (APCDs) and air quality management districts (AQMDs), private contractors, and the National Park Service. The air quality sampling stations are referred to as the State and Local Air Monitoring Stations (SLAMS) network. The SLAMS network provides air quality monitoring data, including real-time meteorological data and ambient pollutant levels, as well as historical data. The SLAMS network in the SJVAB consists of 30 monitoring stations, two of which are located in the City of Merced. The closest monitoring station to the project is located at 2334 M Street in Merced, approximately 4.5 miles to the southwest. This station monitors ambient pollutant concentrations of PM_{10} and $PM_{2.5}$. The next nearest monitoring station to the site is located at 385 South Coffee Avenue in Merced, approximately 4.5 miles south of the project site. This station monitors ambient pollutant concentrations of O_3 and NO_2. The nearest monitoring station to the project site that monitors CO is located at 1034 South Minaret Street in the City of Turlock, approximately 25 miles to the northwest. Lastly, the nearest station to the project site that monitors SO_2 is located at 3425 North First Street in Fresno, approximately 55 miles to the southeast.

Table 4.3-3, Ambient Pollutant Concentrations Registered Nearest to the Project Site, lists the measured ambient pollutant concentrations and the violations of state and federal standards that have occurred at the above mentioned monitoring stations from 2003 through 2007, the most recent years for which data are available. As shown, the monitoring stations in the City of Merced have registered values above state and federal standards for O_3, the state standard for PM_{10}, and the federal standard for $PM_{2.5}$. Levels of SO_2 were not monitored at the Fresno station in 2004, 2005, or 2006; however, monitoring resumed in 2007. The concentration of that pollutant exceeded state and federal standards in 2007. Concentrations of CO, NO_2, lead, and sulfate have not been exceeded anywhere within the basin for several years. Values for lead and sulfate are not presented in the table below since ambient concentrations are well below the state standards. Hydrogen sulfide, vinyl chloride, and visibility reducing particles were not monitored by CARB or the SJVAPCD in the SJVAB during the period from 2003 to 2007.

Table 4.3-3
Ambient Pollutant Concentrations Registered Nearest to the Project Site

Pollutant	Standards[1, 2]	Year				
		2003	2004	2005	2006	2007
OZONE (O_3)						
Maximum 1-hour concentration monitored (ppm)		0.122	0.114	0.100	0.102	0.105
Maximum 8-hour concentration monitored (ppm)		0.110	0.110	0.093	0.092	0.097
Number of days exceeding state 1-hour standard	0.09 ppm	54	14	6	4	5
Number of days exceeding state 8-hour standard	0.070 ppm	113	74	37	33	25
Number of days exceeding federal 8-hour standard [3]	0.075 ppm	54	15	3	4	5
CARBON MONOXIDE (CO)						
Maximum 1-hour concentration monitored (ppm)		3.4	2.9	2.8	2.6	2.7
Maximum 8-hour concentration monitored (ppm)		2.31	1.78	2.34	2.06	1.69
Number of days exceeding state 8-hour standard	9.0 ppm	0	0	0	0	0
Number of days exceeding federal 8-hour standard	9 ppm	0	0	0	0	0
NITROGEN DIOXIDE (NO_2)						
Maximum 1-hour concentration monitored (ppm)		0.063	0.059	0.062	0.062	0.050
Annual average concentration monitored (ppm)		0.012	0.011	0.011	0.010	0.009
Number of days exceeding state 1-hour standard [4]	0.18 ppm	0	0	0	0	0

Pollutant	Standards[1, 2]	Year				
		2003	2004	2005	2006	2007
PARTICULATE MATTER (PM_{10})						
Maximum 24-hour concentration monitored (μg/m³)		74.0	56.0	70.0	98.0	69.0
Annual average concentration monitored (μg/m³)		32.7	28.7	28.6	32.5	29.7
Number of samples exceeding state standard	50 μg/m³	7	2	5	8	6
Number of samples exceeding federal standard	150 μg/m³	0	0	0	0	0
PARTICULATE MATTER ($PM_{2.5}$)						
Maximum 24-hour concentration monitored (μg/m³)		46.7	53.1	53.9	55.8	81.6
Annual average concentration monitored (μg/m³)		15.7	15.2	14.1	14.8	15.2
Number of samples exceeding federal standard [5]	35 μg/m³	0	0	0	0	3.3
SULFUR DIOXIDE (SO_2)						
Maximum 24-hour concentration monitored (ppm)		0.004	—	—	—	0.067
Number of samples exceeding 24-hour state standard	0.04 ppm	0	—	—	—	2
Number of samples exceeding federal 24-hour standard	0.14 ppm	0	—	—	—	1

Sources: California Air Resource Board, "Air Quality Data Statistics," http://www.arb.ca.gov/adam/welcome.html
US Environmental Protection Agency, "Air Data: Access to Air Pollution Data," http://www.epa.gov/air/data/.
— No air quality data received for this year.
[1] Parts by volume per million of air (ppm), micrograms per cubic meter of air (μg/m³), or annual arithmetic mean (aam).
[2] Federal and state standards are for the same time period as the maximum concentration measurement unless otherwise indicated.
[3] US EPA revised the 8-hour standard effective May 27, 2008. The statistics are based on the previous standard of 0.08 ppm.
[5] CARB revised the 1-hour standard effective March 20, 2008. The statistics are based on the previous standard of 0.25 ppm. In addition, CARB adopted an annual standard of 0.030 ppm, which is more stringent than the federal standard of 0.053 ppm.
[6] The federal standard for $PM_{2.5}$ was changed to 35 μg/m³ in 2006. Statistics shown are based on the 65 μg/m³ standard.

4.3.2.2 Alternative 2, Yosemite Avenue

Under Alternative 2, the Campus and Community North would be located on UCLC and LWH Farms LLC, lands; and Community South would be located south of Yosemite Avenue. This alternative would be located in the same air basin and general geographic area, and the same air quality conditions would apply to this site as are described above for Alternative 1, Proposed Action.

4.3.2.3 Alternative 3, Bellevue Ranch

The Bellevue Ranch Alternative location is approximately 2 miles west of the Phase 1.1 Campus area. This alternative would be located in the same air basin and general geographic area, and the same air quality conditions would apply to this site as are described above for Alternative 1, Proposed Action.

4.3.2.4 Alternative 4, 2002 Proposed Project

The site of Alternative 4, identified as the 2002 Proposed Project, is similar to that under Alternative 1, Proposed Action, except that the Campus and the University Community areas are larger than under the Proposed Action. This alternative would be located in the same air basin and general geographic area, and the same air quality conditions would apply to this site as are described above for Alternative 1, Proposed Action.

4.3.2.5 Alternative 5, No Action

The site of Alternative 5 is the same as the site under Alternative 1, Proposed Action. This alternative would be located in the same air basin and general geographic area, and the same air quality conditions would apply to this site as are described above for Alternative 1, Proposed Action.

4.3.2.6 Alternative 6, No Build

The site of Alternative 6 is the same as the site under Alternative 1, Proposed Action. However, no additional construction would occur on the Campus, and no development of the University Community would take place. This alternative would be located in the same air basin and general geographic area, and the same air quality conditions would apply to this site as are described above for Alternative 1, Proposed Action.

4.3.3 APPLICABLE LAWS, REGULATIONS, AND POLICIES

Air quality within the SJVAB is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work individually, as well as jointly, to improve air quality through legislation, regulations, planning, policy making, education, and a variety of other programs. The agencies primarily responsible for improving the air quality within the SJVAB include the US EPA, CARB, SJVAPCD, and the Regional Council of Governments. The County of Merced also includes policies in its general plan that are designed to improve air quality in unincorporated areas of the County. The adopted *UC Merced 2002 Long Range Development Plan* (LRDP) also includes policies that govern development on the Campus and that pertain to air quality. These agencies, their laws, regulations, rules, plans, and policies as they pertain to air quality and the Proposed Action are discussed below.

4.3.3.1 Federal Laws and Regulations

The US EPA is responsible for enforcing the Clean Air Act (CAA) and the NAAQS that the act establishes. This agency also has regulatory and enforcement jurisdiction over emission sources beyond

state waters (outer continental shelf), and those that are under the exclusive authority of the federal government, such as aircraft, locomotives, and interstate trucking.

The CAA was originally adopted in 1970, but was amended most recently in 1990 with regulations that better protect the public's health and create more efficient methods of lowering pollutant emissions. The major areas of improvement resulting from the amendments include air basin designations (previously discussed), automobile/heavy-duty engine emissions, and toxic air pollutants. The amendments established more stringent standards for hydrocarbons, oxides of nitrogen (NO_X), and CO emissions in order to reduce O_3 and CO levels in heavily populated areas. Fuels became more strictly regulated, requiring new fuels to be less volatile, contain less sulfur (regarding diesel fuels), and have higher levels of oxygenates (oxygen-containing substances to improve fuel combustion).

States with basins that are not in attainment with the NAAQS are required to submit a State Implementation Plan (SIP) that describes how the air basin will achieve the federal standards by specified dates. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The CAA amendments dictate that states containing areas violating the NAAQS revise their SIP to include extra control measures to reduce air pollution.

SIPs are not single documents, but are a compilation of state regulations, air quality management/attainment plans, programs, and air district rules that are continuously revised to meet CAA amendment requirements.

Local air districts, such as the SJVAPCD, and other agencies prepare air quality management/attainment plans and submit them to CARB for review and approval. Once a plan is approved, CARB forwards the plan to the US EPA as a SIP revision. The US EPA reviews the plan to determine if it conforms to the 1990 amendments and would achieve that air basin's air quality goals. Upon a satisfactory review, approval of the plan is published in the *Federal Register*.

In general, air quality management/attainment plans contain a discussion of ambient air data and trends; a baseline emissions inventory; future-year projections of emissions, which account for growth projections and already adopted control measures; a comprehensive control strategy of additional measures needed to reach attainment; attainment demonstration, which generally involves complex modeling; and contingency measures. Plans may also include interim milestones for progress toward attainment. The status of the SJVAB with respect to attainment with the NAAQS is summarized above in **Table 4.3-2**.

The 1990 amendments also list 189 hazardous air pollutants (HAPs), which are carcinogenic, mutagenic, and/or reproductive toxicants, to be reduced. The air toxics program under the CAA involves locating all

major (greater than 10 tons per year [tpy]) and area emission sources in order to implement Maximum Achievable Control Technology (MACT) to reduce HAP emissions and their associated health impacts.

General Conformity Analysis

Section 176(c)(1) of the CAA (42 U.S.C. Section 7506(c)) is known as the General Conformity Rule. It prohibits the federal government from "engag[ing] in, support[ing] in any way, or provid[ing] financial assistance for, licens[ing] or permit[ing] or approv[ing] any activity" that does not conform to a SIP approved by the US EPA. The rule ensures that nonexempt[1] actions taken by federal agencies in nonattainment and maintenance areas do not impede local efforts to control air pollution, and requires federal agencies to demonstrate that their actions "conform with" (i.e., do not undermine) the approved SIP for the subject geographic area. In this regard, it requires a detailed analysis of conformity with the approved SIP to determine if the federal project exceeds the established de minimis level of emissions of an air pollutant that is regulated due to the nonattainment or maintenance status of the region. In addition, the conformity rule requires that a proposed project be consistent with emission growth factors (land use and population forecasts that were used to generate emission forecasts) contained in the local air district's clean air plan. The de minimis levels for O_3 precursors (VOC and NO_X) and PM_{10} are currently 50 and 70 tpy, respectively, as they are federal nonattainment pollutants in the SJVAB. However, the levels will change as a result of upcoming US EPA actions to redesignate the SJVAB to an extreme O_3 nonattainment area and a PM_{10} attainment area. The de minimis level for CO, as an attainment pollutant, is 100 tpy. The de minimis level for $PM_{2.5}$ is 100 tpy for directly emitted $PM_{2.5}$. General conformity is discussed further in **Subsection 4.3.6.1.**

4.3.3.2 State Laws and Regulations

The California Clean Air Act (CCAA) established a legal mandate for air basins to achieve the CAAQS by the earliest practical date. The CAAQS, established by CARB, apply to the same seven NAAQS, as well as for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. CAAQS are more stringent than the NAAQS, and in the case of PM_{10} and SO_2, far more stringent.

As a branch of the California Environmental Protection Agency (Cal/EPA), CARB oversees air quality monitoring, planning, and control throughout California. It is primarily responsible for implementing the CCAA, ensuring conformance with CAA requirements, and for regulating emissions from motor vehicles and consumer products within the state. In addition, CARB sets the CAAQS and control measures for

1 The exemptions are set out in 40 CFR. sections 51.853(c) and (d) and include activities that would result in no emissions increase or an increase in emissions that is clearly de minimis and activities that have been explicitly exempted by Congress.

toxic air contaminants (TACs). CARB approves the regional air quality management/attainment plans for incorporation into the SIP and is responsible for preparing those portions of the SIP related to mobile source emissions. CARB establishes new standards for vehicles sold in California and for various types of commercially available equipment. It also sets fuel specifications to further reduce vehicular emissions.

CARB also makes area designations for O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, sulfates, lead, hydrogen sulfide, and visibility-reducing particles. Health and Safety Code Section 39607(e) requires CARB to establish and periodically review area designation criteria. These designation criteria provide the basis for CARB to designate areas of the state as "attainment," "nonattainment," or "unclassified" according to state standards. In addition, Health and Safety Code Section 39608 requires CARB to use the designation criteria to classify areas of the state and to annually review those area designations.

4.3.3.3 Regional Regulations

The SJVAPCD has jurisdiction over most air quality matters[2] within the SJVAB, which includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, and Tulare Counties and the valley portion of Kern County. The district regulates most air pollutant sources in the air basin, maintains ambient air quality monitoring stations at numerous locations throughout the air basin, and prepares the air quality management/attainment plans for the SJVAB that are required under the CAA and CCAA.

SJVAPCD Air Quality Plans

As shown in **Table 4.3-2**, the SJVAB is in nonattainment for the federal standards for ozone (8-hour), PM_{10}, and $PM_{2.5}$. The air basin is also in nonattainment for the state standards of ozone (1-hour), ozone (8-hour), PM_{10}, and $PM_{2.5}$. Therefore, the district has prepared attainment plans for the SJVAB in order to demonstrate achievement of the state and federal ambient air quality standards for ozone, PM_{10}, and $PM_{2.5}$. The most recent plans include

- *Extreme Ozone Attainment Demonstration Plan; San Joaquin Valley Air Basin Plan Demonstrating Attainment of Federal 1-hour Ozone Standards* (SJVAPCD 2004)
- *2007 Ozone Plan* (SJVAPCD 2007a)
- *2007 PM_{10} Maintenance Plan and Request for Redesignation* (SJVAPCD 2007b)
- *2008 $PM_{2.5}$ Plan* (SJVAPCD 2008)

[2] SJVAPCD does not regulate air pollutants from motor vehicles, locomotives, aircraft, agriculture equipment, and marine vessels.

The SJVAPCD must continuously monitor its progress in implementing these attainment plans and must periodically report to CARB and the US EPA. It must also periodically revise its attainment plans to reflect new conditions and requirements in accordance with schedules mandated by the CAA and the CCAA. The following sections provide an overview of these four plans.

One-Hour Extreme Ozone Attainment Demonstration Plan

The SJVAPCD was classified in 1990 by the CAA as having a serious nonattainment status for the 1-hour ozone standard and was given an attainment date of November 15, 1999. When the SJVAB failed to attain that standard, the US EPA reclassified the basin from serious to severe status, effective December 10, 2001. The final notice, reclassifying the SJVAB to severe status, set a new attainment deadline of November 15, 2005. This required the State of California to develop a new SIP by May 31, 2002.

After considerable discussion and public input, the SJVAPCD Board decided to request an extreme designation ahead of a formal US EPA decision that the basin failed to attain the standard by 2005. With the extreme designation, the new attainment date for the SJVAB was revised to 2010.

On April 8, 2004, the US EPA's regional administrator signed a final rule that granted the State of California's request to reclassify the SJVAB nonattainment area from severe to extreme for the national 1-hour ozone standard. The US EPA's ruling required the SJVAPCD and the State of California to submit a SIP incorporating the SJVAB extreme nonattainment requirements within 12 months from the effective date of the rule revisions. CARB submitted the *Extreme Ozone Attainment Demonstration Plan – San Joaquin Valley Air Basin Plan Demonstrating Attainment of Federal 1-hour Ozone Standards* to the US EPA on November 15, 2004. The plan is currently undergoing US EPA review; however, US EPA intends to approve the 2004 plan by January 15, 2009, pursuant to a consent decree.

The SJVAPCD's *Extreme Ozone Attainment Demonstration Plan* sets forth the emission reductions and timeline for attaining the 1-hour ozone ambient air quality standards in the SJVAB by November 15, 2010. The SJVAPCD, in conjunction with CARB, the US EPA, and the eight regional transportation-planning agencies in the San Joaquin Valley, developed the plan to meet the state and federal ambient ozone requirements. State and federal agencies committed to controls—primarily on mobile sources—between 2005 and 2010 that will reduce emissions in the SJVAB by approximately 105 tons per day. Additionally, the expanded time frame allowed the District's incentive-based programs to take effect. These programs would provide financial incentives to users of heavy-duty engines to implement cleaner alternatives and to valley residents to purchase hybrid electric-gasoline automobiles and electric lawnmowers. The plan also allowed time for the development and implementation of the SJVAPCD's indirect source mitigation fee, which requires a new development project to mitigate a portion of its emissions from vehicle trips.

In 1997, the US EPA determined that the 1-hour ozone ambient air quality standard was not needed to protect public health given the promulgation of the new 8-hour ozone ambient air quality standard. On April 15, 2004, the US EPA issued a final rule revoking the 1-hour standard in lieu of the 8-hour standard, effective June 15, 2005. Nonetheless, anti-backsliding provisions require the SJVAB to meet its reduction commitments for extreme nonattainment in the plan.

The US EPA classified the SJVAB as serious nonattainment for the new 8-hour ozone standard with a 2013 attainment date.

2007 Ozone Plan

On April 30, 2007, the SJVAPCD adopted the *2007 Ozone Plan,* which demonstrates attainment of the federal 8-hour O_3 standard by 2023. The plan calls for a substantial reduction of NO_X (an ozone precursor) by implementing regulatory measures for mobile and stationary sources and by providing incentives for emission reductions and the deployment of advanced technologies. The plan also calls for moderate reductions of volatile organic compound (VOC) emissions, which are also ozone precursors. The SJVAPCD expects to adopt all proposed local measures in the plan by 2012 and to expeditiously adopt measures that require advanced technologies or incentive funding as they become available. The SJVAPCD expects that, by 2020, 90 percent of the population living in the SJVAB will reside in areas meeting the federal ozone standard. The remaining areas east of Arvin and northwest of Fresno, which typically experience the highest ozone concentrations in the SJVAB, are expected to meet the standard between 2020 and 2023 as newer technologies become available and are put in use.

The plan also requested that the US EPA reclassify the basin from serious to extreme nonattainment status with a 2024 attainment date. In September 2007, CARB modified the mobile source control strategies contained in the state portion of the SIP to accelerate emission reductions from mobile sources. In addition, CARB created a task force to identify ways to meet the federal O_3 standard before 2024. The taskforce presented findings on November 7, 2007, that demonstrated that the emission rate in excess of the attainment emission rate in the SJVAB would be reduced from 202 tons per day to 49 tons per day by 2017. With these findings, the SJVAPCD and CARB expect to demonstrate attainment by 2017 instead of 2024. Additional recommendations aimed at achieving the federal ozone standard by 2017 are being developed, including a recommendation that valley cities and counties incorporate air quality considerations into their development projects. Nonetheless, the SJVAPCD expects the US EPA to redesignate the SJVAB by the end of 2009.

2007 PM_{10} Maintenance Plan and Request for Redesignation

On June 19, 2003, the SJVAPCD adopted the *2003 PM_{10} Plan*, which demonstrates attainment of the federal 24-hour and annual average standards for PM_{10}. CARB subsequently adopted the plan and submitted it to the US EPA on August 19, 2003. The US EPA approved the plan into the SIP, and it became effective June 25, 2004.

The SJVAPCD subsequently adopted *2006 PM_{10} Plan – San Joaquin Valley Strategy for Meeting Federal Air Quality Requirements for Particulate Matter 10 Microns and Smaller* on February 16, 2006. This plan reevaluated the overall PM_{10} control strategy in the *2003 PM_{10} Plan* using updated emissions information, air quality monitoring data from 2003 through 2005, and air quality modeling. The updated information demonstrated that the SJVAB was on track in attaining the federal PM_{10} ambient air quality standard before the 2010 deadline. This plan was not adopted by CARB or forwarded to the US EPA; however, based on this information, the US EPA issued a final determination in 2006 that the SJVAB had attained the federal PM_{10} ambient air quality standards and would redesignate the SJVAB to attainment upon approval of a PM_{10} maintenance plan.

In 2007, the SJVAPCD prepared, adopted, and submitted the *2007 PM_{10} Maintenance Plan and Request for Redesignation* to CARB for review and approval. CARB approved the plan on October 27, 2007 and submitted it to the US EPA. At the time of this writing (August 2008), the US EPA approval of this plan and the redesignation has been proposed but not approved.

This plan demonstrates continued attainment with the federal PM_{10} ambient air quality standards using additional monitoring data from 2006. Although the US EPA revoked the annual PM_{10} standard (effective December 18, 2006) the plan, nonetheless, provides for continued attainment of both the 24-hour and annual PM_{10} NAAQS since both standards were included in the *2003 PM_{10} Plan* that the US EPA approved into the SIP.

The plan notes that NO_X and PM_{10} will be substantially reduced in the SJVAB due to emission reductions contained in the *2007 Ozone Plan* and the *2008 $PM_{2.5}$ Plan* (discussed below). NO_X participates in the formation of particulate matter; therefore, the emission reduction measures in the *2007 Ozone Plan* will also reduce PM_{10} concentrations from current levels. The maintenance demonstration in the plan indicates that concentrations of PM_{10} will be reduced across the SJVAB through the projected year of 2020.

2007 $PM_{2.5}$ Plan

In July 1997, the US EPA revised the primary federal (health-based) particulate matter standards by adding a new annual fine particulate matter ($PM_{2.5}$) standard. $PM_{2.5}$ includes particles up to an

aerodynamic diameter of 2.5 microns, which makes it a subset of PM_{10}. Health studies demonstrate that $PM_{2.5}$ is considered to have a greater adverse effect on human health than larger particulate matter because it has the potential to be deeply inhaled into the lungs. In 1997, the annual $PM_{2.5}$ standard was set at 15 $\mu g/m^3$ and a new 24-hour $PM_{2.5}$ standard set at 65 $\mu g/m^3$; the US EPA designated the SJVAB as nonattainment for that standard. In 2006, the US EPA lowered the 24-hour standard to 35 $\mu g/m^3$, while retaining the original annual standard. Additional rulemaking by the US EPA is required before states are required to submit plans for the revised standard.

In order to attain the federal $PM_{2.5}$ ambient air quality standards, the SJVAPCD Board adopted the *2008 $PM_{2.5}$ Plan* on April 30, 2008. The plan builds upon the *2007 Ozone Plan* to bring the SJVAB into attainment with the 1997 $PM_{2.5}$ standards. Control of O_3 precursors as a method to control $PM_{2.5}$ is important because $PM_{2.5}$ can be directly emitted or generated via atmospheric reaction with NO_X or SO_2. The *2008 $PM_{2.5}$ Plan* demonstrates attainment of the 1997 $PM_{2.5}$ standards by 2014, primarily by controlling NO_X emissions, which tend to dominate the generation of $PM_{2.5}$ in the SJVAB. Additional controls of directly emitted $PM_{2.5}$ and SO_2 will help to expedite compliance with the standard.

SJVAPCD Rules and Regulations

The SJVAPCD's primary means of implementing its attainment plans is through its adopted rules and regulations. The Proposed Action would be subject to the following rules adopted by the SJVAPCD that are designed to reduce and control pollutant emissions throughout the basin.

- **Rule 2010 (Permits Required)** – This rule requires that any project constructing, altering, replacing, or operating any source operation, the use of which emits, may emit, or may reduce emissions, to obtain an Authority to Construct (ATC) and a Permit to Operate (PTO). This rule applies to the construction and operation of new or modified processes and equipment, except those specifically exempted from permitting requirements.

- **Rule 2201 (New and Modified Stationary Source Review)** – This rule applies to all new and modified stationary sources that would emit, after construction, a criteria pollutant for which there is an established NAAQS or CAAQS. The rule provides mechanisms by which an ATC can be granted without interfering with the basin's attainment with ambient air quality standards. These mechanisms offer methods to generate no net increases in emissions of nonattainment pollutants over specific thresholds as detailed in the rule.

- **Rule 2520 (Federally Mandated Operating Permits)** – This rule requires that major sources of criteria pollutants or HAPs obtain a Title V federal operating permit within one year after becoming a major source. This rule would apply to the Campus if the total facility emissions of criteria pollutants from permitted stationary sources exceed the major source thresholds in Rule 2201 or the major source thresholds for HAPs as defined in the CAA.

- **Rule 4102 (Nuisance)** – This rule applies to any source operation that emits or may emit air contaminants or other materials. In the event that the project or construction of the project creates a public nuisance, it could be in violation and subject to district enforcement action.

- **Rule 4306 (Boilers, Steam Generators, and Process Heaters – Phase 3)** – This rule limits the NO_x and CO emissions from boilers, steam generators, and process heaters with heat input ratings greater than 5 million British thermal units per hour (MMBtu/hr). The source must also comply with the monitoring and reporting requirements specified in the rule.

- **Rule 4601 (Architectural Coatings)** – This rule limits VOC from architectural coatings by specifying architectural coatings storage, cleanup, and labeling requirements and applies to any person who supplies, sells, offers for sale, applies, or solicits the application of any architectural coating.

- **Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving, and Maintenance Operations)** – Asphalt paving operations are subject to Rule 4641. This rule applies to the manufacture and use of rapid and medium cure cutback asphalt, slow cure asphalt, and emulsified asphalt for paving and maintenance operations. The user or manufacturer of cutback, slow cure, and emulsified asphalt must comply with the recordkeeping requirements specified in Rule 4641.

- **Rule 4702 (Internal Combustion Engines – Phase 2)** – This rule limits the emissions of NO_x, CO, and VOCs emitted from internal combustion engines. The rule is applicable to any internal combustion engine with a rated brake horsepower greater than 50 horsepower. Emission standards for the three pollutants are specified for each category of engine along with compliance dates for each standard. The source must also comply with the monitoring methods and other requirements specified in the rule.

- **Rule 4901 (Wood-burning Fireplaces and Wood-burning Heaters)** – This rule limits CO and particulate emissions from wood-burning fireplaces and heaters. The rule specifies that only US EPA Phase II Certified or pellet-fueled wood-burning heaters are to be sold, installed, transferred, or offered for sale within the district. The rule sets wood-burning heater and fireplace limitations for new residential developments as follows:

  5.3.1 No person shall install a wood-burning fireplace in a new residential development with a density greater than two dwelling units per acre.

  5.3.2 No person shall install more than two US EPA Phase II Certified wood-burning heaters per acre in any new residential development with a density equal to or greater than three dwelling units per acre.

  5.3.3 No person shall install more than one wood-burning fireplace or wood-burning heater per dwelling unit in any new residential development with a density equal to or less than two dwelling units per acre.

- **Rule 4902 (Residential Water Heaters)** – This rule applies to and limits emissions of NO_x from residential natural gas-fired heaters. Natural gas-fired heaters with a rated heat input equal to or less than 75,000 British thermal units per hour (Btu/hr) and manufactured after December 17, 1993, are not to be sold, installed, or offered for sale that emit more than 40 nanograms of NO_x per joule of heat output.

- **Regulation VIII: Fugitive Dust** – The purpose of Regulation VIII is to reduce ambient concentrations of particulate matter by requiring actions to prevent, reduce, or mitigate anthropogenic fugitive dust emissions. Regulation VIII contains the following rules that would be applicable to the Proposed Action:

  Rule 8021: Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities

  Rule 8031: Bulk Materials

  Rule 8041: Carryout and Trackout

  Rule 8051: Open Areas

  Rule 8061: Paved and Unpaved Roads

  Rule 8071: Unpaved Vehicle/Equipment Traffic Areas

- **Rule 9510 (Indirect Source Review)** – This rule fulfills the district's emission reduction commitments in the PM_{10} and ozone attainment plans. Applicants developing property over the limits specified in the rule (e.g., 50 or more residential units) or nonresidential projects emitting more than 2 tpy of operational NO_X or PM_{10} are subject to this rule and must file an Air Impact Assessment (AIA) application prior to applying for a final discretionary approval from a lead agency (e.g., tentative tract map). This rule is discussed in more detail below.

  - Indirect sources are land uses that attract or generate motor vehicles trips. Indirect source emissions contain many pollutants, principally PM_{10}, reactive organic gases (ROG), and NO_X. The SJVAPCD included a requirement in the adopted *2003 PM_{10} Plan* and the *Extreme Ozone Attainment Demonstration Plan* to develop and implement an indirect source rule (ISR) by July 2004, with implementation to begin in 2005. The SJVAPCD adopted Rule 9510 (Indirect Source Review) on December 15, 2005, and it became effective in March 2006.

  - The purpose of Rule 9510 is to reduce emissions of NO_X and PM_{10} from new development projects. The rule applies to development projects that seek to gain a discretionary approval for projects that, upon full buildout, will include any one of the following:

    - 50 residential units
    - 2,000 square feet of commercial space
    - 25,000 square feet of light industrial space
    - 20,000 square feet of medical or recreational space
    - 39,000 square feet of general office space
    - 100,000 square feet of heavy industrial space
    - 9,000 square feet of educational space

- 10,000 square feet of government space
- 9,000 square feet of any land use not identified above

Several sources are exempt from the rule, including transportation projects, transit projects, reconstruction projects that result from a natural disaster, and development projects that have primary sources of emissions that are subject to SJVAPCD Rule 2201 (New and Modified Stationary Source Review) and Rule 2010 (Permits Required). Any development project that has a mitigated baseline below 2 tpy for NO_X and 2 tpy for PM_{10} is also exempted from the mitigation requirements of the rule.

Developers with projects that are subject to the Indirect Source Rule are required to reduce emissions occurring during construction and operational phases of their projects. During construction, exhaust emissions from construction equipment of NO_X and PM_{10} are to be reduced by 20 percent and 45 percent, respectively, compared to the statewide average. Operational emissions of NO_X and PM_{10} are to be reduced by 33.3 percent and 50 percent, respectively, of the project's baseline for a period of 10 years.

Developers are encouraged to reduce as much air pollution as possible through on-site mitigation, such as incorporating design features into the project that achieve the aforementioned emissions reductions. Some examples include bicycle paths and sidewalks; traditional street design; medium-to-high density residential developments; locating development near bus stops and bicycle paths; locating residential development near different land use zones, such as commercial; and increasing energy efficiency. If on-site mitigation does not completely meet the required reductions under the Rule 9510, the rule provides a mechanism by which a developer can pay an off-site mitigation fee to the district. One hundred percent of all off-site mitigation fees received by the district go towards its Emission Reduction Incentive Program. Activities financed by this program include retirement and crushing of gross polluting cars, replacement of older diesel engines and diesel-powered vehicles, and implementing programs that would encourage the replacement of gas-powered lawn mowers with electric lawn mowers. By incorporating design features into a project that reduce emissions of NO_x and PM_{10} by 33.3 percent and 50 percent, respectively, for a period of 10 years and/or by paying an off-site mitigation fee to the district, a project's potential impact on air quality in the SJVAB would be mitigated to less than significant.

4.3.3.4 Local Plans and Policies

Local governments, such as the County of Merced, have the authority and responsibility to reduce air pollution through their police power and land use decision-making authority. In general, a first step toward implementation of a local government's responsibility is accomplished by identifying air quality goals, policies, and implementation measures in its general plan. Local jurisdictions are also encouraged by the SJVAPCD to incorporate air quality elements in local plans. In 1994, SJVAPCD published *Air*

Quality Guidelines for General Plans, which was subsequently revised in June 2005. The guidelines provide assistance for developing policies and implementing strategies at the local level that are consistent with regional efforts to manage air quality.

Through capital improvement programs, local governments can fund infrastructure that contributes to improved air quality. Examples of infrastructure improvements include bus turnouts, energy-efficient streetlights, and synchronized traffic signals.

Finally, CEQA requires local governments to assess air quality impacts, and recommend and enforce feasible mitigation of potential air quality impacts by conditioning discretionary permits, and by monitoring and ensuring implementation of the mitigation. To facilitate compliance with CEQA requirements, the SJVAPCD published, and subsequently amended, in 2002 the *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI). The GAMAQI is an advisory document that provides local jurisdictions with procedures for addressing air quality impacts in environmental documents. The guide provides methods for assessing air quality impacts, thresholds of significance recommended in the *State CEQA Guidelines* and those adopted by the SJVAPCD, and recommended mitigation measures.

The SJVAPCD requires all local governments within its eight-county jurisdiction to adopt resolutions as part of the *Extreme Ozone Attainment Demonstration Plan*. The resolutions, which must be approved by the US EPA, must describe reasonably available control measures that each jurisdiction will implement in order to reduce ozone-causing emissions from transportation sources. The *2003 PM_{10} Plan* requires local jurisdictions to adopt best available control technology (BACT) measures to reduce particulate emissions.

To ensure a coordinated approach between the SJVAPCD, local governments, and regional transportation plans, the air district entered into a memorandum of understanding with the Merced County Association of Governments (MCAG), which includes the City and County of Merced. As a regional transportation planning agency, one of the purposes of MCAG is to inform and advise member agencies on air quality issues and policies; to ensure that MCAG's transportation plans, programs, and projects conform to the most recent air quality requirements, and to coordinate effectively with other government agencies on these matters. In addition, SJVAPCD relies upon CARB's emission forecasting model, California Emission Forecast System (CEFS), for stationary and areawide emissions.

Merced County General Plan

The Merced County General Plan contains the following policies that would apply to the proposed University Community in the event it is not annexed to the City. Although the Merced County General Plan does not contain an air quality element, there are policies presented in other elements of the General Plan that address air quality.

Circulation Element

Policy 7: Encourage the construction of Class I, II, or III bike routes as designated in the overall Merced County Bikeway Plan and in Community Specific Plans.

Policy 8: Support efforts by the Merced County Associations of Governments (MCAG) and other public entities to improve public transportation.

Policy 10: Encourage and develop programs which promote the use of ridesharing, carpooling, and vanpooling.

Open Space/Conservation Element

Policy 18: Encourage, when appropriate, the use of solar and other renewable energy resources for residential, commercial, industrial, and public building applications.

Policy 19: New subdivision lots should be oriented to allow for both passive and active solar design and technology and to minimize energy losses.

Policy 20: Rural land uses, which involve a high volume of vehicle traffic, should be located adjacent to major roadways to reduce access distances.

Policy 24: Evaluate potential air quality impacts through the environmental review of all development projects which may significantly increase air emissions.

Policy 25: The County will assist in voluntary efforts to improve air quality through regional cooperation and will resist efforts to create additional State air pollution mandates which are contrary to the overall goals of the General Plan.

Policy 26: All development projects will be reviewed for compliance with applicable regional air quality plans.

Policy 27: In planning of new SUDPs, the County should encourage the use of innovative technologies to improve air quality, such as incorporation of facilities for zero emission vehicles into project design.

University Community Plan

The University Community Plan (UCP) contains numerous policies that directly address air quality. The plan also contains numerous policies that indirectly address air quality. These are included under the plan's goals and objectives for land use, transportation, and agricultural resources. The policies that directly and indirectly address air quality are listed below in **Table 4.3-4, UCP Policies**.

Table 4.3-4
UCP Policies

Air Quality	
AQ 1.1	Determine air quality effects of projects using analysis methods and significance criteria recommended by the SJVAPCD. This would help to ensure impacts identified during CEQA review are consistently and fairly mitigated with feasible, implementable, and cost-effective strategies.
AQ 1.2	Work with the City of Merced and other jurisdictions and agencies to address cross jurisdictional and regional transportation and air quality issues. Encourage staff planners to participate in activities of neighboring jurisdictions and regional agencies. The aim would be to examine congestion in other jurisdictions caused by University Community projects, effects of projects on viability of regional transit and pedestrian-oriented projects, progress of jurisdictions to construct segments regional bikeway plans, proposed land use or circulation changes that would alter traffic flow or increase urban sprawl in jurisdictions.
AQ 2.1	Integrate planning efforts by considering air quality when planning land use and transportation systems and considering air quality and mobility when reviewing any proposed change to the land use pattern.
AQ 2.2	Develop a congestion management plan to reduce motor vehicle trips, as defined by the UCP's transportation policies (T 7.1 to 7.4). These include policies for (a) the provision of grid streets and "flexible corridors" that provide travel-mode options and future capacity and (b) street design standards for bicyclists, pedestrians, and traffic calming.
AQ 2.3	Establish land use pattern, densities, and pedestrian-enhanced infrastructure, in accordance with Land Use policies, to encourage the use of alternative transportation modes and reduce the length and number of motor vehicle trips. These encompass policies to manage the density and intensity of development; develop a planned "heart" of the community, parklands, pedestrian-oriented mixed use districts, neighborhood convenience commercial, neighborhood schools, and centralized large-scale commercial and office uses in village centers with appropriate transportation services; as well as compact and orderly outward expansion of contiguous development and infrastructure through "land use phasing" and urban limit lines.
AQ 2.4	Design streetscapes, housing, and village centers to improve access by pedestrians and bicyclists. Land Use policies provide a structure that maximizes pedestrian activity and transit use.
AQ 2.5	Implement a transportation infrastructure that provides opportunity for reduced trip lengths and minimized new trips while anticipating a multi-modal system in accordance with Transportation policies. This should include internal and regional public transit systems, supporting transit infrastructure and amenities (shelters, benches, bus turnouts, route signs, park and ride lots, and so on), multi-modal connections to regional transportation system (airports and passenger rail facilities), a comprehensive system of bikeways, required bicycle storage and parking at appropriate sites, and infrastructure for telecommunication facilities.

AQ 2.6	Require the installation of electrical outlets in residential garages and commercial and office parking structures/lots for the use of electrical vehicles.
AQ 2.7	Comply with SJVAPCD published guidelines and mitigation measures for analyzing and mitigating air quality impacts related to development of the University Community.
AQ 3.1	Adequately separate or buffer sensitive uses from sources of odors and dust. Require new point sources of pollution, including sources of odors and dust, to be located an adequate distance from sensitive receptors.
AQ 4.1	Implement energy conservation policies defined in the Energy policy section of the University Community Plan.
AQ 5.1	Implement measures to reduce dust and particulates created during construction activities including limiting traffic on unpaved roads, installing erosion control measures to prevent silt runoff onto public roads, use of wheel washers for construction vehicles, installation of windbreaks, suspension of excavation and grading during high winds, and similar techniques.
AQ 5.2	Promote the use of alternative fuel construction equipment, where feasible, and the use of low emission on-site stationary equipment.
AQ 5.3	Limit the hours of operation of heavy duty construction equipment and the amount of construction equipment in use at any time.
AQ 5.4	Curtail construction activities during periods of high ambient air pollution concentration.
AQ 6.1	Require the installation of low-emitting, US EPA-certified wood-burning appliances or natural gas fireplaces in residential developments.
AQ 7.1	Identify opportunities for and encourage the procurement and use of alternative fuel vehicle fleets by large employers in the University Community and UC Merced. Collaborate with UC Merced on an alternative fuel vehicle shuttle system servicing the Campus, the University Community, and the City of Merced.
Transportation	
T 4.1	Create a complete, interconnected bicycle and pedestrian circulation system that serves both commuter and recreational travel, and provides access to major destinations.
T 4.2	Work with UC Merced to establish convenient pedestrian and bicycle access routes to and through Campus.
T 4.3	Install amenities to serve bicyclists and pedestrians, such as secure and convenient bicycle parking and shaded seating areas at public facilities.
T 4.4	Establish bicycle parking standards for new development.
T 4.5	Work with the transit provider to encourage transit-bicycle transfers by installing bike racks on buses.
T 5.1	Provide high-frequency transit services that seamlessly connect major destinations, including the UC Merced Campus. Encourage convenient transfers between transit and other modes of travel.
T 5.2	Work proactively with local and regional transit providers to coordinate transit service. Work with transit providers, the regional Air Pollution Control District, and public utility providers to encourage actions that reduce pollution from transit vehicles (such as purchasing vehicles that use alternative fuels, and providing fueling/charging stations).
T 5.3	Establish a transit hub at the interface between the town center and Campus core for timed transfers between local Campus/Community transit service and regional transit connections serving the City of Merced, the rest of Merced County, and major interregional destinations.
T 5.4	Work with UC Merced to design a transit fare policy and transit pass system that provides maximum incentives for transit ridership for University students and employees.

T 5.5	Establish development standards, such as inclusion of handicap-accessible bus stops and shelters, to make transit attractive. Require development to fund its share of necessary transit facilities.
T 5.6	Establish a County/City/University transportation clearinghouse and website that provides information on local transit services and alternative travel options.
T 7.1	Encourage non-residential developments to offer telecommute and flexible work-hour opportunities, and provide employee incentives for using transit, ridesharing, bicycling and walking.
T 7.2	Locate parking at strategic intercept points to minimize driving into and through central areas of the Community and Campus. Serve remote parking with frequent transit shuttles.
T 7.3	Promote ridesharing through public information and outreach.
T 7.4	Encourage non-residential developments to provide amenities for bicyclists, including showers and changing facilities.
Land Use	
LU 4.1	Concentrate land uses to minimize impacts on natural environmental resources and agricultural uses, and maximize the efficiency of supporting infrastructure, community/ pedestrian activity, and transit use.
LU 4.3	Site and design land uses and buildings to maximize the Community's quality of life, including the establishment of pedestrian-oriented mixed use districts and residential neighborhoods that reflect the traditional qualities of Merced, while providing opportunities for innovative and creative forms of development.
LU 4.4	Locate the highest development densities within and adjacent to the Town Center and primary transit corridors and stations to support community activity and transit use. Prioritize areas adjacent to the Town Center and Campus as housing locations for UC Merced students, faculty, and staff.
LU 5.8	Develop the Town Center with the highest densities in the University Community to reinforce its role as the "heart" of the community and foster pedestrian and transit use, according to the following standards: • Retail and office uses (free standing): minimum floor area ratio (FAR) of 0.4 and maximum of 3.0 (one to six stories), • Mixed use: minimum FAR of 1.5 and maximum 3.0, (housing/retail or office) with a minimum FAR of 0.35 and maximum of 1.0 for retail or office components (three to six stories) • Residential: minimum of 18 and maximum of 32 units per net acre (two to four stories)
LU 5.16	Develop and design public streetscapes to enhance pedestrian activity including the integration of landscape, street furniture, signage, lighting, public art, distinctive paving materials, and other amenities. Local and/or Campus artists should be involved in the design of streetscapes, in lieu of the exclusive use of traditional "catalogue" elements, to impart a distinctive character and enhance ownership by the community.
Agricultural Resources	
A 2.2	Enforce the County of Merced's Right-to-Farm Ordinance for the University Community that requires nonagricultural residents be made aware of local agricultural operations, their practices, and the potential agriculturally related impacts (noise, odors, dust, and so on).
A 2.3	Provide materials such as brochures and pamphlets to all future residents of the University Community informing them about the effects of agricultural activities that states residents within the University Community may be subject to inconveniences or discomfort arising from the use of agricultural chemicals, such as fertilizers and pesticides; and from the pursuit of agricultural operations including but not limited to, plowing, spraying, and burning which occasionally may generate dust, smoke, noise and odor.

UC Merced 2009 Long Range Development Plan

Lands on which the Campus would be built are owned by the Regents of the University of California. Therefore, UC Merced is generally exempted by the state constitution from compliance with local laws and regulations. The LRDP is the plan for the development of the campus. The LRDP does not contain policies that specifically address air quality. However, the LRDP does contain elements with respect to energy-efficiency provisions that will reduce air pollutant emissions, emissions of ozone-depleting substances, and greenhouse gas emissions. The LRDP also contains sustainability elements, such as encouraging the use of renewable energy sources, conservation, and recycling. Lastly, the LRDP includes measure to encourage walking and bicycling on campus and in surrounding neighborhoods. The relevant policies that would, if implemented, reduce the project's air quality impacts are listed below.

Triple Zero Commitment

TZC-3: **Zero Net Carbon:** Achieve zero net carbon emissions (carbon neutrality) by 2020. Minimize atmospheric carbon generation by campus operations and employ measures to mitigate carbon emissions such as aggressive tree planting. On-site and regional measures will be prioritized.

Sustainability in Planning, Design, and Construction

SUST-1: Adhere to principles of sustainable environmental stewardship, conservation and habitat protection in the planning, design and construction of the campus and individual projects, adopting an approach of continuous improvement in the sustainability of campus development, operations and management.

SUST-3: Create a unique architectural identity for the campus by employing passive environmental systems, such as shading, orientation and roof configuration, as design features on campus buildings; employing sustainable materials; and designing campus buildings to employ renewable energy production systems.

SUST-4: Design buildings to maximize day lighting, occupant control over the interior environment, indoor air quality, and general indoor environmental quality. Wherever feasible and programmatically compatible, occupied building interiors should be naturally lit and naturally ventilated, as a priority in facility design.

SUST-5: Design buildings to utilize exterior shading to reduce building cooling loads, and utilize circulation systems such as arcades, loggias, or porches to protect major

entries to ground floor functions, reducing the need for environmentally conditioned space in areas of high traffic.

SUST-6: Minimize grid connected peak electricity loads by shifting electricity used for cooling (approximately 25 percent of total) away from peak electricity demand periods through chilled water thermal storage, gas or cogeneration-driven cooling, and/or solar power.

SUST-7: Install campus energy performance monitoring systems in all new buildings and other monitoring equipment to foster continuous improvement in indoor environmental quality and performance. These systems will enable optimization of campus operations, inform improved design of future phases of the campus, and make the campus a "Living Laboratory" for study of engineering and resource conservation.

SUST-11: Utilize tree planting and other methods to shade buildings, walking and open activity areas, and reduce to heat island effects of roads and surface parking lots.

Environments Policies

ENV-1: Develop an interdisciplinary Academic Core with a 10 minute walking radius and shared open space.

Mobility Policies

MOB-6: Create a comprehensive, interconnected bicycle and pedestrian circulation system that provides access to major campus destinations. The design of the bicycle and pedestrian system should be consistent with the following principles:

- Design all campus vehicular streets (transit, service and general traffic) as bike-friendly streets, with calmed traffic speeds, adequate bike lanes, no parking or parallel parking only, and roundabouts rather than stop signs at intersections.
- Minimize bike paths separate from and paralleling roadways, unless they can be designed in a manner that offers significant safety or direct access advantages over streets with integral bike lanes.
- Separate pedestrians from cyclists, either in different corridors (or block grids) or, when using the same corridor, on a bikeway with a parallel but separate walkway.

- Minimize the number of pedestrian/bicycle crossing points. Where bicycle and pedestrian paths cross, emphasize proven safe and efficient design treatments such as roundabouts and pedestrian refuges. Design bike paths and lanes for moderate but safe speeds at pedestrian and vehicular crossings (8 to 10 mph).
- In the most dense areas of the campus core, design the bike grid to be at least two square blocks in scale, to avoid having each building surrounded by bike streets, and promote a more protected pedestrian realm and more efficient bike realm.
- Design integrated and secure bicycle parking at residences, lecture halls, research facilities and student service buildings
- Sidewalks shall be 10 feet wide at a minimum.

MOB-7: Accompany each new building on campus with appropriate addition to the bicycle and pedestrian system, to ensure that the bicycle/pedestrian system expands to keep pace with campus development.

MOB-8: Install amenities to serve bicyclists and pedestrians, such as water fountains, bicycle maintenance and repair tool, campus maps, secure bicycle parking and lockers, and showers and changing rooms.

MOB-9: Link the campus bicycle system with regional bikeways to encourage utilitarian and recreational travel by bicycle. Prime candidates for campus-regional linkages include existing paths along Lake Road and Bellevue Road.

MOB-10: Work cooperatively with transit providers to encourage transit-bicycle transfers by installing bike racks on all transit vehicles.

MOB-11: Develop a comprehensive public information strategy to publicize bicycle-and pedestrian-related pathways, networks, rules and regulations.

MOB-12: Provide high-frequency, safe and convenient transit services that seamlessly connect major activity centers on campus and in the neighboring University Community. Primary transit destinations would include the campus core, the Town Center, the Gateway District outlying commuter parking facilities, and key locations within on-campus and off-campus housing areas. Each building in the campus core should be within a 5 minute walk of a transit stop.

MOB-13: Work with local and regional transit providers to coordinate transit service, and establish convenient transfers between transit and other modes of travel. Integrate transit corridors with the City of Merced transit corridors.

MOB-14: Contribute to development of a transit hub at the interface between the Town Center and campus core, for timed transfers between local and regional transit connections.

MOB-15: Develop a transit fare policy and transit pass system that provides maximum convenience and incentives for transit ridership among University students and employees.

MOB-20: Provide priority parking for vanpools, carpools, and energy-efficient and low-pollution vehicles, with recharge stations for electric vehicles and provide a natural gas vehicle charging stations. Provide leadership by using alternative fuel or other low-emission vehicles in the campus service fleet.

4.3.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

Council on Environmental Quality (CEQ) guidance for evaluating the types and significance of impacts under National Environmental Protection Act (NEPA) is summarized in **Section 4.0, Affected Environment and Environmental Consequences.** For purposes of this analysis, this EIS/EIR conservatively uses significance criteria derived from Appendix G of the *State CEQA Guidelines* and the CEQ guidelines regarding the determination of environmental consequences to identify impacts. In accordance with NEPA, the EIS also must evaluate potential effects on the human environment which includes an analysis of the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14). For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. For the purpose of this Draft EIS/EIR, impacts related to air quality would be significant if implementation of the Proposed Action or its alternatives would:

- conflict with or obstruct implementation of the applicable air quality plan;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors;
- expose sensitive receptors to substantial pollutant concentrations; or
- create objectionable odors affecting a substantial number of people.

To assess a project's impact relative to the significance criteria listed above, the SJVAPCD has established air quality significance thresholds to determine whether air quality impacts from implementing proposed projects will be significant. These thresholds are contained in the SJVAPCD's GAMAQI. If project-specific emissions would exceed any of the emission thresholds listed in **Table 4.3-5, SJVAPCD Air Quality Significance Thresholds**, the impact from the emissions of the specific pollutant will be considered a significant impact.

Table 4.3-5
SJVAPCD Air Quality Significance Thresholds

Mass Emissions Thresholds	
Pollutant	**Construction/Operation**
NO_X	10 tpy
ROG	10 tpy
PM_{10}	15 tpy
$PM_{2.5}$	—
SO_X	—
CO	—
Lead	—
Toxic Air Contaminants and Odor Thresholds	
TACs	Probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in 1 million; or Ground-level concentrations of non-carcinogenic toxic air contaminants would result in a Hazard Index greater than 1 for the MEI.
Odor	More than one confirmed complaint per year averaged over a three-year period or three unconfirmed complaints per year averaged over a three-year period.
Ambient Air Quality for Attainment Criteria Pollutants of Concern	
NO_2 1-hour average annual average	In attainment; significant if project causes or contributes to an exceedance of either of the following standards: 0.18 parts per million (state) 0.03 parts per million (state)
CO 1-hour average 8-hour average	In attainment; significant if project causes or contributes to an exceedance of either of the following standards: 20 parts per million (state) 9.0 parts per million (state)

Source: SJVAPCD 2002.

[1] *The SJVAPCD's approach to analyses of construction impacts is to require implementation of effective and comprehensive control measures rather than to require detailed quantification of emission concentrations for modeling of direct impacts. The SJVAPCD has determined that compliance with Regulation VIII for all sites and implementation of all other control measures indicated in Tables 6-2 and 6-3 of the GAMAQI (as appropriate, depending on the size and location of the project site) would constitute sufficient mitigation to reduce PM_{10} impacts to a level considered less than significant.*

In addition to the thresholds presented in **Table 4.3-5**, the GAMAQI recommends procedures for identifying cumulative impacts by pollutant. Lead agencies are recommended to use the project thresholds for ROG and NO_X in **Table 4.3-5** to determine cumulative ozone impacts. For cumulative PM_{10} impacts, lead agencies are recommended to examine the potential exposure of nearby sensitive receptors to PM_{10} emissions from earthmoving activities associated with the project and any nearby projects that may occur at the same time. If warranted, enhanced dust control measures listed in the GAMAQI should be used to reduce the cumulative PM_{10} impact to less than significant levels. Cumulative carbon monoxide impacts are accounted for in the CO "hotspots" analysis, which assesses the potential for the project and other development in the area to result in heavy traffic volumes and congestion and create localized CO concentrations or "hotspots." Cumulative CO impacts are considered less than significant if future cumulative traffic levels, including the project's contribution to traffic, does not cause an exceedance of the ambient air quality standards. Cumulative analysis of TACs can be accomplished by identifying all sources of these pollutants near the project site and using a dispersion model to determine exposure levels from the combined emissions of all sources. The SJVAPCD recommends a radius of 1 mile for sources of TACs, including existing sources, the project, and any reasonably foreseeable projects.

Issues Not Discussed Further

Although the Proposed Action at buildout would include sources that would result in TAC emissions, at this time adequate information with respect to these sources (including but not limited to the exact location of each future source; the types and quantities of chemicals that would be used in the case of laboratories; the types and volumes of fuels that would be used in the case of combustion sources; building and stack heights; types of controls; etc) is not available to allow for the quantification and evaluation of the potential human health risk. However, based on data from other comparable campuses such as UC Davis, it is anticipated that the human health risk from the buildout of the Campus and University Community would not result in a significant human health risk on or off site. For instance, according to the 2003 LRDP EIR prepared for UC Davis which evaluated impacts from the development of the campus through 2015 to an enrollment level of 30,000 FTE students, the cumulative human health risk from all on-campus sources (existing and future research laboratories, boilers and generators, on-site landfill, a cogeneration plant, etc for a total of more than 100 individual sources) was determined to be less than 8 in 1 million (This impact is considered significant if the probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in 1 million) (UC Davis 2003). Given that UC Davis campus with a much larger existing and future research program (including a medical school and an extensive veterinary medicine program) and certain unique TAC sources (wastewater treatment plant, cogeneration plant, and a landfill) is not expected to result in a significant human health risk in the region, UC Merced and its associated community are not considered likely to result in toxic air

contaminant emissions that would result in a significant human health risk in the region. This issue is not discussed further.

4.3.5 METHODOLOGY FOR EVALUATING EFFECTS

While not a requirement of CEQA or NEPA, the analysis of potential adverse air quality impacts in this EIS/EIR incorporates a conservative approach. This approach entails the premise that whenever the analysis requires that assumptions be made, the assumptions that result in the greatest reasonable adverse impacts are typically chosen. This method ensures that no potential effects of the Proposed Action or its alternatives are understated.

Construction-related emissions can be distinguished as either on site or off site. On-site emissions generated during construction principally consist of exhaust emissions (NO_X, SO_X, CO, ROG, PM_{10}, and $PM_{2.5}$) from the operation of heavy-duty construction equipment, fugitive dust (PM_{10} and $PM_{2.5}$) from disturbed soil, and ROG emissions from asphaltic paving and painting. Off-site emissions during the construction phase normally consist of exhaust emissions and entrained paved road dust (PM_{10} and $PM_{2.5}$) from construction worker commute trips, material delivery trips, and haul truck material removal trips to and from the construction site.

The estimated construction emissions generated by Alternative 1 (Proposed Action), Alternative 2 (Yosemite Avenue), Alternative 3 (Bellevue Ranch), Alternative 4 (2002 Proposed Project), and Alternative 5 (No Action) are quantified below. Alternative 6 is the No Build Alternative, which would not involve any new construction; therefore, its construction emissions are not quantified below. Air emissions associated with the construction of each of the proposed alternatives were estimated using the URBEMIS2007 land use and air emissions estimation model. URBEMIS2007 is a computer model designed to estimate regional air emissions from new development projects in California. Detailed calculations of the construction emissions are found in **Appendix 4.3**. Finally, this section concludes with a discussion of the construction-related air quality impacts of Alternatives 2 through 6 relative to the impacts of Alternative 1, Proposed Action.

This Draft EIS/EIR also evaluates the operational emissions of six build alternatives. Air emissions associated with the daily operations of each of the proposed alternatives were estimated using the URBEMIS2007 model. Vehicle trip rates in URBEMIS2007 were adjusted according to the trip rates used in the traffic study for the project. Detailed calculations of the operational emissions are found in **Appendix 4.3**.

Air pollutants associated with operations under each of the alternatives would be generated primarily by two categories of pollution sources: stationary and mobile. Stationary sources consist of "point sources," which have one or more fixed emission sources at a single facility, and "area sources," which are widely distributed and produce many small emissions. Point sources usually are associated with manufacturing

and industrial uses, and include sources such as refinery boilers or combustion equipment that produces electricity or processes heat. Stationary sources at the Campus would include central plant boilers and emergency generators distributed throughout the Campus. No large stationary sources are anticipated for the University Community. When viewed individually, an area source may have an insignificant impact on air quality; however, if viewed collectively, area sources could have a significant impact on air quality. Examples of area sources include residential water heaters, painting operations, landscape maintenance equipment, and consumer products, such as barbecue lighter fluid or hair spray. "Mobile sources" refers to operational and evaporative emissions from motor vehicles. Mobile sources account for over 75 percent of CO emissions, approximately 20 percent of SO_x emissions, over 80 percent of NO_x emissions, and approximately 40 percent of the ROG emissions found within the SJVAB (CARB 2007). With respect to the alternatives, vehicle trips generated by the daily operational activities would contribute to mobile source emissions within the SJVAB.

4.3.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.3.6.1 Alternative 1 – Proposed Action

The Proposed Action Alternative consists of the development of a major research university in Merced County, which would ultimately support (1) up to 25,000 full-time equivalent (FTE) students, and associated faculty and staff, and (2) an associated community needed to support the university. For purposes of evaluation under NEPA and CEQA, the Proposed Action encompasses the Campus, Community North, and Community South.

Alt 1 – Impact AQ-1: The Proposed Action would result in construction emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation. (*Significant; Significant and Unavoidable*)

Campus

Development of the campus under the 2009 LRDP would require site preparation (i.e., clearing and grading); pavement and asphalt installation; and construction of the academic buildings, campus support services, and housing. For purposes of this assessment, it was assumed that there would be ongoing construction on the campus between 2009 and 2030, and site buildout under the Proposed Action was assumed to be completed by 2030; although, in reality, development could take longer and buildout may not be completed until several years later. During this period, construction emissions would be generated by heavy-duty construction equipment, on-road trucks for material deliveries, and construction worker vehicles. ROG emissions would occur as a result of asphalt paving and architectural coatings. In addition, fugitive dust would be generated by grading and related activities.

Because of the construction time frame and the normal day-to-day variability in construction activities, it is difficult, if not impossible, to precisely quantify the emissions associated with each construction subphase. In order to estimate the construction emissions using URBEMIS2007, a conservative approach was taken in which construction of the campus was assumed to occur over the following four construction subphases within an overall time schedule from July 1, 2009, pending issuance of all relevant permits, to December 31, 2030:

Grading: The 815-acre campus site would be graded at a maximum rate of 10 acres per day. Grading would take place from July 1, 2009, to June 30, 2030. Fugitive dust control measures would be applied during this entire period to comply with SJVAPCD Regulation VIII.

Paving: Paving would occur from October 1, 2009, (three months after grading commences) to September 30, 2030, and approximately 25 percent of total disturbed acreage would be paved (URBEMIS2007 default assumption).

Building Construction: Building construction would take place from January 1, 2010, (six months after grading commences) to June 30, 2030. A total of 8.9 million square feet of buildings[3] (6.25 million square feet of academic and related buildings, 1.0 million square feet of student services, 1.25 million square feet of Campus support services, and 400,000 square feet of athletics and recreation), housing consisting of 12,500 beds (corresponding to 3,571 "apartments" with 3.5 beds per unit) would be built. Due to the presence of a calculation error in the URBEMIS2007 model, vendor trips and worker trips associated with building construction are overestimated for multi-year projects. URBEMIS2007 calculates the number of vendor trips and worker trips based on the total square footage of buildings and residential units for the entire project. It does not take into account the fact that the project would be constructed gradually over a period of time. Therefore, the vendor trip and worker trip emissions associated with building construction were divided by 20.5 to account for the number of years of building construction assumed in this analysis.

Architectural Coatings: Architectural coatings would be applied from July 1, 2010, (six months after building construction commences) to December 31, 2030.

Based on the schedules and assumptions described above and URBEMIS2007 default assumptions, the URBEMIS2007 model was used to estimate annual construction emissions of criteria pollutants from 2009 to 2030, which are shown in **Table 4.3-6, Alternative 1 – Estimated Construction Emissions for the Campus**. **Table 4.3-6** also shows the NO_X and PM_{10} reductions required for construction equipment exhaust under Rule 9510, which would apply to the construction of the campus.

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3 URBEMIS2007 allows the user only to enter the number of students for the university/college land use type. The corresponding amount of buildings to be constructed assumes 92 square feet per student. This value would underestimate the amount of buildings for the Campus (i.e., 2,300,000 square feet for 25,000 students). Therefore, 96,739 students were entered in URBEMIS to arrive at 8,900,000 square feet of buildings.

Table 4.3-6
Alternative 1 – Estimated Construction Emissions for the Campus

Construction Year	Emissions in Tons per Year					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2009	0.41	3.04	1.73	0.00	6.13	1.41
2010	4.76	11.38	13.98	0.01	12.51	3.14
2011	7.45	10.62	13.09	0.01	12.43	3.09
2012	7.36	9.96	12.30	0.01	12.42	3.05
2013	7.25	9.29	11.50	0.01	12.37	3.00
2014	7.14	8.62	10.76	0.01	12.31	2.95
2015	7.04	7.92	10.10	0.01	12.27	2.91
2016	6.94	7.28	9.53	0.01	12.22	2.87
2017	6.83	6.66	8.99	0.01	12.13	2.82
2018	6.77	6.14	8.59	0.01	12.14	2.79
2019	6.70	5.64	8.20	0.01	12.10	2.76
2020	6.66	5.21	7.88	0.01	12.12	2.74
2021	6.59	5.04	6.77	0.01	12.07	2.73
2022	6.56	5.02	6.75	0.01	12.02	2.72
2023	6.56	5.02	6.75	0.01	12.02	2.72
2024	6.61	5.06	6.80	0.01	12.11	2.74
2025	6.59	5.04	6.77	0.01	12.07	2.73
2026	6.57	4.98	6.27	0.01	12.07	2.73
2027	6.57	4.98	6.27	0.01	12.07	2.73
2028	6.54	4.96	6.24	0.01	12.02	2.72
2029	6.57	4.98	6.27	0.01	12.07	2.73
2030	6.22	2.81	3.44	0.00	5.99	1.37
Maximum Emissions in Any Year	7.45	11.38	13.98	0.01	12.51	3.14
Rule 9510 Emission Reductions	—	1.99	—	—	0.30	—
Net Maximum Emissions	7.45	9.39	13.98	0.01	12.21	3.14
SJVAPCD Threshold:	10	10	—	—	15	—
Exceeds Threshold?	NO	NO	—	—	NO	—

Source: Impact Sciences, Inc.
*Emissions calculations are provided in **Appendix 4.3**.*
Totals in the table may not appear to add exactly due to rounding in the computer model calculations.
[1] *PM_{10} and $PM_{2.5}$ emissions reflect compliance with SJVAPCD Regulation VIII.*

As shown in **Table 4.3-6**, the SJVAPCD significance thresholds would not be exceeded during construction. Therefore, construction emissions would result in a less than significant impact on air quality.

University Community

Development of the University Community would require site preparation (i.e., clearing and grading); pavement and asphalt installation; and construction of the commercial, retail, and institutional buildings, housing, and streets. Similar to the assumptions used to estimate emissions from the construction of the Campus, for purposes of this assessment, it was assumed that there would be ongoing construction on the University Community site between 2009 and 2030, and that buildout of the University Community resulting from the two agreements considered under the Proposed Action would be completed by 2030. Although, in reality, buildout could take longer. During this period, emissions would be generated by heavy-duty construction equipment, on-road trucks for material deliveries, and construction worker vehicles. ROG emissions would occur as a result of asphalt paving and architectural coatings. In addition, fugitive dust would be generated by grading and related activities.

In order to estimate the construction emissions using URBEMIS2007, a conservative approach was taken in which construction of Community North and Community South was assumed to occur over the following four construction subphases within an overall time schedule from July 1, 2009, pending issuance of all relevant permits, to December 31, 2030.

Community North

Grading: The 833-acre Community North would be graded at a maximum rate of 10 acres per day. Grading would take place from July 1, 2009, to June 30, 2030. Fugitive dust control measures would be applied during the entire period to comply with SJVAPCD Regulation VIII.

Paving: Paving would occur from October 1, 2009, (three months after grading commences) to September 30, 2030, and approximately 25 percent of total acreage would be paved (URBEMIS2007 default assumption).

Building Construction: Building construction would take place from January 1, 2010, (six months after grading commences) to September 30, 2030). A total of 4,774 single-family residential units (including townhouse/rowhouse units); 1,020 multi-family units; 998,400 square feet of retail and commercial space; 2,308,300 square feet of research and development space; schools; and parks would be built. As previously mentioned, due to the presence of a calculation error in the URBEMIS2007 model, vendor trips and worker trips associated with building construction are overestimated for multi-year projects.

Therefore, the vendor trip and worker trip emissions associated with building construction were divided by 20.5 to account for the number of years of building construction assumed in this analysis.

Architectural Coatings: Architectural coatings would be applied from April 1, 2010, (six months after building construction commences) to December 31, 2030.

Based on the schedules and assumptions described above and URBEMIS2007 default assumptions, the URBEMIS2007 model was used to estimate the construction emissions from 2009 to 2030, which are shown in **Table 4.3-7, Alternative 1 – Estimated Construction Emissions for Community North**. **Table 4.3-7,** also shows the NO_X and PM_{10} reductions required for construction equipment exhaust under Rule 9510, which would apply to the construction of the Community North.

Table 4.3-7
Alternative 1 – Estimated Construction Emissions for Community North

Construction Year	Emissions in Tons per Year					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2009	0.41	3.04	1.73	0.00	6.13	1.41
2010	6.00	12.60	17.87	0.01	12.58	3.19
2011	7.12	11.73	16.61	0.01	12.49	3.14
2012	7.02	10.95	15.51	0.01	12.48	3.10
2013	6.89	10.17	14.41	0.01	12.42	3.04
2014	6.77	9.39	13.39	0.01	12.36	2.99
2015	6.65	8.59	12.47	0.01	12.32	2.95
2016	6.54	7.87	11.68	0.01	12.27	2.90
2017	6.42	7.18	10.95	0.01	12.18	2.85
2018	6.36	6.61	10.39	0.01	12.18	2.82
2019	6.28	6.06	9.85	0.01	12.14	2.78
2020	6.22	5.59	9.41	0.01	12.16	2.77
2021	6.13	5.29	7.81	0.01	12.10	2.75
2022	6.11	5.27	7.78	0.01	12.06	2.74
2023	6.11	5.27	7.78	0.01	12.06	2.74
2024	6.16	5.31	7.84	0.01	12.15	2.76
2025	6.13	5.29	7.81	0.01	12.10	2.75
2026	6.10	5.19	7.08	0.01	12.10	2.75
2027	6.10	5.19	7.08	0.01	12.10	2.75
2028	6.08	5.17	7.06	0.01	12.05	2.74
2029	6.10	5.19	7.08	0.01	12.10	2.75

Construction Year	Emissions in Tons per Year					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2030	5.82	3.37	4.86	0.01	6.05	1.41
Maximum Emissions in Any Year	7.12	12.60	17.87	0.01	12.58	3.19
Rule 9510 Emission Reductions	—	1.99	—	—	0.30	—
Net Maximum Emissions	7.12	10.61	17.87	0.01	12.28	3.19
SJVAPCD Threshold:	10	10	—	—	15	—
Exceeds Threshold?	NO	**YES**	—	—	NO	—

Source: Impact Sciences, Inc.
*Emissions calculations are provided in **Appendix 4.3**.*
Totals in the table may not appear to add exactly due to rounding in the computer model calculations.
[1] *PM_{10} and $PM_{2.5}$ emissions reflect compliance with SJVAPCD Regulation VIII.*

As shown in **Table 4.3-7**, the SJVAPCD significance thresholds would be exceeded for NO_X (2010). Therefore, construction emissions would result in a significant impact on air quality.

Community South

Grading: The 1,118-acre Community North would be graded at a maximum rate of 10 acres per day. Grading would take place from July 1, 2009, to June 30, 2030. Fugitive dust control measures would be applied during the entire period to comply with SJVAPCD Regulation VIII.

Paving: Paving would occur from October 1, 2009, (three months after grading commences) to September 30, 2030, and approximately 25 percent of total disturbed acreage would be paved (URBEMIS2007 default assumption).

Building Construction: Building construction would take place from January 1, 2010, (six months after grading commences) to September 30, 2030. A total of 4,029 single-family residential units; 1,794 multi-family units; 390,000 square feet of retail and commercial space; schools; and parks would be built. As previously mentioned, due to the presence of a calculation error in the URBEMIS2007 model, vendor trips and worker trips associated with building construction are overestimated for multi-year projects. Therefore, the vendor trip and worker trip emissions associated with building construction were divided by 20.5 to account for the number of years of building construction assumed in this analysis.

Architectural Coatings: Architectural coatings would be applied from April 1, 2010, (six months after building construction commences) to December 31, 2030.

Based on the schedules and assumptions described above and URBEMIS2007 default assumptions, the URBEMIS2007 model was used to estimate the construction emissions from 2009 to 2030, which are shown in **Table 4.3-8, Alternative 1 – Estimated Construction Emissions for Community South**. **Table**

4.3-8 also shows the NO_X and PM_{10} reductions required for construction equipment exhaust under Rule 9510, which would apply to the construction of the Community South.

Table 4.3-8
Alternative 1 – Estimated Construction Emissions for Community South

Construction Year	Emissions in Tons per Year					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2009	0.42	3.04	1.74	0.00	6.13	1.41
2010	4.57	11.33	15.54	0.01	12.52	3.14
2011	5.29	10.57	14.48	0.01	12.43	3.09
2012	5.19	9.92	13.56	0.01	12.43	3.05
2013	5.07	9.25	12.63	0.01	12.37	3.00
2014	4.96	8.59	11.78	0.01	12.32	2.95
2015	4.85	7.89	11.01	0.01	12.28	2.92
2016	4.76	7.25	10.36	0.01	12.23	2.87
2017	4.65	6.64	9.74	0.01	12.14	2.82
2018	4.58	6.12	9.27	0.01	12.15	2.80
2019	4.51	5.62	8.83	0.01	12.11	2.76
2020	4.46	5.20	8.46	0.01	12.13	2.75
2021	4.39	5.03	7.15	0.01	12.08	2.73
2022	4.37	5.01	7.12	0.01	12.03	2.72
2023	4.37	5.01	7.12	0.01	12.03	2.72
2024	4.41	5.04	7.18	0.01	12.12	2.74
2025	4.39	5.03	7.15	0.01	12.08	2.73
2026	4.37	4.96	6.55	0.01	12.08	2.73
2027	4.37	4.96	6.55	0.01	12.08	2.73
2028	4.35	4.95	6.52	0.01	12.03	2.72
2029	4.37	4.96	6.55	0.01	12.08	2.73
2030	4.09	3.21	4.45	0.01	6.03	1.40
Maximum Emissions in Any Year	5.29	11.33	15.54	0.01	12.52	3.14
Rule 9510 Emission Reductions	—	1.99	—	—	0.30	—
Net Maximum Emissions	5.29	9.34	15.54	0.01	12.22	3.14
SJVAPCD Threshold:	10	10	—	—	15	—
Exceeds Threshold?	NO	NO	—	—	NO	—

Source: Impact Sciences, Inc.
*Emissions calculations are provided in **Appendix 4.3**.*
Totals in the table may not appear to add exactly due to rounding in the computer model calculations.
[1] *PM_{10} and $PM_{2.5}$ emissions reflect compliance with SJVAPCD Regulation VIII.*

As shown in **Table 4.3-8**, the SJVAPCD significance thresholds would not be exceeded during construction. Therefore, construction emissions would result in a less than significant impact on air quality.

Combined Campus and University Community Emissions and Conclusion

The construction schedule and assumptions for the Campus and University Community were discussed above. The emissions in **Table 4.3-9, Alternative 1 – Estimated Construction Emissions for the Campus and University Community**, reflect the emissions that would occur during overlapping construction of the two project components.

Table 4.3-9
Alternative 1 – Estimated Construction Emissions for the Campus and University Community

Construction Year	Emissions in Tons/Year					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2009	1.24	9.12	5.20	0.00	18.38	4.23
2010	15.34	35.31	47.39	0.03	37.62	9.47
2011	19.87	32.92	44.18	0.03	37.36	9.33
2012	19.58	30.83	41.37	0.03	37.33	9.21
2013	19.21	28.71	38.54	0.03	37.16	9.05
2014	18.87	26.60	35.94	0.03	36.99	8.89
2015	18.54	24.40	33.58	0.03	36.87	8.78
2016	18.24	22.40	31.57	0.03	36.72	8.64
2017	17.91	20.48	29.68	0.03	36.45	8.49
2018	17.72	18.87	28.25	0.03	36.47	8.41
2019	17.49	17.32	26.88	0.03	36.35	8.30
2020	17.34	16.00	25.75	0.03	36.40	8.26
2021	17.11	15.35	21.74	0.03	36.25	8.21
2022	17.05	15.29	21.65	0.03	36.11	8.18
2023	17.05	15.29	21.65	0.03	36.11	8.18
2024	17.18	15.41	21.82	0.03	36.39	8.24
2025	17.11	15.35	21.74	0.03	36.25	8.21
2026	17.04	15.13	19.90	0.03	36.24	8.21
2027	17.04	15.13	19.90	0.03	36.24	8.21
2028	16.97	15.07	19.82	0.03	36.10	8.17
2029	17.04	15.13	19.90	0.03	36.24	8.21
2030	16.12	9.39	12.75	0.02	18.07	4.18

Construction Year	Emissions in Tons/Year					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Maximum Emissions in Any Year	19.87	35.31	47.39	0.03	37.62	9.47
Rule 9510 Emission Reductions	—	5.96	—	—	0.91	—
Net Maximum Emissions	19.87	29.35	47.39	0.03	36.71	9.47
SJVAPCD Threshold:	10	10	—	—	15	—
Exceeds Threshold?	**YES**	**YES**	—	—	**YES**	—

Source: Impact Sciences, Inc.
*Emissions calculations are provided in **Appendix 4.3**.*
Totals in the table may not appear to add exactly due to rounding in the computer model calculations.
[1] *PM_{10} and $PM_{2.5}$ emissions reflect compliance with SJVAPCD Regulation VIII.*

As shown in **Table 4.3-9,** the SJVAPCD significance thresholds would be exceeded for ROG (from 2010 to 2030), NO_X (from 2010 to 2020), and PM_{10} (from 2009 to 2030), inclusive of required Rule 9510 emission reductions. Therefore, construction emissions associated with the Proposed Action would result in a significant impact on air quality. The following mitigation measures are proposed to reduce the Proposed Action's impact on air quality.

MM AQ-1a: The Campus and the developers within the University Community shall include in all construction contracts the measures specified in SJVAPCD Regulation VIII (as it may be amended for application to all construction projects generally) to reduce fugitive dust impacts, including but not limited to the following:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purpose, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, or vegetative ground cover.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions using application of water or by presoaking.
- When materials are transported off-site, all material shall be covered, effectively wetted to limit visible dust emissions, or at least 6 inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit visible dust emissions. Use of blower devices is expressly forbidden.)

- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, storage piles shall be effectively stabilized of fugitive dust emissions by using sufficient water or chemical stabilizer/ suppressant. (*Applicability – Campus and University Community*)

MM AQ-1b: The Campus and the developers within the University Community shall include in construction contracts for large construction projects near sensitive receptors the following control measures characterized by the SJVAPCD as enhanced and optional control measures:

- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.
- To the extent feasible, limit area subject to excavation, grading, and other construction activity at any one time. (*Applicability – Campus and University Community*)

MM AQ-1c: The Campus and the developers within the University Community shall implement the following mitigation measures to reduce impacts of ROG and NO_X emissions from construction equipment exhaust:

- When feasible, use construction equipment operated by alternative fuel.
- Minimize idling time to a maximum of 10 minutes when construction equipment is not in use.
- To the extent practicable, manage operation of heavy-duty equipment to reduce emissions.
- Employ construction-activity management techniques such as extending the construction period outside the ozone season of May through October.
- Use low-emission on-site stationary equipment. (*Applicability – Campus and University Community*)

Significance after Mitigation: As stated in the GAMAQI, implementation of fugitive dust control measures in Regulation VIII and Tables 6-2 and 6-3 of the GAMAQI would reduce PM_{10} impacts to a less than significant level. However, construction-related air quality impacts of the Proposed Action would remain significant and unavoidable after mitigation for ROG and NO_X.

Alt 1 – Impact AQ-2: The Proposed Action would result in operational emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation. (*Significant; Significant and Unavoidable*)

Campus

Under Alternative 1, the Campus portion of the Proposed Action would result in the development of Campus facilities, which would accommodate approximately 25,000 FTE students and associated 1,420 faculty, 4,828 staff, and 312 postdoctoral researchers for a total of 6,560 FTE employees. Campus facilities would include approximately 6.25 million square feet of core academic land uses, such as classrooms, laboratory and research areas, and alumni and conference centers; 1.0 million square feet of student services; 1.25 million square feet of campus services, such as one or more central plants, a logistical center for centralized receiving and corporation yard functions, fire and police stations, electrical substations, and water storage facilities; 400,000 square feet of athletic and recreational buildings; housing land uses with approximately 12,500 beds; approximately 15,500 parking spaces; 140 acres of athletics and recreational land uses; and open space.

Trip generation rates used in URBEMIS2007 were obtained from the traffic study for the Proposed Action. For the purposes of the URBEMIS2007 model, the Campus project consisted of the university land use type with a trip generation rate of 2.08 trips per student. The anticipated mobile source emissions are based upon buildout of all land uses associated with the Campus and are reflected in **Table 4.3-10, Alternative 1 – Estimated Unmitigated Campus Operational Emissions**.

Emissions resulting from area sources, such as natural gas combustion for water and space heating, landscape maintenance equipment, and periodic architectural coating activities, were estimated using URBEMIS2007. The area sources are shown in **Table 4.3-10, Alternative 1 – Estimated Unmitigated Campus Operational Emissions**.

Operational emissions from existing and future central plant boilers and emergency generators were calculated using emission limits in current Permits to Operate for this equipment. The operational emissions from future boilers were based on the SJVAPCD's BACT requirements for boilers with a maximum heat input rating of 20 MMBtu/hr and emission factors contained in US EPA's *Compilation of Air Pollutant Emission Factors* (US EPA 1998). It was estimated that an additional 169 MMBtu/hr would be needed at full buildout. Emissions from emergency generators were calculated using emission standards for off-road diesel (compression-ignition) engines established by CARB and the US EPA (CARB 2000) and emission factors contained in AP 42 (US EPA 1996). Because the engines would likely have an output rating greater than 50 horsepower, these units must comply with CARB's Airborne Toxics Control

Measure (ATCM) for stationary compression-ignition engines (CARB 2005). The ATCM requires that new emergency standby engines must comply with hydrocarbon, NO_x, and CO limits that are applicable to an off-road engine of the same model year and horsepower rating. The ATCM further limits the PM emissions from an emergency standby engine to either (1) 0.15 gram per horsepower-hour (g/hp-hr) (with a maximum operating limit of 50 hours per year for testing and maintenance) or 0.01 g/hp-hr (with a maximum operating limit of 100 hours per year for testing and maintenance), or (2) the emission limit for an off-road engine with the same maximum rated power, whichever is more stringent. For purposes of this analysis, and assuming a 2010 model year or later engine operating less than 20 hours per year (based on current testing of Campus emergency generators), the 0.15 g/hp-hr limit is the applicable PM limit under California and federal standards for off-road engines. Since June 2006, the sulfur content of available CARB diesel fuel has been 15 ppm (0.0015 percent) by weight, and this concentration was used to estimate the SO_x emissions from the proposed engine. It was estimated that an additional two 1,000 kilowatt emergency engines would be needed at full buildout. The emissions associated with the operation of the central plant boilers and emergency generators are included in the stationary source category in **Table 4.3-10**, **Alternative 1 – Estimated Unmitigated Campus Operational Emissions**.

Table 4.3-10
Alternative 1 – Estimated Unmitigated Campus Operational Emissions

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_x**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Campus Emissions						
Operational (Mobile) Sources	36.14	36.94	278.88	0.67	56.40	12.56
Area Sources	2.76	4.06	3.55	0.00	0.01	0.01
Stationary Sources	0.88	5.34	19.65	0.75	1.38	1.38
Annual Emissions Total	39.78	46.34	302.08	1.42	57.79	13.95
Rule 9510 Emission Reduction	—	15.43	—	—	28.90	—
Net Annual Emissions Total	39.78	30.91	302.08	1.42	28.89	13.95
SJVAPCD Threshold	10	10	—	—	15	—
Exceeds Threshold?	**YES**	**YES**	—	—	**YES**	—

*Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 4.3**.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

As shown in **Table 4.3-10**, the Campus at buildout and in full operation would generate annual emissions that exceed the SJVAPCD significance thresholds for ROG, NO_x, and PM_{10}. Therefore, operational emissions of ROG, NO_x, and PM_{10} generated by campus operations would be considered to have a significant air quality impact.

University Community

Under Alternative 1, the Proposed Action includes the construction and operation of the University Community, which would occupy approximately 1,950 acres of land and would be developed with high-, medium-, and low-density housing; commercial buildings; buildings to house research and development; parking, parks, schools, and open space for passive recreation. The University Community comprises two distinct subareas: the 833-acre Community North and the 1,118-acre Community South. Both subareas of the University Community are treated as a single planning unit; however, a Section 404 permit application to fill the wetlands has been submitted for only the Community North area.

Trip generation rates used in URBEMIS2007 were obtained from the traffic study for the Proposed Action. For the purposes of the URBEMIS2007 model, the University Community consisted of the land use types, units, and trip generation rates listed in **Table 4.3-11, Alternative 1 – University Community Land Use Types for URBEMIS2007**. Emissions resulting from area sources such as natural gas combustion for water and space heating, consumer products, landscape maintenance equipment, and periodic architectural coating activities were estimated using URBEMIS2007.

Table 4.3-11
Alternative 1 – University Community Land Use Types for URBEMIS2007

	Community North		Community South	
Land Use	**Units**	**Trip Rate per Unit**	**Units**	**Trip Rate per Unit**
Single-Family Housing	4,774 DU	7.40	4,029 DU	7.40
Apartments Low Rise	1,020 DU	4.64	1,794 DU	4.65
Elementary School	248.65 ksf	14.49	331.54 ksf	14.49
City Park	80 acres	1.59	148 acres	1.59
Strip Mall	392.10 ksf	49.74	250.00 ksf	49.75
Office Park	606.30 ksf	10.86	140.00 ksf	10.86
General Light Industry	2,308.30 ksf	9.57	—	—

Source: Fehr & Peers 2008.
DU = dwelling units; ksf = thousand square feet

The anticipated operational emissions are based upon buildout of all land uses associated with the University Community and are reflected in **Table 4.3-12, Alternative 1 – Estimated Unmitigated University Community Operational Emissions**.

Table 4.3-12
Alternative 1 – Estimated Unmitigated University Community Operational Emissions

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Community North Emissions						
Operational (Mobile) Sources	47.84	61.46	484.28	1.12	93.09	20.82
Area/Stationary Sources	63.03	16.36	117.40	0.30	14.84	14.28
Annual Emissions Total	110.87	77.82	601.68	1.42	107.93	35.10
Community South Emissions						
Operational (Mobile) Sources	29.91	37.77	298.14	0.68	57.19	12.81
Area/Stationary Sources	64.78	15.88	165.71	0.47	23.37	22.49
Annual Emissions Total	94.69	53.65	463.85	1.15	80.56	35.30
University Community Emissions						
Operational (Mobile) Sources	77.75	99.23	782.42	1.80	150.28	33.63
Area/Stationary Sources	127.81	32.24	283.11	0.77	38.21	36.77
Annual Emissions Total	205.56	131.47	1,065.53	2.57	188.49	70.40
Rule 9510 Emission Reduction	—	43.78	—	—	94.25	—
Net Annual Emissions Total	205.56	87.69	1,065.53	2.57	94.24	70.40
SJVAPCD Threshold	10	10	—	—	15	—
Exceeds Threshold?	**YES**	**YES**	—	—	**YES**	—

*Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 4.3**.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

As shown in **Table 4.3-12**, the project at buildout and in full operation would generate annual emissions that exceed the SJVAPCD significance thresholds for ROG, NO_X, and PM_{10}. Therefore, operational emissions of ROG, NO_X, and PM_{10} generated by the University Community would be considered to have a significant impact on air quality.

Combined Campus and University Community Emissions and Conclusion

Development of both the Campus and University Community would result in combined emissions listed in **Table 4.3-10** and **Table 4.3-12** above. The impacts are summarized below in **Table 4.3-13, Alternative 1 – Estimated Campus and University Community Unmitigated Operational Emissions**. The anticipated operational emissions are based on the buildout of all land uses associated with the Proposed Action.

Table 4.3-13
Alternative 1 – Estimated Campus and University Community Unmitigated Operational Emissions

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Proposed Action Emissions						
Operational (Mobile) Sources	113.89	136.17	1,061.30	2.47	206.68	46.19
Area/Stationary Sources	131.45	41.64	306.31	1.52	39.60	38.16
Annual Emissions Total	245.34	177.81	1,367.61	3.99	246.28	84.35
Rule 9510 Emission Reduction	—	59.21	—	—	123.14	—
Net Annual Emissions Total	245.34	118.60	1,367.61	3.99	123.14	84.35
SJVAPCD Threshold	10	10	—	—	15	—
Exceeds Threshold?	**YES**	**YES**	—	—	**YES**	—

*Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 4.3**.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

As shown in **Table 4.3-13**, the Proposed Action at buildout and in full operation would generate annual emissions that exceed the SJVAPCD significance thresholds for ROG, NO_X, and PM_{10}. Therefore, operational emissions of ROG, NO_X, and PM_{10} generated by the Proposed Action would be considered to have a significant impact on air quality. The following mitigation measures are proposed to reduce the Proposed Action's operational impact.

MM AQ-2a: The Campus will work with the SJVAPCD to ensure that emissions directly and indirectly associated with the Campus, University Community, and induced growth are adequately accounted for and mitigated in applicable air quality planning efforts. The SJVUAPCD can and should adopt adequate measures consistent with applicable law to ensure that air quality standard violations are avoided. (*Applicability—Campus only*)

MM AQ-2b: The Campus and the developers within the University Community shall implement the following measures to reduce emissions from vehicles:

- Provide pedestrian-enhancing infrastructure to encourage pedestrian activity and discourage vehicle use.
- Provide bicycle facilities to encourage bicycle use instead of driving.
- Provide transit-enhancing infrastructure to promote the use of public transportation.
- Provide facilities to accommodate alternative-fuel vehicles such as electric cars and CNG vehicles.

- Improve traffic flows and congestion by timing of traffic signals to facilitate uninterrupted travel. (*Applicability – Campus and University Community)*

MM AQ-2c: The Campus and the developers within the University Community shall implement the following measures to reduce emissions from area sources, as feasible:

- Use solar or low-emission water heaters.
- Orient buildings to take advantage of solar heating and natural cooling and use passive solar designs.
- Increase wall and attic insulation.
- EPA certified wood-burning appliances, or residential natural-gas fireplaces.
- Provide electric equipment for landscape maintenance. (*Applicability – Campus and University Community)*

Significance after Mitigation: Significant and unavoidable for ROG, NO_x, and PM_{10}.

Alt 1 – Impact AQ-3: The Proposed Action would not expose sensitive receptors to substantial pollutant concentrations of carbon monoxide. (*Less than Significant*)

Campus and University Community

The Proposed Action was evaluated for its potential to cause high levels of CO due to traffic associated with the Campus and the University Community. Motor vehicles are a primary source of pollutants within the project vicinity. Traffic-congested roadways and intersections have the potential to generate localized high levels of CO. Localized areas where ambient concentrations exceed state and/or federal standards are termed CO "hotspots." CO is produced in greatest quantities from vehicle combustion and is usually concentrated at or near ground level because it does not readily disperse into the atmosphere. As a result, potential air quality impacts to sensitive receptors are assessed through an analysis of localized CO concentrations. Areas of vehicle congestion have the potential to create CO hotspots that exceed the state ambient air quality 1-hour standard of 20 ppm or the 8-hour standard of 9.0 ppm. The federal levels are less stringent than the state standards and are based on 1- and 8-hour standards of 35 and 9 ppm, respectively. Thus, an exceedance condition would occur based on the state standards prior to exceedance of the federal standard.

The Proposed Action was evaluated to determine if it would cause a CO hotspot utilizing a simplified CALINE4 screening model developed by the Bay Area Air Quality Management District (BAAQMD). The simplified model is intended as a screening analysis that identifies a potential CO hotspot. If a

hotspot is identified, the complete CALINE4 model is then utilized to determine precisely the CO concentrations predicted at the intersections in question. This methodology assumes worst-case conditions (i.e., wind direction is parallel to the primary roadway and 90 degrees to the secondary road, wind speed of less than 1 meter per second and extreme atmospheric stability) and provides a screening of maximum, worst-case, CO concentrations.

This methodology is utilized to predict future CO concentrations 0 and 25 feet from the intersections in the study area based on projected traffic volumes from the intersections contained in the traffic study for the Proposed Action. The intersections were determined in the traffic study to operate at a level of service (LOS) between A through F. Intersections operating at a LOS of E or F are considered to have the potential to create a CO hotspot (SJVAPCD 2002); therefore, for the purposes of this analysis, only intersections estimated to operate at LOS E or F under future cumulative plus project traffic conditions were analyzed. Traffic volumes due to the Campus, the University Community, and future cumulative background growth were used in this analysis.

Maximum future cumulative plus project CO concentrations were calculated for peak hour morning and evening traffic volumes. Background CO concentrations were included in the analysis. The results of these CO concentration calculations are presented in **Table 4.3-14, Alternative 1 – Campus and University Community Carbon Monoxide Concentrations**, for representative receptors located 0 and 25 feet from the intersections projected to operate at LOS E or F.

Table 4.3-14
Alternative 1 – Campus Carbon Monoxide Concentrations

Intersection	0 Feet		25 Feet	
	1-Hour[1]	8-Hour[2]	1-Hour[1]	8-Hour[2]
Snelling Hwy (SR-59) at Bellevue Rd	3.5	2.8	3.2	2.6
R Street at Olive Ave	3.9	3.1	3.6	2.8
M Street at Olive Ave	3.9	3.0	3.5	2.8
V Street at W 16th Street	3.7	2.9	3.3	2.7
Campus Pkwy at Yosemite Ave	3.2	2.6	3.0	2.5
Campus Pkwy at Yosemite Ave	4.0	3.1	3.5	2.8
Exceeds state 1-hour standard of 20 ppm?	NO	—	NO	—
Exceeds federal 1-hour standard of 35 ppm?	NO	—	NO	—
Exceeds state 8-hour standard of 9.0 ppm?	—	NO	—	NO
Exceeds federal 8-hour standard of 9 ppm?	—	NO	—	NO

*Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 4.3**.*

As shown, the CALINE4 screening procedure predicts that, under worst-case conditions, future CO concentrations at each of these worst intersections affected by the traffic associated with the Proposed Action would not exceed the state 1-hour and 8-hour standards. No significant CO-hotspot impacts would occur to sensitive receptors in the vicinity of these intersections. As a result, no significant project-related impacts would occur relative to future CO concentrations.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact AQ-4: **The Proposed Action would result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). (*Significant; Significant and Unavoidable*)**

According to the SJVAPCD's GAMAQI, "Any proposed project that would individually have a significant air quality impact…would also be considered to have a significant cumulative air quality impact" (SJVAPCD 2002). Accordingly, the Proposed Action's construction and operational emissions will be discussed in comparison to the SJVAPCD significance thresholds.

Campus

As shown in **Table 4.3-6**, construction of the Campus under the Proposed Action, after accounting for the required reduction under Rule 9510, would result in maximum annual ROG, NO_X and PM_{10} emissions of 7.45 tpy, 9.39 tpy, and 12.21 tpy, respectively, which would not exceed the SJVAPCD significance thresholds. Operation of the Campus under the Proposed Action would generate on-road vehicle travel, which would result in mobile source emissions. The mobile source emissions would include emissions that contribute to violations of state and federal ozone and PM_{10} standards. Ozone precursors include ROG and NO_X. To a lesser extent, area and stationary sources would also result in emissions of ROG, NO_X, and PM_{10}. The total increase in the Campus' operational emissions, after accounting for the required reductions under Rule 9510, would be 39.78 tpy of ROG, 30.91 tpy of NO_X, and 28.90 tpy of PM_{10}, as shown in **Table 4.3-10**. These values would exceed the SJVAPCD significance thresholds, and the impacts are considered individually and cumulatively significant, particularly when viewed against the background of the serious nature of existing air quality problems in the SJVAB. The SJVAB is in nonattainment with state and federal ozone and particulate matter ambient air quality standards. Given the serious situation in the air basin, and as required under CEQA, all reasonable and feasible mitigation must be imposed on the Proposed Action to minimize the emissions of these criteria pollutants. Although all feasible and reasonable mitigation as described above under **Mitigation Measures AQ-1** and **AQ-2**

will be imposed, there would still be remaining contributions of ROG, NO_X, and PM_{10}. Thus, the campus portion of the Proposed Action would have a significant cumulative impact on air quality.

University Community

As shown in **Table 4.3-7** (Community North) and **Table 4.3-8 (**Community South), construction of the University Community under the Proposed Action, after accounting for the required reductions under Rule 9510, would result in ROG emissions of 12.41 tpy, NO_X emissions of 19.95 tpy, and PM_{10} emissions of 24.50 tpy, which exceed the SJVAPCD significance thresholds. Operation of the University Community portion of the Proposed Action would generate on-road vehicle travel, which would result in mobile source emissions. The mobile source emissions would include emissions that contribute to violations of state and federal ozone and PM_{10} standards. Ozone precursors include ROG and NO_X. To a lesser extent, area and stationary sources would also result in emissions of ROG, NO_X, and PM_{10}. The total increase in the University Community's operational emissions, after accounting for the required reductions under Rule 9510, would be 205.56 tpy of ROG, 87.69 tpy of NO_X, and 94.24 tpy of PM_{10}, as shown in **Table 4.3-12**. These values would exceed the SJVAPCD significance thresholds, and the impacts are considered individually and cumulatively significant—particularly when viewed against the background of the serious nature of existing air quality problems in the SJVAB. Although all feasible and reasonable mitigation, as described above under **Mitigation Measures AQ-1 and AQ-2,** will be imposed, there would still be remaining contributions of ROG, NO_X, and PM_{10}. Thus, the University Community portion of the Proposed Action would have a significant cumulative impact on air quality.

Combined Campus and University Community Emissions and Conclusion

As shown in **Table 4.3-9**, construction of the Campus and University Community under the Proposed Action, after accounting for the required reductions under Rule 9510, would result in ROG emissions of 19.87 tpy, NO_X emissions of 29.35 tpy, and PM_{10} emissions of 36.71 tpy, which exceed the SJVAPCD significance thresholds. The Proposed Action's operational emissions, after accounting for the required reductions under Rule 9510, would be 245.34 tpy of ROG, 118.60 tpy of NO_X, and 123.14 tpy of PM_{10} as shown in **Table 4.3-13**. These values would exceed the SJVAPCD significance thresholds, and the impacts of the Proposed Action are considered individually and cumulatively significant—particularly when viewed against the background of the serious nature of existing problems in the SJVAB. Although all feasible and reasonable mitigation will be imposed (as described above under **Mitigation Measures AQ-1 and AQ-2**), there would still be remaining contributions of ROG, NO_X, and PM_{10}. Thus, the Proposed Action would have a significant cumulative impact on air quality.

Mitigation Measure: **Mitigation Measures AQ-1** and **AQ-2** would apply to this impact. No further mitigation is available.

Significance after Mitigation: As stated in the GAMAQI, implementation of fugitive dust control measures in Regulation VIII and Tables 6-2 and 6-3 of the GAMAQI would reduce PM_{10} impacts to a less than significant level. Construction-related air quality impacts of the Proposed Action would remain significant and unavoidable after mitigation for ROG and NO_X. Operational air quality impacts of the Proposed Action would remain significant and unavoidable after mitigation for ROG, NO_X, and PM_{10}.

Alt 1 – Impact AQ-5: The Proposed Action would not conflict with or obstruct implementation of the applicable air quality plan. (*Less than Significant*)

In compliance with the *State CEQA Guidelines*, the analysis below evaluates whether the Proposed Action would conflict with or otherwise obstruct implementation of regional air quality plans. For air quality planning purposes, the SJVAPCD creates emissions inventories based on existing and foreseeable future land uses within its jurisdiction. If a new project is consistent with the planned land use designation that was considered in the development of an air quality management plan, the proposed project would not conflict and would not obstruct implementation of the applicable air quality management plan. Generally, a project's conformance with a local general plan that was taken into account in the preparation of an air quality management plan would demonstrate that the project would not conflict with or obstruct implementation of the air quality management plan. The most recent plans adopted by the SJVAPCD are the 2007 Ozone Plan and the 2007 PM_{10} Maintenance Plan.

Campus

As discussed in **Section 4.9, Land Use and Planning**, Merced County has recognized the Campus since it amended the Merced County General Plan in 1996 to designate a UC Merced Specific Urban Development Plan. The Campus was also included in the 2004 General Plan Amendment resulting from approval of the UCP. Accordingly, the development of the Campus is included in the Merced County General Plan, the growth projections of which would be reflected in the SJVAPCD's air quality plans adopted in 2007. Therefore, the Campus portion of the Proposed Action would not conflict with or obstruct implementation of the applicable air quality plan. While the emissions associated with construction and operation of the Campus would result in a significant impact for the reasons set forth in the discussion of **Impacts AQ-1** and **AQ-2**, the effect of the Proposed Action with respect to the air quality management plan is itself less than significant.

University Community

As discussed in **Section 4.9, Land Use and Planning**, Merced County adopted the UCP and amended the General Plan to include a Multiple Use Urban Development land use designation for the UCP. Accordingly, the development of the University Community is included in the Merced County General Plan, the growth projections of which would be reflected in the SJVAPCD's air quality plans adopted in 2007. Therefore, the University Community portion of the Proposed Action would not conflict with or obstruct implementation of the applicable air quality plan. While the emissions associated with construction and operation of the University Community would result in a significant impact for the reasons set forth in the discussion of **Impacts AQ-1** and **AQ-2**, the effect of the Proposed Action with respect to the air quality management plan is itself less than significant.

Combined Campus and University Community and Conclusion

As discussed above, the Campus and University Community are reflected in the current Merced County General Plan and would not conflict with or obstruct implementation of the applicable air quality plan. The impact would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact AQ-6: The Proposed Action would not create objectionable odors affecting a substantial number of people. (*Less than Significant*)

Campus

Construction of the Campus would require the use of diesel-fueled equipment, architectural coatings, and asphalt, all of which have an associated odor. However, these odors are not pervasive enough to cause objectionable odors affecting a substantial number of people. Consequently, construction of the Campus would not cause or be affected by odors.

The Proposed Action consists of a university development, such as academic facilities, athletic fields, and student housing. The operation of such facilities is not considered to be a significant source of odors, and all research using odorous materials would take place inside buildings, so there would be no odorous emissions associated with research activities. In addition, the project would not be located near any significant odor sources. Consequently, the Campus would not cause or be affected by odors. This impact is less than significant.

University Community

Construction of the University Community would require the use of diesel-fueled equipment, architectural coatings, and asphalt, all of which have an associated odor. However, these odors are not pervasive enough to cause objectionable odors affecting a substantial number of people. Consequently, construction of the University Community would not cause or be affected by odors.

The University Community consists largely of residential development with some commercial and research and development land uses. The operation of such uses is not considered to be a significant source of odors. In addition, the project would not be located near any significant odor sources. Consequently, the University Community would not cause or be affected by odors. This impact is less than significant.

Conclusion

As noted above, neither the Campus nor the University Community would be considered a significant source of odors and would not be located near any significant odor sources. This impact is less than significant. As discussed in **Section 2.0**, in the event that the University Community and the Campus areas outside of the first two phases are not annexed to the City, an on-site wastewater treatment plant (WWTP) using conventional or emerging technologies would be established on the Campus or University Community. General descriptions of such a WWTP are developed at this time. However details, including specific design and location are not available to allow a meaningful evaluation of potential odor effects. However, it is reasonable to expect that by using odor controls and by locating the WWTP away from developed areas, odor impacts on a substantial number of persons would be avoided. Furthermore, as and when such a facility is proposed on the campus or in the University Community, it will be reviewed for its environmental impacts.

Mitigation Measure: No mitigation is required.

4.3.6.2 Alternative 2 – Yosemite Avenue

The Yosemite Avenue Alternative site is located in the same general area as the Proposed Action for purposes of evaluating air quality impacts. It would consist of the same intensity of development of the Campus and the University Community as Alternative 1. However, it would occur in a slightly different location. Alternative 2 would generate the same construction and operational emissions as the development would occur under the same assumptions as those described for Alternative 1 (e.g., start construction in mid-2009, full buildout in 2030). Accordingly, the air quality impacts would be generally the same as those for Alternative 1.

Violation of Air Quality Standards

The construction and operational emissions of this alternative would exceed the SJVAPCD significance thresholds; thus, the air quality impacts would be significant for this criterion. Because the project-level impact would be significant, this alternative would result in a significant cumulative air quality impact.

Exposure of Sensitive Receptors to Substantial Carbon Monoxide Concentrations

As the number of vehicle trips associated with this alternative would be the same as under Alternative 1, no significant project-related impacts would occur relative to future CO concentrations.

Conflict with Regional Air Quality Plans

Like Alternative 1, the Yosemite Avenue Alternative would not conflict with or obstruct implementation of the applicable air quality plan. Therefore, the impact with respect to this criterion would be less than significant.

Result in Objectionable Odors

Like Alternative 1, this alternative would not result in objectionable odors affecting a substantial number of people.

4.3.6.3 Alternative 3 – Bellevue Ranch

The Bellevue Ranch Alternative site is located in the same general area as the Proposed Action for purposes of evaluating air quality impacts. It would consist of the same intensity of development of the Campus and the University Community as Alternative 1. However, it would occur in a different location. Alternative 3 would generate the same construction and operational emissions as the development would occur under the same assumptions as those described for Alternative 1 (e.g., start construction in mid-2009, full buildout in 2030). Accordingly, the air quality impacts would be generally the same as those for Alternative 1.

Violation of Air Quality Standards

The construction and operational emissions of this alternative would exceed the SJVAPCD significance thresholds; thus, the air quality impacts would be significant for this criterion. Because the project-level impact would be significant, this alternative would result in a significant cumulative air quality impact.

Exposure of Sensitive Receptors to Substantial Carbon Monoxide Concentrations

As the number of vehicle trips associated with this alternative would be the same as under Alternative 1, no significant project-related impacts would occur relative to future CO concentrations.

Conflict with Regional Air Quality Plans

Like Alternative 1, the Bellevue Ranch alternative would not conflict with or obstruct implementation of the applicable air quality plan. Therefore, the impact with respect to this criterion would be less than significant.

Result in Objectionable Odors

Like Alternative 1, this alternative would not result in objectionable odors affecting a substantial number of people.

4.3.6.4 Alternative 4 – 2002 Proposed Project

The site of Alternative 4, identified as the 2002 Proposed Project, is similar to that under Alternative 1, Proposed Action, except that the Campus and the University Community areas are larger than under the Proposed Action.

Violation of Air Quality Standards

Campus

The 2002 Proposed Project Alternative would involve the same number of persons as Alternative 1, specifically 25,000 students. Since the operational emissions, as estimated by URBEMIS2007, are a function of the number of students, the operational emissions for the Campus portion of Alternative 4 would be the same as those for Alternative 1, as shown in **Table 4.3-15, Alternative 4 – Estimated Unmitigated Campus Operational Emissions.** The 2002 EIR for the Campus included a cogeneration system (i.e., gas turbines) for the central plant, but it would not be part of this alternative since it is not currently being considered for the Campus. While Alternative 4 would include less overall building construction (approximately 3.56 million square feet compared to 8.9 million square feet for Alternative 1), the air quality impacts would be the same in a given year if the level of construction performed under the two alternatives was the same. On average, however, Alternative 4 would result in less construction emissions compared to Alternative 1.

Table 4.3-15
Alternative 4 – Estimated Unmitigated Campus Operational Emissions

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Campus Emissions						
Operational (Mobile) Sources	36.14	36.94	278.88	0.67	56.40	12.56
Area Sources	2.76	4.06	3.55	0.00	0.01	0.01
Stationary Sources	0.88	5.34	19.65	0.75	1.38	1.38
Annual Emissions Total	39.78	46.34	302.08	1.42	57.79	13.95
Rule 9510 Emission Reduction	—	15.43	—	—	28.90	—
Net Annual Emissions Total	39.78	30.91	302.08	1.42	28.89	13.95
SJVAPCD Threshold	10	10	—	—	15	—
Exceeds Threshold?	**YES**	**YES**	—	—	**YES**	—

*Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 4.3**.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Under Alternative 4, the operational emissions for the Campus portion would still exceed the SJVAPCD significance thresholds, and this alternative would result in significant air quality impacts for ROG, NO_X, and PM_{10}.

University Community

The University Community for the 2002 Proposed Project Alternative consists of the same general uses; however, the intensities of the land uses are different that those in Alternative 1. Under Alternative 4, Community North would include 2,939 single-family residential units; 2,854 multi-family units; 1,190,000 square feet of retail and commercial space; 400,000 square feet of research and development space; schools; and parks. Community South would consist of the same level of development as Alternative 1: 4,029 single-family residential units; 1,794 multi-family units; 390,000 square feet of retail and commercial space; schools; and parks. The operational emissions for the University Community under Alternative 4 were estimated using URBEMIS2007 and are shown in **Table 4.3-16, Alternative 4 – Estimated Unmitigated University Community Operational Emissions**. The construction emissions associated with development of the University Community under this alternative would be similar to those of Alternative 1 in a given year since a similar amount of construction would be likely to take place.

Table 4.3-16
Alternative 4 – Estimated Unmitigated University Community Operational Emissions

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Community South Emissions						
Operational (Mobile) Sources	66.43	83.77	660.82	1.51	126.58	28.35
Area/Stationary Sources	125.25	30.98	294.49	0.83	41.33	39.78
Annual Emissions Total	191.68	114.75	955.31	2.34	167.91	68.13
Rule 9510 Emission Reduction	—	38.21	—	—	83.96	—
Net Annual Emissions Total	191.68	76.54	955.31	2.34	83.95	68.13
SJVAPCD Threshold	10	10	—	—	15	—
Exceeds Threshold?	**YES**	**YES**	—	—	**YES**	—

*Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 4.3**.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Under Alternative 4, the operational emissions for the University Community portion would still exceed the SJVAPCD significance thresholds, and this alternative would result in significant air quality impacts for ROG, NO_X, and PM_{10}.

Combined Campus and University Community Emissions and Conclusion

Development of both the Campus and University Community under Alternative 4 would result in combined operational emissions listed in **Table 4.3-15** and **Table 4.3-16** above. The impacts are summarized below in **Table 4.3-17, Alternative 4 – Estimated Campus and University Community Unmitigated Operational Emissions**.

Table 4.3-17
Alternative 4 – Estimated Campus and University Community Unmitigated Operational Emissions

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Proposed Action Emissions						
Operational (Mobile) Sources	102.57	120.71	939.70	2.18	182.98	40.91
Area/Stationary Sources	128.89	40.38	317.69	1.58	42.72	41.17
Annual Emissions Total	231.46	161.09	1257.39	3.76	225.70	82.08
Rule 9510 Emission Reduction	—	53.64	—	—	112.85	—
Net Annual Emissions Total	231.46	107.45	1,257.39	3.76	112.85	82.08
SJVAPCD Threshold	10	10	—	—	15	—
Exceeds Threshold?	**YES**	**YES**	—	—	**YES**	—

*Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 4.3**.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Under Alternative 4, the operational emissions for the Campus and University Community would exceed the SJVAPCD significance thresholds, and this alternative would result in significant air quality impacts for ROG, NO_X, and PM_{10}. Because the project-level impact would be significant, this alternative would result in a significant cumulative air quality impact.

Exposure of Sensitive Receptors to Substantial Carbon Monoxide Concentrations

As the number of vehicle trips associated with this alternative would be the same as under Alternative 1, no significant project-related impacts would occur relative to future CO concentrations.

Conflict with Regional Air Quality Plans

Like Alternative 1, the 2002 Proposed Project Alternative would not conflict with or obstruct implementation of the applicable air quality plan. Therefore, the impact with respect to this criterion would be less than significant.

Result in Objectionable Odors

Like Alternative 1, this alternative would not result in objectionable odors affecting a substantial number of people.

4.3.6.5 Alternative 5 – No Action

Under the No Action Alternative, no permits would be issued by the USACE; however, the Phase 1.1 Campus could be built out to service 3,612 students with associated faculty and staff, and Community South could be constructed unrelated to the Campus. For purposes of analysis, it is assumed that Community South would consist of the same level of development as the Community South development included in Alternatives 1 and 4: 4,029 single-family residential units; 1,794 multi-family units; 390,000 square feet of retail and commercial space; schools; and parks.

Violation of Air Quality Standards

Campus

The operational emissions for the Phase 1.1 Campus under Alternative 5, based on an enrollment of 3,612 students, were estimated using URBEMIS2007 and are shown in **Table 4.3-18, Alternative 5 – Estimated Unmitigated Phase 1.1 Campus Operational Emissions**. A limited amount of construction would occur under this alternative; thus, it would result in much lower construction emissions than Alternative 1.

Table 4.3-18
Alternative 5 – Estimated Unmitigated Phase 1.1 Campus Operational Emissions

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NOx**	**CO**	**SOx**	**PM_{10}**	**$PM_{2.5}$**
Campus Emissions						
Operational (Mobile) Sources	5.86	4.62	42.98	0.10	9.21	1.99
Area Sources	0.40	0.59	0.63	0.00	0.00	0.00
Stationary Sources	0.38	2.37	7.41	0.28	0.56	0.56
Annual Emissions Total	6.64	7.58	51.02	0.38	9.77	2.55
Rule 9510 Emission Reduction	—	2.52	—	—	4.89	—
Net Annual Emissions Total	6.64	5.06	51.02	0.38	4.88	2.55
SJVAPCD Threshold	10	10	—	—	15	—
Exceeds Threshold?	NO	NO	—	—	NO	—

*Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 4.3**.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Under Alternative 5, the operational emissions for the Phase 1.1 Campus would not exceed the SJVAPCD significance thresholds, and this alternative would result in less than significant air quality impacts with respect to this criterion.

Community South

The operational emissions for Community South under Alternative 5 were estimated using URBEMIS2007 and are shown in **Table 4.3-19, Alternative 5 – Estimated Unmitigated Community South Operational Emissions**. The amount of community development would be less than that of Alternative 1 since Alternative 5 would not involve the development of Community North. Thus, the construction emissions for Alternative 5 would be much less than those of Alternative 1 and would be less than significant.

Table 4.3-19
Alternative 5 – Estimated Unmitigated Community South Operational Emissions

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Community South Emissions						
Operational (Mobile) Sources	29.91	37.77	298.14	0.68	57.19	12.81
Area/Stationary Sources	64.78	15.88	165.71	0.47	23.37	22.49
Annual Emissions Total	94.69	53.65	463.85	1.15	80.56	35.30
Rule 9510 Emission Reduction	—	17.87	—	—	40.28	—
Net Annual Emissions Total	94.69	35.78	463.85	1.15	40.28	35.30
SJVAPCD Threshold	10	10	—	—	15	—
Exceeds Threshold?	**YES**	**YES**	—	—	**YES**	—

*Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 4.3**.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Under Alternative 5, the operational emissions for the Community South portion would still exceed the SJVAPCD significance thresholds, and this alternative would result in significant air quality impacts for ROG, NO_X, and PM_{10}.

Combined Phase 1.1 Campus and Community South Emissions and Conclusion

Buildout of Phase 1.1 Campus and Community South under Alternative 5 would result in combined emissions listed in **Table 4.3-18** and **Table 4.3-19** above. The impacts are summarized below in

Table 4.3-20, Alternative 5 – Estimated Phase 1.1 Campus and Community South Unmitigated Operational Emissions.

Table 4.3-20
Alternative 5 – Estimated Phase 1.1 Campus and Community South
Unmitigated Operational Emissions

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Proposed Action Emissions						
Operational (Mobile) Sources	35.77	42.39	341.12	0.78	66.40	14.80
Area/Stationary Sources	65.56	18.84	173.75	0.75	23.93	23.05
Annual Emissions Total	101.33	61.23	514.87	1.53	90.33	37.85
Rule 9510 Emission Reduction	—	20.39	—	—	45.17	—
Net Annual Emissions Total	101.33	40.84	514.87	1.53	45.16	37.85
SJVAPCD Threshold	10	10	—	—	15	—
Exceeds Threshold?	**YES**	**YES**	—	—	**YES**	—

*Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 4.3**.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Under Alternative 5, the operational emissions for the Campus and University Community would still exceed the SJVAPCD significance thresholds, and this alternative would result in significant air quality impacts for ROG, NO_X, and PM_{10}. Because the project-level impact would be significant, this alternative would result in a significant cumulative air quality impact.

Exposure of Sensitive Receptors to Substantial Carbon Monoxide Concentrations

As the number of vehicle trips associated with this alternative would be less than as under Alternative 1, no significant project-related impacts would occur relative to future CO concentrations.

Conflict with Regional Air Quality Plans

Like Alternative 1, the No Action Alternative would not conflict with or obstruct implementation of the applicable air quality plan. Therefore, the impact with respect to this criterion would be less than significant.

Result in Objectionable Odors

Like Alternative 1, this alternative would not result in objectionable odors affecting a substantial number of people.

4.3.6.6 Alternative 6 – No Build

Under the No Build Alternative, no additional construction would occur on the Campus, and the Phase 1.1 Campus would continue at its current enrollment of about 2,700 students and associated faculty and staff. No development of the University Community would take place.

Violation of Air Quality Standards

The operational emissions for the Phase 1.1 Campus under Alternative 6, based on an enrollment of 2,700 students, were estimated using URBEMIS2007 and are shown in **Table 4.3-21, Alternative 6 – Estimated Unmitigated Phase 1.1 Campus Operational Emissions**.

Table 4.3-21
Alternative 6 – Estimated Unmitigated Phase 1.1 Campus Operational Emissions

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Campus Emissions						
Operational (Mobile) Sources	13.59	16.35	119.43	0.07	6.20	1.47
Area Sources	0.31	0.44	0.52	0.00	0.00	0.00
Stationary Sources	0.31	1.96	5.71	0.22	0.45	0.45
Annual Emissions Total	14.21	18.75	125.66	0.29	6.65	1.920
SJVAPCD Threshold	10	10	—	—	15	—
Exceeds Threshold?	**YES**	**YES**	—	—	NO	—

*Source: Impact Sciences, Inc. Emissions calculations are provided in **Appendix 4.3**.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Under Alternative 6, the operational emissions for the Phase 1.1 Campus would exceed the SJVAPCD significance thresholds for ROG and NO_X and would result in significant air quality impacts with respect to this criterion. Because the project-level impact would be significant, this alternative would result in a cumulative air quality impact with respect to ROG and NO_X emissions.

Exposure of Sensitive Receptors to Substantial Carbon Monoxide Concentrations

As the number of vehicle trips associated with the No Build Alternative would not increase, no significant project-related impacts would occur relative to future CO concentrations.

Conflict with Regional Air Quality Plans

Like Alternative 1, the No Build Alternative would not conflict with or obstruct implementation of the applicable air quality plan. Therefore, the impact with respect to this criterion would be less than significant.

Result in Objectionable Odors

Like Alternative 1, this alternative would not result in objectionable odors affecting a substantial number of people.

4.3.7 SUMMARY COMPARISON OF ALTERNATIVES

Alternatives 1, 2, and 3 would be identical in terms of their construction and operational emissions and related air quality impacts. Alternative 4 would result in somewhat lower operational emissions than Alternative 1 because of the reduced building space included in that alternative, but it would still result in significant air quality impacts with respect to its construction and operational emissions. Alternatives 5 and 6 would have lower construction (no impact for Alternative 6) and operational emissions than Alternative 1, and Alternative 6 would have less than significant air quality impacts with respect to its construction and operational emissions.

The relative air quality impacts of Alternatives 2 through 6 are compared to those of Alternative 1 in **Table 4.3-22, Comparison of Alternatives to the Proposed Project**.

Table 4.3-22
Comparison of Alternatives to the Proposed Project

Threshold	Alternative 1 (Proposed Action)	Alternative 2 (Yosemite Avenue)	Alternative 3 (Bellevue Ranch)	Alternative 4 (2002 Proposed Project)	Alternative 5 (No Action)	Alternative 6 (No Build)
AQ-1 (Construction Emissions)	Significant and unavoidable	Similar, significant and unavoidable	Similar, significant and unavoidable	Similar, significant and unavoidable	Less, but significant and unavoidable	No impact
AQ-2 (Operational Emissions)	Significant and unavoidable	Similar, significant and unavoidable	Similar, significant and unavoidable	Less, but significant and unavoidable	Less, but significant and unavoidable	Less, but significant and unavoidable
AQ-3 (CO Hotspots)	Less than Significant	Similar, less than significant	Similar, less than significant	Similar, less than significant	Similar, less than significant	Similar, less than significant
AQ-4 (Cumulative Impact)	Significant and unavoidable	Significant	Significant	Significant	Significant	Significant
AQ-5 (Conflict with Air Quality Plans)	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant
AQ-6 (Odors)	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant	Less than Significant

4.3.8 REFERENCES

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4.4 BIOLOGICAL RESOURCES

4.4.1 INTRODUCTION

This section describes the impacts to biological resources that could result from implementation of the Proposed Action or its alternatives. For the purposes of this biological resources section, the project region is considered to be eastern Merced County (**Figure 4.4-1, Project Study Area**). The project site corresponds to the footprint of the major components of this project: the UC Merced Campus (815 acres) (Campus site), the Campus Natural Reserve (about 1,307 acres), and the University Community that comprises the Community North (833 acres) and the Community South (1,118 acres) The Campus Natural Reserve (CNR) would consist of open space to the northeast of the campus. The CNR would be placed under a conservation easement, maintained permanently in an undeveloped state, and dedicated to scientific research and education. As explained in the **Section 2.0, Project Description**, 26,645 acres of lands within the project region have been acquired by the University in fee title and dedicated to conservation management (Tier 1 conservation lands) or protected by granting of conservation easements (Tier 2 conservation lands) to provide for species conservation. These conservation lands are incorporated into the Proposed Action and are also addressed in this section (**Figure 4.4-2, Conservation Lands Included in the Proposed Action**). The term "Conservation Lands" is used throughout this section to refer to both Tier 1 and Tier 2 conservation lands.

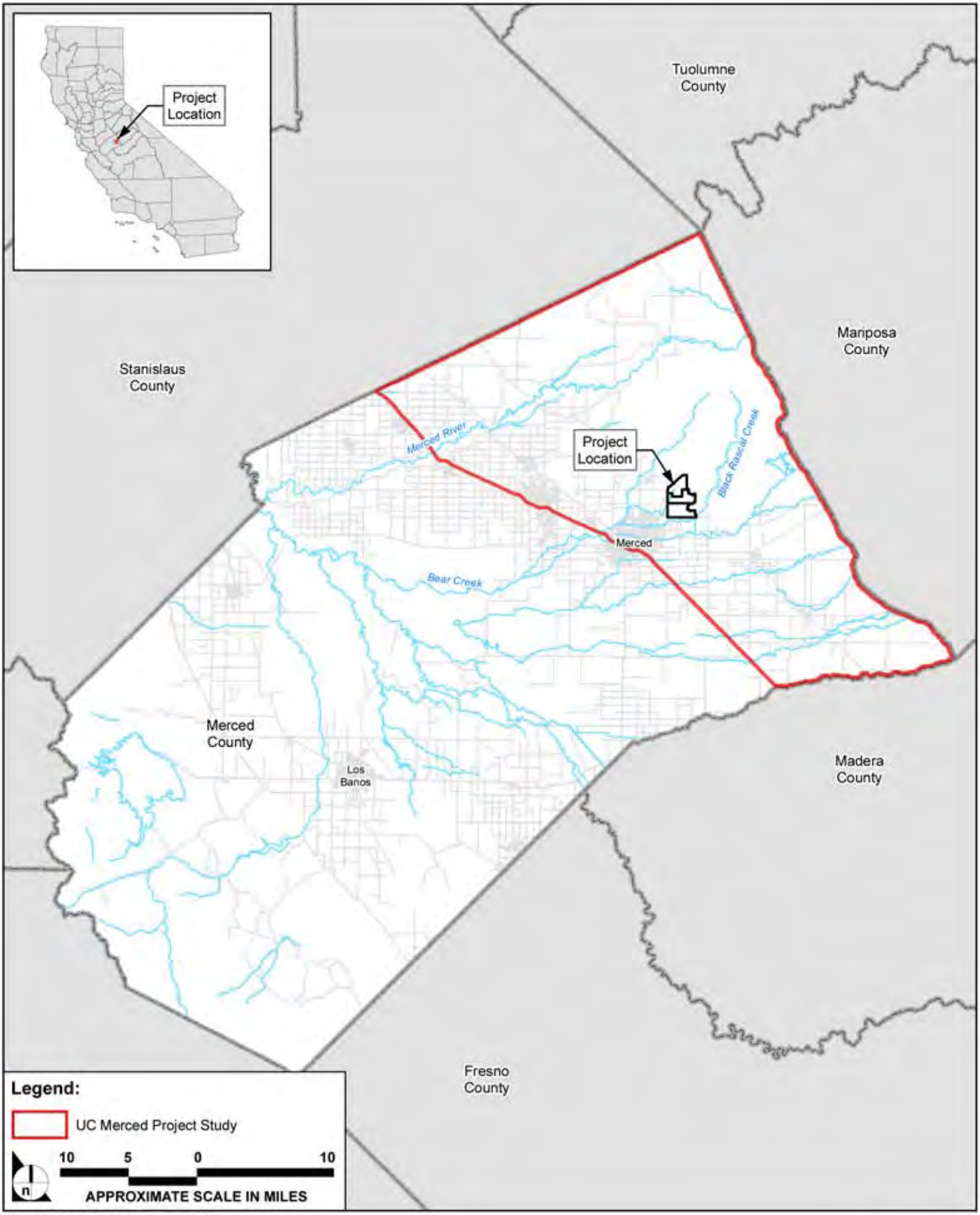
In response to the Notice of Preparation (dated March 31, 2008) and the Notice of Intent (dated March 18, 2008) (see **Appendix ES**), the following concerns were raised regarding biological resources:

- The potential for significant permanent impacts to the long-term viability of threatened and endangered species;
- The potential for direct or indirect impacts that could result in significant degradation to the clay playa area between the Campus and Lake Yosemite, which was identified by the US Environmental Protection Agency (US EPA) as an "Aquatic Resource of National Importance;" and
- The need to satisfactorily address the long-term viability of environmental resources surrounding the Campus and University Community before permits can be issued for the development of the Proposed Action.

4.4.1.1 Data Sources

ICF Jones & Stokes biologists reviewed existing resource information, including prior environmental documents related to the project vicinity to evaluate whether special-status species or other sensitive biological resources could occur within the project footprint. This information was used to develop lists of special-status species and other sensitive biological resources that could be present at the project site. Information presented in this section is based on the following data sources:

- California Natural Diversity Database (CNDDB) records search of the Winton, Yosemite Lake, Haystack Mountain, Atwater, Merced, Planada, Sandy Mush, El Nido, and Plainsburg US Geological Society (USGS) 7.5 Minute Topographic Quadrangles (California Natural Diversity Database 2008);
- California Native Plant Society's (CNPS's) 2008 online Inventory of Rare and Endangered Plants of California (California Native Plant Society 2008);
- List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database (California Department of Fish and Game 2003);
- List of California Vegetation Alliances (California Department of Fish and Game 2007);
- US Fish and Wildlife Service (USFWS) list of endangered, threatened, and proposed species for the Winton, Yosemite Lake, Haystack Mountain, Atwater, Merced, Planada, Sandy Mush, El Nido, and Plainsburg USGS 7.5 Minute Topographic Quadrangles and Merced County list obtained from the USFWS Web site (US Fish and Wildlife Service 2008);
- Proposed Conservation Strategy for the UC Merced Project (**Appendix 2.0-3**);
- County of Merced University Community Plan Draft Environmental Impact Report (County of Merced 2001);
- County of Merced University Community Plan Final Environmental Impact Report (County of Merced 2004);
- Long Range Development Plan Final Environmental Impact Report (UC Merced 2002a);
- Biological Assessment Clean Water Act (CWA) Section 404 permit applications for UC Merced Campus Project and County of Merced Infrastructure in Support of UC Merced Project (County of Merced 2002);
- Supplement to the Biological Assessment for the UC Merced Campus Project and County of Merced Infrastructure in Support of UC Merced Project (Jones & Stokes 2002a);
- Resource Mitigation Plan for Federally Listed Species that May be Affected by the Establishment of the University of California, Merced (Jones & Stokes 2002b);
- Final Biological Opinion on the Proposed University of California Merced Campus, Phase 1 and Campus Buildout (US Fish and Wildlife Service 2002);
- 2008 Supplement to Biological Assessment for the University of California, Merced Campus and University Community North (Airola 2008a);
- Compensatory Wetland Mitigation and Monitoring Plan (Gibson & Skordal 2008);
- Management Plan for Conservation Lands and the Adjacent Campus Buildout Lands for the University of California, Merced (Airola 2008b); and
- ICF Jones & Stokes file information.



SOURCE: ICF Jones & Stokes - August 2008

FIGURE **4.4-1**

Project Study Area

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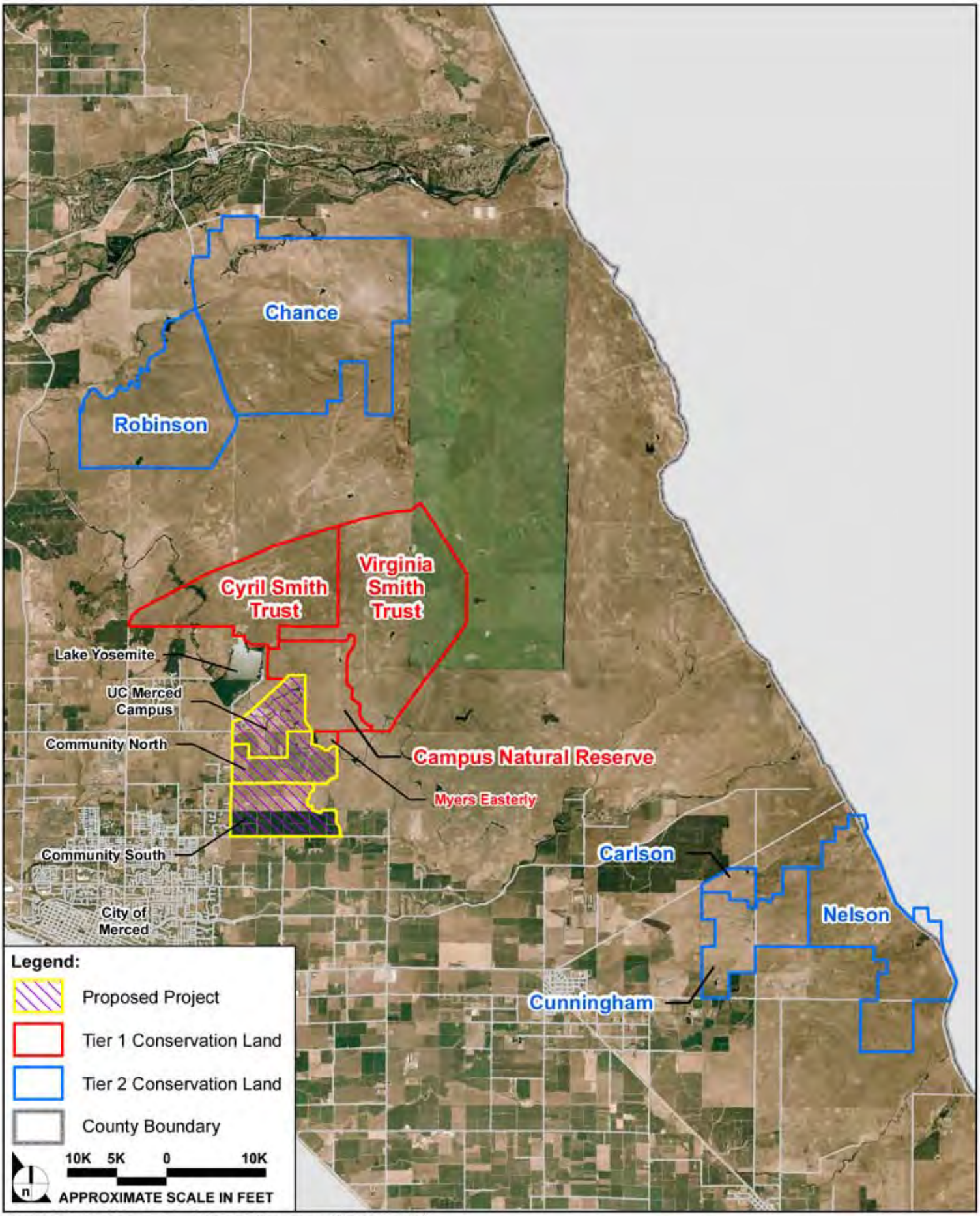

SOURCE: ICF Jones & Stokes - August 2008; Aerial Photo Source: NAIP2006, DFG2003

FIGURE **4.4-2**

Conservation Lands Included in the Proposed Action

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4.4.1.2 Field Surveys

Since the inception of the UC Merced Campus and University Community Project, numerous biological surveys have been conducted on the project site and in the project vicinity. General types of surveys conducted include botanical surveys, wildlife surveys, and wetland delineations. Surveys were conducted by ICF Jones & Stokes, EIP Associates, Vollmar Consulting, URS, and Gibson and Skordal. **Table 4.4-1, Biological Resource Surveys in the Project Site and Vicinity,** contains a comprehensive summary of each of these surveys.

4.4.2 AFFECTED ENVIRONMENT

The study area for the Proposed Action includes the project site which is located southeast of Lake Yosemite, east of North Lake Road and north of Yosemite Avenue. The indirect impact area relative to biological resources extends out from the boundaries of the project site and ranges from 250 to 1,640 feet, depending on the biological resource being evaluated. The methodology used to determine indirect impacts for each species is discussed in the impact analysis section of this EIS/EIR and in the *Conservation Strategy*, **Appendix 2.0-3**. Additionally, because the conservation lands have been incorporated into the Proposed Action, these lands are considered to be part of the study area. The study area is shown in **Figure 4.4-1.**

4.4.2.1 Environmental Setting

The Proposed Action is located in the San Joaquin Valley in eastern Merced County, a transition zone between the Sierra Nevada foothills to the east and the flat San Joaquin Valley floor to the west. The project site is 2 miles northeast of the City limits of Merced, southeast of Lake Yosemite Regional Park (see **Figures 2.0-1** and **2.0-2** of **Section 2.0, Project Description**).

Table 4.4-1
Biological Resource Surveys in the Project Site and Vicinity

Survey Dates	Survey Purpose	Survey Area	Surveyor (s)
Various surveys between April 19-June 16, and July 6-August 27, 1999	Botanical surveys	1999 (10,360 acre) UC Merced / University Community Plan Planning Area	EIP Associates (1999b)
April 2-3, May 8, and June 26, 2001	Botanical surveys	2001 (2,396 acre) University Community Plan site	EIP Associates (2001b)
April 19 and June 9 and 10, 1999 and April 17, May 9, and 24, and September 15, 2000	Botanical surveys	Campus Parkway (including northern half of 2001 University Community Plan)	URS Corporation (UC Merced 2001)
April 4-mid-July, 2001	Botanical surveys	Tier 2 mitigation lands (Chance Ranch, Cunningham Ranch, Nelson [San Felipe]) and various other private lands in project region (Flying M Ranch, China Hat Ranch, Richards Ranch, Kelsey Ranch, Rodner Ranch, Ichord Ranch, Crookam Ranch, Ranch, Chowchilla Ranch, Knapp Ranch and Flynn Ranch)	Vollmar (UC Merced 2001)
Various dates in 2007 (surveys excluded vernal pool branchiopods) and 2008 (surveys included all species)	Surveys for listed vernal branchiopods, California tiger salamander, western spadefoot, western burrowing owl and other raptors, and special-status plants.	Tier 2 mitigation land (Robinson Ranch)	Vollmar Consulting (2008)
May and June 1999 and April and May 2000	Wetland delineation	UC Merced/University Community Planning Area	EIP Associates (2000)
Various dates during February 14 through April 12, 2001	Wetland delineation	2001 (2,396 acre) University Community Plan site	EIP Associates (2001e)
Various dates in June and July 2002	Wetland assessment	Eastern Merced County	EIP Associates (2002)
August 20 and 21, 2007 and February 4, 2008	Wetland delineation	University Community Land Company (UCLC) (229 acres) and Hunt Property (80 acres) within the 2008 University Community site	Gibson & Skordal, LLC (2008)

Survey Dates	Survey Purpose	Survey Area	Surveyor (s)
February 8-March 26, 1999	Vernal pool branchiopod surveys	Vernal pool grasslands located north of Cardella Road and ponded water along Arboleda Drive, Yosemite Avenue, Kibby Road, South Orchard Drive, Olive Avenue, and Bear Creek Drive	URS Corporation (1999)
February 1- March 16, 2000	Vernal pool branchiopod protocol surveys	Campus Parkway study area	URS Corporation (2000)
February 4-April 16, 1999	Vernal pool branchiopod surveys	1999 (10,360 acre) UC Merced / University Community Planning Area	EIP Associates (1999a)
February 14-April 29, 2000	Vernal pool branchiopod protocol surveys	Subset of 1999 (10,360 acre) UC Merced / University Community Plan Planning Area	EIP Associates (2001a)
February 9 to mid-April, 2001	Vernal pool branchiopod surveys	Tier 2 mitigation lands (Chance Ranch, Cunningham Ranch, Nelson [San Felipe] and various other lands in project region (Flying M Ranch, China Hat Ranch, Richards Ranch, Kelsey Ranch, Rodner Ranch, Ichord Ranch, Crookam Ranch, Ranch, Chowchilla Ranch, Knapp Ranch and Flynn Ranch)	Vollmar Consulting (UC Merced 2001)
February 8, 21, and 22, and March 8-11, and 20-26, 1999	California tiger salamander larval surveys	Vernal pool grasslands north of Yosemite Avenue, vernal pools in the upper portion of Black Rascal Creek, seasonal wetlands associated with the headwaters of Cottonwood Creek, vernal pool grasslands located north of Cardella Road.	URS Corporation (UC Merced 2001)
January 18 and 25, 2000	California tiger salamander nocturnal surveys	Study area included areas north of Bellevue Road and west of Lake Road, south of the Flying M Ranch dirt road, east of Lake Road, grassland located north of the golf course, east of Lake Road, east of Lake Road between the golf course and the Flying M Ranch dirt road	URS Corporation (UC Merced 2001)

Survey Dates	Survey Purpose	Survey Area	Surveyor (s)
March 30-April 7, April 18-19, and May 8-11, 2000	California tiger salamander larval surveys	1999 (10,360 acre) UC Merced / University Community Plan Planning Area in the larger marshes located adjacent to Merced Irrigation District's Le Grand and Main Canals	EIP Associates (2001d)
March 27-May 10, 2001	California tiger salamander surveys	Tier 2 mitigation lands (Chance Ranch, Cunningham Ranch, Nelson [San Felipe] and various other lands in project region (Flying M Ranch, China Hat Ranch, Richards Ranch, Kelsey Ranch, Rodner Ranch, Ichord Ranch, Crookam Ranch, Ranch, Chowchilla Ranch, Knapp Ranch and Flynn Ranch)	Vollmar Consulting (UC Merced 2001)
Between April 19-June 16, 1999 and July 6-August 27, 1999	Avian surveys	1999 (10,360 acre) UC Merced / University Community Plan Planning Area	EIP Associates (UC Merced 2001)
February 8-March 26, April 12, and May 3, 1999 and January 18, and 25, and June 19-20, 2000	Avian surveys	Campus Parkway (including northern half of 2001 University Community Plan site)	URS Corporation (UC Merced 2001)
May 18-19, 1999 and June 19-20, 2000	Swainson's hawk surveys	Campus Parkway (including northern half of 2001 University Community Plan) and 10-mile radius	URS Corporation (UC Merced 2001)
Early March to mid-June, 2001	Avian surveys	Tier 2 mitigation lands (Chance Ranch, Cunningham Ranch, Nelson [San Felipe] and various other lands in project region (Flying M Ranch, China Hat Ranch, Richards Ranch, Kelsey Ranch, Rodner Ranch, Ichord Ranch, Crookam Ranch, Ranch, Chowchilla Ranch, Knapp Ranch and Flynn Ranch)	Vollmar Consulting (UC Merced 2001)
July 12-23, July 28-August 8, and August 16-27, 1999	Small mammal trapping	1999 (10,360 acre) UC Merced / University Community Plan Planning Area	EIP Associates (1999c)
Week of August 8, 2000	Small mammal trapping	Campus Parkway (including northern half of 2001 University Community Plan)	URS Corporation (UC Merced 2001)

Survey Dates	Survey Purpose	Survey Area	Surveyor (s)
April 30-June 7, 2001	Small mammal trapping	Tier 2 mitigation lands (Chance Ranch, Cunningham Ranch, Nelson [San Felipe] and various other lands in project region (Flying M Ranch, China Hat Ranch, Richards Ranch, Kelsey Ranch, Rodner Ranch, Ichord Ranch, Crookam Ranch, Ranch, Chowchilla Ranch, Knapp Ranch and Flynn Ranch)	Vollmar Consulting (UC Merced 2001)
July 12-23, July 28-August 8, and August 16-27, 1999	San Joaquin kit fox protocol surveys	1999 (10,360 acre) UC Merced / University Community Plan Planning Area	EIP Associates (1999c)
August 9-23, 2000	San Joaquin kit fox protocol surveys	Campus Parkway (including northern half of 2001 University Community Plan)	URS Corporation (UC Merced 2001)
May 23, 2008	General site visit	2008 (2,925 acre) Long Range Development Plan (LRDP) and University Community Project Site	ICF Jones & Stokes

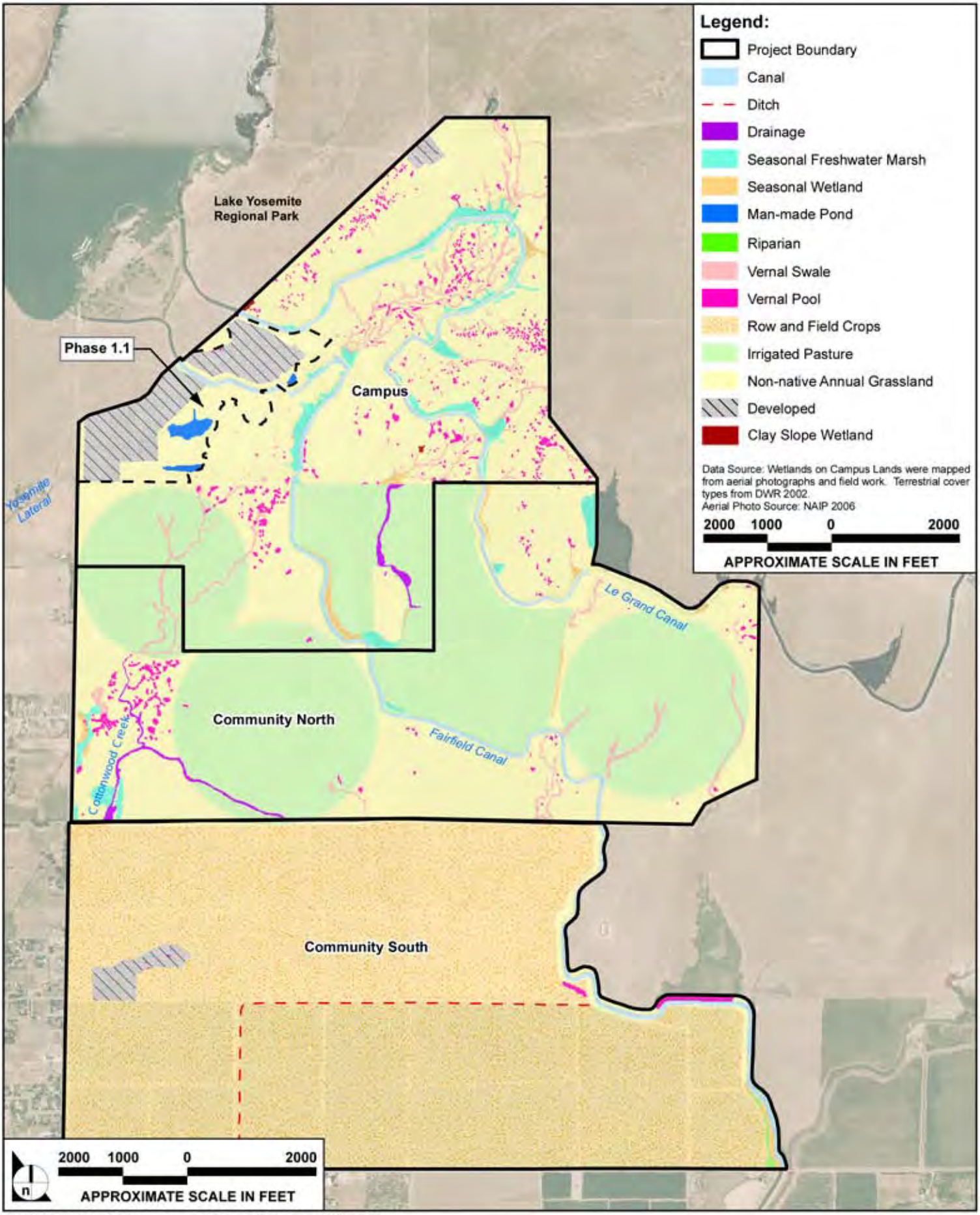
Regional Setting

For the purposes of this section, the project region is defined as the eastern portion of Merced County (see **Figure 4.4-2**). The Proposed Action is located in the transition zone between land utilized for grazing and land developed for intensive agriculture and urban development. This transition zone is marked by changes from older alluvial soils with well-developed hardpans or claypans to younger alluvial soils that lack well-developed hardpans or claypans. The poorly drained soils with hardpans or claypans are primarily utilized for grazing, while level, well-drained soils on the valley floor have been largely converted to agriculture or urban land uses. Evidence of claypans and hardpans throughout the eastern San Joaquin Valley is demonstrated most effectively at the soils' surface by the presence of seasonally inundated areas—vernal pools and swales. Grazing of grassland areas with poorly drained soils, and the conversion of younger, more fertile lands to agricultural, residential, and commercial land uses, have altered the landscape through the removal of trees and native vegetation, the introduction of nonnative species, and the modification of natural watercourses. Habitat types typical of the region include annual grasslands, irrigated pasture and croplands, oak woodlands, vernal pool and swale complexes, seasonal seeps and marshes, ponds, riparian forest and scrub, perennial streams, and scattered areas of ruderal vegetation (UC Merced 2001).

Alternative 1 (Proposed Action) Site

The topography of the project site is relatively level with elevations ranging from approximately 200 to 300 feet above mean sea level. The northeastern portion of the project site contains small hills and valleys while the remainder of the project site slopes gently from the northeast to southwest. The topography of the project site is altered from historical conditions. Historically, portions of the campus site were modified in conjunction with the construction and operation of the Merced Hills Golf Course; construction and operation of ponds in grazed annual grassland; grading of unimproved roadways; grading and land leveling associated with irrigated pasture; and construction and operation of canals, channels, and levees. The UC Merced Campus site and portions of Community North contain mima mound topography (hummocking) which is associated with the vernal pool complexes. The Community South site is level and has been planted with row and field crops.

Canals and drainages that traverse the project site include Le Grand Canal, Fairfield Canal, Yosemite Lateral, and the headwaters of Cottonwood Creek (see **Figure 4.4-3, Land Cover Types in the Proposed Action Site**). The Merced Hills Golf Course previously occupied the north-central portion of the UC Merced Campus site. The first phase of the campus (Phase 1) was developed beginning in 2002 on approximately 104 acres of the approximately 200-acre Merced Hills Golf Course (UC Merced 2001; County of Merced 2001).



SOURCE: ICF Jones & Stokes - August 2008; Aerial Photo Source: NAIP2006

FIGURE **4.4-3**

Land Cover Types in the Proposed Action Site

Land Cover Types within the Project Site

The primary land cover types identified on the project site are California annual grasslands, agricultural lands (irrigated pasture and row and field crops), vernal pool ecosystems, vernal swales, clay slope wetlands, seasonal wetlands, ponds, seasonal freshwater marsh, drainages, riparian, canals, ditch, and developed areas.

Annual Grassland

The dominant plant community within the project site is California annual grassland (Sawyer and Keeler-Wolf 1995) (see **Table 4.4-2, Cover Types in the Project Site,** and **Figure 4.4-3**). California annual grassland, also known as non-native grassland (Holland 1986), is dominated by non-native annual grass species such as soft chess (*Bromus hordeaceus*), wild oats (*Avena fatua*, *A. barbata*), barley (*Hordeum murinum* ssp. *leporinum*), and rat-tail fescue (*Vulpia myuros*), but it also contains a high diversity of native grasses and native and non-native forbs, such as filaree (*Erodium cicutarium*, *E. moschatum*, *E. botrys*), peppergrass (*Lepidium nitidum*), fiddleneck (*Amsinckia menziesii*), chickweed (*Cerastium glomeratum*), dwarf brodiaea (*Brodiaea nana*), white hyacinth (*Triteleia hyacinthina*), Ithuriel's spear (*T. laxa*), and gold nuggets (*Calochortus luteus*). In addition, other species that appear later in the growing season (e.g., June and July) have a limited distribution in the project site, including virgate tarweed (*Holocarpha virgata*) and prickly lettuce (*Lactuca serriola*) (County of Merced 2001). Though the project site supports non-native grass species, the area does not support other invasive ruderal (i.e., weedy) species that are often found in other annual grasslands. Species that are conspicuously absent from the annual grassland flora of the project site include yellow star thistle (*Centaurea solstitialis*) and black mustard (*Brassica nigra*). The absence of these plant species reflects the relatively undisturbed nature of the grassland community within the Campus and Community North portions of the project site.

Wildlife known to use annual grassland for all or part of their life cycle include numerous mammal and avian species. Small mammals including California meadow vole (*Microtus californicus*), black-tailed hare (*Lepus californicus*), California ground squirrel (*Spermophilus beecheyi*), deer mouse (*Peromyscus maniculatus*), Merced kangaroo rat (*Dipodomys heermanni dixoni*), and western harvest mouse (*Reithrodontomys megalotis*) provide foraging opportunities for mammalian predators, such as coyote (*Canis latrans*), bobcat (*Felis rufus*), and avian predators such as American kestrel (*Falco sparverius*), merlin (*Falco columbarius*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), burrowing owl (*Athene cunicularia*), barn owl (*Tyto alba*), short-eared owl (*Asio flammeus*), northern harrier (*Circus cyaneus*), white-tailed kite (*Elanus leucurus*), prairie falcon (*Falco mexicanus*), and golden eagle (*Aquila chrysaetos*). Other avian species known to forage in annual grasslands include, mountain plover (*Charadrius montanus*), long-billed curlew (*Numenius americanus*), California horned lark (*Eremophila*

alpestrisis actia), loggerhead shrike (*Lanius ludovicianus*), tricolored blackbird (*Agelaius tricolor*), and numerous other common raptors and other migratory birds. The annual grasslands also provide potential nesting habitat for western burrowing owl, northern harrier, and California horned lark, and potential denning and dispersal habitat for San Joaquin kit fox (*Vulpes macrotis mutica*).

Table 4.4-2
Cover Types in the Project Site (acres[1])

Cover Type	Campus	Community North	Community South	Project Site
Annual Grassland	527	331	16	874
Irrigated Pasture	179	477	1	657
Row and Field Crops	0	0	1,084	1,084
Vernal Pool Ecosystems	10	5	<1	16
Vernal Swales	16	9	<1	26
Clay Slope Wetlands	<1	0	0	<1
Seasonal Wetlands	4	2	<1	6
Manmade Ponds	5	0	0	5
Seasonal Freshwater Marsh	10	6	0	16
Drainages	2	3	0	5
Ditches	0	0	1	1
Riparian	0	0	1	1
Developed Areas	62	0	13	75
Totals	**815**	**833**	**1,118**	**2,766**

[1] *Cover type acreages do not include areas within canal easements because these areas cannot be developed and are not within the bounds of the project. Areas within canal easements that may be directly impacted by operations and maintenance activities associated with the project are reflected in direct impact acreages for the project.*

Data Source: Wetlands on Campus Lands were mapped from aerial photographs and field work. Terrestrial cover types from DWR 2002.

Agricultural Land

Agricultural land within the project site includes flood-irrigated pastures, pivot-irrigated pastures, and row and field crops (see **Table 4.4-2** and **Figure 4.4-3**). Flood-irrigated pastures are grassland areas irrigated during the spring and summer months. Flow of irrigation water in the pastures is controlled by a series of parallel levees or contour checks constructed approximately 12 to 14 inches high and approximately 6 to 10 feet apart, extending for the full length of each field. Vegetation in flood-irrigated pastures consists primarily of pasture grasses and other weedy species favored by summer irrigation. The

characteristic species within the project site include sporadic to dense stands of Pacific rush (*Juncus effuses*), perennial ryegrass (*Lolium perenne*), Bermuda grass (*Cynodon dactylon*), white clover (*Trifolium repens*), and annual blue grass (*Poa annua*). With the exception of the Pacific rush, all of the above species are common in pasture seed mixes and were likely seeded for pasture cultivation.

The project site also contains pivot-irrigated pasture. Pivot-irrigated pastures receive less summer water than flood-irrigated pastures but function very similarly and have vegetation similar in composition to flood-irrigated pasture.

Row and field crops occur primarily in the Community South portion of the project site. Crops grown within this area consist of corn that is rotated with oats, wheat, and tomatoes.

Irrigated pastures support many of the same wildlife species found in annual grassland habitats. Though altered from their natural state, row and field crops provide foraging habitat for numerous mammals and birds. Mammals known to occupy these habitats include California meadow vole, black-tailed hare, California ground squirrel, deer mouse, and Botta's pocket gopher (*Thomomys bottae*). San Joaquin kit fox and coyote may also use these areas for foraging. Birds known to use these areas for foraging are similar to those known to forage in annual grasslands. Though row and field crops provide foraging opportunities similar to those provided by annual grasslands and irrigated pastures, these habitats do not typically provide nesting habitat for ground-nesting birds such as California horned lark, northern harrier, and burrowing owl (except along the edges or along irrigation canals) or denning by mammals such as San Joaquin kit fox.

Vernal Pool Ecosystems

Within the project site, annual grasslands are closely associated with a mosaic of vernal pool complexes (see **Table 4.4-2** and **Figure 4.4-3**). These complexes are concentrated throughout the Campus site with fewer occurrences within the Community North site, and less than 1 acre of vernal pools within the Community South site.

Vernal pools are seasonally inundated wetland communities. Vernal pools occur in shallow depressions in areas that are underlain by an impermeable subsurface layer, such as hardpan, claypan, or bedrock. Vernal pools at the project site have been classified as northern hardpan vernal pools (Holland 1986; Sawyer and Keeler-Wolf 1995). These hardpans are so thick and dense that they do not allow water from winter rains to seep into the lower soil column. Instead, the water accumulates or "ponds," above the hardpan.

Small hummocks or mounds frequently characterize the topography in these areas. Vernal pools develop in areas where depressions between the hummocks meet areas underlain with a hardpan. Vernal pools collect winter and spring rain and dry out completely in the summer and fall months. Subsequently, these vernal pools support unique vegetation and wildlife endemic only to vernal pools.

The dominant plant species in the vernal pools in the project site include coyote thistle (*Eryngium castrense*), goldfields (*Lasthenia fremontii*), downingia (*Downingia bicornuta*), popcorn flower (*Plagiobothrys acanthocarpus*, *P. stipitatus*), woolly marbles (*Psilocarphus brevissimus* var. *brevissimus*), white meadowfoam (*Limnanthes alba*), annual hairgrass (*Deschampsia danthonioides*), and foxtail grass (*Alopecurus saccatus*). Vernal pool ecosystems within the project area are also known to support several special-status plant species including succulent owl's-clover (*Castilleja campestris* var. *succulenta*), Hoover's spurge (*Chamaesyce hooveri*), Colusa grass (*Neostapfia colusana*), San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*), hairy Orcutt grass (*Orcuttia pilosa*), and Greene's tuctoria (*Tuctoria greenei*).

Wildlife species found in vernal pools on the project site include vernal pool fairy shrimp (*Branchinecta lynchi*), midvalley fairy shrimp (*B. mesovallensis*), vernal pool tadpole shrimp (*Lepidurus packardi*), California linderiella (*Linderiella occidentalis*), and California tiger salamander (*Ambystoma californiense*). Other vernal pool species known to occur in the region include Conservancy fairy shrimp (*B. conservatio*), molestan blister beetle (*Lytta molesta*), and western spadefoot (*Spea hammondii*).

Within the project site, the plant species and some of the wildlife species (e.g., vernal pool invertebrates) described above are adapted to, and depend on, the cyclical inundation of water and complete desiccation of the soil that occurs in vernal pools. Most vernal pool-associated plant and wildlife species life cycles can only be completed by the progression of inundation and desiccation. Avian species that rely on vernal pools for resting and foraging during the winter and spring migration periods include mallards (*Anas platyrhynchos*), cinnamon teal (*Anas cyanoptera*), killdeer (*Charadrius vociferus*), and greater yellow-legs (*Tringa melanoleuca*).

Vernal Swales

Swales are narrow, linear seasonal wetlands found in low-lying areas, often at the base of hills where surface water collects and the underlying soil often remains saturated for extended periods during the rainy season. Swales can connect vernal pools into large complexes. Some vernal pool/swale complexes are so interrelated by hydrology that isolated features cannot be discerned. Swales are integral to the health and sustainability of vernal pools and seasonal wetlands. Swales provide important hydrology to the pool and wetland basins and also provide linkages between plant and invertebrate populations for genetic exchange. There are several swale systems on the project site (see **Table 4.4-2** and **Figure 4.4-3**)

that connect the vernal pool features found on site. The swales on the project site lack a well-defined channel and are sparsely vegetated or are vegetated with wild ryegrass and filaree. Swales are essential to the health of vernal pool ecosystems and provide habitat values similar to vernal pools.

Clay Slope Wetlands

Approximately 0.33 acre of clay slope wetland is interspersed within annual grasslands on the project site. This vegetation type is not described in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995) but has been noted as distinctly different from typical annual grassland (Jones & Stokes 1990). On the campus site, clay slope wetlands typically support a low density of annual grasses such as Italian rye grass, soft chess, and thintail (*Hainardia cylindrica*). Annual forbs comprise approximately 50 percent of the cover within the clay slope wetlands and include species such as hogwallow star-fish (*Hesperevax caulescens*), dwarf peppergrass (*Lepidium latipes* var. *latipes*), Crete weed (*Hedypnois cretica*), Douglas' microseris (*Microseris douglasii*), and shining navarretia (*Navarretia nigelliformis* ssp. *Radians*).

Seasonal Wetlands

Numerous seasonal wetlands occur within the project site (see **Table 4.4-2** and **Figure 4.4-3**). The term seasonal wetland is used within the context of this EIS/EIR to describe wetlands that fill naturally during the winter through direct precipitation and either natural or man-maintained overland flows and are dry during most of the year. Within the project site, this habitat occurs in areas where the natural hydrology of the landscape has been altered to create wetland features that did not naturally occur or in areas where the natural hydrology has been augmented with summer irrigation with a resultant change in the vegetation composition of the natural feature. Although their hydrology is similar to that of vernal pools, they do not support typical vernal pool vegetation diversity and abundance due to disturbance or due to their recent formation.

Seasonal wetlands appear along the Le Grand Canal and Fairfield Canal in several overflow areas where the surrounding topography prevents water from draining away from the canal. These areas, as well as some seasonal freshwater marsh areas (see discussion below) were delineated on site as canal wetlands. Seasonal wetlands also appear in areas where irrigation waters from pastures create summer flooding in former vernal pool systems. These areas were delineated on site as irrigation wetlands.

Seasonal wetlands within the project site provide similar habitat for wildlife as vernal pools and may occasionally support vernal pool fairy shrimp, midvalley fairy shrimp, California linderiella, California tiger salamander, and a variety of shorebird and waterfowl species.

Permanent Ponds

At least five artificial ponds occur within the project site (see **Table 4.4-2** and **Figure 4.4-3**), including the Campus Lake, a small settling pond located just north of the Fairfield Canal within the Phase 1 portion of the campus site, and several stock ponds. Additional ponds (mostly intermittent) have been created and are maintained as livestock watering sources. Vegetation surrounding these ponds generally include Pacific rush, Bermuda grass, and cattail (*Typha* sp.), although emergent and riparian vegetation in ponds used as water sources is more limited. Species known to occur in ponds within the project site include bullfrog (*Rana catesbeiana*), greater yellowlegs, American avocet (*Recurvirostra americana*), mallard, and cinnamon teal. Some of the intermittent ponds within undeveloped portions of the project site and conservation lands provide known or potential breeding habitat for the California tiger salamander, Colusa grass, and San Joaquin Valley Orcutt grass. Although the western pond turtle (*Actinemys marmorata*) has not been observed on the project site, some of these ponds, particularly the Campus Lake, provide suitable habitat for this species.

Seasonal Freshwater Marsh

Seasonal freshwater marshes (delineated on site as canal wetlands) are located adjacent to drainages and canals at the Campus site and North Community portion of the project site (see **Table 4.4-2** and **Figure 4.4-3**). Along the canal, seasonal water is provided by precipitation and sheet flow, and perennial water is provided by canal leakage. The vegetation is dominated by Pacific rush, spikerush (*Eleocharis macrostachya*), and buttercup (*Ranunculus bonariensis* var. *trisepalus*).

Marsh areas are valuable wildlife habitat and provide foraging, nesting, breeding, and resting grounds for many birds, small mammals, amphibians, and reptiles. Some typical species found in marshes include great blue heron (*Ardea herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), mallard, cinnamon teal, red-winged blackbird (*Agelaius phoeniceus*), song sparrow (*Melospiza melodia*), marsh wren (*Cistothorus palustris*), Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), western pond turtle, western aquatic garter snake (*Thamnophis couchi*), Pacific tree frog (*Hyla regilla*), and bullfrog.

Drainages

The project site contains two drainages in the Community North portion of the project site (Cottonwood Creek and an unnamed tributary of Cottonwood Creek) and one unnamed drainage on the Campus site (see **Table 4.4-2** and **Figure 4.4-3**). These drainages are supplied with water from precipitation, sheet flow, and irrigation overflow. The banks and portions of the drainage bottoms support dense stands of Pacific rush. Drainages provide an important source of water to wildlife, including but not limited to

Pacific tree frog, gopher snake, common garter snake (*Thamnophis sirtalis*), striped skunk, raccoon, and cliff swallows (*Hirundo pyrrhonota*).

Riparian

A 1-acre patch of riparian habitat is located in the southeast corner of the Community South portion of the project site (see **Table 4.4-2** and **Figure 4.4-3**). Riparian communities typically contain a canopy tree layer, subcanopy tree layer, understory shrub layer, and dense ground cover. Vegetation comprising riparian communities often includes California sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), willow (*Salix* spp.), and Himalayan blackberry (*Rubus discolor*). Mexican elderberry (*Sambucus mexicana*) can also often be found in these communities. Birds known to occur in riparian communities include Swainson's hawk, white-tailed kite, red-shouldered hawk, Nuttall's woodpecker (*Picoides nuttallii*), western wood-pewee (*Contopus sordidulus*), tree swallow (*Tachycineta bicolor*), downy woodpecker (*Picoides pubescens*), Pacific-slope flycatcher (*Empidonax difficilis*), and house wren (*Troglodytes aedon*). Common amphibians and reptiles known to occur in riparian communities include Pacific tree frog, bullfrog, and common garter snake.

Canals

Canals within the project site include Le Grand Canal and Fairfield Canal (see **Figure 4.4-3**). A third canal called the Yosemite Lateral occurs as an above ground canal adjacent to the western portion of the Campus site; although it previously traversed the Phase 1.1 Campus site, it has been re-routed and does not pass through the Phase 1.1 Campus. Though technically within the project site boundaries, Le Grand Canal and Fairfield Canal are located within 150-foot easements that will not be developed as part of the Proposed Action. Therefore, though described here with regard to the project site setting, acreages for these canals are not included in **Table 4.4-2**. However, because fill of wetlands located within these canal easements is being requested in the current Section 404 permit application (submitted in February 2008), these wetlands are included in the acres of wetlands affected by the Proposed Action. Further, the wetlands impact discussion below applies to these wetlands.

Within the project site, Le Grand Canal is bordered mainly by grassland with some areas bordered by irrigated pasture. Fairfield Canal is bordered by annual grassland, irrigated pasture, and row and field crops. Both of the canals are also bordered by large areas of seasonal freshwater marsh. These canals likely support various amphibians and reptiles, including Pacific tree frog, bullfrog, western pond turtle, and common garter snake.

Ditch

An unnamed agricultural ditch borders the row and field crops in the Community South portion of the project site (see **Table 4.4-2** and **Figure 4.4-3**). The ditch contains similar vegetation to the canals within the project site and provides comparable habitat for wildlife.

Developed Areas

Developed areas within the project site include the Phase 1.1 portion of the UC Merced Campus, a barn and a corral located to the east of the Phase 1.1 Campus, and a ranch house and related structures located within the Community South site.

Alternative 2, Yosemite Avenue Alternative Site

The Yosemite Avenue Alternative site is located in the same general area as the Proposed Action. Under this alternative, campus development would occur in two areas: the already developed 104-acre Phase 1.1 Campus and a 711-acre campus area bordered on the west by Lake Road and located south of the Phase 1.1 Campus up to Cardella Road. The University Community under this alternative would include a total of approximately 1,950 acres be organized into a Community North and Community South. The Community North would include about 833 acres, bordered on the west by Lake Road and located south of the campus approximately between Cardella Road and Yosemite Avenue. The Community South would include 1,118 acres, bordered on the west by Lake Road, and approximately between East Yosemite Avenue and Olive Avenue.

As with Alternative 1, land cover types including annual grassland, agricultural lands (irrigated pasture, row and field crops), vernal pools and swales, seasonal wetland, seasonal freshwater marsh, drainages, riparian (located along Black Rascal Creek), canals/ditches, and developed areas are also found in the Alternative 2 area (see **Figure 4.4-4, Land Cover Types in the Yosemite Avenue Alternative Site**). Plants and wildlife known to occur in these cover types are described under the Alternative 1 setting discussion. In addition to these cover types, south of Yosemite Avenue the Alternative 2 site contains orchards. Orchards provide foraging opportunities for birds including Brewer's blackbird, American crow, common raven, and often support mammals such as California ground squirrel, black-tailed hare, Botta's pocket gopher, deer mouse, and California meadow vole. **Table 4.4-3, Cover Types in the Yosemite Avenue Site,** below shows the acreages of each cover type within the Alternative 2 site.

Table 4.4-3
Cover Types in the Yosemite Avenue Site (acres)

Cover Type	Campus	Community North	Community South	Project Site
Annual Grassland	417	6	0	423
Irrigated Pasture	366	<1	120	487
Row and Field Crops	<1	811	660	1,471
Orchards	0	0	295	295
Vernal Pool Ecosystems	6	<1	0	7
Vernal Swales	9	0	0	9
Seasonal Wetlands	1	<1	0	2
Seasonal Freshwater Marsh	7	0	0	7
Drainages	4	0	0	4
Canals	<1	0	0	<1
Ditches	0	1	<1	2
Riparian	0	0	13	13
Developed	0	13	30	43
Totals[1]	**812**	**833**	**1,118**	**2,763**

[1] *Numbers are rounded.*
Data Source: Wetlands were mapped from aerial photographs and field work. Terrestrial cover types from DWR 2002.

Alternative 3, Bellevue Ranch Alternative Site

Under Alternative 3, the campus portion of the site is generally bounded by Nevada Street on the north, G Street on the east, Bellevue Road on the south, and the western boundary is approximately 0.25 mile east of State Route 59. The University Community portion of the site is located immediately to the west and south of the proposed campus, and is generally bounded by State Route 59 on the west, Cardella Road on the south, and G street on the east. This alternative would encompass a Campus area of approximately 711 acres, and an associated community area of approximately 1,953 acres. The site would be located approximately 1.5 miles from the Phase 1.1 Campus and therefore would not be contiguous with the Phase 1.1 campus (**See Figure 4.4-5, Land Cover Types in the Bellevue Ranch Alternative Site**). As with Alternative 1, land cover types including annual grassland, agricultural lands (irrigated pasture, row and field crops), vernal pools and swales, seasonal wetland, seasonal freshwater marsh, ponds, and developed areas are found in the Alternative 3 site. Plants and wildlife known to occur in these land cover types are described under the Alternative 1 setting discussion. In addition to these cover types, the Alternative 3 site contains orchards. A description of wildlife associated with orchards is provided under

the Alternative 2 description above. **Table 4.4-4, Cover Types in the Bellevue Ranch Site,** below shows the acreages of each cover type within the Alternative 3 site.

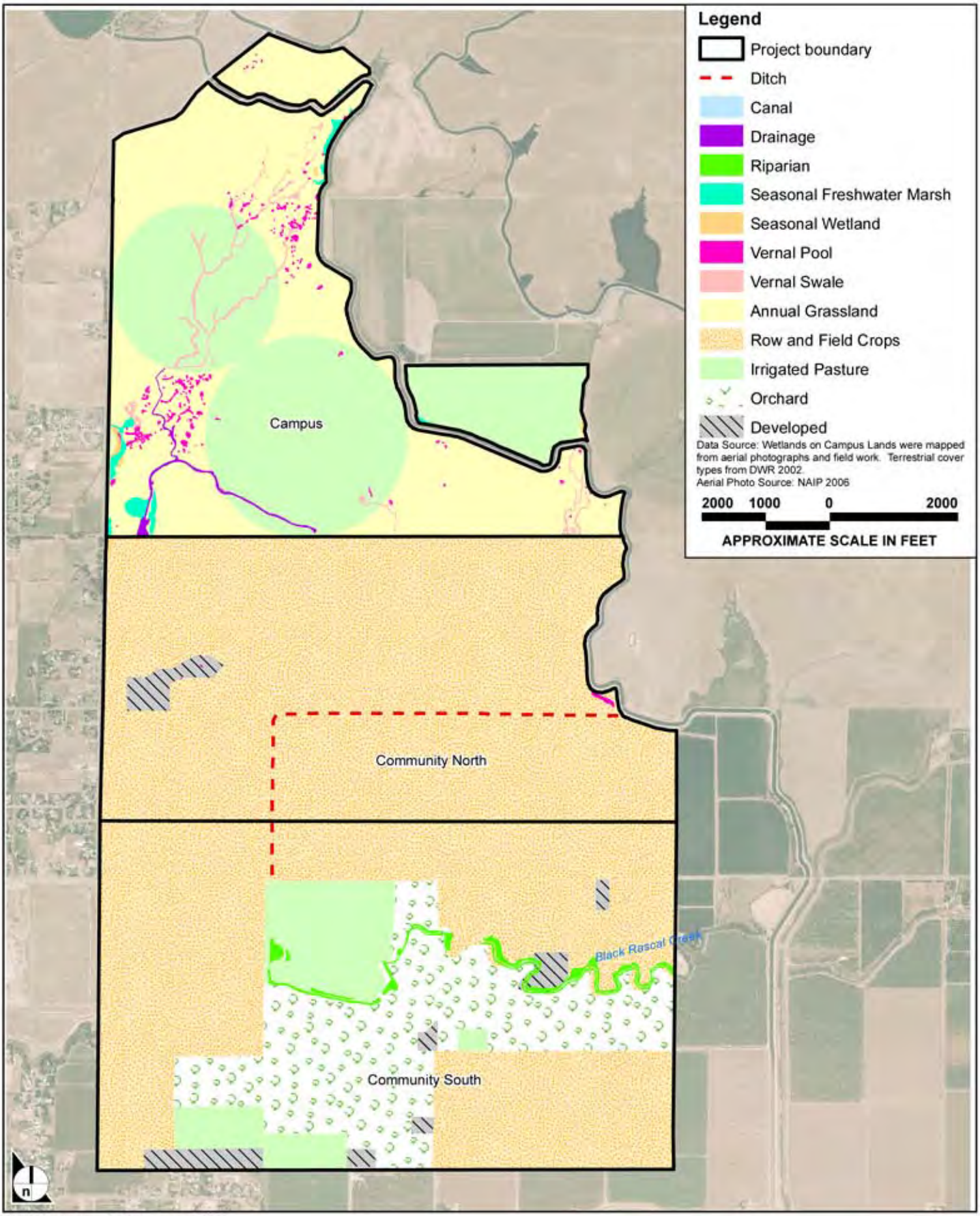
Table 4.4-4
Cover Types in the Bellevue Ranch Site (acres)

Cover Type	Campus	Community North	Community South	Project Site
Annual Grassland	395	329	296	1020
Irrigated Pasture	59	200	198	457
Row and Field Crops	137	156	498	791
Orchards	135	70	0	205
Vernal Pool Ecosystems	5	1	8	14
Vernal Swales	0	0	6	6
Seasonal Wetlands	2	2	101	105
Seasonal Freshwater Marsh	0	0	4	4
Ponds	5	2	1	8
Developed	78	73	7	158
Totals	**815**	**834**	**1,119**	**2,768**

Data Source: Wetlands were mapped from aerial photography and field work. Terrestrial cover types from DWR 2002.

Alternative 4, 2002 Proposed Project Alternative Site

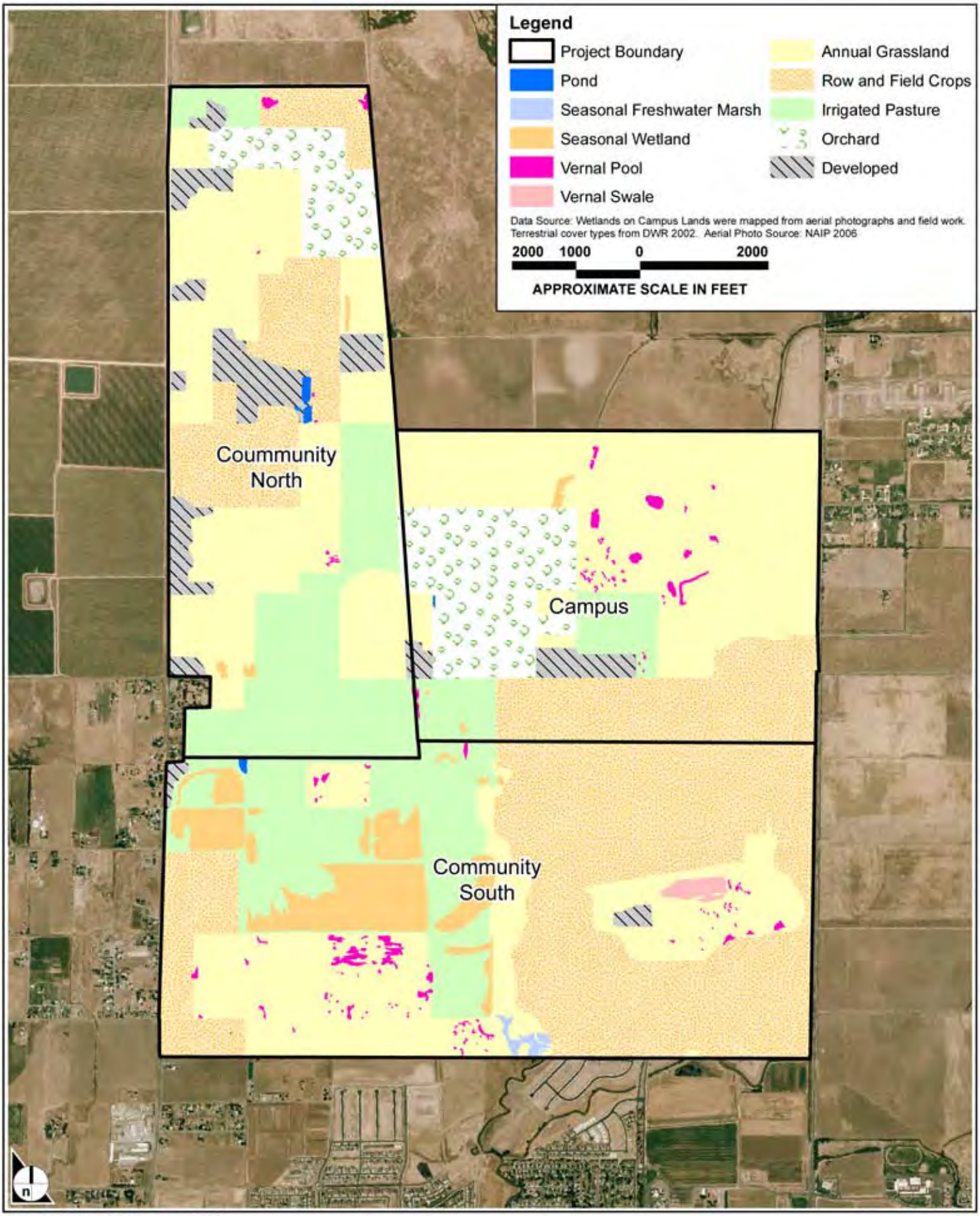
While the Alternative 4 site is located in the same general location as the site of the Proposed Action, the major difference between this alternative and the Proposed Action is that with Alternative 4, the northern boundary of the site is located roughly adjacent to the eastern boundary of Lake Yosemite and a portion of the eastern boundary of the Community North is shifted west of where it lies under the Proposed Action. As with the Proposed Action, the Fairfield Canal forms a portion of the site's eastern boundary. The Campus would include a 981-acre "Main Campus," a 340-acre "Campus Land Reserve," and a 750-acre "Campus Natural Reserve." In addition to the 981-acre Campus, this alternative consists of an approximately 2,136-acre University Community adjacent to and in support of the UC Merced Campus (see **Figure 4.4-6, Land Cover Types in the 2002 Proposed Site**). As with Alternative 1, land cover types including annual grassland, agricultural lands (irrigated pasture, row and field crops), vernal pools and swales, seasonal wetland, clay slope wetlands, ponds, seasonal freshwater marsh, drainages, riparian, canals/ditches, and developed areas are found in the Alternative 4 site. Under Alternative 4, larger acreages of vernal pools, swales, seasonal wetlands, and clay slope wetlands are present on the site, along with the clay playa between the Lake Yosemite Regional Park and Phase 1.1 Campus (identified as an Aquatic Resource of National Importance by the EPA).



SOURCE: ICF Jones & Stokes – August 2008

FIGURE **4.4-4**

Land Cover Types in the Yosemite Avenue Alternative Site



SOURCE: ICF Jones & Stokes – August 2008

FIGURE **4.4-5**

Land Cover Types in the Bellevue Ranch Alternative Site

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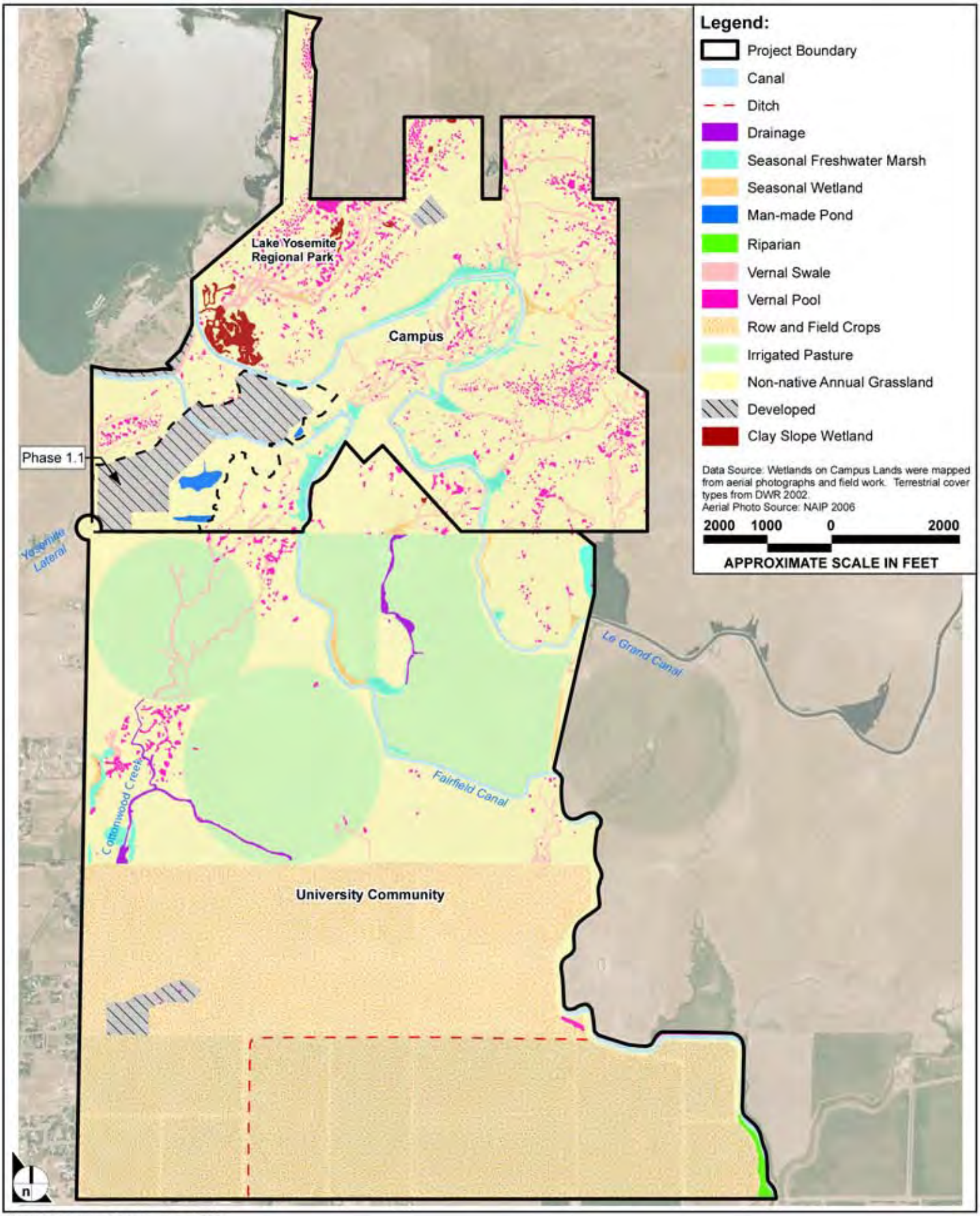

SOURCE: ICF Jones & Stokes – August 2008

FIGURE **4.4-6**

Land Cover Types in the 2002 Proposed Site

Additionally, canals are located within the project site but are located within in easements that could not be developed as part of the project. Land cover types, and associated plants and animals that are common to both Alternative 4 and 1 are discussed under the Alternative 1 setting discussion above. **Table 4.4-5, Cover Types in the 2002 Proposed Project Site,** below shows the acreages of each cover type within the Alternative 4 site.

Table 4.4-5
Cover Types in the 2002 Proposed Project Site (acres)

Cover Type	Campus	Community
Annual Grassland	799	444
Irrigated Pasture	0	524
Row and Field Crops	0	1,091
Canals	18	22
Vernal Pool Ecosystems	25	9
Vernal Swales	32	9
Seasonal Wetlands	2	6
Clay Slope Wetlands	10	<1
Ponds	5	0
Seasonal Freshwater Marsh	17	8
Drainages	0	6
Ditches	0	1
Riparian	0	3
Developed	73	13
Totals	**981**	**2,136**

Data Source: Wetlands on Campus Lands were mapped from aerial photographs and field work. Terrestrial cover types from DWR 2002.

4.4.2.2 Special-Status Species

Special-status species are plants and wildlife that are legally protected under the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA) or other regulations, and other plants and wildlife that are considered sufficiently rare to qualify for consideration under the National Environmental Quality Act (NEPA) and the California Environmental Quality Act (CEQA). The categories for special-status plants and animals are described below.

- Species listed or proposed for listing as threatened or endangered under the ESA (50 Code of Federal Regulations [CFR] 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [FR] [proposed species])

- Species that are candidates for possible future listing as threatened or endangered under the ESA (72 FR 69034, December 6, 2007)
- Species listed or candidates for listing by the State of California as threatened or endangered under CESA (14 CCR 670.5)
- Species that meet the definitions of rare, threatened, or endangered under CEQA (*State CEQA Guidelines*, Section 15380)
- Plants listed as rare or endangered under the California Native Plant Protection Act (NPPA) (California Fish and Game Code, Section 1900 et seq.)
- Plants considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered in California (Lists 1B and 2 in California Native Plant Society [2008])
- Plants listed by CNPS as those about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in California Native Plant Society [2008]) that may be included as special-status species on the basis of local significance or recent biological information
- Animals listed on California Department of Fish and Game's Special Animals List (California Fish and Game 2008) Animals fully protected in California (California Fish and Game Code, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians])

Special-status plant and wildlife species that occur or have potential to occur in or near the project site are presented in **Tables 4.4-6, Special-Status Plants Occurring in the Vicinity of the UC Merced Project,** and **4.4-7, Wildlife Species with Potential to Occur in the Project Site**.

Special-Status Plants

Twenty-six plant species were identified as having the potential to occur in the vicinity of the project site, based on a general review of species lists obtained from CNDDB (2008), CNPS (2008), and USFWS (2008) and previous studies, reports and plans for the project site listed in **Subsection 4.4.1**. Six of the species (heartscale, lesser saltscale, vernal pool smallscale, subtle orache, recurved larkspur, and delta button-celery) are not known to occur in the project region and suitable habitat for them is not present on the project site; therefore these species are not discussed further. One species, Keck's checkermallow, has been reported in the project region (CNDDB 2008), but because the identification of the plants has not been verified, because the project area is not within the species' range, and because habitat for this plant is not present on the project site, this species is not discussed further.

Table 4.4-6
Special-Status Plants Occurring in the Vicinity of the UC Merced Project

Name	Status* Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Region/Site
Henderson's bentgrass *Agrostis hendersonii*	–/–/3.2	Scattered locations in Central Valley and adjacent foothills	Moist places in grasslands, vernal pool	Occurs in project region
Heartscale *Atriplex cordulata*	–/–/1B.2	Central Valley from Colusa County to Kern County	Alkali grassland, alkali meadow, alkali scrub	Not present in project region
Lesser saltscale *Atriplex minuscula*	–/–/1B.1	San Joaquin Valley from Merced County to Kern County; Butte County	Alkali sink and sandy alkaline soils in grasslands, between 65 to 325 feet	Not present in project region
Vernal pool smallscale *Atriplex persistens*	–/–1B.2	Central Valley, from Glenn to Tulare County	Dry beds of vernal pools, on alkaline soils	Not present in project region
Subtle orache *Atriplex subtilis*	–/–1B.2	San Joaquin Valley from Merced County to Kern County; Butte County	Alkali sink and sandy alkaline soils in grasslands, between 65 to 325 feet	Not present in project region
Hoover's calycadenia *Calycadenia hooveri*	–/–1B.3	Northern and central Sierra Nevada foothills from Calaveras County to Madera County	Rocky, barren areas in grasslands and foothills woodlands, between 215 to 850 ft	Occurs in project region
Succulent owl's-clover *Castilleja campestris* subsp. *succulenta*	T/E/1B.2	Eastern edge of San Joaquin Valley and adjacent foothills, from Stanislaus County to Fresno County	Vernal pools	Present on the project site

Name	Status* Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Region/Site
Hoover's spurge *Chamaesyce hooveri*	T/–/1B.2	Central Valley from Tehama County to Tulare County	Large, deep vernal pools	Occurs in project region
Beaked clarkia *Clarkia rostrata*	–/–/1B.3	Central Sierra Nevada foothills: Stanislaus, Mariposa, and Merced County	Annual grassland, blue oak woodland	Occurs in project region
Ewan's larkspur *Delphinium hansenii* subsp. *ewanianum*	–/–/4.2	Sierra Nevada foothills, San Joaquin Valley	Grasslands, foothill woodlands, between 200-2,300 ft	Occurs in project region
Recurved larkspur *Delphinium recurvatum*	–/–/1B.2	San Joaquin Valley and interior valleys of the South Coast Ranges, from Contra Costa County to Kern County	Subalkaline soils in annual grassland, saltbush scrub	Not present in project region
Dwarf downingia *Downingia pusilla*	–/–/2.2	Central Valley from Tehama to Fresno Counties, northern San Francisco Bay Area, southern South Coast Ranges	Vernal pools	Present on the project site
Delta button-celery *Eryngium racemosum*	–/E/1B.1	San Joaquin River delta and floodplains	Seasonally inundated depressions along floodplains	Not present in project region
Spiny-sepaled button-celery *Eryngium spinosepalum*	–/–/1B.2	San Joaquin Valley, southern Sierra Nevada foothills	Vernal pools, swales, roadside ditches, between 325-2,625 ft	Not present in project region
Stinkbells *Fritillaria agrestis*	–/–/4.2	Outer North Coast Ranges, Sierra Nevada foothills, Central Valley, central western California	Grasslands, foothill woodlands, and open grassy areas in chaparral, between 30-5,100 ft	Occurs in project region

Name	Status* Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Region/Site
Bogg's Lake hedge-hyssop *Gratiola heterosepala*	–/E/1B.2	From Oregon south to northern Sacramento County	Vernal pools and swales	Occurs in project region
Pincushion navarretia *Navarretia myersii* subsp. *myersii*	–/–/1B.1	Central Valley, from Placer County to Merced County	Vernal pools	Occurs in project region
Shining navarretia *Navarretia nigelliformis* subsp. *radians*	–/–/1B.2	Interior foothills of South Coast Ranges from Merced County to San Luis Obispo County	Mesic areas with heavy clay soils, in swales and clay flats; in oak woodland, grassland; between 650-3,300 feet	Present on the project site
Colusa grass *Neostapfia colusana*	T/E/1B.1	Merced, Solano, and Yolo Counties	Large, deep vernal pools	Occurs in project region
San Joaquin Valley Orcutt grass *Orcuttia inaequalis*	T/E/1B.1	Scattered locations along east edge of the San Joaquin Valley and adjacent foothills, from Stanislaus County to Tulare County	Large, deep vernal pools	Occurs in project region
Hairy Orcutt grass *Orcuttia pilosa*	E/E/1B.1	Scattered locations along east edge of the Central Valley and adjacent foothills, from Tehama County to Merced County	Large, deep vernal pools	Occurs in project region
Merced phacelia *Phacelia ciliata* var. *opaca*	–/–/1B.2	Endemic to eastern Merced County	Adobe or clay soils of valley floor, open hills, or alkali flats	Occurs in project region
Hartweg's golden sunburst *Pseudobahia bahiifolia*	E/E/1B.1	Eastern San Joaquin Valley and adjacent foothills, formerly as far north as Yuba County	Clay soils in grasslands, adjacent to vernal pools and streams	Occurs in project region

Name	Status* Federal/State/ CNPS	Distribution	Habitat	Occurrence in Project Region/Site
Sanford's arrowhead *Sagittaria sanfordii*	–/–/1B.2	Scattered locations in Central Valley and Coast Ranges	Freshwater marsh, sloughs, canals, and other slow-moving water habitats	Occurs in project region
Keck's checkerbloom *Sidalcea keckii*	E/–/1B.1	Southern Sierra Nevada foothills: Fresno and Tulare Counties	Grassland areas within blue oak woodland, on clay soils derived from serpentinite; between 590-1,395 ft	Reported from project region
Greene's tuctoria *Tuctoria greenei*	E/R/1B.1	Eastern Central Valley and foothills	Large vernal pools	Reported from project region

**Status explanations:*

Federal

– = No status
E = Listed as "endangered" under the federal Endangered Species Act.
T = Listed as "threatened" under the federal Endangered Species Act.

State

– = No status
E = Listed as "endangered" under the California Endangered Species Act.
R = Listed as "rare" under the California Endangered Species Act.

California Native Plant Society

1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
2 = List 2 species: rare, threatened, or endangered in California, but more common elsewhere.
3 = List 3 species: plants about which we need more information.
4 = List 4 species: Plants of limited distribution.
0.1 = Seriously endangered in California
0.2 = Fairly endangered in California
0.3 = Not very endangered in California

Table 4.4-7
Wildlife Species with Potential to Occur in the Project Site

Common and Scientific Names	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project Site
Invertebrates				
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	T/--/--	Stream side habitats below 3,000 feet throughout the Central Valley	Riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant	Low Potential-No elderberry shrubs occur in the project site.
Conservancy fairy shrimp *Branchinecta conservatio*	E/--/--	Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, and Glenn counties	Large, deep vernal pools in annual grasslands	Low Potential-Not observed in vernal pools on site during protocol-level surveys.
Midvalley fairy shrimp *Branchinecta mesovallensis*	--/--/--	Endemic to California's Central Valley, occurring from Sacramento to Fresno counties.	Associated with relatively small ephemeral pools often roadside ditches	Known to Occur-Species is known to occur in vernal pools in the Campus and Community North portions of the project site.
Vernal pool fairy shrimp *Branchinecta lynchi*	T/--/--	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. Isolated populations also in Riverside County.	Common in vernal pools; also found in sandstone rock outcrop pools.	Known to Occur-Species is known to occur in vernal pools throughout the project site.
Vernal pool tadpole shrimp *Lepidurus packardi*	E/--/--	Shasta County south to Merced County	Vernal pools and ephemeral stock ponds	Known to Occur-Species is known to occur in vernal pools in the Community North portion of the project site.

Common and Scientific Names	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project Site
Amphibians				
California tiger salamander *Ambystoma californiense*	T/SSC/--	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Butte County south to northeastern San Luis Obispo County.	Small ponds, lakes, or vernal pools in grass-lands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy	Known to Occur-Species is known to breed in the stock pond within the Phase 1.1 site and has been observed in vernal pools in the campus and Community North portions of the project site.
Western spadefoot *Spea hammondii*	--/SSC/--	Sierra Nevada foothills, Central Valley, Coast Ranges, coastal counties in southern California	Shallow streams with riffles; seasonal wetlands, such as vernal pools in annual grasslands and oak woodlands	High Potential-The species has been documented in numerous locations throughout the project region but has not been documented in the project site (California Natural Diversity Database 2008). Project site contains suitable habitat for the species.
Reptiles				
Blunt-nosed leopard lizard *Gambelia silus*	E/E	San Joaquin Valley from Stanislaus County through Kern County and along the eastern edges of San Luis Obispo and San Benito Counties	Open habitats with scattered low bushes on alkali flats, and low foothills, canyon floors, plains, washes, and arroyos; substrates may range from sandy or gravelly soils to hardpan	Low Potential-The project region is within blunt-nosed leopard lizard's range but supports limited suitable habitat for the species. The species has not been documented in the project region (California Natural Diversity Database 2008).
Giant garter snake *Thamnophis couchi gigas*	T/T/--	Central Valley from the vicinity of Burrel in Fresno County north to near Chico in Butte County; has been extirpated from areas south of Fresno	Sloughs, canals, low gradient streams and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter	Low Potential-There is one historical record from 1908 for this species in the project region but no recent occurrences (California Natural Diversity Database 2008). Suitable habitat is present in the project site.

Common and Scientific Names	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project Site
Reptiles (continued)				
California horned lizard *Phrynosoma coronatum frontale*	--/SSC/--	Sacramento Valley, including foothills, south to southern California; Coast Ranges south of Sonoma County; below 4,000 feet in northern California	Grasslands, brushlands, woodlands, and open coniferous forest with sandy or loose soil; requires abundant ant colonies for foraging	Low Potential-The project site is within the range for California horned lizard but supports limited suitable habitat for the species. The species has not been documented in the project region (California Natural Diversity Database 2008).
Western pond turtle *Actinemys marmorata*	--/SSC/--	Occurs from the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada	Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests	High Potential- The species has been documented in numerous locations throughout the project region but not in the project site (California Natural Diversity Database 2008). Project site contains suitable habitat for the species.
Birds				
Prairie falcon *Falco mexicanus*	--/SSC/--	Found as permanent resident on the south Coast, Transverse, Peninsular, and northern Cascade Ranges, the southeastern deserts, Inyo-White Mountains, Modoc, Lassen, and Plumas Counties, and the foothills surrounding the Central Valley; winters in the Central Valley, along the coast from Santa Barbara County to San Diego County, and in Marin, Sonoma, Humboldt, Del Norte, and Inyo Counties	Cliffs or escarpments for nesting; adjacent dry, open terrain or uplands, marshes, and seasonal marshes for foraging	Known to Occur -The species has been documented foraging in the project site (UC Merced 2001).

Common and Scientific Names	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project Site
Birds (continued)				
Merlin *Falco columbarius*	--/SSC/--	Does not nest in California. Rare but widespread winter visitor to the Central Valley and coastal areas	Forages along coastline in open grasslands, savannas, and woodlands. Often forages near lakes and other wetlands	Known to Occur -This species has been documented foraging in the project site (UC Merced 2001).
Bald eagle *Haliaeetus leucocephalus*	--/E, FP/--	Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and in the Lake Tahoe Basin. Reintroduced into central coast. Winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, and east of the Sierra Nevada south of Mono County	In western North America, nests and roosts in coniferous forests within 1 mile of a lake, reservoir, stream, or the ocean	Known to Occur- This species has been documented foraging in the project area (UC Merced 2001). Project site contains limited suitable foraging but not nesting habitat for the species.
Golden eagle *Aquila chrysaetos*	PR/SSC, FP/--	Foothills and mountains throughout California. Uncommon nonbreeding visitor to lowlands such as the Central Valley	Nest on cliffs and escarpments or in tall trees overlooking open country. Forages in annual grasslands, chaparral, and oak woodlands with plentiful medium and large-sized mammals	High Potential - This species has been documented foraging adjacent to the project site and likely forages on site (UC Merced 2001). Project site contains suitable foraging habitat but not nesting habitat for the species.
White-tailed kite *Elanus leucurus*	--/ FP/--	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging	Known to Occur - White-tailed kites have been documented foraging in the project site (UC Merced 2001). Project site contains suitable foraging and nesting habitat for the species.
Northern harrier *Circus cyaneus*	--/SSC/--	Occurs throughout lowland California. Has been recorded in fall at high elevations	Grasslands, meadows, marshes, and seasonal and agricultural wetlands	Known to Occur- This species has been documented nesting in the project site (UC Merced 2001).

Common and Scientific Names	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project Site
Birds (continued)				
Swainson's hawk *Buteo swainsoni*	--/T/--/--	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, Yolo County.	Nests in oaks or cottonwoods in or near riparian habitats. Forages in grasslands, irrigated pastures, and grain fields.	High Potential-The project site is within Swainson's hawk's breeding range and supports suitable foraging habitat for the species. This species is documented to nest in numerous locations throughout the project region (California Natural Diversity Database 2008). Project site contains suitable foraging and nesting habitat for the species.
Ferruginous hawk *Buteo regalis*	--/SSC/--	Does not nest in California; winter visitor along the coast from Sonoma County to San Diego County, eastward to the Sierra Nevada foothills and southeastern deserts, the Inyo-White Mountains, the plains east of the Cascade Range, and Siskiyou County.	Open terrain in plains and foothills where ground squirrels and other prey are available.	Known to Occur- This species has been documented in numerous locations throughout the project region (California Natural Diversity Database 2008) and was observed overhead the project site (UC Merced 2001).
Western burrowing owl *Athene cunicularia hypugea*	--/SSC/--	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Rare along south coast.	Level, open, dry, heavily grazed, or low stature grassland or desert vegetation with available burrows.	Known to Occur- This species has been documented to nest in the project site on the campus site (California Natural Diversity Database 2008, UC Merced 2001).

Common and Scientific Names	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project Site
Birds (continued)				
Short-eared owl *Asio flammeus*	--/SSC/--	Permanent resident along the coast from Del Norte County to Monterey County although very rare in summer north of San Francisco Bay, in the Sierra Nevada north of Nevada County, in the plains east of the Cascades, and in Mono County; small, isolated populations.	Freshwater and salt marshes, lowland meadows, and irrigated alfalfa fields; needs dense tules or tall grass for nesting and daytime roosts.	Known to Occur-. This species has been documented foraging in the project site (UC Merced 2001). Limited suitable nesting habitat occurs in the project site.
Loggerhead shrike *Lanius ludovicianus*	--/SSC/--	Resident and winter visitor in lowlands and foothills throughout California; rare on coastal slope north of Mendocino County, occurring only in winter.	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches.	Known to Occur- This species has been documented foraging in the project site and could nest in suitable habitat (UC Merced 2001).
Tricolored blackbird *Agelaius tricolor*	--/SSC/--	Permanent resident in the Central Valley from Butte County to Kern County; breeds at scattered coastal locations from Marin County south to San Diego County and at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties.	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grain fields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony.	Known to Occur-.A large flock (approximately 3,000) of tricolored blackbirds was documented foraging in the UC Merced Phase 1.1 project site (Widdowson pers. comm.).
California horned lark *Eremophila alpestris actia*	--/SSC	Found throughout much of the state, less common in mountainous areas of the north coast and in coniferous or chaparral habitats.	Common to abundant resident in a variety of open habitats, usually where large trees and shrubs are absent. Grasslands and deserts to dwarf shrub habitats above tree line.	Known to Occur-. This species has been documented foraging in the project site and could nest in suitable habitat (UC Merced 2001). Project site contains suitable foraging and nesting habitat for the species.

Common and Scientific Names	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project Site
Birds (continued)				
Mountain plover *Charadrius montanus*	--/SSC/--	Mountain plovers do not nest in California and are winter residents primarily in the Central Valley from Sutter and Yuba Counties south to Kern County.	Suitable wintering habitat for mountain plover includes open areas with short grasses, plowed fields, and scattered shrub or sagebrush. Species avoids areas with tall, dense vegetation.	Known to Occur- This species has been documented foraging in the project site (UC Merced 2001).
Long-billed curlew *Numenius americanus*	--/SSC/--	Nests in northeastern California in Modoc, Siskiyou, and Lassen Counties. Winters along the coast and in interior valleys west of Sierra Nevada.	Nests in high-elevation grasslands adjacent to lakes or marshes. During migration and in winter; frequents coastal beaches and mudflats and interior grasslands and agricultural fields.	Low Potential- This species has been documented in the project region but not in the project site (UC Merced 2001). Project site contains suitable winter foraging habitat only for this species.
Mammals				
Pallid bat *Antrozous pallidus*	--/SSC/WBWG: High priority	Occurs throughout California except the high Sierra from Shasta to Kern County and the northwest coast, primarily at lower and mid elevations.	Occurs in a variety of habitats from desert to coniferous forest. Most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California and oak woodland, grassland, and desert scrub in southern California. Relies heavily on trees for roosts.	Low Potential- This species has been documented just north of the project site (California Natural Diversity Database 2008). Project site contains suitable foraging habitat.
Fresno kangaroo rat *Dipodomys nitratoides exilis*	E/E/--	Historically found from Merced Co. south to Central Fresno Co.	Found at elevations from 200 to 300 feet in alkali sink habitats.	No Potential-There is no suitable habitat for Fresno kangaroo rat in the project site.

Common and Scientific Names	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project Site
Mammals (continued)				
Giant kangaroo rat *Dipodomys ingens*	E/E/--	Occurs at high densities in only 12 square miles of habitat along the western side of the San Joaquin Valley, in five separate localities on Elkhorn Plain, Carrizo Plain, McKittrick Valley, and Cuyama Valley in Kern and San Luis Obispo Counties.	Restricted to flat, sparsely vegetated areas with native annual grassland and shrubland habitats; requires uncultivated soils consisting of dry, fine, sandy loams for burrowing.	No Potential-Project site outside of known range for this species.
Merced kangaroo rat *Dipodomys heermanni dixoni*	--/--/IUCN-NT	This subspecies is highly restricted to the San Joaquin Valley with known occurrences in Merced County only.	Found in dry grassy plains with partly open gravelly ground on slopes with sparse chaparral. Breeding occurs from February through October, with peak activity in April. The diet consists mostly of green vegetation.	High Potential- This subspecies has been documented in numerous locations throughout the project region (California Natural Diversity Database 2008) and was documented on an adjacent property to the northeast (VST property) during focused surveys (UC Merced 2001).
American badger *Taxidea taxus*	--/SSC/--	In California, badgers occur throughout the state except in humid coastal forests of northwestern California in Del Norte and Humboldt Counties.	Badgers occur in a wide variety of open, arid habitats but are most commonly associated with grasslands, savannas, mountain meadows, and open areas of desert scrub; the principal habitat requirements for the species appear to be sufficient food (burrowing rodents), friable soils, and relatively open, uncultivated ground.	Low potential-The project site contains suitable denning and foraging habitat for this species. Species has not been documented in project region (California Natural Diversity Database 2008).

Common and Scientific Names	Status Federal/State/ Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Project Site
Mammals (continued)				
San Joaquin kit fox *Vulpes macrotis mutica*	E/T/--	Principally occurs in the San Joaquin Valley and adjacent open foothills to the west; recent records from 17 counties extending from Kern County north to Contra Costa County.	Saltbush scrub, grassland, oak, savanna, and freshwater scrub.	High Potential-The project site is within the range for this species, is identified as being within the linkages site for San Joaquin kit fox (SJKF) (USFWS 2007), and contains suitable denning and foraging habitat. This species has been documented approximately 1mile east of the project site (California Natural Diversity Database 2008).

Status explanations:

Federal

E = listed as endangered under the federal Endangered Species Act.

T = listed as threatened under the federal Endangered Species Act.

C = species for which USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list, but issuance of the proposed rule is precluded.

– = no listing.

State

E = listed as endangered under the California Endangered Species Act.

T = listed as threatened under the California Endangered Species Act.

FP = fully protected under the California Fish and Game Code.

SSC = species of special concern in California.

– = no listing.

Other

IUCN-NT = The World Conservation Union, near threatened species

– = no listing.

Western Bat Working Group (WBWG) Available: http://www.wbwg.org/spp_matrix.html)

High priority = species are imperiled or at high risk of imperilment

Moderate priority = this designation indicates a level of concern that should warrant closer evaluation, more research, and conservation actions of both the species and possible threats. A lack of meaningful information is a major obstacle in adequately assessing these species' status and should be considered a threat

Low priority = While there may be localized concerns, the overall status of the species is believed to be secure.

Potential Occurrence in the Project Site High: California Natural Diversity Database (CNDDB), or other source documents species within a 10-mile radius of the project site. Suitable habitat is present within the project site. Moderate: CNDDB, or other source documents species within a 10-mile radius of the project site. Poor quality suitable habitat is present within the project site. Low: CNDDB, or other source does not document species within a 10-mile radius of the project site. Suitable habitat is present within the project site.

No Potential: Project site is outside the species range or suitable habitat is absent from the project site.

A total of 19 special-status plant species were identified as having potential to occur within the Proposed Action site. Three of these special-status plant species (succulent owl's-clover, shining navarretia, and dwarf downingia) are known to occur within the project site based on documented sightings. Potentially suitable habitat is present for 15 of the species, but surveys of the project site have not detected them. One species, spiny-sepaled button-celery, has been reported from the project region, but a recent re-evaluation of these populations (Preston & Park submitted) has determined them to be a different, non-sensitive species. However, a discussion of this species is provided to update the information presented in the previous project environmental documents. The following species descriptions summarize information for these 19 plant species.

Succulent Owl's-clover

Succulent owl's-clover (*Castilleja campestris* subsp. *succulenta*) (aka fleshy owl's-clover) is a state endangered, federally threatened, and CNPS List 1B.2 species. Succulent owl's-clover is endemic to vernal pool complexes along a 66-mile stretch of the eastern San Joaquin Valley and the adjacent foothills up to 2,500 feet. The species' range extends through northern Fresno, western Madera, southeastern San Joaquin, and Stanislaus Counties. The CNDDB lists 88 occurrences[1] within the state (California Natural Diversity Database 2008).

Succulent owl's-clover is restricted to vernal pools. Beyond its restriction to vernal pools, the specific habitat requirements of succulent owl's-clover are not known. It occurs in vernal pools with a wide range of area and depth, as well as on a variety of geologic formations and soils, although the specific microhabitat requirements have not been determined (EIP Associates 1999b; Dittes and Guardino 2002; California Natural Diversity Database 2008). A regional analysis based on the results of several surveys indicate that succulent owl's-clover in eastern Merced County occurs primarily on Laguna, Riverbank, and North Merced Gravel geologic units. Commonly reported associates include Fremont's goldfields (*Lasthenia fremontii*), three-colored monkey-flower (*Mimulus tricolor*), vernal pool popcornflower (*Plagiobothrys stipitatus*), downingia (*Downingia* sp.), and coyote-thistle (*Eryngium* sp.) (EIP Associates 1999b, California Natural Diversity Database 2008).

Most of the known occurrences (60) of succulent owl's-clover are located in the project region, and two occurrences are present within the project site (California Natural Diversity Database 2008). Ten occurrences are within Tier 1 conservation lands, and 13 to 14 occurrences are within Tier 2 properties. Surveys completed subsequent to the original Campus and Community surveys, not yet incorporated by

1 "Occurrence" is a term of art for a map feature that represents a breeding locality, resident population, or identified patches of plants or vegetation. The CNDDB uses the term "occurrence" for a population or group of nearby populations located more than 0.25 mile from any other population (CDFG 2008b).

the CNDDB, have further documented additional occurrences of the species in the study area (Jones & Stokes 2003, Vollmar Consulting 2008, Airola 2008a).

Hoover's Spurge

Hoover's spurge (*Chamaesyce hooveri*) is a federally threatened and CNPS List 1B.2 species. Hoover's spurge is endemic to vernal pool complexes along a 240-mile stretch of the eastern Central Valley in California at elevations of 80 to 425 feet. The CNDDB lists 30 occurrences in the state (California Natural Diversity Database 2008). Most occurrences are at the Vina Plains in Tehama and Butte Counties or in Tulare County north of Visalia.

Beyond its restriction to vernal pools, little is known of the specific habitat requirements of Hoover's spurge. The species is found primarily in larger and deeper vernal pools on soils that range in texture from clay to sandy loam and in pH from acidic to alkaline, and that include some saline soils (Stone et al. 1988, California Natural Diversity Database 2008). Within these pools, Hoover's spurge grows in varied locations from the margins to the deepest zones. Significantly, it often grows in areas devoid of other species (Stone et al. 1988). Throughout the range of Hoover's spurge, two frequent associates are Greene's tuctoria and hairy Orcutt grass (California Natural Diversity Database 2008). Given the rarity of all three species, this co-occurrence indicates similar habitat requirements for these species at the scales of individual pools or pool complexes.

Hoover's spurge is not known to occur in the project region, including the project site or Conservation Lands. The nearest known occurrence is located about 10 miles southwest of Merced (California Natural Diversity Database 2008).

Colusa Grass

Colusa grass (*Neostapfia colusana*) is a state endangered, federally threatened, and CNPS List 1B.1 species. Colusa grass is endemic to the Sacramento and San Joaquin Valleys, where it grows in large or deep vernal pools at elevations of 5 to 360 feet (California Native Plant Society 2008; California Natural Diversity Database 2008). The species' historical distribution included Merced, Stanislaus, Solano, and Colusa Counties (California Natural Diversity Database 2008). The CNDDB lists 61 occurrences within the known distribution (California Natural Diversity Database 2008).

The species grows primarily in large pools retaining water until late spring (Crampton 1976, US Fish and Wildlife Service 2002). These pools occur on a wide variety of soils. Within them, Colusa grass typically grows in monospecific patches; consequently, associated species may grow in very different microsites within a pool. San Joaquin Valley Orcutt grass, hairy Orcutt grass, Solano grass, and Hoover's spurge

occur in the same pools as Colusa grass at several sites (Stone et al. 1988, EIP 1999b, California Natural Diversity Database 2008). Given the rarity of all these species, this co-occurrence indicates similar habitat requirements at the scales of individual pools or pool complexes.

Colusa grass is known to occur at 27 locations within the project region but is not known to occur on the project site (California Natural Diversity Database 2008). Nine occurrences are within Tier 1 Conservation Lands.

San Joaquin Valley Orcutt Grass

San Joaquin Valley Orcutt (*Orcuttia inaequalis*) grass is a state endangered, federally threatened, and CNPS List 1B.1 species. San Joaquin Valley Orcutt grass is the only Orcutt grass restricted to the San Joaquin Valley. This grass was once relatively common in vernal pool complexes along the eastern margin of the valley in Stanislaus, Merced, Fresno, Madera, and Tulare Counties. The CNDDB lists 47 occurrences in the state (California Natural Diversity Database 2008). It grows at elevations of 100 to 2,500 feet (California Native Plant Society 2008).

The species grows primarily in large pools that retain water until late spring (Crampton 1976, Stone et al. 1988). Soils underlying these pools are typically acidic, varying in texture from clay to sandy loam (Stone et al. 1988). Interestingly, Colusa grass, hairy Orcutt grass, and Hoover's spurge occur at several of the same sites as San Joaquin Valley Orcutt grass (EIP 1999b; US Fish and Wildlife Service 2002; California Natural Diversity Database 2008). Given the rarity of all of these species, this co-occurrence indicates similar habitat requirements at the scales of individual pools or pool complexes.

San Joaquin Valley Orcutt grass is known to occur at 25 locations in the project region. There are four recorded occurrences within Tier 1 conservation lands.

Hairy Orcutt Grass

Hairy Orcutt grass (*Orcuttia pilosa*) is a state and federally endangered species and CNPS List 1B.1 species. Hairy Orcutt grass is endemic to the eastern margins of California's Central Valley. Historically, it occurred from Tehama County south to Merced and Madera Counties at elevations of 80 to 400 feet (California Native Plant Society 2008; California Natural Diversity Database 2008). The CNDDB lists 34 occurrences within the state (California Natural Diversity Database 2008).

The species grows primarily in large pools that retain water until late spring (Crampton 1976; Stone et al. 1988). These pools occur on a variety of soils. Interestingly, hairy Orcutt grass co-occurs at several sites with Colusa grass, Hoover's spurge, and Greene's tuctoria (Stone et al. 1988; California Natural Diversity

Database 2008). Given the rarity of all these species, this co-occurrence indicates similar habitat requirements at the scales of individual pools or pool complexes.

Hairy Orcutt grass may have a limited distribution within the project region, where the species is presumed extirpated from the two documented occurrences (Dittes and Guardino 2002; California Natural Diversity Database 2008). Hairy Orcutt grass is not known to occur on the project site or on Conservation Lands within the study area. The nearest occurrence to the project site, located about 2 miles west of the project site, has been extirpated (California Natural Diversity Database 2008).

Hartweg's Golden Sunburst

Hartweg's golden sunburst (*Pseudobahia bahiifolia*) is a state and federally endangered species and CNPS List 1B.1 species. Hartweg's golden sunburst is endemic to California's Central Valley. Historically, the species' range may have extended from Yuba County approximately 200 miles south to Fresno County at elevations of 50 to 460 feet. The CNDDB lists 24 occurrences within the state (California Natural Diversity Database 2008). Apparently, it was locally abundant but never common. The distribution is now concentrated in the Friant region of Fresno County and the La Grange region of Stanislaus County (California Natural Diversity Database 2008).

The specific habitat requirements of Hartweg's golden sunburst are largely unknown. It grows on grassy slopes in valley and foothill grasslands, usually on clay or shallow, fine-textured and gravelly soils (Johnson 1993; California Natural Diversity Database 2008). Where it occurs in vernal pool complexes, it grows on mima mounds, not in the pools. Reported associates include common nonnative annual grasses and forbs, as well as Fremont's goldfields (*Lasthenia fremontii*), shining peppergrass (*Lepidium nitidum*), and miniature lupine (*Lupinus bicolor*), all three of which are native species (Stebbins 1991 in US Fish and Wildlife Service 2002; California Natural Diversity Database 2008).

The CNDDB lists five occurrences of Hartweg's golden sunburst within the project region (California Natural Diversity Database 2008). All are in the northeastern portion of the project region on the Ione or Valley Springs Formations (Dittes and Guardino 2002). No occupied habitat has been documented in the central or southern portions of the project region. There are no known occurrences of this species on the project site or on Conservation Lands within the study area (California Natural Diversity Database 2008).

Greene's Tuctoria

Greene's tuctoria (*Tuctoria greenei*) is a state rare, federally endangered, and CNPS List 1B.1 species. Greene's tuctoria is endemic to vernal pools of California's Central Valley. The CNDDB (2008) lists 43 occurrences within its historical range, which included parts of Shasta, Tehama, and Butte Counties in the

northern and eastern Central Valley, and extended south through Fresno, Madera, Merced, San Joaquin, Stanislaus, and Tulare Counties in the San Joaquin Valley.

Greene's tuctoria grows in vernal pools at elevations of 100 to 3,500 feet (California Native Plant Society 2008). The species grows primarily in large pools; however, these pools tend to be somewhat smaller and shallower and to dry earlier in the year than those typically occupied by other Orcutt grasses (Stone et al. 1988; Alexander and Schlising 1998). These pools occur on a variety of soils. Greene's tuctoria has been observed to co-occur with Hoover's spurge at several sites (Stone et al. 1988; California Natural Diversity Database 2008). Eleven occurrences of Greene's tuctoria are present in the project region (California Natural Diversity Database 2008). One occurrence of Greene's tuctoria is reported from a Tier 2 property.

Henderson's Bentgrass

Henderson's bentgrass (*Agrostis hendersonii*) is a very uncommon species that faces threats to some of its populations. It has been assigned to CNPS List 3 because there are unresolved taxonomic questions about its status as a species distinct from small-flowered bentgrass (*Agrostis microphylla*), a more common species with similar morphology and habitat associations.

Henderson's bentgrass occurs at elevations below 3,380 feet from Shasta County to Merced County (California Natural Diversity Database 2008). Little information on the species' habitat associations and specific habitat requirements is available. Henderson's bentgrass is usually found in seasonal wetlands (typically vernal pools and swales) in annual grassland, and foothill woodland habitats (California Natural Diversity Database 2008).

The project site is within the geographic range of Henderson's bentgrass and contains habitat that is potentially suitable for the species. The species has been documented at four locations within the project region. One occurrence, about 3 miles northeast of the project site near the intersection of Hornitos Road and Six-mile Grade, has not been observed since 1935 and possibly has been extirpated (California Natural Diversity Database 2008). Three of the occurrences are within Tier 1 conservation lands.

Hoover's Calycadenia

Hoover's calycadenia (*Calycadenia hooveri*) is a CNPS List 1B.3 species. It is found in valley and foothill grasslands and woodlands on exposed, rocky, barren soils derived from calcareous sandstone formations. It occurs in the northern and central Sierra Nevada foothills at elevations below 900 feet. Hoover's calycadenia is known from 35 occurrences in Calaveras, Madera, Merced, Mariposa, and Stanislaus Counties (California Natural Diversity Database 2008).

The project site is within the geographic range of Hoover's calycadenia and contains habitat that is potentially suitable for the species. The species has been documented at 19 locations within the project region (California Natural Diversity Database 2008). Hoover's calycadenia has not been documented on the project site, but three occurrences are present within Tier 2 properties.

Beaked Clarkia

Beaked clarkia (*Clarkia rostrata*) is a CNPS List 1B.3 species. It is often found in annual grassland and blue oak woodland communities on north-facing slopes, rock outcrops, and bluffs in rocky or sandy soil. It occurs in the central Sierra Nevada foothills and adjacent San Joaquin Valley at elevations below 1,500 feet. It is known from 34 occurrences in Mariposa, Merced, and Stanislaus Counties (California Natural Diversity Database 2008).

The project site is within the geographic range of beaked clarkia and contains habitat that is potentially suitable for the species. The species has been documented at five locations within the project region (California Natural Diversity Database 2008). Beaked clarkia has not been documented on the project site, but two occurrences are reported within Tier 2 properties.

Ewan's Larkspur

Ewan's larkspur (*Delphinium hansenii* subsp. *ewanianum*) is a CNPS List 4 species. It occurs in annual grassland and blue oak woodlands at elevations below 1,970 feet (California Native Plant Society 2008). It occurs in the Sierra Nevada foothills and adjacent San Joaquin Valley from Calaveras to Kern Counties. Fewer than 25 occurrences have been documented by voucher specimens, although other occurrences have been reported (Dittes and Guardino 2002).

The project site is within the geographic range of Ewan's larkspur and contains habitat that is potentially suitable for the species. The species has been documented at several locations within the project region (Dittes and Guardino 2002). Ewan's larkspur has not been documented on the project site or on Conservation Lands within the study area.

Dwarf Downingia

Dwarf downingia (*Downingia pusilla*) is a CNPS List 2.2 species. It occurs in vernal pools in the interior North Coast Ranges, southern Sacramento Valley, and northern and central San Joaquin Valley. It has been reported from 117 occurrences, 10 of which have been extirpated (California Natural Diversity Database 2008).

The project site is within the geographic range of dwarf downingia and contains habitat that is potentially suitable for the species. The species has been documented at 11 locations within the project region (California Natural Diversity Database 2008). One occurrence has been documented at the northern end of the project site. One occurrence is present within the Tier 1 conservation lands, and three occurrences are reported within Tier 2 properties.

Spiny-Sepaled Button-Celery

Spiny-sepaled button-celery (*Eryngium spinosepalum*) is a CNPS List 1B.2 species that occurs in vernal pools. The species has previously been regarded to occur in the Sierra Nevada foothills from Tuolumne to Tulare Counties (California Natural Diversity Database 2008). Dittes and Guardino (2002) discussed the occurrence of spiny-sepaled button-celery in Merced County and noted taxonomic problems with identifying the species in this area. More recent research has determined that populations north of Fresno County are not *E. spinosepalum* but another species (*E. castrense*) with similar morphological characteristics. According to Dr. Robert Preston, lead author for the treatment of *Eryngium* in the forthcoming second edition of *The Jepson Manual (*Preston & Park submitted*)*, all populations of *Eryngium* in eastern Merced County with spiny sepals will be treated as *E. castrense,* which is not a special-status species.

Because the project site is no longer considered to be within the range of spiny-sepaled button-celery, this species would not be affected by the project and is not addressed further.

Stinkbells

Stinkbells (*Fritillaria agrestis*) is a CNPS List 4 species. It occurs on clay soils in annual grasslands and grassy openings in other habitats, including chaparral, oak woodland, and pinyon-juniper woodland (California Native Plant Society 2008). It is widely distributed in northern California, ranging from the outer North Coast Ranges into the South Coast Ranges, with scattered populations in the southern Sacramento Valley and Sierra Nevada foothills (Ness 1993).

The project site is within the geographic range of stinkbells and contains habitat that is potentially suitable for the species. The species has been documented at one location in the northeastern project region (Dittes and Guardino 2002). Stinkbells has not been documented on the project site.

Boggs Lake Hedge-Hyssop

Boggs Lake hedge-hyssop (*Gratiola heterosepala*) is state-listed as endangered and is a CNPS List 1B.2 species. It is found in the shallow waters or moist clay soils of vernal pools and the margins of shallow

lakes and reservoirs, where it inhabits barren, muddy areas on extremely shallow soils (California Natural Diversity Database 2008). It is widely distributed in northern California, ranging from the Modoc Plateau south into the southern Sacramento Valley and Sierra Nevada foothills (Wetherwax 1993), with scattered populations in Merced, Madera, and Fresno Counties (California Natural Diversity Database 2008). It has been reported from 87 occurrences within the state, one of which has been extirpated (California Natural Diversity Database 2008).

The project site is within the geographic range of Boggs Lake hedge-hyssop and contains habitat that is potentially suitable for the species. The species has been documented at one location within the project region (California Natural Diversity Database 2008). Boggs Lake hedge-hyssop has not been documented on the project site.

Pincushion Navarretia

Pincushion navarretia (*Navarretia myersii* subsp. *myersii*) is a CNPS List 1B.1 species. It occurs in vernal pools along the east edge of the Central Valley from Placer to Merced Counties (California Natural Diversity Database 2008). It typically grows in small to medium-sized vernal pools (Dittes & Guardino 2002).

The project site is within the geographic range of pincushion navarretia and contains habitat that is potentially suitable for the species. The species has been documented at four locations within the project region (California Natural Diversity Database 2008). Pincushion navarretia has not been documented on the project site.

Shining Navarretia

Shining navarretia (*Navarretia nigelliformis* subsp. *radians*) is a CNPS List 1B.2 species. It typically grows in clay flats in annual grasslands, although it also occurs in heavy clay soils on grassy slopes, vernal swales, and vernal pools (California Natural Diversity Database 2008).

The project site is within the geographic range of shining navarretia and contains habitat that is suitable for the species. The species has been documented at 29 occurrences within the project region (California Natural Diversity Database 2008). Portions of two occurrences of shining navarretia are located within the Campus site, and another occurrence is located within the Community North site. Ten occurrences are located within Tier 1 conservation lands, and another seven occurrences are located within Tier 2 properties.

Merced Phacelia

Merced phacelia (*Phacelia ciliata* var. *opaca*) is a CNPS List 1B.2 species. It is reported to occur in heavy clay soils in grasslands. Only seven occurrences are known, all within eastern Merced County (California Natural Diversity Database 2008).

The project site is within the geographic range of Merced phacelia and contains habitat that is potentially suitable for the species. All known occurrences are within the project region (California Natural Diversity Database 2008). Merced phacelia may have occurred on the project site historically. A collection from 1929 was mapped within the Community North portion of the project site, with a mapping precision of 1 mile (California Natural Diversity Database 2008). One occurrence is recorded from a Tier 2 property. No occurrences were documented within the project site or Conservation Lands during the botanical surveys listed in **Table 4.4-1**.

Sanford's Arrowhead

Sanford's arrowhead (*Sagittaria sanfordii*) is a CNPS List 1B.2 species. It is distributed at scattered locations in the Central Valley and Coast Ranges, where it occurs in freshwater marsh, sloughs, canals, and other slow-moving perennial water habitats (California Natural Diversity Database 2008). It has been reported from 62 occurrences in California, 17 of which are historic and seven of which have been extirpated or potentially extirpated (California Natural Diversity Database 2008).

The project site is within the geographic range of Sanford's arrowhead and contains habitat that is suitable for the species. One historic occurrence is within the project region (California Natural Diversity Database 2008). Sanford's arrowhead has not been documented on the project site.

Special-Status Wildlife

Specials-status wildlife species were identified as having the potential to occur in the project site based on a review of species lists obtained from CNDDB (2008) and USFWS (2008); and previous studies, reports, and plans for the project site listed in **Subsection 4.4.1**.

A total of 32 special-status wildlife species were identified as having potential to occur in the project site. Sixteen of these special-status wildlife species are known to occur in the project site based on documented sightings; six special-status species have a moderate to high potential to occur in the project site based on the presence of suitable habitat and known occurrences in the project region; and 10 special-status species have low to no potential to occur based on the lack of suitable habitat. Included in the category of species with low to no potential to occur based on the lack of suitable habitat within the project site are the

federally listed endangered Conservancy fairy shrimp and federally listed threatened valley elderberry longhorn beetle (VELB). Though Conservancy fairy shrimp has not been observed in the project site due to the lack of suitable habitat, this species is discussed further in this report due to its known occurrence within Conservation Lands, specifically CNR lands. Alternatively, though recent elderberry shrub (the host plant for VELB) surveys have not been conducted on the project site, elderberry shrubs have not been observed in any of the previous surveys conducted on the project site and VELB is not known to occur within Conservation Lands. Surveys are summarized in **Table 4.4-1**. This species is therefore considered to have very low potential for occurrence and is discussed in the special-status wildlife species table only (**Table 4.4-7**). With the exception of Conservancy fairy shrimp, all other special-status species that have low to no potential to occur are also not discussed further in this section, but are included in **Table 4.4-7**.

The following species descriptions summarize information for 23 special-status wildlife species that are known to occur in the project site or within Conservation Lands or have moderate to high potential to occur on the project site.

Invertebrates

Vernal pool fairy shrimp

Vernal pool fairy shrimp is a federally listed threatened species. This species is the most widely distributed of the special-status vernal pool crustaceans occurring in the project region. The species is found from Shasta County in the north throughout the Central Valley and west to the central Coast Ranges, at elevations of 30 to 4,000 feet. Additional populations have been reported from the Agate Desert region of Oregon near Medford, and disjunct populations occur in San Luis Obispo, Santa Barbara, and Riverside Counties. However, most known locations are in the Sacramento and San Joaquin Valleys and along the eastern margin of the central Coast Ranges (Eng et al. 1990).

Vernal pool fairy shrimp inhabit vernal pools that form in depressions, usually in grassland habitats (Eng et al. 1990). Pools must remain inundated long enough for the species to complete its life cycle. Vernal pool fairy shrimp also occur in other wetlands that provide habitat similar to vernal pools, such as alkaline rain pools, ephemeral drainages, rock outcrop pools, ditches, stream oxbows, stock ponds, vernal swales, and some seasonal wetlands (Helm 1998). Occupied wetlands range in size from as small as several square feet to more than 10 acres. Vernal pool fairy shrimp and other fairy shrimp have been observed in artificial depressions and drainages where water ponds for a sufficient duration (Helm 1998). Examples of such areas include roadside ditches and ruts left behind by off-road vehicles or heavy

equipment. Soil compaction from construction activity can sometimes create an artificial hardpan, or restrictive layer, which allows water to pond and form suitable habitat for vernal pool fairy shrimp.

The CNDDB lists 561 extant occurrences for this species within the state, 254 of which are located within the project region (California Natural Diversity Database 2008). Based on surveys conducted for the proposed project which are not fully reflected in the CNDDB, there are 211 occurrences within the project site and 670 occurrences of the species on Conservation Lands. Vernal pool fairy shrimp has been documented in vernal pools and swales throughout the project site (California Natural Diversity Database 2008, UC Merced 2001). A total of 54 acres of lands with the project site are considered to be occupied by vernal pool fairy shrimp (ICF Jones & Stokes 2008). Additionally, Conservation Lands that have been incorporated in the Proposed Action account for 1,143 acres of occupied habitat for this species, which would be conserved as part of the Proposed Action. The known occupied habitat reported to occur within the project site and the project region on Conservation Lands was determined based on numerous surveys listed in **Table 4.4-1** and on the methodology developed as part of the 2008 UC Merced Conservation Strategy (ICF Jones & Stokes 2008; *Conservation Strategy;* described under the **Subsection 4.4.3.3, Local Laws, Regulations, Plans and Policies** section below).

Vernal pool tadpole shrimp

Vernal pool tadpole shrimp is a federally listed endangered species. This species is a California Central Valley endemic species, with the majority of populations in the Sacramento Valley. This species has also been reported from the Sacramento River Delta east of San Francisco Bay and from scattered localities in the San Joaquin Valley from San Joaquin to Madera Counties (Rogers 2001).

Vernal pool tadpole shrimp occur in a wide variety of seasonal habitats including vernal pools, ponded clay flats, alkaline pools, ephemeral stock tanks, and roadside ditches (Helm 1998; Rogers 2001; California Natural Diversity Database 2008). Habitats where vernal pool tadpole shrimp have been observed range in size from small (<25 square feet), clear, vegetated vernal pools to highly turbid alkali scald pools to large (>100-acre) winter lakes (Helm 1998; Rogers 2001). These pools and other ephemeral wetlands must dry out and be inundated again for the vernal pool tadpole shrimp cysts to hatch. This species has not been reported in pools that contain high concentrations of sodium salts, but may occur in pools with high concentrations of calcium salts (Helm 1998; Rogers 2001).

The CNDDB lists 247 extant occurrences for this species within the state, 44 of which are located within the project region (California Natural Diversity Database 2008). Vernal pool tadpole shrimp has been documented to occur in vernal pools and swales within the Community North portion of the project site (California Natural Diversity Database 2008). A total of 2 acres of lands within the project site are

considered to be occupied by vernal pool tadpole shrimp. Conservation Lands that have been incorporated in the Proposed Action would conserve 14 acres of occupied habitat for this species. The known occupied habitat reported to occur within the project site and the project region on Conservation Lands was determined based on numerous surveys listed in **Table 4.4-1** and on the methodology developed as part of the *Conservation Strategy*.

Conservancy Fairy Shrimp

Conservancy fairy shrimp is a federally listed endangered species. The range of Conservancy fairy shrimp extends from the northern Sacramento Valley to the San Joaquin Valley, and includes Butte, Glenn, Tehama, Solano, and Yuba Counties in the Sacramento Valley and Stanislaus and Merced Counties in the San Joaquin Valley (California Natural Diversity Database 2008). The CNDDB lists a total of 28 records of occurrence.

Conservancy fairy shrimp occur in alkaline pools and vernal lakes and pools (Helm 1998). Observations suggest this species is generally found in pools that are relatively large and turbid (King et al. 1996; Helm 1998; Eriksen and Belk 1999). These pools may exceed several acres in size. The species is known to occur in pools on the Anita, Pescadero, Riz, Solano, Edminster, San Joaquin, and Peters soil series.

Conservancy fairy shrimp occur with several other vernal pool crustaceans, including vernal pool fairy shrimp (*Branchinecta lynchi*), California linderiella (*Linderiella occidentalis*), and vernal pool tadpole shrimp (King et al. 1996; Helm 1998; Eriksen and Belk 1999). The species also occurs with several vernal pool plant species, including Colusa grass and the Orcutt grasses.

The CNDDB reports 28 records of occurrence for Conservancy fairy shrimp, all of which are presumed to be extant (California Natural Diversity Database 2008). This species requires large, deep vernal pools that are not present within the project site. This species was not observed in vernal pools within the project site during protocol-level surveys (see **Table 4.4-1** for summary of these surveys). This species is discussed further in this document due to its known occurrence within Conservation Lands, specifically the CNR lands. Approximately 14 acres of occupied Conservancy fairy shrimp habitat was estimated to occur within the CNR.

Midvalley fairy shrimp

Midvalley fairy shrimp is not currently considered to be a special-status species. Midvalley fairy shrimp is endemic to California's Central Valley, occurring from Sacramento to Fresno Counties (Belk and Fugate 2000). In the project region, the vast majority of midvalley fairy shrimp occurrences have been recorded

on the Riverbank Formation; a significant number have been recorded on North Merced Gravels (see *Conservation Strategy* **Appendix 2.0-3**).

Midvalley fairy shrimp differ from vernal pool tadpole shrimp and, to a lesser degree, vernal pool fairy shrimp in that they are generally associated with smaller and more ephemeral pools than these other species (Helm 1998). Midvalley fairy shrimp can also occur in roadside ditches adjacent to occupied habitat (Belk and Fugate 2000).

The CNDDB lists 99 extant occurrences for this species within the state, 64 of which are located within the project region (California Natural Diversity Database 2008). Midvalley fairy shrimp has been documented in vernal pools and swales within the Campus and Community North portions of the project site accounting for 24 acres of occupied habitat (ICF Jones & Stokes 2008).

USFWS proposed to list this species, but then declined to list it because it was determined to be "well represented on protected lands and in areas with little or no current threat" (USFWS 2004). The 2002 BO for the UC Merced project (which was issued prior to the decision to decline the listing of the species) identified the need to provide protection for midvalley fairy shrimp due to its potential to be listed. Although the BO requirements no longer apply to this species (because it was not listed), 24 acres of vernal pools occupied by this species will be removed by the Proposed Action and 325 acres of occupied midvalley fairy shrimp habitat has been identified on Conservation Lands and therefore will be protected (at a mitigation ratio of 12:1) as part of the project. Because this species is not currently considered by the scientific community to be at risk for significant decline, impacts to this species are not considered significant under CEQA and NEPA, with or without the incorporation of environmental commitments outlined in the *Conservation Strategy*. Accordingly, for these reasons, midvalley fairy shrimp is not evaluated further in this EIS/EIR. The species, however, is treated in the *Conservation Strategy* and 2008 Biological Assessment (BA) Supplement because of commitments made in the previous ESA consultation process.

Amphibians

California tiger salamander

California tiger salamander is a federally listed threatened species and a state candidate species (i.e., listing under consideration). California tiger salamanders are endemic to the San Joaquin–Sacramento River Valleys, bordering foothills, and coastal valleys of central California (Barry and Shaffer 1994). The species occurs from Sonoma County and the Colusa-Yolo County line south to Santa Barbara County in the Coast Ranges, and from southern Sacramento County south to Tulare County in the Central Valley (Jennings and Hayes 1994).

California tiger salamander is a lowland species restricted to grasslands and low foothill regions where suitable breeding habitat (vernal pools, ephemeral pools, or human-made ponds with a minimum inundation period of 3 to 4 months) occurs. Permanent aquatic sites are unlikely to be used for breeding unless they lack fish predators or periodically dry out (Jennings and Hayes 1994). Though California tiger salamanders develop in these aquatic sites, this species spends the dry summer and fall months in underground retreats, typically burrows of small mammals, in upland areas in the vicinity of breeding sites (within 1 mile) (Shaffer et al. 2004; Trenham et al. 2001).

The CNDDB lists 908 extant occurrences for this species within the state, 61 of which are located within the project region (California Natural Diversity Database 2008). Approximately, 178 acres of USFWS-designated critical habitat for this species is located on the Campus and Community North portions of the project site. Within the Campus site, adult California tiger salamanders have been detected within grassland areas (UC Merced 2001). Within the Community North portion of the project site, adult California tiger salamanders have been observed in vernal pools (Merced County 2001). Observations of adults in vernal pools are considered to represent documented breeding of the species on site. Currently, California tiger salamanders have not been detected on the Community South site, likely due to the predominance of agricultural land. A total of 1,648 acres of lands within the project site are considered to be occupied by the species. Additionally, Conservation Lands that have been incorporated in the Proposed Action account for 20,136 acres of occupied habitat for this species and 12,101 acres of critical habitat, which would be conserved at a 14:1 ratio as part of the project. The known occupied habitat reported to occur within the project site and the project region on Conservation Lands was determined based on numerous surveys listed in **Table 4.4-1** and on the methodology developed as part of the *Conservation Strategy.*

Recent studies near Lake Yosemite found hybrids of the eastern tiger salamander and the California tiger salamander in vernal pools (Fitzpatrick and Schaffer 2007). This finding may affect the management of occupied California tiger salamander habitats in the project region. This research suggests that permanent ponds have a higher representation of eastern tiger salamander genes, while intermittent ponds support more genetically pure California tiger salamander. Therefore, pond management may be available as a technique to reduce effects of hybridization.

Western spadefoot

Western spadefoot is a state species of special concern. Western spadefoot occurs in the Central Valley and adjacent foothills and in the Coast Ranges from Point Conception to Santa Barbara County and south to the Mexican border (Zeiner et al. 1988).

Suitable habitats include grassland habitats and valley-foothill hardwood forests with shallow temporary pools formed by heavy winter rains. The shallow temporary pools provide the aquatic component essential for breeding and egg laying. Underground burrows are also important to provide cover for most of the year when adequate pools are not available. Some populations are capable of persisting for a few years in orchards and vineyards (Zeiner et al. 1988).

The project site is within western spadefoot's range and contains suitable habitat for the species. The CNDDB lists 392 extant occurrences for this species within the state, 30 of which are located within the project region. There are no known occurrences of this species on the project site (California Natural Diversity Database 2008).

Reptiles

Western pond turtle

Western pond turtle is a state species of special concern. Western pond turtles were formerly known as far north as western Washington (though now thought to be near extinction in this region), south to northwestern Baja, California; and mostly west of the Cascade-Sierran crest. Outlying areas include the Mojave River in California; the Truckee, Carson, and East Walker Rivers in Nevada; near Susanville in Lassen County, California; and in Drews Creek, the Canyon Creek area, and the Deschutes River in Oregon, where introduced (Stebbins 2003).

Western pond turtle is a thoroughly aquatic turtle of water bodies such as ponds, marshes, rivers, streams, and irrigation ditches with rock or mud substrates that support aquatic vegetation (e.g., watercress, cattails, water lilies). Western pond turtles are often seen basking on logs, emergent vegetation, and mud banks (Stebbins 2003). They move to upland areas up to 0.25 mile from watercourses to deposit eggs and overwinter (Jennings and Hayes 1994). Their diet consists of aquatic plants, insects, worms, fish, amphibian eggs and larvae, crayfish, aquatic invertebrates, and carrion (Stebbins 2003).

The project site is within western pond turtle's range, and ponds, seasonal freshwater marsh, and canals in the project site may support this species. The CNDDB lists 353 extant occurrences for this species within the state, 10 of which are located within the project region. There are no known occurrences of this species within the project site (California Natural Diversity Database 2008).

Birds

The project site contains suitable nesting and foraging habitat for numerous special-status raptors and other migratory birds. Special-status bird species known to forage in the project site and vicinity include

white-tailed kite, northern harrier, bald eagle (*Haliaeetus leucocephalus*), golden eagle, Swainson's hawk, merlin, prairie falcon, mountain plover, short-eared owl, western burrowing owl, loggerhead shrike, California horned lark, and tricolored blackbird. Of these species, only northern harrier and western burrowing owl have been documented to nest on the project site (California Native Diversity Database 2008; UC Merced 2001). The project site also contains suitable nesting habitat for white-tailed kite, northern harrier, Swainson's hawk, western burrowing owl, loggerhead shrike, tricolored blackbird, and California horned lark. Except for northern harrier and western burrowing owl, none of these species are currently known to nest on the project site. Each of these species is discussed below in more detail.

White-tailed kite

White-tailed kite is a fully protected species under California Fish and Game Code Section 3511. The species has a restricted distribution in the United States, occurring only in California and western Oregon and along the Texas coast (American Ornithologists' Union 1983). The species is fairly common in California's Central Valley lowlands (Zeiner et al. 1990a).

White-tailed kites nest in open canopy forests, especially cismontane forests; they are also known to nest in riparian areas. Nests typically occur near agricultural lands, where foraging most often occurs. Foraging also occurs in open grasslands, meadows, and emergent wetlands. White-tailed kites use dense trees for cover. Breeding occurs from February to October, with peak activity from May through August. Their diet commonly consists of voles, mice, and other diurnal species. White-tailed kites are known to glide or hover about 100 feet above ground while hunting for prey and to make a vertical descent to prey (Zeiner et al. 1990a).

The project site is within white-tailed kite's breeding and wintering range and provides suitable foraging and nesting habitat for the species. The CNDDB lists 108 extant occurrences for this species within the state, none of which are reported within the project region (California Natural Diversity Database 2008). However, based on surveys conducted for the proposed project, white-tailed kites have been documented foraging throughout the project site (UC Merced 2001; County of Merced 2001).

Northern harrier

Northern harrier is a state species of special concern. The breeding range includes most of the Central Valley, the Sacramento–San Joaquin Delta, the Suisun Marsh, and portions of San Francisco Bay (Zeiner et al. 1990a).

Tall grasses and forbs in wetlands and field borders provide cover for northern harriers. Northern harriers nest on the ground in thick grass, shrubbery, or other vegetation, often near marshes. Their nests

typically consist of a pile of sticks and grass. The breeding season for this species is between April and September, with peak activity in June and July. Northern harriers feed on voles and other small mammals, birds, small reptiles, crustaceans, and insects (Zeiner et al. 1990a).

The project site is within northern harriers' breeding and wintering range and provides suitable nesting and foraging habitat for the species. The CNDDB lists 42 extant occurrences for this species within the state, one of which is reported within the project region (California Natural Diversity Database 2008). Additionally, this species has been documented to nest within the Campus site and is known to forage on the Community North and South sites (UC Merced 2001; County of Merced 2001).

Bald eagle

Bald eagle is a state-listed endangered species and is fully protected under California Fish and Game Code Section 3511. It was removed from the federal list of threatened species, but is still protected under the federal Bald and Golden Eagle Protection Act. The current breeding distribution in California has spread from historical nesting areas in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties to many other regions of the state. Bald eagles are permanent inhabitants and regular winter migrants in California (Zeiner et al. 1990a).

Bald eagles occur mainly near large bodies of water with associated larger trees and snags. Tall, open canopy, large trees, particularly ponderosa pine, or cliffs are required for nesting. High tree snags, trees, or rocks are used for cover. Bald eagles roost communally in winter in dense, isolated conifer or riparian stands. Their diet consists mainly of fish, water birds, and frequently carrion (Zeiner et al. 1990a).

The project site is within bald eagle's wintering range and suitable foraging habitat for the species is located within the Campus site. The CNDDB lists 235 extant occurrences for this species within the state, 3 of which were reported within the project region (California Natural Diversity Database 2008). Additionally, this species has been documented foraging within the campus portion of the project site (UC Merced 2001). The Community North and South portions of the project site provide limited foraging opportunities for this species (County of Merced 2001).

Golden eagle

Golden eagle is a state species of special concern and is fully protected under California Fish and Game Code Section 3511. It is also protected by the federal Bald and Golden Eagle Protection Act. This species is an uncommon permanent resident and migrant throughout California; it is more common in the Central Valley and southern California (Zeiner et al. 1990a).

This species can be found in a variety of habitats including foothills, mountains, sage-juniper flats, and deserts. Suitable nest sites include cliffs or large trees in open areas. Nesting eagles construct large platform-type nests. Breeding occurs from late January through August, with peak activity occurring March through July. A variety of open habitats are used for foraging; these include grasslands, deserts, savannahs, young forests, and shrubby areas. The diet consists mostly of small mammals but may include reptiles, birds, and carrion (Zeiner et al. 1990a).

The project site is within golden eagle's wintering range and supports suitable foraging habitat for the species. The CNDDB lists 15 extant occurrences for this species within the state, none of which are reported within the project region (California Natural Diversity Database 2008). However, based on surveys conducted for the proposed project, this species has been documented foraging in the project vicinity (UC Merced 2001).

Swainson's hawk

Swainson's hawk is a state-listed threatened species. Swainson's hawks migrate annually from wintering areas as far as South America to breeding locations in northwestern Canada, the western United States, and Mexico. In California, the breeding distribution includes the Central Valley, the Klamath Basin, the northeastern plateau, Lassen County, and the Mojave Desert (Zeiner et al. 1990a), and the California population winters in Mexico.

Swainson's hawks nest in the Central Valley in large trees in riparian corridors, oak savannah, and juniper-sage flats in open tree stands (Zeiner et al. 1990a). This species is also typically found nesting adjacent to agricultural fields. Swainson's hawks breed from late March to late August, with peak activity from late May through July. In the Central Valley, Swainson's hawks forage in large, open agricultural habitats, including alfalfa and hay fields (California Department of Fish and Game 1994). Their diet consists of small mammals, invertebrates, amphibians, reptiles, birds and, less frequently, fish (Zeiner et al. 1990a).

The project site is within Swainson's hawk's breeding range and provides suitable foraging habitat and limited nesting habitat for the species. The CNDDB lists 1,636 extant occurrences for this species within the state, 11 of which are reported within the project region. Several nest sites are reported to occur within 5 to 10 miles of the project site (California Natural Diversity Database 2008). Swainson's hawk has been observed foraging just south of the campus portion of the project site and likely forages in grasslands and agricultural lands throughout the project site (UC Merced 2001).

Ferruginous hawk

Ferruginous hawk is a state species of special concern. The species is currently an uncommon winter resident and migrant in the Central Valley of California (Zeiner et al. 1990a).

Habitats include open grasslands, sagebrush flats, desert scrub, and low foothills surrounding valleys and fringes of pinyon juniper habitats. Ferruginous hawks nest in foothills or prairies on low cliffs, buttes, cut banks, shrubs, trees, or other natural or human-made elevated structures. The species is not known to nest in California. Ferruginous hawks arrive in California in September and leave by mid-April (Zeiner et al. 1990a).

The project site is within ferruginous hawk's wintering range and supports suitable foraging habitat for the species. The CNDDB lists 75 extant occurrences for this species within the state, 4 of which are reported within the project region (California Natural Diversity Database 2008). This species has been documented flying over the project site (UC Merced 2001).

Merlin

Merlin is a state species of special concern. The species is currently an uncommon winter visitor and migrant in California, typically occurring only from September to May. The winter range for this species is concentrated along the coast and in the Central Valley (Zeiner et al. 1990a).

Merlins use a wide range of habitats: coastlines, grasslands, lakes, wetlands, young forests with early growth, savannahs, and woodlands. They use dense forests near water for cover. Their diet consists mostly of small birds but may also include insects and small mammals (Zeiner et al. 1990a).

The project site is within merlin's wintering range and provides suitable foraging habitat for the species. The CNDDB lists 10 extant occurrences for this species within the state, two of which are reported within the project region (California Natural Diversity Database 2008). This species has been documented foraging in the campus portion of the project site (UC Merced 2001).

Prairie falcon

Prairie falcon is a state species of special concern. Prairie falcons are uncommon permanent residents and migrants throughout California, using the Central Valley primarily for wintering with some breeding occurring around the valley perimeter (Zeiner et al. 1990a).

Habitats vary from annual grasslands to alpine meadows, but preferred areas contain perennial grasslands, savannahs, rangeland, agricultural land, and desert scrub. Prairie falcons nest on sheltered

ledges of cliffs or may use old nests of large raptors located on cliffs, bluffs, or rock outcrops. Breeding occurs from mid February through mid September with peak activity occurring April to early August. Their diet consists mostly of small mammals but may include small birds and reptiles (Zeiner et al. 1990a).

The project site is just outside the prairie falcon's breeding and wintering range reported by Zeiner et al. (1990a). The study area has no suitable breeding habitat, but provides suitable foraging habitat that is likely used in winter. The species has been documented foraging in the campus portion of the project site (UC Merced 2001).

Short-eared owl

Short-eared owl is a state species of special concern. Short-eared owls are winter migrants to California, found mostly in the Central Valley and western Sierra Nevada foothills but also along the coast. They occasionally breed in northern California (Zeiner et al. 1990a).

Habitats typically used by short-eared owls are those that are open with few to no trees, such as grasslands, prairies, dunes, meadows, irrigated areas, and saline or fresh emergent wetlands. Dense vegetation is an important habitat component. These owls use tall grasses, brush, ditches, and wetlands for cover. Short-eared owls are ground-nesting birds that use depressions surrounded by tall vegetative cover. The species is also known to use burrows occasionally for nesting. Breeding occurs from early March through July. Their diet consists of a variety of prey, including small mammals, reptiles, amphibians, arthropods, and birds in winter coastal areas (Zeiner et al. 1990a).

The project site is within short-eared owl's wintering range and supports suitable foraging and nesting habitat for the species (Zeiner et al. 1990a). The CNDDB lists nine extant occurrences for this species within the state, none of which are reported within the project region (California Natural Diversity Database 2008). However, based on surveys conducted for the proposed project, this species has been documented foraging throughout the project site (UC Merced 2001; County of Merced 2001).

Western burrowing owl

Western burrowing owl is a state species of special concern. Western burrowing owls are found throughout much of California in annual and perennial grassland, desert, and arid scrubland (California Department of Fish and Game 1995).

Throughout their range, burrowing owls rely on burrows excavated by fossorial mammals or reptiles, including prairie dogs, ground squirrels, badgers, skunks, armadillos, woodchucks, foxes, coyotes, and

gopher tortoises. Where the number and availability of natural burrows is limited (for example, where burrows have been destroyed or ground squirrels eradicated), burrowing owls will occupy drainage culverts, cavities under piles of rubble, discarded pipe, and other tunnel-like structures. The breeding season is March through August, peaking in April and May (Zeiner et al. 1990a).

The project site is within western burrowing owl's breeding and wintering range and supports suitable breeding and foraging habitat for the species. The CNDDB lists 973 extant occurrences for this species within the state, 10 of which are reported within the project region (California Natural Diversity Database 2008). This species has been documented throughout the project region and is known to nest in the campus portion of the project site (California Natural Diversity Database 2008; UC Merced 2001; County of Merced 2001).

Loggerhead shrike

Loggerhead shrike is a state species of special concern. Loggerhead shrikes occur year-round throughout the lowlands and foothills of California (Zeiner et al. 1990a).

Suitable habitat includes open areas with shrubs, fences, utility line poles, or other perches. Loggerhead shrikes tend to avoid urbanized areas, but often frequent open croplands. Nests of this species are usually hidden in densely foliaged shrubs or trees. The breeding season is March through August. Their diet consists mainly of large insects but may also include small birds, mammals, amphibians, reptiles, fish, carrion, and invertebrates (Zeiner et al. 1990a).

The project site is within loggerhead shrike's breeding and wintering range and supports suitable nesting and foraging habitat for the species. The CNDDB lists 19 extant occurrences for this species within the state, none of which are reported within the project region (California Natural Diversity Database 2008). However, based on surveys for the proposed project this species has been documented to forage in the campus portion of the project site (UC Merced 2001).

California horned lark

California horned lark, a subspecies of horned lark, is a state species of special concern and is found throughout much of the state.

California horned lark is a ground-nesting bird, preferring open grasslands and prairies with short vegetation or bare ground and little to no shrub or tree cover. California horned larks may also occupy the edges of agricultural fields or row crop stubble (Beason 1995). Breeding occurs from March through

July. Their diet consists of insects, snails, and spiders during the breeding season and seeds of grasses and forbs during the non-breeding season (Zeiner et al. 1990a).

The project site is within California horned lark's breeding and wintering range and supports suitable nesting and foraging habitat for the species. The CNDDB lists 75 extant occurrences for this species within the state, none of which are reported within the project region (California Natural Diversity Database 2008). However, based on surveys for the proposed project, this species has been documented to nest in the project region just north of UC Merced Conservation Lands (discussed later in section) on the Virginia Smith Trust (VST) and Cyril Smith Trust (CST) properties and has been observed foraging in the campus portion of the project site (County of Merced 2001; UC Merced 2001).

Tricolored blackbird

Tricolored blackbird is a state species of special concern. Tricolored blackbird breeding colonies have been observed in all Central Valley counties (CNDDB 2008). The vast majority of the population occurs in central California, with additional populations in coastal and inland southern California locations, as well as scattered sites in Oregon, western Nevada, and western coastal Baja California (Beedy and Hamilton 1997).

There are three basic criteria for selecting nest colony sites: open accessible water; a protected nesting substrate, characterized either by flooded areas or by thorny or spiny vegetation; and a suitable foraging space providing adequate insect prey within a few miles of the nesting colony. Nesting substrates used by tricolored blackbirds include freshwater marsh dominated by tules and cattails, willows, blackberries, thistles, and nettles (Beedy and Hamilton 1997).

The project site is within tricolored blackbird's winter and summer range and contains suitable nesting habitat along marshes, and stock ponds on the project site and foraging habitat in grasslands and agricultural lands throughout the project site. The CNDDB lists 355 extant occurrences for this species within the state, one of which is reported within the project region (California Natural Diversity Database 2008). Specifically, a large flock (approximately 3,000) of tricolored blackbirds was documented foraging in the UC Merced Phase 1.1 project site by a Jones & Stokes avian ecologist during environmental compliance monitoring on March 25, 2003. A focused tricolored blackbird nesting survey conducted by the avian ecologist on April 3, 2003 determined that nesting of this species was not occurring on site. Based on CNDDB nesting records, this species is known to nest within the project region in northeastern Merced County and could nest in suitable habitat on the project site in the future (California Natural Diversity Database 2008).

Mountain plover

Mountain plover is a state species of special concern. Mountain plovers do not nest in California and are winter residents primarily in the Central Valley from Sutter and Yuba Counties south to Kern County (Zeiner et al. 1990a).

Suitable wintering habitat for mountain plover includes open areas with short grasses, plowed fields, and scattered shrub or sagebrush. This species avoids areas with tall, dense vegetation. Their diet consists of large insects, particularly grasshoppers (Zeiner et al. 1990a).

The project site is within mountain plover's wintering range and supports suitable foraging habitat for the species. The CNDDB lists 40 extant occurrences for this species within the state, one of which is reported within the project region (California Natural Diversity Database 2008). This species has been documented foraging within the project site (County of Merced 2001; UC Merced 2001), but is considered most likely to use the site mainly during migratory movements to and from more frequently used Central Valley wintering areas (EIP Associates 2002).

Non-special-status nesting raptors and other migratory birds

Non-special-status nesting raptors and other migratory birds are protected under the Migratory Bird Treaty Act (MBTA) (50 CFR 10 and 21) and California Fish and Game Code Sections 3503 and 3503.5. Numerous non-special-status raptors and other migratory birds, including but not limited to, red-tailed hawk, red-shouldered hawk, American kestrel, and red-winged blackbird, could breed on the project site on the basis of the presence of suitable nesting habitat. Additionally, cliff swallows were observed nesting within the Phase 1.1 portion of the campus site under the pedestrian bridge over Fairfield Canal during the May 23, 2008 site visit. Pedestrian bridges throughout the project site provide suitable nesting habitat for cliff swallows. A variety of other migratory birds may nest in grassland, wetland, and riparian habitats on site.

Mammals

Merced kangaroo rat

Merced kangaroo rat (*Dipodomys heermanni dixoni*) is discussed in this section due to its previous status, prior to 2003, as a federal species of concern. This category has since been dropped by the USFWS and this species currently appears only on the CDFG's Special Animals List as a World Conservation Union lower risk/near threatened taxon mainly due to its limited range. It is a subspecies of Heermann kangaroo

rat (*Dipodomys heermanni*) that occurs only in grassland vegetation communities of eastern Stanislaus and Merced Counties.

This species is found in dry grassy plains with partly open gravelly ground on slopes with sparse chaparral. Breeding occurs from February through October, with peak activity in April. Their diet consists mostly of green vegetation (Burt and Grossenheider 1980).

The project site is within Merced kangaroo rat's expected range and supports suitable habitat for the subspecies. The CNDDB lists 23 extant occurrences for this species within the state, all of which are reported within the project region (California Natural Diversity Database 2008). Within the project study area, this species was documented on the Conservation Lands (VST property), northeast of the campus site, during focused surveys (UC Merced 2001).

This species is discussed due to known occurrences on lands within the VST Conservation Lands. The Proposed Action will not remove land occupied by this species and will therefore not impact this species. The conservation of lands that are part of the Proposed Action would protect lands occupied by this species, specifically lands within the VST property, and other grasslands that provide suitable habitat. This species is not discussed further in this report.

San Joaquin kit fox

The current known range of San Joaquin kit fox extends from central Contra Costa County south through Kern County and to the northeastern edge of Santa Barbara County. Three distinct core areas support the largest known extant populations: the Carrizo Plain Natural Area in San Luis Obispo County, natural lands in western Kern County, and the Ciervo-Panoche Natural Area of western Fresno and eastern San Benito Counties. Other areas that either support San Joaquin kit fox populations or have the potential to support them include the Salinas-Pajaro River watersheds (San Benito and Monterey Counties); Camp Roberts and Fort Hunter Liggett in Monterey County; western Madera County; western, central, and eastern Merced County; eastern Stanislaus County; northern Kings County; western Tulare County; and around the Bakersfield metropolitan area in Kern County (US Fish and Wildlife Service 1998).

In the central portion of the range, San Joaquin kit fox is associated with the following natural vegetation communities: valley sink scrub, interior coast range saltbush scrub, upper Sonoran subshrub scrub, annual grassland, and the remaining native grasslands. Kit foxes in the central region also use grazed nonirrigated grasslands, tilled or fallow fields, irrigated row crops, orchards, and vineyards because of the predominance of these cover types in the region (US Fish and Wildlife Service 1998).

Kit foxes prefer loose-textured and deeper soils, but have been found on a wide range of soil types. Kit foxes may construct their own dens, but where soils make digging difficult, foxes frequently use and modify burrows built by other animals, particularly those of California ground squirrels. Structures such as culverts, abandoned pipelines, and well casings may also be used as den sites. The breeding season begins during September and October when adult females begin to clean and enlarge natal or pupping dens. Mating and conception occur between late December and March. Gestation is 48–52 days, and litters of two to six pups are born some time between late February and late March (US Fish and Wildlife Service 1998).

The CNDDB lists 949 extant occurrences for this species within the state, five of which are reported within the project region (California Natural Diversity Database 2008). An extensive review of the distribution of San Joaquin kit fox in the project vicinity revealed a total of four records within a 10-mile radius of the project site. Three of these occurrences are for foraging individuals, and only one of these records involved juveniles; this observation of two juveniles and a single adult, reported from Atwater in the early 1980s, is the only evidence of reproduction within 10 miles of the project site. The closest recorded occurrence for this species is a 1999 observation of a foraging adult located 1.45 miles north of the intersection of Yosemite Avenue and Arboleda Drive along Black Rascal Creek (California Native Diversity Database 2008).

Critical Habitat

Critical habitat is a term defined and used in the ESA as a specific geographic area(s) that contain features essential for the conservation of a federally-listed threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. An area is designated as "critical habitat" after USFWS publishes a proposed federal regulation in the Federal Register and then receive and consider public comments on the proposal. The final boundaries of the critical habitat area are also published in the Federal Register. Critical habitat considered with respect to the Proposed Action include vernal pool species critical habitat and California tiger salamander critical habitat, as described below.

Vernal Pool Invertebrates and Plants

Critical habitat for vernal pool species was originally designated in a final rule published on August 6, 2003 (68 FR 46683). Critical habitat was designated for the following species that occur on the project site and within the project region: Conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, Hoover's spurge, succulent owl's clover, Colusa grass, San Joaquin Orcutt grass, hairy Orcutt Grass, and Greene's tuctoria (FR 68 46684–46867). A revised final rule for critical habitat, with a re-

evaluation of non-economic exclusions, was published in 70 FR 11140 on March 8, 2005. Economic exclusions from the 2003 final rule were evaluated and published on August 11, 2005 (70 FR 46923). Administrative revisions with species-by-unit designations were published on February 10, 2006 (71 FR 7117). On May 31, 2007, USFWS clarified its designation of critical habitat (FR 72 30279–30297), which resulted in the addition of 147,638 acres of critical habitat in Merced County. The designated area of critical habitat is located east of Lake Yosemite and north of Paloma Road and does not include land within the Campus and University Community sites. Approximately 16,188 acres of critical habitat for vernal pool species have been designated within the Conservation Lands. Critical habitat for listed vernal pool species is discussed in this section because it is located adjacent to portions of the Campus and Community North sites and is located within conservation lands. The acreages of critical habitat contained within Conservation Lands are listed in **Table 4.4-8, Acreages of Habitat Losses and Lands Conserved for Federally Listed Species for the UC Merced Proposed Project**.

California Tiger Salamander

In August 2005, the USFWS designated 199,109 acres of critical habitat for California tiger salamander in 19 counties (FR 70 49379–49458). Specifically, critical habitat unit 9 is located in eastern Merced County and includes 178 acres located within the Campus and Community North lands and over 12,000 acres within the Conservation Lands. The acreages of critical habitat contained within the project site and specific conservation lands are included in **Table 4.4-8.**

4.4.3 APPLICABLE LAWS, REGULATIONS, AND POLICIES

4.4.3.1 Federal Laws and Regulations

Federal Endangered Species Act

The federal ESA protects fish and wildlife species, and their habitats that have been identified as threatened or endangered. *Endangered* refers to species, subspecies, or distinct population segments that are in danger of extinction through all or a significant portion of their range; *threatened* refers to those likely to become endangered in the near future.

The USFWS in the Department of the Interior and the National Oceanic and Atmospheric Administration (NOAA)-Fisheries in the Department of Commerce share responsibility for administration of the federal ESA. Provisions of Section 7 of the ESA relevant to the Proposed Action are summarized below.

Table 4.4-8
Acreages of Habitat Losses and Lands Conserved for Federally Listed Species for the UC Merced Proposed Project

Resource	Proposed Action						Conserved Lands								
	University's Proposed Project														
	Campus		Community North		Community South		Tier 1				Tier 2				
4.4-4. Species Habitat	direct	indirect	direct	indirect	direct	indirect	VST	CNR	Myers East	CST	Carlson	Chance	Cunningham	Nelson	Robinson
Vernal Pool Species Critical Habitat	0	0	0	0	0	0	0	0	0	393	0	7,572	771	3,861	3,571
Succulent owl's clover	23	4	2	2	0	0	219	94	0	68	1	164	56	84	3
Colusa grass	0	0	0	0	0	0	117	39	0	0	0	0	0	0	0
SJ Valley Orcutt grass	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0
Conservancy fairy shrimp	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0
Vernal pool fairy shrimp	39	3	15	4	<1	0	349	139	2	137	34	71	60	340	11
Midvalley fairy shrimp	18	<1	6	3	0	0	90	105	0	64	32	0	0	34	<1
Vernal pool tadpole shrimp	0	0	2	2	0	0	14	0	0	0	0	0	0	<1	0
California tiger salamander															
Occupied habitat	815	156	833	80	0	0	4,904	1,254	84	2,545	194	4,675	1,179	2,994	2,307
Critical habitat	147	44	29	7	0	0	4,787	1,055	72	2,233	194	22	1,372	2,366	0
San Joaquin kit fox															
Primary habitat	430	290	374	199	19	42	4,933	1,156	39	2,997	229	6,265	1,350	3,730	3,508
Secondary habitat	175	21	435	45	1,011	275	52	12	0	30	52	832	395	115	36
Degraded Conserved Habitat								135	52						

Section 7 provides a means for authorizing take of threatened and endangered species by federal agencies. "Take" is defined by the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Section 7 applies to actions that are conducted, permitted, or funded by a federal agency. Under Section 7, the federal agency conducting, funding, or permitting an action (the federal lead agency) must consult with the USFWS, as appropriate, to ensure that the Proposed Action will not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat. If a Proposed Action "may affect" a listed species or designated critical habitat, the lead agency is required to prepare a biological assessment evaluating the nature and severity of the expected effect. In response, the USFWS issues a biological opinion, with a determination that the Proposed Action either

- may jeopardize the continued existence of one or more listed species (jeopardy finding) or result in the destruction or adverse modification of critical habitat (adverse modification finding); or
- will not jeopardize the continued existence of any listed species (no jeopardy finding) or result in adverse modification of critical habitat (no adverse modification finding).

The biological opinion may stipulate discretionary "reasonable and prudent" alternatives. If the Proposed Action would not jeopardize a listed species, the USFWS issues an incidental take statement to authorize the Proposed Action.

The Proposed Action could result in direct and indirect effects to federally-listed species including succulent owl's-clover, vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and San Joaquin kit fox, and their associated habitats.

Pursuant to Section 7 of the ESA, UC Merced and Merced County submitted a biological assessment (2002 BA) to the US Army Corps of Engineers (USACE) in February 2002 to address the effects of the development of the Campus and the infrastructure components on succulent owl's-clover, Colusa grass, San Joaquin Valley Orcutt grass, vernal pool fairy shrimp, vernal pool tadpole shrimp, Conservancy fairy shrimp, bald eagle, mountain plover, and San Joaquin kit fox. On February 22, 2002, the USACE requested formal consultation with USFWS under Section 7 of the ESA.

In July 2002, the *Supplement to the Biological Assessment for the UC Merced Campus Project and County of Merced Infrastructure in Support of UC Merced Project* (2002 Supplemental BA), which addressed an expanded project area, was submitted to USFWS (Jones & Stokes 2002). USFWS completed consultation on August 19, 2002, with the issuance of the *Final Biological Opinion on the Proposed University of California Merced Campus, Phase 1.1 and Campus Buildout and Infrastructure Project* (1-1-02-I-2926), hereinafter referred to as the 2002 BO. In its 2002 BO, USFWS concluded that, contingent upon implementation of and compliance with conservation measures and parameters set forth in the 2002 BO, the UC Merced project

would not result in jeopardy to federally-listed threatened and endangered species covered by the 2002 BO (US Fish and Wildlife Service 2002).

The 2002 BO Parameters were intended to act as a guide to subsequent planning for the Campus and University Community and for acquired conservation areas. A summary of the 2002 BO Parameters and the current status of compliance with these parameters is presented in **Table 4.4-9, Summary of the Status of Compliance with the Parameters Included in the 2002 Biological Opinion for the University of California Merced Campus and Infrastructure Project**. While the Parameters provide general guidance, the 2002 BO Conservation Measures provide more specific guidance for achieving the requirements of the Parameters and are the means by which the Parameters would be implemented. The BO Conservation Measures represent measures that the University and the County have agreed to apply in order to avoid, minimize, and compensate for potential effects that the Proposed Action could have on listed species.

The Conservation Measures include a variety of avoidance, minimization, and compensation measures for effects on wetlands and other biological resources. A summary of the topics addressed by these Conservation Measures is included below. A complete discussion of each measure can be found in the 2002 BO (USFWS 2002) and 2008 BA Supplement (Airola 2008b). The 2008 Conservation Strategy (ICF Jones & Stokes 2008), described under the Local Laws, Regulations, and Policies section below, contains 13 strategies that were developed to implement the 2002 BO Parameters and Conservation Measures. Compliance with these measures is specifically discussed in the 2008 BA Supplement and the Conservation Strategy.

Table 4.4-9
Summary of the Status of Compliance with the Parameters Included in the 2002 Biological Opinion for the University of California Merced Campus and Infrastructure Project

Parameter	Sub-parameter Requirements for Applicants	Status of Compliance
1. Development of Conservation Strategy	a. Prepare and implement a comprehensive strategy that incorporates Conservation Measures for San Joaquin kit fox, vernal pool plants and branchiopods, and other protected species to guide development and implementation of specific conservation for the Proposed Actions	These requirements have been met through commitments outlined in the Conservation Strategy, Management Plan for Conservation Lands, Compensatory Wetland Mitigation Plan, the 2008 BA Supplement, and this Draft EIR/EIS.
	b. Include monitoring and adaptive management measures consistent with and implementing species recovery plans	Monitoring and adaptive management measures are incorporated into management of UC Merced Conservation Lands, other Conservation Lands, and compensatory wetland mitigation planning, as outlined in the Conservation Strategy, Management Plan for Conservation Lands, Compensatory Wetland Mitigation Plan, and the 2008 BA Supplement.
2. Parameters for Covered Projects	a. (1) USFWS to review all preserve lands that have been acquired to date to determine the applicability for conservation of protected species	This review has been accomplished through the USFWS's review of the 2002 BAs, preparation of the 2002 BO, review of several drafts of the Conservation Strategy and Compensatory Wetland Mitigation Plan, and numerous discussions regarding the configurations of the Campus and University Community . This parameter will be further addressed in the USFWS's forthcoming review of the final Conservation Strategy, the 2008 BA Supplement, Management Plan for Conservation Lands, and Compensatory Wetland Mitigation Plan.
	a. (2) USFWS to review and approve of future fee or easement acquisitions	No additional acquisitions have been made since the availability of the 2002 BO. Lands formerly proposed as a part of the Campus and designated as the Campus Land Reserve have been incorporated into the CNR at the recommendation of the USFWS.
	a. (3) Prepare a Resource Mitigation Plan (for Main Campus)	Preparation of the Management Plan for Conservation Lands has met this requirement.

Parameter	Sub-parameter Requirements for Applicants	Status of Compliance
	a. (4) Prepare a Habitat Mitigation Plan (for Infrastructure Project and Campus Community)	A Habitat Mitigation Plan was prepared by the County and submitted to the Service. The Infrastructure Project has now been subsumed into the University's proposed project for the Campus and Community North. Habitat mitigation for the Infrastructure and Community North portions of the project has been incorporated into the Conservation Strategy, Compensatory Wetland Mitigation Plan, and the 2008 BA Supplement.
	b. Develop a plan to address potential effects on kit fox, including a migration corridor to the north and northeast of the Proposed Actions, to be protected and maintained through acquisitions and other possible actions (e.g., passage over canals)	This measure was addressed in the Conservation Strategy. The Campus and University Community were reconfigured through extensive discussions with USFWS and other agencies. Maintenance of a corridor for kit fox movements was achieved as a result of this reconfiguration. Construction of a passage across the canal is proposed, as discussed in the Conservation Strategy (see **Appendix 2.0-3**).
	c. Ensure that the extent and nature of proposed conservation, and any proposed ratios, for grassland and vernal pool species will be at least equivalent to those in the BA	Land conservation for listed species remains consistent with the approach described in the BA and 2002 BA Supplement. The acreage of impacts on listed species habitat has declined as a result of the Campus reconfiguration, while the assignment of former campus lands and the Campus Land Reserve to the CNR has increased the acreage of Conservation Lands. Therefore, ratios of compensation to impact acreages, which previously exceeded minimum ratios in the 2002 BA, have been further increased. Summaries of impacts and mitigation acreages to occupied habitats and "occurrences" for listed species are presented in the Conservation Strategy and **Tables 4.4-15** of this Draft EIS/EIR.
	d. Ensure long-term funding assurances for management and monitoring of preserve lands	Funding for management and monitoring is assured through an endowment established by the University. Funding Assurances are discussed in Chapter 9 of the Management Plan for Conservation Lands.

Parameter	Sub-parameter Requirements for Applicants	Status of Compliance
	e. Avoid any direct impact on Conservancy fairy shrimp; Avoid and minimize indirect impacts to the maximum extent practicable; compensate for any unavoidable indirect impacts though preservation of approved area.	Direct impacts on Conservancy fairy shrimp have been avoided through incorporation of the entire watershed of the pool occupied by the species within the CNR, which will protected with a conservation easement and managed according to the measures described in the Management Plan for Conservation Lands. The potential for indirect impacts have been further reduced since the 2002 BO by incorporation of additional lands (the former Campus Land Reserve) adjacent to the watershed of the occupied pool into the CNR during campus reconfiguration. The Management Plan for Conservation Lands also outlines a full range of management measures to prevent unauthorized disturbance of the CNR lands, and ensure proper management for conservation values, as well as monitoring to detect and address threats of invasive species. Conservation for this species is addressed in detail in the 2002 BA and BO, Conservation Strategy, Management Plan for Conservation Lands, and in the 2008 BA Supplement.
	f. (1) Avoid and minimize effects on seven listed vernal pool plants to the maximum extent practicable through siting, design, and conservation measures	Avoidance and minimization measures implemented during Campus siting, design, and operation, and related conservation measures were previously incorporated in the 2002 BA and BA Supplement and in the 2002 BO. With the exception of the succulent owl's clover, impacts on listed vernal pool plant species were avoided during siting of the Campus and Community North. Conservation lands are protecting habitat for two species, the San Joaquin Valley Orcutt grass and Colusa grass. The project would result in loss of 28 acres of occupied habitat for the succulent owl's clover, but would protect 689 acres (a 25:1 ratio). Conservation values for listed plants are detailed in the Conservation Strategy. Measures for managing habitats for listed plants are included in the Management Plan for Conservation Lands, and in the 2008 BA Supplement.
	f. (2). Develop and implement a restoration/creation plan for vernal pools and associated habitats and other wetlands, focusing on areas where the vernal pool signature is still present or other suitable areas; include provisions for monitoring and adaptive management, and adequate financial assurances	The program outlined in the Compensatory Wetland Mitigation Plan meets these requirements.

Parameter	Sub-parameter Requirements for Applicants	Status of Compliance
3. Parameters Regarding Development and Other Discretionary Projects in the Study Area	a. Merced County will provide written assurances that all other projects in the study area will comply with the ESA	This requirement is based on the objectives and policies set forth in the UCP EIR and is the responsibility of Merced County. This requirement will be met by either expanding the Infrastructure Project Habitat Mitigation Plan to cover the Community South site or by developing project-specific habitat mitigation plans.
	b. Applicants will provide evidence that groundwater pumping and stormwater discharges will not affect Merced River and Delta species	This issue was addressed in the 2002 project BA and in the BO. Changes to the project have not altered the conclusion that the use of groundwater for the Campus and University Community will not result in impacts on the Merced River flows and Delta species. It is also addressed in this section.

2002 BO Conservation Measure Topics

- Adopted Environmental Commitments for the UC Merced Campus
- The Resource Mitigation Plan for Campus Buildout
- LRDP Biological Resource Policies and Mitigation Measures
- Compensation Measures for Phase 1.1
- Presentation of Compensation Measures for Phase 1.1 and Subsequent Development
- Campus Siting Measures
  - Siting Commitments Made for the Currently Proposed Campus Location
  - Restrictions on Campus Siting Imposed by Existing and Pending Conservation Easements
  - Campus Design Measures
- Construction Measures
- Campus Operations and Maintenance Measures
- Compensation Measures for the Proposed Actions
  - Overview of Existing Land Acquisition Program
  - Compensatory Wetland Mitigation Plan
  - Compensation Plan for Protected Species
  - Compensation Strategy for Listed Plants
  - Compensation Strategy for Conservancy Fairy Shrimp
  - Compensation Strategy for Other Protected Vernal Pool Crustaceans
  - Compensation Strategy for San Joaquin Kit Fox
- Incorporation of Adaptive Management and Monitoring into Management Plans
  - Management Strategies for University-owned Lands
  - Management Strategies for Wildlife Conservation Board (WCB) Preserve Lands
- Adopted Conservation Measures for Phase 1.1 Campus Project
  - Design Measures

  - Construction Measures
  - Operations and Maintenance Measures
- Measures to Minimize Effects of the Phase 1.1 Campus on Adjacent Habitats
- Compensation Measures for Phase 1.1
  - Conservation Measures for San Joaquin Kit Fox
  - Management of the Campus Natural Reserve and VST Remainder Property for Multiple Species
- Adopted Environmental Commitments for the Infrastructure Project
  - Habitat Mitigation Plan
- Adopted Environmental Commitments for the University Community
  - Following campus reconfiguration in 2008, the University prepared revised versions of both the BA (2008 Biological Assessment; Airola 2008b) and *Conservation Strategy* (ICF Jones & Stokes 2008) to address impacts associated with the development of the Campus and Community North.

The *2008 Supplement to the BA for the University of California, Merced Campus and University Community North* will be submitted to the USACE and USFWS in Fall 2008. An updated BO is expected to be issued for the Proposed Action.

Migratory Bird Treaty Act

The MBTA protects migratory bird species from take. *Take,* under the MBTA, is defined as the action of, or an attempt to, pursue, hunt, shoot, capture, collect, or kill (50 Code of Federal Regulations [CFR] 10.12). The definition differentiates between "intentional" take (take that is the purpose of the activity in question) and "unintentional" take (take that results from, but is not the purpose of, the activity in question).

Executive Order (EO) 13186 (signed January 10, 2001) directs each federal agency taking actions that would have or would likely have a negative impact on migratory bird populations to work with the USFWS to develop a Memorandum of Understanding (MOU) to promote the conservation of migratory bird populations. Protocols developed under the MOU must include the following agency responsibilities:

- Avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting federal agency actions.
- Restore and enhance habitat of migratory birds, as practicable.

- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

The EO is designed to assist federal agencies in their efforts to comply with the MBTA; it does not constitute any legal authorization to take migratory birds.

Numerous migratory bird species have potential to nest in the project site. Mitigation has been incorporated into this Draft EIS/EIR to avoid impacts to nesting migratory birds.

Federal Bald and Golden Eagle Protection Act

The Federal Bald and Golden Eagle Protection Act provides regulations to protect bald and golden eagles as well as their nests and eggs from willful damage or injury. The project site is within the wintering range for bald eagle and golden eagle and contains suitable foraging habitat for these species. These species have been documented foraging in the project site but do not have potential to nest on site due to the lack of suitable nesting habitat (UC Merced 2001).

Clean Water Act: Sections 401 and 404

The USACE and the EPA regulate the placement of fill into waters of the United States under CWA Section 404. "Waters of the United States" include lakes, rivers, streams and their tributaries, and wetlands. Wetlands are defined for regulatory purposes as areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3, 40 CFR 230.3).

Project proponents must obtain a permit from the USACE for all discharges of fill material into waters of the United States, including wetlands, before proceeding with a proposed project.

Development of the Campus and University Community would involve the fill of waters of the United States considered jurisdictional under Section 404 of the CWA. Consequently, on November 9, 2001, the University submitted an application to the USACE for a permit under Section 404 of the CWA to fill approximately 79.35 acres of jurisdictional waters in connection with the full development of the UC Merced Campus. On February 9, 2002, UC submitted a supplemental Section 404 permit application, and Merced County submitted a Section 404 permit application for activities associated with the infrastructure project. In December 2007 the University withdrew its previous Section 404 permit application because the University was now considering a revised location and footprint of the Campus and in February 2008. Merced County also withdrew its previous permit application in light of the more comprehensive permit application filed for Community North (below). On February 20, 2008, the

University and University Community Land Company (UCLC) submitted a Section 404 Revised Permit Application for the proposed UC Merced Campus and the northern portion of University Community. Although a Section 404 permit application has not yet been filed for the southern portion of the University Community, this EIS/EIR evaluates the entire University Community (Community North and Community South) because the development of Community South is a connected action and the entire University Community is part of the project purpose. Thus, for purposes of evaluation in this EIS/EIR, the "Proposed Action" encompasses the Campus, Community North, and Community South.

CWA Section 401 requires that applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a CWA Section 404 permit) must also comply with CWA Section 401. The project sponsors anticipate obtaining water quality certification from the Regional Water Quality Control Board (RWQCB) to comply with CWA Section 401.

Rivers and Harbors Act of 1899

The Rivers and Harbors Act prohibits the obstruction or alteration of any navigable water of the United States and requires authorization from the USACE for any excavation or deposition of materials into these waters or for any work that could affect the course, location, condition, or capacity of rivers or harbors.

Implementation of the Proposed Action would not result in construction activities in or over any navigable water, excavation from or deposition of material into such waters, or the accomplishment of any work affecting the course, location, condition, or capacity of a navigable water. Thus, development of the Proposed Action is not anticipated to require a permit from the USACE under Section 10.

Executive Order 13112: Prevention and Control of Invasive Species

EO 13112, signed February 3, 1999, directs all federal agencies to prevent and control introductions of invasive species in a cost-effective and environmentally sound manner. It established a National Invasive Species Council (NISC) composed of federal agencies and departments and a supporting Invasive Species Advisory Committee (ISAC) composed of state, local, and private entities. NISC and ISAC prepared a national invasive species management plan that recommends objectives and measures to implement the EO and to prevent the introduction and spread of invasive species (National Invasive Species Council & Invasive Species Advisory Committee 2001). The EO requires consideration of invasive species in NEPA

analyses, including their identification and distribution, their potential impacts, and measures to prevent or eradicate them.

As part of the environmental commitments that the University has incorporated into the Proposed Action, the University has committed to discourage the introduction, establishment, and spread of invasive species as summarized below in the *2008 UC Merced Conservation Strategy* summary under Strategy 2 and further detailed in the Conservation Strategy and the Management Plan for Conservation Lands (see **Appendices 2.0-3** and **2.0-1**, respectively).

4.4.3.2 State Laws and Regulations

California Endangered Species Act

The California Endangered Species Act (CESA) (California Fish and Game Code Section 2050 et seq.) establishes state policy to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that state agencies should not approve projects that jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. For projects that would affect a species that is both federally and state-listed, compliance with ESA satisfies CESA if the California Department of Fish and Game (CDFG) determines that the federal incidental take authorization is consistent with CESA under California Fish and Game Code Section 2080.1. CDFG administers CESA and authorizes take through Section 2081 agreements (except for species designated as fully protected).

Development of the Proposed Action could result in direct and indirect effects to state-listed species including succulent owl's clover, Swainson's hawk, and San Joaquin kit fox, and their associated habitats. The University would be required to consult with CDFG regarding the Proposed Action's effects on species listed as threatened or endangered, or proposed for listing as threatened or endangered under CESA. The University would either be required to obtain a 2081 take permit from CDFG prior to conducting activities that result in the potential take of state-listed species (i.e., mortality) or a consistency determination in accordance with CDFG Code Section 2080.1.

California Fish and Game Code

Streambed Alteration Agreements (Section 1602 et seq.)

Under Section 1602 of the CDFG Code, agencies are required to notify CDFG before implementing any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental review

process. When an existing fish or wildlife resource may be substantially adversely affected, CDFG is required to propose reasonable changes to the project to protect the resources. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project.

Development of the Proposed Action may require a 1602 streambed alteration agreement from CDFG for authorization based on the current proposed plan.

Unlawful Destruction of Nests or Eggs and Birds-of-Prey or their Eggs (Sections 3503 and 3503.5)

Under these sections of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, or to take, possess, or destroy any birds of prey or their nest or eggs. Numerous birds-of-prey have potential to nest within the project site. Mitigation measures incorporated into this EIS/EIR under Impact BIO-9 ensure that active bird-of-prey nests will not be disturbed by the Proposed Action.

California Fully Protected Species

The California Fish and Game Code provides protection from take for a variety of species, referred to as "fully protected species." Section 5050 lists fully protected amphibians and reptiles; Section 3515 lists fully protected fish; Section 3511 lists fully protected birds; and Section 4700 lists fully protected mammals. The California Fish and Game Code defines "take" as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Except for take related to scientific research, all take of fully protected species is prohibited. Three fully protected bird species, bald eagle, golden eagle, and white-tailed kite, have potential to forage in the project site. White-tailed kite also has potential to nest along drainages on the project site.

California Native Plant Protection Act

The California Native Plant Protection Act (CNPPA) preserves, protects and enhances endangered native plants in California. The act gave the California Fish and Game Commission the power to designate native plants as endangered, threatened, or rare, and to require permits for collecting, transporting, or selling such plants. Three special-status plant species afforded protection under the CNPPA are known to occur within the project site .

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act authorizes the State Water Resources Control Board (SWRCB) to regulate state water quality and protect beneficial uses. As noted above, the SWRCB certifies

that activities subject to CWA Section 404 permits. The project sponsors anticipate obtaining a Section 401 water quality certification for their federal wetlands permit.

4.4.3.3 Local Laws, Regulations, Plans, and Policies

The Proposed Action consists of the development of the Campus and the University Community. The University is constitutionally exempt from local land use laws and regulations under Article IX, Section 9 of the California Constitution. This exemption applies to all city and county general plans, as well as community plans and zoning regulations. However, the University has and will continue to work cooperatively with adjacent local communities to pursue cooperative planning, land use compatibility and consistency with local plans and policies, whenever feasible. Thus, the campus has voluntarily reviewed municipal plans for general consistency with the LRDP.

The University Community lands are privately owned and are subject to local laws, regulations, and policies. This section summarizes relevant policies contained in the UC Merced 2009 LRDP, University Community Plan (UCP), and County regulations related to biological resources.

UC Merced 2009 LRDP

The following are applicable policies of the 2009 LRDP related to conservation and/or protection of biological resources. These policies will be implemented as appropriate during the development of the Campus.

SUST-1: Adhere to principles of sustainable environmental stewardship, conservation and habitat protection in the planning, design and construction of the campus and individual projects, adopting an approach of continuous improvement in the sustainability of campus development, operations and management.

SUST-10: Design campus landscaping to emphasize regional natives, avoid invasive or allergenic species, and select plantings that are compatible with campus infrastructure, developing a palette of approved plant, ground cover and tree lists, as well as landscape design guidelines.

ENV-9: Develop and maintain an open space system in and around the periphery of the developed portions of the campus that will protect the campus from natural hazards, such as fire or flood, will respect natural resources, and will provide a natural amenity.

ENV-11: Use roads and trails buffers to separate campus buildings and activity centers from adjacent vernal pool grasslands.

ENV-12: Implement conservation measures in the 2009 UC Merced Conservation Strategy for fragile resources such as grasslands and vernal pools.

ENV-13: To the extent possible, work towards percolation of precipitation into groundwater by the use of the Low Impact Development (LID), or equally effective measures, such as clustering of structures, bioretention areas, planted swales and permeable pavement where appropriate.

University Community Plan

The following UCP plant and animal resource policies respond to the presence of valuable and legally protected species and habitats within and near the University Community. The following policies provide guidance to ensure that future development within the University Community area supports the County's commitment to resource conservation through avoidance, minimization, compensatory mitigation, and sensitive design of open spaces and edges of the University Community.

PA 1.1 Ensure that direct and indirect effects to wetland habitats are minimized through the promotion of environmentally sensitive project siting and design, to the maximum extent practicable.

PA 1.2 Obtain the appropriate regulatory approvals prior to the initiation of project construction.

PA 1.3 Ensure protection of on site avoided, created, or restored permanent wetlands.

PA 1.4 Ensure the protection of off-site adjacent wetland habitats, including those with hydrological connections to off-site wetland resources, through the implementation of measures that will protect the quality and quantity of source waters and will avoid disturbance of wetland habitats by human activity including domestic pets.

PA 1.5 Require monitoring, cleanup and maintenance of preserved wetland habitats within and adjacent to the University Community, as necessary.

PA 1.6 Ensure the development of a habitat mitigation plan, acceptable to the USACE, USFWS, and CDFG, that achieves no net loss of wetland function and values by

meeting established ratios for wetland enhancement/restoration and on- and off-site compensation for the loss of wetland functions and values within the Community Plan.

PA 2.1 Minimize effects to annual grasslands to the maximum extent feasible through the promotion of environmentally sensitive project siting and design.

PA 2.3 Ensure the development of a habitat mitigation plan to provide off-site compensation for the loss of annual grassland functions within the University Community that is acceptable to the USFWS, CDFG and other relevant agencies.

PA 3.2 Utilize native vegetation in local landscaping to the maximum extent feasible.

PA 3.3 Create open water park features, where feasible, to provide resting areas for migrating waterfowl and shorebirds.

PA 3.4 Ensure the protection of wildlife through establishment of programs to control feral pet populations.

PA 3.5 Provide public environmental educational programs to inform the public about the natural resources of the region, including information about cohabitation with wildlife populations that are common in urban areas.

Merced County General Plan

The Open Space/Conservation Element of the Merced County General Plan contains goals, objectives, and policies pertaining to plant and animal resources of Merced County. Those goals, objectives, and policies that are relevant to the UCP area are presented below.

Goal 1 Habitats which support rare, endangered or threatened species are not substantially degraded.

Objective 1A Rare and endangered species are protected from urban development and are recognized in rural areas.

Policies:

1. Recognize as significant wetland habitats those which meet the definition of having a high wetland habitat value based on Adamus methodology and based on the Corps delineation method.

2. Continue to regulate the location, density and design of development to minimize adverse impacts and encourage enhancement of rare and endangered species habitats.

3. The redesignation of land from rural to an urban designation should occur in careful consideration of the potential impact on significant habitats and conformance with the Open Space Action Plan.

4. Urban designated areas should not include identified threatened species habitat areas unless specific provisions are made for their protection.

Implementation

Where sensitive habitat areas are threatened by urban development or other activities, the County may use area plans in order to address resource, open space, land use, circulation, infrastructure, or conservation issues.

5. Urban uses, which could result in significant loss of sensitive habitat, should be directed to less sensitive wetland, wildlife, and vegetation habitat areas if possible.

7. In wetland areas, all public utilities and facilities, such as roads, sewage disposal ponds and gas, electrical and water systems, should be located and constructed to minimize or avoid significant loss of wetland resources.

8. Development approval adjacent to rare and endangered species habitat or within identified significant wetland should include mechanisms to ensure adequate on-going protection and monitoring occurs.

9. Significant aquatic and waterfowl habitats should be protected against excessive water withdrawals which would endanger or interrupt normal migratory patterns.

The Merced County General Plan also contains an Open Space Action Plan (OSAP, referred to in Policy 3, above). The OSAP contains a series of Sensitive Resource Mitigation Principles that "define goals for sensitive wetland, wildlife and vegetation resource mitigation measures and how to select appropriate measures for individual projects and to provide guidelines for successful implementation of those measures." The Principles outline the following goals for wildlife mitigation.

1. A central goal of wildlife mitigation in the County will be to pursue a consistent, fair, and cost effective approach to wildlife mitigation that provides the greatest protection for the most sensitive resources.

2. Goals for significant wildlife areas will be to:

    - provide possible protection for designated significant habitat areas and to maintain or enhance their present value for wildlife;

- in rare and endangered habitat areas, to avoid impacts to the extent possible, minimize or compensate for avoidable significant impacts and encourage voluntary efforts to enhance such areas for wildlife;
- to the extent feasible, to channel future development to less sensitive habitat areas if consistent with other policies of the County;
- improvement of the same habitats as those lost, but at an appropriate site elsewhere (in-kind, off site); and
- improvement of alternative habitat types on or adjacent to the project site (in-kind, on-site).

3. In preserving or restoring a sensitive habitat to benefit a particular species, it must be recognized that some departures from historic conditions may be necessary - but such departures should be minimized.
4. In selecting a mitigation option, priority should usually be given to improving or replicating natural ecosystem natural ecosystems rather than artificial ones.
5. The range of mitigation options will depend on the parcel size involved.
6. Mitigation options may be limited by the intensity of development on a parcel.

In addition to the above-described principles, the OSAP also contains recognition of the need for long-term monitoring to measure the effectiveness of various approaches to mitigation for plant and animal resources and sensitive habitats.

4.4.3.4 Environmental Commitments included in the Proposed Action

In conjunction with the processing of the Section 404 permit application submitted by UC Merced and the County in 2002, in February 2002, the USACE requested formal consultation with USFWS under Section 7 of the ESA. USFWS completed consultation in August 2002 with the issuance of the 2002 BO. For the full text of the 2002 BO, see **Appendix 2.0-2**. In its 2002 BO, USFWS concluded that, contingent upon implementation of and compliance with all the Conservation Measures and Parameters set forth in the BO, the UC Merced project would not result in jeopardy to federally listed threatened and endangered species (US Fish and Wildlife Service 2002). The University has committed to implement these Conservation Measures and Parameters set forth in the BO to reduce the potential for impacts primarily to biological resources on and adjacent to the project site. As these conservation measures are existing commitments and therefore constitute a part of the Proposed Action, they are described below, and the Proposed Action as offset by these measures is evaluated in this EIS/EIR. Note that the 2002 BO and its mitigation requirements apply to the entire project site (both the Campus and University Community).

2008 UC Merced Conservation Strategy

The full text of *Conservation Strategy* is included in **Appendix 2.0-3** and is summarized both in **Section 2.0, Project Description** and below. The purpose of the *Conservation Strategy* is to outline the strategies and conservation measures that UC Merced has developed for the purposes of complying with the 2002 BO Conservation Measures and Parameters. Specifically, these strategies and conservation measures represent the environmental commitments that the University has incorporated into the Proposed Action for the conservation of San Joaquin kit fox, vernal pool plants and invertebrates, and other protected species in the project region. Specifically, BO Parameter 1 addresses the requirement to prepare a conservation strategy for the Proposed Action. The following is a list of the strategies (organized by resource) contained within the *Conservation Strategy* and their status of implementation. See Chapter 5 of the *Conservation Strategy* in **Appendix 2.0-3** for the complete discussion of these strategies.

Conservation Strategies for All Species

Strategy 1: Avoid and Minimize Losses of Habitats Supporting Target Species

The University has emphasized avoidance and minimization of loss of habitats supporting the target species as part of the project design process. Project boundaries have been redesigned several times to reduce impacts to sensitive biological resources. For example, during the initial redesign of the project from the 2002 project design, the campus footprint was moved to entirely avoid the watershed of the vernal pool occupied by Conservancy fairy shrimp and to maintain a 250-foot setback from this watershed. Additionally, during the 2008 Campus and Community reconfiguration, the northern boundary of the campus site was shifted southeast to reduce effects on the clay playa east of Lake Yosemite which is considered by EPA to be an "Aquatic Resource of National Importance", and the entire footprint of the Proposed Action was minimized to allow for a more compact full-buildout footprint that would minimize fragmentation of habitat. As part of the redesign, the CLR was redesignated as part of the Conservation Lands to further protect the watershed of the Conservancy fairy shrimp. The eastern boundary of the University Community was also redesigned to minimize impacts to the vernal pool tadpole shrimp and to avoid impacts to a population of the San Joaquin Valley Orcutt grass.

Strategy 2: Incorporate Site-Specific Measures into Development Projects

The University has committed to avoidance and minimization measures to be implemented during the design, construction, and O&M (operation and maintenance) stages of the project. These measures are also described in detail in the *Resource Mitigation Plan for Federally Listed Species that May be Affected by the Establishment of the University of California, Merced* (Jones & Stokes 2002a), which was prepared in conjunction with the 2002 Supplemental BA (Jones & Stokes 2002b), and were incorporated into the

successfully implemented Phase 1.1 Campus Construction Mitigation Plan (Jones & Stokes 2002c). The full text of *Resource Mitigation Plan (RMP)* is included in **Appendix 2.0-5**. These measures include the following elements.

Construction Measures

- Incorporate species protection obligations into construction contracts.
- Conduct environmental sensitivity training.
- Implement best management practices (BMPs).
- Implement preconstruction surveys and avoidance and minimization measures to minimize take of species.
- Fence project boundaries and sensitive resources.
- Discourage introduction and establishment of invasive species.
- Conduct Environmental Monitoring when necessary.

Operations and Maintenance Measures

- Reduce human disturbance.
- Reduce disturbance caused by pets.
- Discourage or limit the spread of invasive species.
- Reduce effects of herbicides, pesticides, and rodenticides.
- Minimize habitat for predators and competitors of target species.

To ensure project consistency with the construction measures described above, the University is preparing and will implement a Construction Mitigation Plan that will be approved by USFWS, the USACE, and CDFG. This plan will describe all avoidance and minimization measures that will be incorporated during construction, as well as the protocols for monitoring implementation of those measures.

To ensure the project's consistency with the O&M measures described above, measures approved by USFWS, the USACE, and CDFG will be incorporated into the various elements of the overall campus facilities management program (e.g., work program descriptions, training programs) and implemented. Additionally, a number of these measures have also been incorporated as protection and management measures into the *Management Plan for Conservation Lands* (**Appendix 2.0-1**) (Airola 2008a). The University

Environmental Manager will be responsible for ensuring that these requirements are integrated into the Campus O&M program.

Strategy 3: Protect and Manage Large Contiguous Areas in the Project Region

Conservation Lands acquired to date encompass a substantial portion of habitat in the project region, and additional land is under compatible land use policy. A total of 6,337 acres of lands (CNR and VST lands) have been acquired in fee title by the University and dedicated to conservation management. An additional 97 acres at the Myers Easterly property, owned by the UCLC, will be managed as Conservation Lands by the University and are protected by a conservation easement. The CST property was purchased for mitigation purposes by the WCB and is owned and managed by The Nature Conservancy (TNC). Finally, the University has, in cooperation with the WCB, TNC, and California Rangeland Trust (CRT), conserved over 17,000 acres through the acquisition of conservation easements. In total, conservation easements and fee title acquisitions have secured over 26,000 acres. With one exception (the Carlson property), Conservation Lands parcels acquired to date are greater than 1,000 contiguous acres; most are contiguous with other conservation lands and are bordered by compatible land uses (see *Conservation Strategy* Figure 1-4 of the **Appendix 2.0-3**). Most other grasslands with vernal wetlands in the project region are located on land designated as Foothill Pasture in the Merced County General Plan (Merced County 1990) and zoned Exclusive Agricultural; conversion of these lands to developed land uses would require formal approval by the County.

Strategy 4: Secure Conservation Easements that Provide for Effective Management

As noted above, UC Merced, in cooperation with the WCB, TNC, and CRT has secured over 17,000 acres in conservation easements. The easements restrict incompatible uses and allow for monitoring of compliance with the terms of the easement.

Strategy 5: Develop and Implement Management Plans for Conserved Lands

For conservation easements acquired in connection with the UC Merced project, the University has committed to working with the easement holders and landowners regarding land management practices consistent with the *Conservation Strategy.* A management plan consistent with the requirements outlined in the *RMP* (Jones & Stokes 2002), the project BA (EIP 2002a), and the supplemental BA (Jones & Stokes 2002a) has been developed for Conservation Lands acquired in fee title by the University. This *Management Plan for Conservation Lands* supports the San Joaquin kit fox recovery plan (US Fish and Wildlife Service 1998) criteria of approving and implementing management plans for recovery areas. It will also contribute to the recovery actions identified in the vernal pool recovery plan (US Fish and

Wildlife Service 2005) by managing, restoring, and monitoring a large area of vernal pool grassland habitat for the recovery of vernal pool species.

Strategy 6: Develop and Implement Adaptive Management Measures to Attain Measurable Objectives

UC Merced has developed adaptive management measures that are incorporated into the RMP (Jones & Stokes 2002) and the *Management Plan for Conservation Lands* (Airola 2008) for UC managed conservation lands that include goals, objectives, management guidelines, and monitoring and funding provisions.

Strategy 7: Develop and Implement a Monitoring Program Sufficient to Support Adaptive Management

A monitoring program is incorporated into the *Management Plan for Conservation Lands* (Airola 2008). The program addresses both compliance and effectiveness of conservation management, and focuses on monitoring grazing management, invasive species, and quality of habitat for conservation species. A more specific monitoring protocol will be developed to direct monitoring program implementation.

Strategy 8: Incorporate Studies to Address Key Uncertainties into Adaptive Management

The University, as a research and teaching institution, has conducted research and monitoring to reduce uncertainties affecting management, and has committed to conducting additional research and monitoring to reduce such uncertainties. For example, during 2003, the University conducted additional surveys to reduce uncertainties regarding the distribution of succulent owl's-clover; these surveys detected large numbers of new occurrences of this species, information that was incorporated project effects analysis and management planning. Also, during Phase 1.1 Campus construction, the University monitored adjacent vernal pools to reduce uncertainty regarding construction effects on water quality in pools. The University's management commitments for the Conservation Lands include monitoring studies addressing nonnative species, hydrologic disruption, and effectiveness of measures to prevent disruption of ecosystem functions. The University's commitments include regular monitoring of grazing intensity and habitat conditions useful in evaluating effects of grazing on vernal pool species. The results of these studies could contribute to the recovery of vernal pool species and San Joaquin kit fox by providing much needed information on these species and their habitat needs and responses to management practices in the project region.

Strategies Specific to San Joaquin Kit Fox

Strategy 9: Manage a Corridor across the Project Region to Allow the Potential for Continuous Residence and Dispersal of San Joaquin Kit Fox

Although the Proposed Action would convert approximately 2,444 acres of kit fox habitat in eastern Merced County to urban uses, implementation of the Proposed Action will result in conservation of over 26,000 acres of natural lands, the majority of which are suitable for kit fox residence and dispersal. These acquisitions contribute to the Upland Species Recovery Plan objective to conserve 90 percent of existing natural lands along the northeastern valley edge from San Joaquin to Madera Counties (US Fish and Wildlife Service 1998) and to the recovery plan's objective to establish a corridor that maintains the potential for dispersal from valley floor habitats to and along the project region (i.e., the Sandy Mush Road Corridor) (US Fish and Wildlife Service 1998).

The 2008 campus reconfiguration specifically responded to concerns regarding the ability of kit foxes to disperse around the northeast side of the campus. The University responded to this concern by shifting the campus to the south and moving the easternmost boundary to the west to widen the area of potential kit fox movement. Finally, the University continues to commit to construct a crossing of the Le Grand Canal to facilitate movement of the kit fox in the area east of the University Community. In the 2008 BA Supplement, the University has identified candidate sites for construction of the crossing for discussion with the USFWS and other agencies.

Strategies Specific to Vernal Pool Grasslands and Associated Special-Status Species

Strategy 10: Represent all Geomorphic Surfaces and Habitats Occupied by Target Species on These Surfaces

Conservation Lands acquired in connection with the project support vernal pools, swales, and clay playas on all of the major geomorphic surfaces supporting these wetlands in the project region (see Table 3-3 of *Conservation Strategy* in **Appendix 2.0-3**). In total, the Conservation Lands support from less than 1 percent to more than 40 percent of these wetlands on each type of geomorphic surface (Appendix C of *Conservation Strategy* in **Appendix 2.0-3**). These Conservation Lands also support substantial areas of habitat occupied by succulent owl's clover, vernal pool fairy shrimp, and California tiger salamander across the range of physical habitats (Table 3-7 and Appendix C of *Conservation Strategy* in **Appendix 2.0-3**). They also support habitat occupied by Colusa grass, San Joaquin Valley Orcutt grass, Conservancy fairy shrimp, midvalley fairy shrimp, and vernal pool tadpole shrimp—but on a more limited set of geomorphic surfaces, partly because these species are more limited in their distributions.

Strategy 11: Sustain Populations of the Rarer and More Specialized Target Species at Occupied Sites

Implementation of the Proposed Action would not adversely affect the five rarer (Hoover's spurge, San Joaquin Valley Orcutt grass, hairy Orcutt grass, Greene's tuctoria, and Conservancy fairy shrimp), more specialized species because they are not located on or near the project site.

The University is implementing this strategy by avoiding and minimizing effects of the Campus and Community North on populations of these species and by acquiring, protecting, and managing Conservation Lands containing wetland habitats occupied by San Joaquin Valley Orcutt grass, Conservancy fairy shrimp, and Colusa grass.

In reconfiguring the Campus and University Community, the University was unable to completely avoid all populations of succulent owl's clover. As documented in the 2008 BA Supplement (Airola 2008), the reconfiguration of the project, however, reduced the extent of impacts to occupied habitat of the succulent owl's clover from 54 to 25 acres. A total of 689 acres of occupied habitat (51 percent of the known total habitat in the region) is protected within the Conservation Lands, thereby achieving a 27.56 mitigation ratio for the species.

Colusa grass also has been found to be relatively abundant regionally, with at least 27 known occurrences in the project region and 282 acres of known occupied habitat. All known populations of Colusa grass were avoided by the reconfigured Campus and University Community, while 156 acres of occupied habitat (55 percent of the known regional occupied habitat) are protected within Conservation Lands. Therefore, even if one or several populations of Colusa grass are discovered later within project lands, adequate mitigation is available through protection and conservation management.

The remaining five rarer vernal pool species are not known to occur within the lands intended for development of the Campus or University Community. The Conservation Lands support 10 percent of the documented occupied habitat for San Joaquin Valley Orcutt grass in the project region and 13 percent of the documented occupied habitat for Conservancy fairy shrimp in the region (Table 3-6 of *Conservation Strategy* in **Appendix 2.0-3**). It is possible that additional undetected populations of these species may occur on Conservation Lands.

Management and monitoring actions for Conservation Lands in the *Management Plan for Conservation Lands* give particular attention to populations of the San Joaquin Valley Orcutt grass, Colusa grass, and Conservancy fairy shrimp (Airola 2008a).

Strategy 12: Compensate for Losses of Wetlands and Target Species with Comparable Habitat that Contributes to Land Conservation Strategies

As part of satisfying Strategy 12 and other requirements, the University has prepared a *Resource Mitigation Plan* for the Campus (Jones & Stokes 2002), and the County prepared a habitat mitigation plan (HMP) for the former infrastructure project (EIP 2002). These mitigation plans have been prepared with USFWS and CDFG involvement and incorporate the BO Conservation Measures approved by USFWS and the USACE. The County HMP serves as an example of the habitat mitigation plans that will be required for future individual development projects proposed within the UCP area.

The University has prepared and submitted to USFWS, CDFG, and the USACE for their review and approval a detailed *Compensatory Wetland Mitigation and Monitoring Plan* (CWMMP) (Gibson & Skordal 2008) for on-site and off-site wetland preservation, enhancement, and restoration efforts. The full text of the CWMMP is presented in **Appendix 2.0-4**. The goal of the CWMMP is to ensure that the project will result in no net loss of wetland functions and to ensure that take and other effects on listed species dependent on these habitats are fully offset. It is based on a holistic watershed-level approach involving a wide range of aquatic habitats and their surrounding upland environments. The CWMMP includes measures to meet the following objectives.

- Ensure that UC Merced will preserve a minimum of 10 acres of vernal pool grassland for each acre of vernal pool grassland developed or filled.
- Evaluate and incorporate existing easement protections and other enhancement activities on preserved lands as needed to achieve the requirement for no net loss of wetland functions.
- Restore wetlands by reestablishing or enhancing areas where the vernal pool signature is still present, to achieve a minimum acreage ratio of 1:1 replacement for vernal pools and other seasonal wetlands that would be filled by the project. If the 1:1 replacement ratio cannot be met through restoration of degraded seasonal wetland habitats, meet the ratio through creation of such habitats in other suitable areas.

In accordance with the conservation requirements specified in the CWMMP, the University will subsequently prepare a Wetland Restoration/Creation Site Design Plan for each conservation site; each plan will include a wetland delineation, and any necessary permits under CWA Section 404 will be applied for and received prior to the initiation of work.

The Conservation Lands acquired to date contain habitats that are comparable to those that would be affected by buildout of the UC Merced project, contribute to land conservation goals, and meet or exceed required mitigation ratios. For target species, the mitigation acreage ratios that exceed the typically required 3:1 ratio are consistent with Parameter 2c of the BO (US Fish and Wildlife Service 2002). The

project site does not include lands designated as critical habitat for vernal pool species but does contain 178 acres of California tiger salamander critical habitat. Critical habitat for vernal pool species and California tiger salamander is located within Conservation Lands.

Strategies for Other Sensitive Habitats and Special-Status Species

Strategy 13: Conserve Habitat Essential to the Survival and Preservation of Other Special-Status Species

Conservation Lands acquired in connection with the UC Merced project encompass a substantial portion of sensitive habitats in the project region. A total of 6,428 acres of lands (CNR, Myers Easterly, and VST) have been acquired in fee title by UC Merced or UCLC and have been dedicated to conservation management. These lands, in concert with CST and the Tier 2 properties, have conserved a total of over 26,000 acres, or more than one-eighth of the remaining unconverted land in the project region.

4.4.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

Council on Environmental Quality (CEQ) guidance for evaluating the types and significance of impacts under NEPA is summarized in **Section 4.0, Affected Environment and Environmental Consequences.** For purposes of this analysis, this EIS/EIR conservatively uses significance criteria derived from Appendix G of the *State CEQA Guidelines* and the CEQ guidance regarding the determination of environmental consequences to identify impacts. For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. To determine the significance of impacts to biological resources, the USACE takes into consideration potential effects on wetlands and aquatic resources and water quality in accordance with the Clean Water Act, threatened and endangered species and their habitats, including critical habitat, under the federal Endangered Species Act, and other natural resources based on the criteria indicated below. For the purpose of this Draft EIS/EIR, impacts related to biological resources would be significant if implementation of the Proposed Action or its alternatives would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species (defined under **Subsection 4.4.2.2** above) in local or regional plans, policies, or regulations, or by the CDFG or USFWS;

  For purposes of this EIS/EIR, an impact on special status species would be a substantial adverse effect if the Proposed Action resulted in the reduction in numbers of individuals or in the reduction of occupied habitat by plant species listed as rare, threatened, or endangered or those plant species that meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code and are eligible for state listing (CNPS List 1 species) (occupied habitat is defined for this analysis as habitat suitable for the growth and reproduction of a species and that contains plants and/or a seed bank of that species).

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFG or USFWS;

- Have a substantial adverse effect on wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

  For purposes of this EIS/EIR, the impact on wetlands would be a substantial adverse effect if the Proposed Action resulted in the net loss of wetland area or function through direct removal, filling, hydrological interruption, or other means.

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

All of these significance criteria are addressed in the analysis below. Note that effect on wildlife movement is addressed in Impact BIO-10 which evaluates the Proposed Action's effects on San Joaquin kit fox dispersal, and effects on nursery sites is addressed in Impact BIO-9 which evaluates the Proposed Action's effects on nesting birds.

Issues Not Discussed Further

The Proposed Action would not result in an impact related to conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan because no habitat conservation plans or natural community conservation plans have been adopted that encompass the project area. The Proposed Action's consistency with the Upland Species Recovery Plan for San Joaquin kit fox is discussed under Impact BIO-10. This issue is not discussed further in this section.

The potential for the Proposed Action to interfere with the movement of wildlife species or with established native resident or migratory wildlife corridors is discussed with respect to San Joaquin kit fox under Impact BIO-10. The Proposed Action's potential to impede the use of native wildlife nursery sites are discussed with respect to vernal pool invertebrates, California tiger salamander, western pond turtle, Swainson's hawk, other migratory birds and raptors, and San Joaquin kit fox under Impacts BIO-4 through -6, and -9 and -10. The Proposed Action would not result in an impact related to movement of native resident or migratory fish and therefore this issue is not discussed further.

The Proposed Action would not result in an impact related to a conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. The Proposed Action will be in compliance with the UCP biological resources policies, listed under **Subsection 4.4.3**. Therefore, this issue is not discussed further.

As described in **Section 2.0, Project Description**, a proposed high voltage transmission line would be installed to provide electricity to the Campus and University Community in the long run. This power line would be aligned along one of three alternate routes to terminate at a location near Lake Road within Community North. The power line could be aligned along Yosemite Avenue or Cardella Road and then along the future Campus Parkway or would be aligned along the future Campus Parkway from its connection point at the existing power line up through the project site (see **Figure 2.0-6)**. The installation of power lines would occur within existing right-of-way within Yosemite Avenue, Cardella Road, or the future Campus Parkway. Therefore, off-site improvements associated with the project would not impact biological resources. Therefore, this issue is not discussed further.

4.4.5 METHODOLOGY FOR EVALUATING EFFECTS

As discussed earlier in this section, in the 2002 BO, the USFWS required that a specified set of Parameters and Conservation Measures be incorporated into the Proposed Action in order avoid Jeopardy to listed species. Incorporation of these Parameters and Conservation Measures into the University's proposed project has resulted in the acquisition of over 26,600 acres of Conservation Lands (see **Table 4.4-10, Conservation Lands [Units and Sizes]**) and the preparation of numerous conservation/mitigation plans that detail the University's environmental commitments. These plans include *UC Merced Conservation Strategy*, *Management Plan for Conservation Lands*, CWMMP, RMP, and the 2002 LRDP EIR. The impacts from the development of the Campus and Community North as avoided or minimized by these environmental commitments are evaluated below.

The 2002 BO established a series of conservation measures (or parameters) intended by the USFWS to apply any configuration of the Campus and Community proposed within the study area defined in the 2002 BO. Accordingly, these parameters—which are built into and reflected in the Conservation Strategy—will be incorporated by the USFWS into any biological opinion issued for the Campus and Community North and, when a 404 permit application is filed for Community South, any BO issued relative to Community South. Moreover, the County has adopted a set of conservation/mitigation measures for the Community South portion of the Proposed Action, which are contained in the University Community Plan biological resource policies (which are general in nature) and the 2004 UCP EIR mitigation measures. When Community South is proposed for development, the landowner will be required to prepare a more

detailed habitat mitigation plan consistent with all of the above measures and detailing its conservation commitments for Community South.

Table 4.4-10
Conservation Lands (Units and Sizes)

Major Land Category	Land Unit	Size (Acres)	Owner	Easement Holder
Tier 1a	Virginia Smith Trust (VST) Preserve	5,030	UC	The Nature Conservancy (TNC)
	Campus Natural Reserve (CNR)	1,307	UC	Not yet conveyed
	Myers Easterly	97	UCLC	TNC
Tier 1b	Cyril Smith Trust	3,070	TNC	Not yet conveyed
Tier 1 Subtotal		**9,504**		
Tier 2	Carlson	305	Private	California Rangeland Trust (CRT)
	Chance	7,619	Private	TNC
	Cunningham	1,761	Private	CRT
	Nelson	3,861	Private	CRT
	Robinson	3,595	Private	TNC
Tier 2 Subtotal		**17,141**		
Total: All Conservation Lands		**26,645**		

Within this biological resources section, impacts analyses pertaining to critical habitat and special-status animal species are provided in a combined discussion for the Campus and Community North portion of the Proposed Action. A separate discussion is presented for the Community South portion of the Proposed Action. Pursuant to the environmental commitments presented above, the Conservation Lands have been incorporated into the University's proposed project and reduce the combined impacts of the Campus and Community North sites. Because similar environmental commitments have yet to be developed for Community South. Accordingly, the impacts from the development of Community South are evaluated separately. A conclusion for the Proposed Action as a whole is provided for each impact analysis.

Because the requirements of the 2002 BO would not only apply to the Proposed Action but also to all other alternatives within the study area defined in the 2002 BO (which is all of eastern Merced County),

the University would be required to implement the conservation strategy for all alternatives included in this Draft EIS/EIR. Therefore, for purposes of analysis, it is assumed that similar to the Proposed Action, the environmental commitments included in the *Conservation Strategy* would be a part of all of the alternatives, and the alternatives as offset by the *Conservation Strategy* measures are evaluated in this section. It should be noted however that some mitigation features specifically associated with the Proposed Action (e.g., a Campus Natural Reserve) wouldn't apply to the other alternatives.

This impact analysis assumes full buildout of the project or alternative site resulting in loss of all habitats located within the boundaries of the site, although some habitat will be maintained and created in drainages retained for storm drainage. Site-specific information gathered during comprehensive field surveys (see **Table 4.4-1**) was used to quantify impacts. The mitigation measures described for potential impacts on sensitive biological resources were developed through extensive coordination with resource agencies.

4.4.5.1 Impact Assumptions

Construction activities associated with the Proposed Action or its alternatives could result in temporary or permanent direct impacts on biological resources in construction areas and indirect impacts on biological resources located adjacent to construction areas. In assessing the magnitude of possible effects, the following assumptions were made regarding construction-related impacts on biological resources.

- Land cover types were used in this document primarily as a means for describing wildlife and plant habitats within the project site. Land cover type acreages were based on the total area contained within the project site boundaries and do not include the canals or the 150-foot wide canal easements. Because future University projects, such as canal maintenance, may affect wetlands within the canal easements, the University proposes to preemptively offset potential wetland impacts within the canal easements through implementation of the CWMMP. For this reason, direct impact acreages for canal wetlands and irrigation wetlands are greater than the sum total of the seasonal wetlands and seasonal freshwater marsh cover types mapped on the project site.

- With respect to terrestrial land cover acreages, impacts to annual grassland, irrigated pasture, and row and field crops directly equate to avian foraging habitat losses. However, in the case of San Joaquin kit fox, the classification of habitats, which was later used to determine kit fox habitat losses, was based primarily on land cover type, but also took into account the suitability of adjacent land cover types. Therefore, annual grassland and irrigated pasture land cover acreages within the project site do not equate to total habitat losses for kit fox.

- Consistent with the *Conservation Strategy*, all suitable habitat within 200 meters of known occupied habitat of a listed species was considered suitable habitat (ICF Jones & Stokes 2008).

- Occupied habitat for listed vernal pool-dependent wildlife species (vernal pool invertebrates and California tiger salamander) was determined based on varying biological factors described in the *Conservation Strategy* in **Appendix 2.0-3**. Based on these varying factors, all lands within 1.3 miles of

known breeding locations for the California tiger salamander were considered occupied habitat. For vernal pool invertebrates, all suitable wetland features occurring (either wholly or partially) within 656 feet around a recorded species observation were considered to be occupied habitat.

- Suitable denning and dispersal habitat for San Joaquin kit fox habitat identified within the project site is assumed to be unoccupied due to the lack of recent occurrences within the project site and vicinity. For determination of indirect impacts to biological resources, different assumptions were used for assessing impacts on different biological resources. For example, the wetlands functional assessment assumed that some degree of indirect impacts would extend up to 1,640 feet from the project site. See CWMMP in **Appendix 2.0-4** for detailed explanation of methodology used. For vernal pool invertebrates and amphibians, habitats located within 250 feet of the project boundary were considered to be indirectly impacted. For San Joaquin kit fox, habitat within 656 feet of the Project boundary was considered to be indirectly impacted (degraded) by the project. A detailed explanation of the methodology used for determining indirect impacts to vernal pool invertebrates and San Joaquin kit fox are explained further in *Conservation Strategy* found in **Appendix 2.0-3**.

- All construction activities, including staging areas and access roads, would occur within the project boundaries. If any staging areas are identified outside this area, they will be located within previously graded, paved, or otherwise disturbed areas that do not support any sensitive biological resources. Off-site staging areas would need to be evaluated and approved by a qualified biological monitor prior to the contractor's use of the site; this includes any soils deposition sites that may be needed during construction.

- All impacts to land cover types and delineated wetland types associated with the Proposed Action were determined using the most current project boundary information provided by the University.

- Direct impacts to habitats and associated species are assumed to result from the conversion of current suitable land cover types within the project site to non-suitable types (development and associated landscaped lands). For wetland habitats fill provides the mechanism for this direct impact. Indirect impacts to habitats and associated species are assumed to occur on adjacent lands as a result of project construction and the operations and maintenance (O&M) activities. The mechanisms assumed responsible for indirect impacts include altered hydrology, pollutant runoff, pesticide runoff or drift, human intrusion, spread of invasive species, habitat fragmentation, and altered grazing regimes on adjacent lands.

4.4.5.2 Impact Types

The following activities could impact biological resources. These types of direct and indirect impacts were used to assess project-related impacts on biological resources.

Direct Impacts

- Vegetation clearing (including trees), grading, excavating/trenching, and paving activities during construction;

- Temporary stockpiling and sidecasting of soil, construction materials, or other construction wastes;

- Soil compaction, dust, and water runoff from the construction site;
- Short-term construction-related noise (from equipment); and
- Degradation of water quality in drainages and wetlands, resulting from construction runoff containing petroleum products.

Indirect Impacts

- Altering light and noise levels;
- Altering hydrology;
- Causing damage through toxicity associated with herbicides, pesticides, and rodenticides;
- Introducing pet and human disturbance (including trash dumping);
- Increasing habitat for native competitors or predators; and
- Introducing invasive nonnative species.

4.4.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.4.6.1 Alternative 1 – Proposed Action

Alt 1 – Impact BIO-1: The Proposed Action would not result in a net loss of wetland area or functions through direct removal, filling, hydrological interruption, or other means because of the environmental commitments included in the Proposed Action. (*Less than Significant)*

Campus and Community North

The Proposed Action would result in both direct and indirect impacts on wetlands. Construction activities, infrastructure installation, and roadway improvements would result in the removal or fill of all wetlands within the Campus and Community North portion of the project site. A total of approximately 77.79 acres of wetlands would be directly affected, including 15.03 acres of vernal pools, 25.05 acres of swale wetlands, 0.33 acre of clay slope wetlands, 12.23 acres of irrigation wetlands, and 25.15 acres of canal wetlands (seasonal wetlands and seasonal freshwater marsh that have formed adjacent to the canals) (**Table 4.4-11, Wetland Impacts Avoided or Modified by Campus and Community Reconfiguration [acres]**).

Table 4.4-11
Wetland Impacts Avoided or Modified by Campus and Community Reconfiguration (acres)

Wetland Type	Proposed Action					2002 Project	Difference
	Campus	Community North	Campus and Community North	Community South	Total		
Vernal Pools	10.28	4.75	15.03	2.48	17.51	33.24	-15.73
Swale Wetlands	16.14	8.91	25.05	0.14	25.19	41.04	-15.85
Clay Slope Wetlands	0.33	0	0.33	0	0.33	10.47	-10.14
Intermittent Channel	0	0	0	1.03	1.03	1	0.03
Irrigation Wetlands	4.15	8.08	12.23	0.01	12.24	12.79	-0.55
Canal Wetlands	21.14	4.01	25.15	3.60	28.75	28.91	-0.16
Totals	**52.04**	**25.75**	**77.79**	**7.26**	**85.05**	**127.49**	**-42.4**

With the placement of fill, wetlands on the project site would lose all wetland functions. As documented in the CWMMP (Gibson and Skordal 2008), wetlands perform functions in three basic categories: hydrology, biogeochemistry, and flora and fauna habitat support (Smith et al. 1995). Vernal pools on the project site have two primary hydrology functions, surface water storage and subsurface water storage and interchange. Their main biogeochemical functions are element and compound cycling and organic carbon export. Vernal pools maintain characteristic plant and faunal communities and support faunal habitat interspersion and connectivity. Swale wetlands and clay slope wetlands perform similar functions as vernal pools, although their primary hydrology function is to moderate surface and shallow subsurface water flow. Swale wetlands and clay slope wetlands are therefore very similar in terms of their function within a vernal pool landscape.

The Proposed Action could also have indirect impacts on wetlands in lands adjacent to the Campus and University Community. Project construction and the operation and maintenance of the University facilities could result in altered hydrology, pollutant runoff, pesticide runoff or drift, human intrusion, spread of invasive species, habitat fragmentation, and altered grazing regimes. These activities would have adverse impacts on functions of wetlands that are not directly affected. Altered hydrology would affect a wetland's ability to store surface water. Pollutants and pesticides would affect a wetland's biogeochemical functions as well as the ability to maintain the characteristic plant and faunal

communities. Disturbance of vegetation or soils or invasion by exotic species would alter a wetland's ability to maintain habitat structure and provide habitat interspersion and connectivity.

Two separate analyses of indirect impacts on wetlands were performed. The first analysis, prepared for the *Conservation Strategy*, assumed that indirect impacts would be limited to within 250 feet of the project boundary. As described in the *Conservation Strategy*, a distance of 250 feet is frequently used in a regulatory context as the distance that detrimental indirect effects extend from the edge of development into adjacent vernal pool habitat. The regulatory standard distance of 250 feet therefore was used to quantify project effects on vernal pools and other suitable wetland features. Based on this analysis, 9.9 acres of wetlands, including approximately 3.25 acres of vernal pools, 4.85 acres of vernal swales, and 1.46 acres of clay slope wetlands, 0.15 acre of irrigation wetlands, and 0.19 acre of canal wetlands would be indirectly affected.

Secondly, as summarized in the CWMMP, a Wetlands Functional Assessment was performed to calculate quantitative estimates of the wetland functions of naturally occurring wetlands (vernal pools, swale wetlands, and clay slope wetlands) under baseline conditions and with the Proposed Action. The functional assessment methodology was not designed for non-naturally occurring wetlands (irrigation wetlands and canal wetlands). Using a mathematical model, the Wetlands Functional Assessment quantified wetland functions as functional capacity units (FCUs), a measure that incorporates both the size of a wetland and its ability to carry out wetland functions. The Wetlands Functional Assessment assessed the change in FCU of wetlands located within the project site (directly impacted wetlands) and within 1,640 feet of the project site (indirectly impacted wetlands) from baseline conditions to post-project conditions. Based on the functional assessment, 102.52 acres of vernal pools, 57.29 acres of vernal swales, and 62.52 acres of clay slope wetlands could be potentially indirectly affected. Direct and indirect impacts on wetland functions, represented by changes in FCUs, are presented in **Table 4.4-12, Direct and Indirect Impacts on Wetland Functions (in functional capacity units (FCUs))**. Wetlands directly impacted by the Proposed Action would lose all functions as represented by the zero values in **Table 4.4-12**.

These potentially significant direct and indirect impacts would be avoided or reduced to less-than-significant levels through implementation of environmental commitments identified in the Resource Mitigation Plan, the 2002 BA and BA supplement, the 2009 Long Range Development Plan, Campus operations and maintenance measures, the *Conservation Strategy*, the *Management Plan for Conservation Lands*, the 2008 BA Supplement, and the CWMMP, as discussed below.

Table 4.4-12
Direct and Indirect Impacts on Wetland Functions (in functional capacity units (FCUs))

Wetland Subclass	Baseline Conditions		Post-Project Conditions		Change in FCUs (direct and indirect)
	Direct Impact FCUs	Indirect Impact FCUs	Direct Impact FCUs	Indirect Impact FCUs	
Vernal Pools	10.718	70.453	0	69.419	-11.752
Swale Wetlands	15.328	42.359	0	41.235	-16.452
Clay Slope Wetlands	0.258	46.570	0	46.233	-0.595

As detailed in the CWMMP (**Appendix 2.0-4**), the University would offset direct and indirect wetland impacts through a combination of (1) wetland preservation and management, (2) restoration, and (3) creation. From a broad perspective, the preservation and management component is primarily intended to ensure that there would be no net loss of wetland functions for naturally occurring wetlands (vernal pools, swale wetlands and clay slope wetlands). The restoration and creation components are primarily intended to ensure that there would be no net loss in the overall areal extent of wetlands. From a functional standpoint, the wetland creation is also intended to compensate for the loss of function to non-naturally occurring wetlands (canal wetlands and irrigation wetlands). This combination of preservation, management, restoration, and creation would compensate for the loss of wetland acreage and functions and fulfill the "no net loss" requirement. Each of these components of the mitigation program is described below.

Wetland Preservation and Management within Conservation Lands: Over 26,600 acres of grasslands containing more than 2,200 acres of wetlands have been preserved on Conservation Lands owned by UC Merced (Tier 1a conservation lands) or through conservation easements acquired or to be acquired on other properties (Tier 1b conservation lands, Tier 2 properties) (see **Table 4.4-10**). Wetland protection and enhancement will be carried out on these Conservation Lands by managed grazing, public and educational uses, and controlling invasive non-native species. Grazing will be maintained at current moderate levels or at levels that maintain specific residual dry matter (RDM) standards. Implementation of monitoring and control actions will avoid future degradation of habitat by pest species.

Restoration of Vernal Pool Landscape: Wetland restoration will be used to further compensate for the loss of naturally occurring wetlands (vernal pools, vernal swales, and clay slope wetlands). This mitigation will be "in kind" and will consist of locating a mitigation site where similar vernal pool

wetlands existed before but have been eliminated or substantially reduced and/or degraded, and improving it to re-establish a vernal pool landscape.

Creation of Non-Naturally Occurring Wetlands: Creation will used to offset the impact to non-naturally occurring wetlands and will be "in kind," i.e., the created wetlands will have the same hydrogeomorphic characteristics and plant communities as those of the impacted wetlands. The creation component is primarily intended to ensure that there will be no net loss in the overall areal extent of wetlands. From a functional standpoint, the wetland creation is also intended to compensate for the loss of function to non-naturally occurring wetlands (canal wetlands and irrigation wetlands).

This combination of preservation, restoration, and creation would compensate for the loss of wetland acreage and functions and fulfill the "no net loss" requirement.

Mitigation lands for implementation of wetland restoration and/or creation have not yet been acquired. An initial review of potential mitigation sites was conducted using aerial photography and field reconnaissance to determine whether sufficient acreage exists in eastern Merced County amenable to wetland restoration/creation, and an additional investigation subsequently was conducted to identify potential restoration sites. This investigation has revealed that a number of suitable sites are available in Merced County and that it would be feasible to create the required acreage of wetlands through restoration and creation. When a potential site(s) is selected, it will be presented to the USACE, US EPA, USFWS, and CDFG for approval. Once a site(s) has been approved and secured, detailed site plans will be prepared by the University and UCLC to implement the restoration and creation measures. The plans will be submitted to the USACE for review and approval.

UC Merced proposes a phased implementation schedule for the restoration and creation efforts contemplated in the CWMMP within the context of UC Merced's prior commitments to habitat preservation and conservation in eastern Merced County. Although construction of the Campus and Community North would be phased over many years, UC Merced proposes to complete construction of all of the wetlands restoration/creation within three to four years of initiation of project construction. UC Merced plans to begin construction of next phased of the campus during the first construction season following issuance of the Section 404 permit. The following restoration/creation implementation schedule takes into account the considerable lead time needed to select and secure the mitigation site(s), prepare and obtain approval of site-specific addendums to the CWMMP, and mobilize the construction of a restoration and creation project of this size.

Site Selection. Within one year of issuance of the permit, UC Merced will select, identify and characterize preferred restoration/creation sites and submit them to the USACE, USFWS, and CDFG for approval.

Submit Site Specific Plans. Within six months of receiving agency approval of the mitigation sites, UC Merced will secure the mitigation sites and prepare site-specific addendums to the CWMMP and submit them to the USACE, USFWS, and CDFG for approval.

Begin Construction. UC Merced will begin construction of the restoration/creation in May immediately following agency approval of the site-specific addendums to the CWMMP. This assumes that agency approval is received by at least January 1 of that year to allow sufficient time to prepare for mobilization of construction.

Although under the schedule outlined above, some fill of wetlands within the next phase of the campus development would occur before the restored or created wetlands would be in place, all of the preservation completed by UC Merced to date is considered adequate to address any "temporal" impacts. Furthermore, any temporal loss would also be offset by the fact that the majority of the restoration and creation will occur within three or four years from issuance of the Section 404 permit whereas the actual impacts will occur over the next several decades.

Because the sites for restoration and creation of wetlands have not yet been selected, the specific environmental impacts from construction activities associated with wetlands restoration and creation cannot be evaluated. However, environmental impacts from construction activities associated with restoration and creation of wetlands are well understood. The types of impacts that are typically associated with wetlands restoration and creation efforts include: the potential to result in incidental fill of wetlands that are being restored or created; the potential to remove sensitive plant species present at the site; potential to affect wildlife species habitat present on the site (including residence, foraging and dispersal habitats); potential to affect resources adjacent to the mitigation site; potential to affect known or unknown cultural resources that may be present on the site; potential to generate short-term construction-related air pollutant emissions including dust; potential to disturb hazardous materials (especially pesticides and herbicides if the site has been under any form of agricultural use in the past); and potential to result in impacts on surface water quality from release of silt and sediment or construction equipment fluids such as fuel. To the extent that any of these potential impacts would be associated with the wetlands restoration and creation sites for the Proposed Action, it would be possible to avoid or reduce all of these impacts to a less-than-significant level by implementing commonly used mitigation measures, including construction-site air emissions control plans, storm water pollution prevention plans, avoidance of sensitive resources, construction-site biological monitoring, etc.

To minimize indirect impacts on lands adjacent to the Proposed Action site, the University has implemented and will continue to implement siting, design, construction, and operation measures (Jones & Stokes 2002b, c; Airola 2008a, b). A stormwater management system will be designed, constructed, and

operated to avoid and minimize alteration of natural hydrologic regimes, increases in sediment and nutrient loading, and introduction of pesticide or other hazardous material in runoff. Perimeter fencing will be constructed to discourage human and pet disturbance of wetlands in adjacent habitat areas and the Campus has a pet policy that prohibits off-leash pets on campus. During project construction, BMPs and specific conservation measures will be implemented to control dust, erosion, sediment, and spills of toxic substances, to prevent intrusion into areas adjacent to the project site, and to prevent the introduction of exotic species. Operations and maintenance conservation measures will be implemented to minimize pesticide use and control invasive weeds. These measures were successfully implemented during the Phase 1.1 Campus construction.

Community South

Approximately 7.26 acres of wetlands and channels have the potential to be adversely impacted by the development of Community South, including grading and fill associated with urban development. The wetlands impacted would include 2.48 acres of vernal pools, 0.14 acre of swale wetlands, 3.60 acres of canal wetlands, 0.01 acre of irrigation wetlands, and 1.03 acres of intermittent channels. The majority of these wetlands are located within the canal easement. In addition, 0.70 acre of riparian delineated areas would be affected. Wetlands that are directly impacted would lose all wetland functions, as discussed above for the Campus and Community North. Indirect impacts on adjacent wetlands would be similar to those described for the Campus and Community North, although the Community South site has fewer wetlands adjacent to it that could be indirectly affected.

Compliance with UCP Policies PA 1.1 through PA 1.6 would ensure that impacts on wetlands would be avoided, minimized, and compensated for , so that this impact would be less than significant. A specific compensation plan has not yet been proposed for this project component, but the BO requires that filled wetlands be replaced at a minimum 1:1 replacement ratio. To comply with Policy PA 1.6, the County would require project applicants for Community South to prepare an agency-approved Habitat Mitigation Plan to ensure that the development of the Community South portion of the Proposed Action would not result in a net loss of wetland functions and values.

Combined Campus and Community Impacts and Conclusion

If fully developed, the combined impact of developing the Campus and University Community would be the loss of 85.05 acres of wetlands and channels, including 17.51 acres of vernal pools, 25.19 acres of swale wetlands, 0.33 acre of clay slope wetlands, 12.24 acre of irrigation wetlands, 28.75 acres of canal wetlands, and 1.03 acres of intermittent channels (**Table 4.4-11**). In addition to these wetlands, 0.70 acre of riparian delineated areas would also be lost as a result of full project development. The Proposed Action would

indirectly impact approximately 9.9 acres of wetlands adjacent to the project site, including approximately 3.25 acres of vernal pools, 4.85 acres of vernal swales, and 1.46 acres of clay slope wetlands, 0.15 acre of irrigation wetlands, and 0.19 acre of canal wetlands. It is assumed that all wetlands within the project site would lose all functions whereas indirectly impacted wetlands would lose some degree of function as shown in **Table 4.4-12**.

It should be noted that the Proposed Action was developed by reconfiguring the Campus and the University Community to minimize impacts on threatened and endangered species and wetlands and other waters of the United States, including the wetlands located between the campus and Lake Yosemite. The result of changing the project footprint was a reduction in direct impacts on wetlands from 127.49 acres to 85.05 acres (**Table 4.4-11**).

However, although project redesign has reduced the wetland impacts, all wetlands on the Campus and University Community site cannot be avoided, and as noted above, approximately 85.05 acres of wetlands within the project boundaries would be directly impacted.

Implementation of environmental commitments described above for the Campus and Community North and implementation of UCP Policies PA 1.1 through PA 1.6 for Community South would compensate for the loss of wetland area and the loss of wetland functions. The impact would be less than significant.

Mitigation Measures: No additional mitigation measures beyond the measures included in the Proposed Action are required.

Alt 1 – Impact BIO-2: The Proposed Action would result in adverse impacts on special-status plant species. (*Significant; Less than Significant)*

Campus and Community North

Development of the Campus and Community North as part of the Proposed Action would result in both direct and indirect impacts on special-status plants.

- Campus development would result in the removal of eight vernal pools containing succulent owl's-clover. Five of these vernal pools are part of Occurrence 47, which was reported to contain an unknown number of plants in about 75 vernal pools (CNDDB 2008), most of which are present within the Campus Natural Reserve and would remain intact. Three of these vernal pools are part of Occurrence 90, which was reported to consist of about 80 plants (CNDDB 2008).
- Campus development would result in the removal of dwarf downingia Occurrence 93, which consists of a single vernal pool containing an unreported number of plants (CNDDB 2008).

- Campus and Community North development would also result in the removal of 14 stands of shining navarretia. Three of five reported stands of Occurrence 21 (CNDDB 2008) would be removed, and the remaining two stands would remain within the Campus Natural Reserve. Eleven stands of shining navarretia Occurrence 22 would be removed. Occurrence 22 was reported to consist of 129 stands with an unknown number of plants in 1999, and additional stands were located in 2001 (CNDDB 2008). Most of Occurrence 22 is located within the Campus Natural Reserve. Development of Community North would remove seven stands of shining navarretia, each with 5 to 60 plants (UCP EIR), which comprise Occurrence 37 (CNDDB 2008).

- In addition to the impacts expected to occur on and adjacent to the project site, there is potential for direct impacts related to habitat disturbance to occur within Conservation Lands containing special-status plant species. These impacts could result from O&M activities including, but not limited to, implementation of the grazing management and pest management plans described in the Management Plan for Conservation Lands and various wetlands monitoring activities outlined in the CWMMP (see **Appendix 2.0-4** for these plans).

The loss of these plants and their habitat would constitute both a reduction in numbers of individuals and a loss of occupied habitat for these species and would be a significant impact.

The Wetlands Functional Assessment (Gibson and Skordal 2008) estimated that the Proposed Action would indirectly affect wetland functions of the vernal pools, swale wetlands, and clay slope wetlands adjacent to and within 1,640 feet (500 meters) of the project site. These indirect impacts were assumed to include a decreased ability to maintain the characteristic plant community, which would include the special-status plant species. Indirect effects would include: altered wetland hydrology, which could adversely affect seed germination, seedling establishment, or other life history stages; exposure to herbicides or other hazardous materials in runoff, which would result in plant mortality; increases in sediment or nutrient levels in runoff, which could directly affect plants or could indirectly affect plants by promoting establishment of invasive species; and trampling or soil compaction from human or pet intrusion, which could result in mortality or altered plant growth. Succulent owl's-clover Occurrence 48 and portions of Occurrences 47 and 53 would be affected. Shining navarretia Occurrence 21 and portions of Occurrence 22 would also be affected.

- The Proposed Action was developed by reconfiguring the Campus and the University Community to minimize impacts on threatened and endangered species, including the clay playa area located between the Campus and Lake Yosemite. Six vernal pools, part of Occurrence 53, were avoided by this reconfiguration.

To minimize indirect impacts on habitat for special-status plant species adjacent to the project site, the *Conservation Strategy* and other environmental commitments will require the University to design, construct, and operate the Campus and Community North in a manner that avoids and minimizes indirect impacts. For instance, a stormwater management system will be designed, constructed, and operated to avoid and minimize alteration of natural hydrologic regimes, increases in sediment and

nutrient loading, and introduction of pesticide or other hazardous material in runoff. Perimeter fencing will be constructed to discourage human and pet disturbance of habitats in adjacent habitat areas. During project construction, BMPs and specific conservation measures will be implemented to control dust, erosion, sediment, and spills of toxic substances, to prevent intrusion into areas adjacent to the project site, and to prevent the introduction of exotic species. Operations and maintenance conservation measures will be implemented to minimize pesticide use and control invasive weeds. Adjacent Conservation Lands will be monitored and managed to identify and address any effects of adjacent habitat disturbance from developed lands.

In addition to avoidance of direct impacts by the reconfiguration of the project footprint and minimization of indirect effects by measures described above, the Campus and Community North portion of the Proposed Action includes Conservation Lands that would offset losses of plants that are unavoidable. The Proposed Action would protect over 26,000 acres of Tier 1 and Tier 2 conservation lands that support suitable habitat for the affected species. This protection will prevent potential future impacts to vernal pool habitats and their species from potentially detrimental unregulated activities and land uses that could otherwise occur. In addition, the Proposed Action includes targeted adaptive management of UC-owned conservation lands. Management programs for conservation lands to conduct compatible livestock grazing, invasive weed control, fire protection, and control of human uses would maintain and enhance the quality of existing habitat. The mitigation achieved by these environmental commitments for each of the three affected special-status plant species is discussed below:

- The development of the Campus and Community North would affect a total of two occurrences of succulent owl's clover which encompass about an acre of occupied habitat. To mitigate for this, 10 occurrences of succulent owl's clover would be preserved on Tier 1 conservation lands and 13 to 14 occurrences would be preserved on Tier 2 properties. Approximately 527.77 acres of vernal pools and vernal pool/swale complexes, potential habitat for succulent owl's clover, would be preserved on Tier 1 conservation lands, and approximately 792.87 acres of vernal pools and vernal pool/swale complexes would be preserved on Tier 2 properties. Approximately 4 percent of the pools surveyed on the Conservation Lands supported succulent owls' clover (Jones & Stokes 2003), and based on this percentage, an estimated 21.1 acres of occupied habitat for succulent owl's clover would be preserved on Tier 1 conservation lands and an estimated 31.7 acres of occupied habitat would be preserved on Tier 2 properties. This is a preservation ratio of approximately 12:1 (occurrences preserved : occurrences affected) or 53:1 (habitat preserved : habitat affected).

- Similarly, while all of one and portions of two occurrences of shining navarretia would be removed by the development of the Campus and Community North, 10 known occurrences of shining navarretia (and portions of the two affected ones) would be preserved on Tier 1 conservation lands, and seven known occurrences would be preserved on Tier 2 properties. Based on occurrences, this represents a mitigation ratio greater than 5.7:1. Approximately 116.97 acres of clay flats, habitat for shining navarretia, would be preserved on Tier 1 conservation lands, and approximately 305.46 acres of clay flats would be preserved on Tier 2 properties. Because the extent of clay flat habitat was not mapped on the project site, the ratio of preserved habitat to affected habitat cannot be determined,

but the ratio is likely to exceed the goals identified by USFWS in the project BO for mitigation of plant species.

As stated above, Campus and Community North development would result in the removal of one vernal pool containing dwarf downingia. One known occurrence of dwarf downingia would be preserved on Tier 1 conservation lands, and three occurrences would be preserved on Tier 2 properties. This represents a mitigation ratio of 4:1. Surveys for dwarf downingia, similar to those done for succulent owl's clover, have not been completed. Therefore, the acreage of occupied habitat for dwarf downingia preserved on the Conservation lands cannot be determined. As noted above, however, 527.77 acres of potential habitat would be preserved on Tier 1 conservation lands, and 792.87 acres of potential habitat would be preserved on Tier 2 conservation lands. Although the preservation of vernal pools that would result from the environmental commitments already included in the Proposed Action would not compensate for the loss of plants and individuals caused by the Proposed Action, the preservation and management of a substantial proportion of the occurrences of succulent owls clover, shining navarretia, and dwarf downingia in the project region, would benefit the species by reducing the risk of extinction and by providing for opportunities to enhance the preserved occurrences. Therefore, this impact would not result in a substantial adverse effect on special-status plant species.

Community South

No special-status plants would be directly impacted by development of Community South because no special status plants occur on the Community South site.

Combined Campus and Community Impacts and Conclusion

The combined impact of developing the Campus and University Community would be the loss of nine occurrences of succulent owl's-clover; the loss of one occurrence of dwarf downingia; and the loss of one occurrence of shining navarretia and partial loss of two other occurrences. One occurrence of succulent owl's-clover and portions of two other occurrences would be indirectly affected, and one occurrence of shining navarretia and portions of a second occurrence would be indirectly affected. The environmental commitments included in the Proposed Action would mitigate impacts on special-status plants by preserving and maintaining populations of the affected species at a number of sites within the Tier 1 conservation lands and Tier 2 properties at ratios much greater than 1:1 (occurrences/acres lost : occurrences/acres preserved), which is the threshold set by *Conservation Strategy*. Approximately 23 to 24 occurrences of succulent owl's-clover, 17 occurrences of shining navarretia, and four occurrences of dwarf downingia potentially would benefit from preservation and management within Conservation Lands. Therefore, the Proposed Action's impacts on succulent owl's-clover, shining navarretia, and dwarf

downingia would be less than significant. To further reduce this impact, the following mitigation measure is proposed.

MM BIO-2: Mitigate for loss of special-status plants and habitat through additional off-site compensation.

To compensate for the loss of succulent owl's-clover, shining navarretia, and dwarf downingia plants, seeds from all three species will be collected from the project site and translocated to suitable habitat within the CNR. Translocating the stands to the CNR would minimize any potential genetic contamination, because the affected stands are part of the occurrences present within the CNR and, presumably, part of the same populations. The University will retain a qualified restoration ecologist to work closely with resource agency specialists (USFWS and CDFG staff) and knowledgeable individuals to locate and determine the suitability of translocation sites within the CNR. Translocation of the stands that would be affected by the Proposed Action would involve (1) identifying suitable transplant sites, (2) moving the plant material to the transplant sites, and (3) monitoring the transplant sites to document recruitment and survival rates. The restoration ecologist will develop a detailed transplantation and monitoring plan that provides detailed information on:

- coordination efforts with agencies and knowledgeable individuals,
- methods for collecting seeds from the affected populations,
- seed storage methods,
- planting plan and specifications (including planting locations and densities),
- measurable success criteria that can be achieved within a 10-year period,
- monitoring and reporting methods and schedule,
- funding source and responsible party, and
- adaptive management measures to ensure that the desired success criteria are achieved.

The University will submit draft copies of the transplantation and monitoring plan to the appropriate resource agencies (e.g., USFWS and CDFG) for review and comment. The plan will be approved by the appropriate agencies before it is implemented. As part of

the plan, the following general steps would be involved in the translocation and monitoring efforts, as appropriate:

- A site analysis will be conducted to document the biotic and physical requirements of succulent owl's-clover, shining navarretia, and dwarf downingia within the project site. This task will include an evaluation of the populations. Information on soil type, plant species associations, aspect, vegetation cover, and level of disturbance will be gathered during this evaluation.

- Sites that may be suitable for transplanting the seeds will be identified and evaluated. Suitable sites may not contain existing stands of species being translocated. The same information as identified above will be gathered for the translocation sites.

- Seeds will be collected for propagation or storage purposes. Seed collection, storage, and propagation will be done by a qualified restoration ecologist. The seeds will be planted at the transplant sites at the appropriate time to ensure higher survival rates.

- Dried plants and topsoil containing seeds will be excavated from the area containing the affected plants. The seed material will be excavated after the plants have set seed and dried (generally by late summer). The excavation will be done using hand tools. A post-translocation report that documents the measures used to relocate the populations and where they were relocated will be prepared.

- Translocated populations will be monitored to document survival and recruitment rates over a period of time established in consultation with the resource agencies but for a minimum of five years. The populations would be monitored annually during the flowering period to document success rates and to identify remedial actions. The detailed transplant and monitoring plan will provide specific monitoring protocol and documentation procedures. A copy of the annual monitoring reports and the final monitoring report will be provided to the appropriate resource agencies for review.

Significance after Mitigation: As noted above, this impact would be less than significant. Implementation of **Mitigation Measure BIO-2** would further reduce the impact of the Proposed Action. It is acknowledged that translocation of succulent owl's-clover, shining navarretia, and dwarf downingia are untested procedures, and the feasibility of success is unknown. However, if it is unsuccessful, the information collected while carrying out the translocation project would benefit the species by providing data that could be used for managing other preserved populations.

Alt 1 – Impact BIO-3: The Proposed Action would not result in a substantial adverse impact on vernal pool species critical habitat. (*Less than Significant*)

Campus and Community North

The designated critical habitat boundary for vernal pool species is located adjacent to the campus site but does not overlap with the Campus or Community North site boundaries. Therefore, no critical habitat would be directly impacted by these portions of the Proposed Action. Development activities associated with the Proposed Action could indirectly affect habitat on adjacent lands through the mechanisms listed in **Subsection 4.4.5.2, Impact Types**, above:

Environmental commitments included in the *Conservation Strategy* and *Management Plan for Conservation Lands* would avoid, minimize, and compensate for potential indirect impacts of the campus on adjacent designated critical habitat. Specific environmental commitments that apply to wetlands include Strategies 1-8 and 10-12 (See Chapter 5 of *Conservation Strategy* in **Appendix 2.0-3**). Specifically, Strategy 1 has resulted in project redesign to avoid indirect impacts to vernal pool critical habitat, and site specific design, construction, and operations and maintenance measures outlined in Strategy 2 will further reduce the potential for indirect impacts to vernal pool critical habitat adjacent to the Campus and Community North sites. Strategies 3-8 and 10-12 describe the University's commitments regarding the acquisition and management of conservation lands for listed species and habitats essential to their survival.

As noted in the USFWS (1998) handbook on Section 7 consultation, adverse impacts on critical habitat do not result in a determination of "adverse modification" unless the loss, when added to the environmental baseline, is likely to appreciably diminish the capability of critical habitat to satisfy requirements essential to both the survival and recovery of a listed species. Implementation of the environmental commitments in the *Conservation Strategy* and *Management Plan for Conservation Lands* would avoid, minimize, and compensate for indirect impacts on critical habitat and will ensure that critical habitat will not be diminished, thereby reducing this potential impact to a less-than-significant level.

Community South

The Community South boundaries do not overlap with designated critical habitat for vernal pool species and are not located adjacent to critical habitat. Therefore, the Community South portion of the Proposed Action would not directly or indirectly affect designated critical habitat for vernal pool species.

Combined Campus and Community Impacts and Conclusion

Neither the Campus nor the University Community would directly impact designated critical habitat. There is no designated critical habitat for vernal pool species adjacent to Community South. Indirect impacts of the Campus and Community North portions of the Proposed Action on adjacent critical habitat will be minimized by environmental commitments contained in the *Conservation Strategy*. These commitments avoid, minimize, and compensate for impacts to adjacent critical habitat, reducing potential impacts to a less-than-significant level.

Mitigation Measure: No additional mitigation measures beyond the measures included in the Proposed Action are required.

Alt 1 – Impact BIO-4: The Proposed Action would not result in a substantial adverse impact on special-status invertebrate species due to the loss of vernal pool ecosystems. (*Less than Significant)*

Campus and Community North

Campus and Community North construction would result direct impacts to 54 acres of occupied vernal pool fairy shrimp habitat and indirect impacts to 7 acres of the species' habitat. The affected habitat represents 209 known occurrences of the species habitat. Construction of the Campus and Community North would also result in a direct impact on 2 acres of occupied vernal pool tadpole shrimp habitat and an indirect impact on 2 acres of the species' habitat. The affected habitat represents the one known occurrence in the area (**Table 4.4-4; Table 4.4-13, Habitat Impacts, Conserved Lands, and Mitigation Ratios Achieved for Federally Listed and Other Key Species for the UC Merced Campus and University Community;** and **Table 4.4-14, Numbers of Species Occurrences within Project Lands and Conserved Lands and Mitigation Ratios Determined from Numbers of Occurrences**). Campus and University North development would therefore affect 2.6 percent of the 2,294 acres of known occupied vernal pool fairy shrimp habitat and 1.2 percent of the 318 acres of known occupied tadpole shrimp habitat within the project region (**Table 4.4-15, Potential Effects of Proposed UC Merced Project on Known Occupied Habitat for Eight Vernal Pool Grassland Species**). In addition to the impacts expected to occur on and adjacent to the project site, there is potential for direct impacts related to habitat disturbance to occur within Conservation Lands containing occupied habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp. These impacts could result from O&M activities including, but not limited to, implementation of the grazing management and pest management plans described in the Management Plan for Conservation Lands and various wetlands monitoring activities outlined in the CWMMP (see **Appendix 2.0-4** for these plans).

With respect to potential impacts to occupied Conservancy fairy shrimp habitat, direct impacts on Conservancy fairy shrimp have been avoided through incorporation of the entire watershed of the pool occupied by the species within the CNR, which will protected with a conservation easement and managed according to the measures described in the Management Plan for Conservation Lands (**Appendix 2.0-1**). The potential for indirect impacts have been further reduced since the 2002 BO by incorporation of additional lands (the former Campus Land Reserve) adjacent to the watershed of the occupied pool into the CNR during campus reconfiguration. The Management Plan for Conservation Lands also outlines a full range of management measures to prevent unauthorized disturbance of the CNR lands, and ensure proper management for conservation values, as well as monitoring to detect and address threats of invasive species.

The *Conservation Strategy* contains environmental commitments to avoid, minimize, and compensate for impacts on vernal pool species. Environmental commitments pertaining to vernal pool invertebrates include Strategies 1-8 and 10-12 (See Chapter 5 of *Conservation Strategy* in **Appendix 2.0-3** and **Subsection 4.4.3** above). These commitments also serve to carry out 2009 LRDP Policy ENV-12 and UCP Policies PA 1.1-1.6, also described in **Subsection 4.4.3**.

Specifically, Strategy 1 has resulted in several project redesigns to avoid indirect impacts to vernal pool habitat, including vernal pool invertebrates. Site-specific design, construction, and operations and maintenance measures outlined in Strategy 2 will further reduce the potential for indirect impacts to vernal pool invertebrates adjacent to the Campus and Community North sites. Strategies 3-8 and 10-12 describe the University's commitments regarding the acquisition and management of conservation lands for listed species and habitats essential to their survival. As noted earlier, more than 26,600 acres of Conservation Land have already been established as part of the Proposed Action.

For vernal pool fairy shrimp, acquired Conservation Lands will protect 1,143 acres of occupied habitat, representing approximately 50 percent of the known habitat in the study region. Of the 1,143 acres of protected land, 627 acres are located within Tier 1 conservation lands (27 percent of the total known habitat) and 516 acres are located within Tier 2 conservation lands (22 percent of the total known habitat). Mitigation ratios achieved for direct and indirect impacts are 10:1 for Tier 1 conservation lands and 19:1 for all conservation lands, substantially above the 3:1 minimum target specified in the 2002 BO.

Table 4.4-13
Habitat Impacts, Conserved Lands, and Mitigation Ratios Achieved for Federally Listed and Other Key Species for the UC Merced Campus and University Community

Species	Impacts of Project Components of Proposed Action[a] (acres)				Total: Proposed Project	Conserved Lands (acres)		Total: All Conservation Lands	Mitigation Ratios		
	Campus[b]	Community North[b]	Total: UC's Proposed Action	Community South[c]		Tier 1	Tier 2		Tier 1: Campus and Community North	Tier 1 and 2: Campus and Community North	Tier 1 and 2: Campus, and Community North and South
Succulent owl's clover	27	4	31	0	31	381	308	689	12	22	22
Colusa grass	0	0	0	0	0	156	0	156			
SJV Orcutt grass	0	0	0	0	0	16	0	16			
Conservancy fairy shrimp	0	0	0	0	0	14	0	14			
Vernal pool fairy shrimp	42	19	61	<1	61	627	516	1,143	10	19	19
Midvalley fairy shrimp	18	9	27	0	27	259	66	325	10	12	12
Vernal pool tadpole shrimp	0	4	4	0	4	14	<1	14	3.5	3.5	3.5
California tiger salamander											
Occupied habitat	971	913	1,884	0	1,893	8,800	11,349	20,149	5	11	11

Species	Impacts of Project Components of Proposed Action[a] (acres)				Total: Proposed Project	Conserved Lands (acres)		Total: All Conservation Lands	Mitigation Ratios		
	Campus[b]	Community North[b]	Total: UC's Proposed Action	Community South[c]		Tier 1	Tier 2		Tier 1: Campus and Community North	Tier 1 and 2: Campus and Community North	Tier 1 and 2: Campus, and Community North and South
Critical habitat	193	36	229	0	227	8,152	3,954	12,106	36	53	53
San Joaquin kit fox											
Primary habitat	720	573	1,293	61	1,354	9,312[d]	15,082	24,394	6	18	18
Secondary habitat	196	480	676	1,286	1,962	94	1,430	1,524	0	2	<1
All habitat	919	1,060	1,979	1,347	3,316	9,406	16,492	25,918	4	12	7

[a] *Includes both direct and indirect impacts.*

[b] *Components comprising the University's Proposed Project.*

[c] *This area is not part of the University's Proposed Project, but is an interrelated and interdependent project under the Proposed Action.*

[d] *187 acres of kit fox residence habitat located within Tier 1 lands is considered degraded because it is located within 656 of the Campus and University Community Project Site.*

Table 4.4-14
Numbers of Species Occurrences within Project Lands and Conserved Lands and Mitigation Ratios Determined from Numbers of Occurrences

Species	Impacts of Project Components of Proposed Action[a]			Conserved Lands		Mitigation Ratios		
	Campus[b]	Community North[b]	Community South[c]	Tier 1	Tier 2	Tier 1: Campus and Community North	Tier 1 and 2: Campus and Community North	Tier 1 and 2: Campus, and Community North and South
Succulent owl's clover	8	1		285	454	32	82	82
Colusa grass				5				
SJV Orcutt grass				1				
Conservancy fairy shrimp				1				
Vernal pool fairy shrimp	98	111	2	525	145	3	3	3
Midvalley fairy shrimp	8	11		75	9	4	4	4
Vernal pool tadpole shrimp		1		4	1	4	5	5
California tiger salamander		1		21	8	21	29	29
San Joaquin kit fox								

[a] *Includes both direct and indirect impacts.*
[b] *Components comprising the University's Proposed Project.*
[c] *This area not part of the University's Proposed Project, but is an interrelated and interdependent project under the Proposed Action.*

Table 4.4-15
Potential Effects of Proposed UC Merced Project on Known Occupied Habitat for Eight Vernal Pool Grassland Species[1]

Species	Documented Occupied Habitat in the Project Region	Occupied Habitat Affected[2] by Proposed Action				Total	Occupied Habitat on Conservation Lands	
		UCM Campus	Community North	Community South	UCM Campus and Community North		Tier 1	Tier 2
Succulent owl's-clover Castilleja campestris ssp. succulenta	1,390	27 (2)	4(<1)	0	31 (2)	31 (2)	381 (27)	308 (22)
Colusa grass Neostapfia colusana	282	0	0	0	0	0	156 (55)	0
San Joaquin Valley Orcutt grass Orcuttia inaequalis	110	0	0	0	0	0	16 (15)	0
Conservancy fairy shrimp Branchinecta conservatio	107	0	0	0	0	0	14 (13)	0
Vernal pool fairy shrimp Branchinecta lynchi	2,294	42 (<3)	19 (<1)	<1 (<1)	61 (3)	61 (3)	627 (27)	516 (22)
Midvalley fairy shrimp Branchinecta mesovallensis	600	18 (3)	9 (1)	0	27 (4)	27 (4)	259 (43)	66 (11)
Vernal pool tadpole shrimp Lepidurus packardi	296	0	4 (1)	0	4 (1)	4 (1)	14 (5)	<1 (<1)

Species	Documented Occupied Habitat in the Project Region	Occupied Habitat Affected[2] by Proposed Action				Total	Occupied Habitat on Conservation Lands	
		UCM Campus	Community North	Community South	UCM Campus and Community North		Tier 1	Tier 2
California tiger salamander Ambystoma californiense	70,988	971 (1)	913 (1)	0	1,884 (3)	1,893 (3)	8,787 (12)	11,349 (16)

*Notes: This table presents data described in the Methods of Analysis sections of the Conservation Strategy. The data presented in this table are from multiple sources as described in Appendix B of the Conservation Strategy (**Appendix 2.0-3**). Occurrence data reflect field survey results and CNDDB records.*

[1] *Values in table are acres of occupied habitat. Values in parentheses are the percentages the acreage represents of the total occupied habitat in the project region.*

[2] *Occupied habitat occurring, at least in part, within 250 feet of proposed project.*

For vernal pool tadpole shrimp, acquired Conservation Lands will protect 14 acres of occupied habitat for the tadpole shrimp, representing 4 percent of the known habitat in the region, nearly all of which is within Tier 1 conservation lands. Tier 2 conservation lands will protect less than 1 acre of occupied habitat for the tadpole shrimp. The achieved mitigation ratio of 3.5:1 is above the 3:1 minimum target specified in the Conservation Measures in the 2002 BO.

In addition, potentially suitable habitat will be created as part of the CWMMP. As noted above under **Impact BIO-1**, the University will identify a mitigation site where similar wetlands existed before but have been eliminated or substantially reduced and/or degraded, and will improve it to re-establish a vernal pool landscape containing vernal pools and swale wetlands. The goal of the proposed restoration efforts is to establish wetlands that are similar to the impacted wetlands in terms of their physical and biological characteristics. This restoration would serve a dual function in that it would mitigate not only impacts to naturally occurring wetlands but also impacts to rare, threatened, or endangered plant and wildlife species. In summary, the development of the Campus and Community North would directly or indirectly disturb a small proportion of the known occupied habitat for the vernal pool fairy shrimp (2.6 percent) and vernal pool tadpole shrimp (1.2 percent) within the region, representing a small proportion of the known regional populations. Commitments to avoid, minimize, and compensate for impacts, discussed above, will benefit these species, especially the protection and management of known occupied habitat within the project region. Therefore, the development of the Campus and Community North portions of the Proposed Action would not result in a substantial adverse impact on vernal pool invertebrates.

Community South

The Community South would eliminate or disturb less than 1 acre of occupied vernal pool fairy shrimp habitat and would not impact (directly or indirectly) occupied vernal pool tadpole shrimp habitat. A specific compensation plan has not yet been proposed for this project component, but the BO requires that habitat impacts be compensated at a ratio of 3:1. Implementation of UCP Policy PA 1.6 provides that the County would require project applicants for Community South to prepare an agency-approved Habitat Mitigation Plan to ensure that the development of the Community South portion of the Proposed Action would not result in a substantial adverse impact on vernal pool invertebrates.

Combined Campus and Community Impacts and Conclusion

The development of Campus and University Community would directly or indirectly disturb a small proportion of the known occupied habitat for the vernal pool fairy shrimp and vernal pool tadpole shrimp within the region, representing a small proportion of the known regional populations. The

environmental commitments detailed in the *Conservation Strategy* along with the acquisition of Conservation Lands and implementation of UCP policies would reduce impacts to special-status vernal pool invertebrates to a less-than-significant level.

Mitigation Measure: No additional mitigation measures beyond the measures included in the Proposed Action are required.

Alt 1 – Impact BIO-5: The Proposed Action would not result in a substantial adverse impact on special-status amphibians dependent on vernal pool ecosystems, annual grasslands, and stock ponds due to the loss of these habitats. (*Less than Significant*)

One special-status amphibian species, California tiger salamander, and its habitat occur on the project site and would be affected by the development of the Campus and University Community. Potential impacts to this species are discussed below. The impact analysis for the California tiger salamander also considers impacts on designated critical habitat for this species. Potential impacts to western spadefoot are also discussed.

Campus and Community North

The Campus and Community North would eliminate approximately 178 acres of critical habitat for the California tiger salamander on the project site and indirectly impact an additional 51 acres (see **Table 4.4-13**). Approximately 8,147 acres of critical habitat will be protected on Tier 1 conservation lands achieving a mitigation ratio of 36:1 for direct and indirect impacts. Tier 2 conservation lands will protect an additional 3,954 acres of critical habitat, for a total of 12,101 acres protected on conservation lands, representing an overall mitigation ratio of 53:1 for direct and indirect impacts.

Development of the Campus and Community North sites would eliminate one known breeding site for the California tiger salamander (representing an unknown number of individuals) and occupied upland habitat (i.e., within 1.75 miles of this and other breeding ponds) equating to the loss of 1,648 acres of occupied habitat and indirect impacts to an additional 236 acres of adjacent occupied habitat (**Tables 4.4-4, 4.4-14,** and **4.4-15**) also see Figure 3-16 in *Conservation Strategy* **Appendix 2.0-3**). The development of the Campus and Community North would therefore affect less than 3 percent of the 70,988 acres (includes aquatic and associated upland habitat) of known occupied within the project region (**Table 4.4-15**). In addition to the impacts expected to occur on and adjacent to the project site, there is potential for direct impacts, related to habitat disturbance, to occur within Conservation Lands containing occupied habitat for California tiger salamander. These impacts could result from O&M activities including, but not limited to, implementation of the grazing management and pest management plans described in the

Management Plan for Conservation Lands and various wetlands monitoring activities outlined in the CWMMP (see **Appendix 2.0-4** for these plans).

Tier 1 conservation lands will protect and manage for conservation 8,147 acres of breeding habitat (4:1 ratio) and 21 breeding occurrences (21:1 ratio). Tier 2 conservation lands will protect an additional 11,349 acres of upland habitat, resulting in the protection of approximately 20,136 acres, representing an overall mitigation ratio of 11:1, and eight (8) additional known breeding occurrences (a 29:1 ratio). Though California tiger salamander was discussed in the 2002 BO, this species was not listed at that time and therefore no minimum compensation ratio was required by USFWS. The standard USFWS-approved mitigation ratio for replacement of occupied California tiger salamander habitat (upland and aquatic breeding habitat) is 3:1 but is considered to be discretionary.

In addition to the conservation of lands specifically directed at preserving habitat known to be occupied by the species, the CWMMP will restore approximately 1,000 additional acres of wetland and associated upland habitat that will provide suitable breeding and upland habitats for the salamander. The environmental commitments contained in the *Conservation Strategy,* which has been incorporated into the Campus and Community North portions of the Proposed Action, would serve to avoid, minimize, and compensate for impacts on California tiger salamander. Environmental commitments pertaining to this species include Strategies 1-8 and 10-12, outlined in the *Conservation Strategy* (See Chapter 5 of *Conservation Strategy* in **Appendix 2.0-3** and **Subsection 4.4.3** above). These commitments also serve to carry out 2009 LRDP Policy ENV-12 and UCP Policies PA 1.1-1.6, also described in **Subsection 4.4.3**.

Specifically, Strategy 1 has resulted in several project redesigns to avoid direct impacts to important vernal pool habitats that support this species, and site-specific design, construction, and operations and maintenance measures outlined in Strategy 2 will further reduce the potential for impacts to California tiger salamander individuals on site and off site. Strategies 3-8 and 10-12 describe the University's commitments regarding the acquisition and management of conservation lands for listed species and habitats essential to their survival.

As described above, the loss of habitat occupied by California tiger salamander within the Campus and Community North sites would equate to less than 3 percent of the known occupied habitat within the project region. Environmental commitments to avoid and minimize impacts to California tiger salamander and the protection of a significant amount (20,136 acres) of occupied habitat within the project region would reduce impacts to California tiger salamander to a less-than-significant level.

Habitats suitable for California tiger salamander are also suitable for western spadefoot, but because thorough surveys were conducted during the appropriate time of year and this species has not been

found to occur on any portion of the project site (Campus, Community North, and Community South), it is not expected that this species will be impacted either directly or indirectly by the Proposed Action. However, conservation lands containing suitable breeding habitat for California tiger salamander will also serve to preserve suitable habitat for western spadefoot and would benefit the species within the project region.

Community South

Community South lands are not considered occupied by California tiger salamander or western spadefoot because of the predominance of agricultural lands. The boundaries of the Community South site are not located within or adjacent to critical habitat for California tiger salamander. Therefore, no occupied habitat or critical habitat would be impacted by the development of the Community South portion of the Proposed Action.

Combined Campus and Community Impacts and Conclusion

Development of Community South would have no impact on California tiger salamander or western spadefoot or on critical habitat for California tiger salamander. The impacts from the development of the Campus and Community North on these species or their habitat would be less than significant given the incorporation of environmental commitments to avoid and minimize impacts to special-status amphibians and the acquisition of conservation lands that serve to offset occupied habitat losses through protection of a significant amount of habitat known to be occupied by these species in the project region.

Mitigation Measure: No additional mitigation measures beyond the measures included in the Proposed Action are required.

Alt 1 – Impact BIO-6: The Proposed Action would not result in a substantial adverse impact on western pond turtle from the loss or disturbance of ponds and seasonal freshwater marsh communities. (*Less than Significant*)

Campus and Community North

Development of the Campus and Community North would remove ponds, marshes, wetlands, and drainages that provide suitable aquatic habitat for western pond turtle, a state species of special concern. Suitable wetland habitats do not include vernal pool ecosystems, vernal swales, or seasonal wetlands. Western pond turtle is known to occur in the region, and therefore, the removal of these habitats has potential to impact western pond turtle. **Table 4.4-16, Impacts to Western Pond Turtle Suitable Habitat on the Proposed Project Site and Acres of Suitable Habitat within Conservation Lands,** shows acres of suitable habitat that would experience direct and indirect impacts. Destruction of active pond turtle nests

or loss of individuals would be considered a potentially significant impact. Though most of the environmental commitments identified in the *Conservation Strategy* are not specifically designed to avoid impacts to this species, the implementation of site specific design, construction, and operations and maintenance measures as part of Strategy 2 would avoid and minimize impacts to nests or individuals, if found to be present. Additionally, under Strategy 13, the University has committed to conserve habitat essential to the survival and preservation of other special-status species. As shown in **Table 4.4-16**, habitats suitable for this species have been preserved in both Tier 1 and 2 conservation lands. These environmental commitments serve to carry out 2009 LRDP Policy ENV-128 and UCP Policies PA 1.1, PA 1.4, and PA 1.5 described in **Subsection 4.4.3**.

Table 4.4-16
Impacts to Western Pond Turtle Suitable Habitat (acres) on the Proposed Project Site and Acres of Suitable Habitat within Conservation Lands

	Proposed Project Site						Conservation Lands	
	Campus		Community North		Community South			
Habitat Types	Direct	Indirect	Direct	Indirect	Direct	Indirect	Tier 1	Tier 2
Ponds	2	0	0	0	0	0	24	47
Suitable Marsh/Wetland/ Drainage Types								
Canal Wetland	21.14	0.19	4.01	0	3.60	0	1	0
Intermittent Channel	0	0	0	0	1.03	0	0	0
Irrigation Wetland	4.15	0.15	8.08	0	0.01	0	0	0
Linear	0	0	0	0	0	0	137	0
Marsh	0	0	0	0	0	0	6	43.35
Riparian	0	0	0	0	0.7	0	0	19.94
Total Suitable Habitat Lost or Protected	27.29	0.15	12.09	0	4.64	0	168	110.12

**All impacts were calculated from the wetlands dataset for the project obtained from numerous delineation efforts (see Conservation Strategy for methodology used to create this dataset). Ponds within the campus site were not delineated due to their artificial nature and the acres for these ponds were therefore derived from aerial photograph interpretation.*

Community South

The Community South portion of the project site contains riparian and marsh habitats that provide potential breeding habitat for the species. However, this habitat is not known to be occupied. Development of the Community South site would remove approximately 4.64 acres of suitable aquatic

habitat for western pond turtle. Implementation of UCP Policies PA 1.1, PA 1.4, and PA 1.5, described in **Subsection 4.4.3**, would avoid and minimize impacts to this species. Though a specific compensation plan has not been proposed for Community South, the County would require project applicants for Community South to prepare an agency-approved HMP as required by UCP Policy PA 1.6. Compliance with Policy PA 1.6 would ensure that impacts to western pond turtle in the region would be minimized through the preservation of suitable aquatic habitat for this species. Implementation of these UCP policies would reduce potential impacts to this species to a less-than-significant level.

Combined Campus and Community Impacts and Conclusion

Development of the Campus and the University Community would result in direct impacts to suitable western pond turtle aquatic habitat. Through the incorporation of environmental commitments into the development plans for the Campus and Community North, which include site specific avoidance and minimization measures and conservation of lands with suitable pond turtle habitats, and the implementation of the UCP policies to address potential impacts from the development of Community South, the combined impact of the development of the Campus and the University Community would be less than significant.

Mitigation Measure: No additional mitigation measures beyond the measures included in the Proposed Action are required.

Alt 1 – Impact BIO-7: The Proposed Action would not result in a substantial adverse impact on Swainson's hawk from the loss of suitable foraging habitat. (*Less than Significant*)

Campus and Community North

The development of the Campus and Community North sites would result in the removal of 1,514 acres of annual grassland and irrigated pasture communities which provide suitable foraging habitat for Swainson's hawk (**Table 4.4-17, Impacts to Swainson's Hawk Foraging Habitat and Suitable Habitat within Conservation Areas [acres]**). Swainson's hawks are known to nest within 5 miles of the Campus and Community North sites. Conservation lands acquired by the University and UCLC contain 8,455 acres of comparable habitats in Tier 1 conservation lands and 15, 830 in Tier 2 conservation lands, for a total of 24,285. These lands offset the loss of this habitat in the Campus and Community North sites at a ratio of 5.5:1 considering Tier 1 conservation lands only and 10:1 considering both Tier 1 and 2 conservation lands. These ratios exceed CDFG's replacement requirement for loss of foraging habitat. CDFG requires that loss of foraging habitat for the species be replaced at a ratio of 0.75:1 for projects where nesting Swainson's hawks are known to occur within a 5-mile radius (California Department of Fish and Game 1994). In addition to acquiring conservation lands for mitigation, the University has

committed to working with the conservation easement holders and landowners regarding land management practices consistent with the *Conservation Strategy*. Although the *Conservation Strategy* does not specifically address this species because it is a state state-listed species only, management commitments aimed at benefiting other grassland-dependent species, such as San Joaquin kit fox, would maintain the habitat value for Swainson's hawk. Specifically, Strategies 5-7, which contain the University's commitments to management and monitoring of conservation lands, would benefit this species. Loss of a substantial amount of foraging habitat within 5 miles of a known Swainson's hawk nest is considered to be a potentially significant impact. However, through the acquisition of Conservation Lands that will preserve significant amounts of suitable foraging habitat for the species and the management and monitoring of these lands for Swainson's hawk habitat values consistent with the University's environmental commitments, this impact is reduced to a less-than-significant level. The acquisition of conservation lands that serve to preserve grasslands, and environmental commitments to prepare and implement management and monitoring plans for these lands, carry out 2009 LRDP Policy ENV-128 and UCP Policy PA 2.3 (in the case of Community North), described in **Subsection 4.4.3**. These lands include the acreages of suitable habitat shown in **Table 4.4-17**, below. Due to the environmental commitments included in the Campus and Community North portions of the Proposed Action, the impact on the species would be less than significant.

Table 4.4-17
Impacts to Swainson's Hawk Foraging Habitat and Suitable Habitat within Conservation Areas (acres)

	Proposed Action Effects			Conservation Lands		
Suitable Foraging Habitats	**Campus**	**Community North**	**Community South**	**Tier 1**	**Tier 2**	**Tier 1 and 2**
Annual grassland	527	331	16	8,455	15,753	24,208
Irrigated pasture	179	477	1	0	76	76
Row and field crops	0	0	1,084	0	1	1
Total impacts /compensation acres	1,514		1,100	8,455	15,830	24,285
Mitigation Ratios for Campus and Community North				5.5:1	10:1	16:1

Community South

The development of the Community South site would remove approximately 1,120 acres of row and field crops which provide suitable foraging habitat for Swainson's hawk (**Table 4.4-17**). Swainson's hawks are known to nest within 10 miles of the Community South site. The impact associated with the loss of row and field crops would be similar to those discussed above for the Campus and Community North sites.

Development within Community South would be required to implement UCP Policy PA 2.3. Project applicants would be required to comply with Policy PA 2.3 and its implementing program through the development of an HMP to provide off-site compensation for the loss of annual grassland functions within the University Community that is acceptable to the USFWS, CDFG, and other relevant agencies. Compliance with this policy would reduce the impact to a less-than-significant level. **Mitigation Measure BIO-7**, below, will further ensure that the impacts to Swainson's hawk foraging habitat will be mitigated in accordance with CDFG's requirements.

Combined Campus and Community Impacts and Conclusion

Development of the Campus and the University Community would result in the total loss of 2,614 acres of suitable foraging habitat for Swainson's hawk through the removal of irrigated grassland, annual grassland, and row and field crops. The combined impact of the development of the Campus and the University Community would be less than significant given the University's acquisition of Conservation Lands that contain comparable habitat and environmental commitment toward management and monitoring of lands for grassland-dependent species, identified in the *Conservation Strategy*, and implementation of UCP Policy PA 2.3. As noted above, in the case of Community South, **Mitigation Measure BIO-7** will further reduce this less than significant impact.

MM BIO-7: Mitigate for loss of Swainson's hawk foraging habitat in accordance with CDFG requirements.

To mitigate for the loss of foraging habitat in the Community South, consistent with Policy PA 2.3, the County shall require the project proponents to provide habitat management lands consistent with CDFG foraging habitat mitigation requirements for projects located within 10 miles of an active nest (California Department of Fish and Game 1994). CDFG requirements state that projects within 10 miles of an active nest but greater than 5 miles from an active nest shall provide 0.5 acre of habitat management lands for each one acre of urban development authorized (0.5:1). All habitat management lands protected under this requirement may be preserved by fee title or conservation easement on agricultural lands, or other suitable habitats (as approved by the CDFG) that provide foraging habitat for Swainson's hawk. (*Applicability – Community South only*)

Significance after Mitigation: As noted above, the impact prior to the implementation of this mitigation would be less than significant. This mitigation measure would further reduce the impact of the Proposed Action.

Alt 1 – Impact BIO-8: The Proposed Action would not result in a substantial adverse impact on special-status avian species from the loss of foraging habitat. (*Less than Significant*)

Campus and Community North

The Campus and Community North sites are used for foraging by numerous special-status birds, including white-tailed kite, northern harrier, bald eagle, merlin, prairie falcon, short-eared owl, burrowing owl, loggerhead shrike, California horned lark, tricolored blackbird, and mountain plover. Though not reported to forage on site, golden eagle, ferruginous hawk, and Swainson's hawk (discussed above under **Impact BIO-7**) are known to occur in the project vicinity and have potential to use the site for foraging. Development of the Campus and Community North sites would result in the removal of 1,514 acres of annual grassland and irrigated pasture communities that provide suitable foraging habitat for special-status avian species.

As discussed under **Impact BIO-7** above, conservation lands acquired as part of the University's environmental commitments contain 8,455 acres of comparable habitats in Tier 1 conservation lands and 15,830 acres in Tier 2 conservation lands. These lands offset the loss of this habitat in the Campus and Community North project sites at a ratio of 5.5:1 considering Tier 1 conservation lands only and 10:1 overall. In addition to acquiring conservation lands for mitigation, the University has committed to working with the conservation easement holders and landowners regarding land management practices consistent with the *Conservation Strategy*. Though the *Conservation Strategy* does not specifically address these species, management commitments aimed at benefiting other grassland dependent species, such as San Joaquin kit fox, would maintain the habitat value for foraging special-status birds. Specifically, Strategies 5-7, which contain the University's commitments to management and monitoring of conservation lands, would benefit these species.

CDFG requires that active western burrowing owl burrows be relocated (discussed below under **Impact BIO-9**) and the loss of foraging habitat (and burrowing habitat) be offset by acquiring and permanently protecting a minimum of 6.5 acres of foraging habitat per occupied burrow identified on the project site (California Department of Fish and Game 1995). Conservation lands containing annual grasslands and irrigated pasturelands, acquired as part of the project, will well exceed this foraging habitat mitigation requirement. Although the removal of 1,514 acres of foraging habitat for special-status birds, including western burrowing owl, is a potentially significant impact, it would be reduced to a less-than-significant level through the protection of comparable habitats within Conservation Lands and would be further reduced through the implementation of environmental commitments that will retain the habitat value within Conservation Lands to ensure that they continue to benefit these species. The acquisition of

Conservation Lands that serve to preserve grasslands and the environmental commitments to prepare and implement management and monitoring plans for these lands carry out 2009 LRDP Policy ENV-12 and UCP Policy PA 2.3, described in **Subsection 4.4.3**.

Community South

As discussed under **Impact BIO-7**, the development of the Community South site would remove approximately 1,120 acres of row and field crops, which are suitable foraging habitat for Swainson's hawk. Other special-status birds known to use the site for foraging include white-tailed kite, northern harrier, short-eared owl, and mountain plover. Other special-status avian species that have potential to forage on site include western burrowing owl, golden eagle, ferruginous hawk, merlin, prairie falcon, loggerhead shrike, California horned lark, and tricolored blackbird.

The mitigation measures and UCP policies included under **Impact BIO-7** would adequately compensate for the loss of this habitat and offset impacts to other special-status species associated with the loss of foraging habitat. This impact is considered less than significant.

Combined Campus and Community Impacts and Conclusion

Development of the Campus and the University Community would result in the total loss of 2,614 acres of suitable foraging habitat for special-status birds. The combined effect of the development of the Campus and the University Community would be potentially significant but would be reduced to a less-than-significant level through the protection of comparable habitats within Conservation Lands and environmental commitments to prepare and implement management and monitoring plans for these lands, and through the County's implementation of UCP Policy PA 2.3 and **Mitigation Measure BIO-7**.

Mitigation Measure: No additional mitigation measures beyond the measures included in the Proposed Action are required.

Alt 1 – Impact BIO-9: The Proposed Action would result in potentially significant adverse impacts on nesting special-status bird species and non-special-status migratory birds and raptors. (*Potentially Significant; Less than Significant*)

Campus and Community North

The development of the Campus and Community North sites would result in the direct loss of suitable ground and tree/shrub nesting habitat for special-status and non-special-status migratory birds, including raptors, through the removal of annual grassland, irrigated pasture, and seasonal freshwater marsh communities, and the removal of individual trees and shrubs that occur mainly along the canals and the

boundary of the project site. Additionally, site development has the potential to disturb active special-status and non-special-status migratory bird nests if construction occurs during the breeding season (generally February 15 through August 15). Special-status birds known to nest on the Campus and Community North sites include western burrowing owl and northern harrier. Other special-status birds for which there is suitable nesting habitat on and adjacent to these sites include California horned lark, white-tailed kite, Swainson's hawk, short-eared owl, loggerhead shrike, and tricolored blackbird. These sites and adjacent lands also contain suitable nesting habitat for numerous non-special-status migratory birds, including red-tailed hawk, red-winged blackbird, and cliff swallow, whose nests are protected under the MBTA and CDFG Code Sections 3503 and 3503.5. Destruction or disturbance of active nests resulting in nest failure or loss of individuals is a potentially significant impact. Implementation of **Mitigation Measures BIO-9a** and **-9b**, below, would reduce this potential impact to a less than significant level.

Community South

Development of the Community South site would result in the removal of minimal habitat suitable for nesting by special-status and non-special-status migratory birds. Site development does, however, have the potential to disturb active special-status and non-special-status migratory bird nests on adjacent lands if construction occurs during the breeding season (generally February 15 through August 15). Suitable nesting habitat in this area is limited to a few trees and shrubs located near the rural development in the western portion of the Community South site. Suitable nesting habitat adjacent to the site consists of trees located along Lake Road and Yosemite Avenue, the riparian area adjacent to the southeastern boundary, and adjacent annual grassland areas. No special-status birds are currently known to nest on the Community South site. Special-status and non-special-status migratory birds with a potential to nest on or adjacent to the Community South site include all species discussed above for the Campus and Community North sites. Potentially significant impacts to these species would be similar to those discussed above for the Campus and Community North sites. Implementation of **Mitigation Measures BIO-9a and -9b** would reduce these potential impacts to a less than significant level.

Combined Campus and Community Impacts and Conclusion

Development of the Campus and the University Community would result in the removal of occupied burrowing owl nesting habitat and suitable nesting habitat for other special-status and non-special-status migratory birds, including raptors, through the removal of annual grassland, irrigated pasture, and seasonal freshwater marsh communities, and the removal of individual trees and shrubs. It would also result in the potential disturbance of active special-status and non-special-status migratory bird nests adjacent to the project site. The combined impacts of the development of the Campus and the University

Community would be potentially significant but would be reduced to a less-than-significant level through the implementation of **Mitigation Measures BIO-9a and -9b**, described below.

MM BIO-9: Avoid and minimize impacts on special-status and non-special-status migratory birds, and raptors.

(a) Limit construction to the non-breeding season or, if breeding season work is required, conduct pre-construction (tree, shrub, and ground) nest surveys to identify and avoid active nests or as an option, remove potential breeding habitat during the non-breeding season.

- If feasible, the applicant shall conduct all construction-related activities including (but not limited to) tree and shrub removal, other vegetation clearing, grading, or other ground disturbing activities during the non-breeding season (between August 16 and February 14) for special-status and non-special-status migratory birds and raptors. If construction activities are scheduled to occur during the breeding season, a qualified avian biologist, with knowledge of the species to be surveyed, shall be retained to conduct focused nesting surveys within 15 days of the start of ground-disturbing or construction activities and within the appropriate habitat.

- Specifically, tree, shrub, and ground nesting surveys for special-status birds (including but not limited to white-tailed kite, Swainson's hawk, northern harrier, burrowing owl, loggerhead shrike, and tricolored blackbird), and other migratory birds and raptors shall be conducted before any construction disturbances occur in or near suitable nesting habitat within 500 feet (0.25 mile for Swainson's hawk) of the construction work area between February 15 and August 15.

- If an active nest is located on or within 500 feet (0.25 mile for Swainson's hawk) of the project area, CDFG shall be consulted to determine an appropriate no-disturbance buffer around the nest until the nest is no longer active and the young have fledged. No construction shall be allowed within this exclusion area without consulting with CDFG. A wildlife biologist shall monitor the nest site during construction at least once a week, or at a frequency determined by CDFG, to ensure that the nest site is not disturbed and the buffer is maintained.

- If the project proponent elects to remove a nest tree, nest trees may only be removed between August 16 and February 28, after the qualified avian biologist has determined that the nests are unoccupied.

(b) Minimize impacts to burrowing owl and compensate for habitat loss.

The CDFG (1995) recommends that preconstruction surveys be conducted to locate active burrowing owl burrows in the construction work area and within a 500-foot-wide buffer zone around the construction area. The project proponent or

its contractor shall retain a qualified biologist to conduct preconstruction surveys for active burrows according to the CDFG's Staff Report on Burrowing Owl Mitigation (California Department of Fish and Game 1995). The preconstruction surveys shall include a breeding season survey and a wintering season survey. If no burrowing owls are detected, no further mitigation is required.

If active burrowing owls are detected, the following additional measures are required:

- Occupied burrows shall not be disturbed during the breeding season (February 1 to August 31), which requires a 250 foot no disturbance buffer.
- If owls must be moved away from the project site during the nonbreeding season, passive relocation techniques (e.g., installing one-way doors at burrow entrances) shall be used instead of trapping, as described in CDFG guidelines. At least 1 week will be necessary to complete passive relocation and allow owls to acclimate to alternate burrows.
- When destruction of occupied burrows is unavoidable during the nonbreeding season (September 1 to January 31), unsuitable burrows shall be enhanced (enlarged or cleared of debris) or new burrows created (by installing artificial burrows) at a ratio of 2:1 on protected lands approved by the CDFG. Newly created burrows shall follow guidelines established by the CDFG (1995). These guidelines also require compensation for loss of foraging habitat described in detail under Impact BIO-8 above. (*Applicability – Campus and University Community*)

Significance after Mitigation: Less than significant.

Alt 1 – Impact BIO-10: The Proposed Action would not result in substantial adverse impacts to San Joaquin kit fox due to the loss of suitable residence and dispersal habitat. (*Less than Significant)*

Campus and Community North

The Campus and Community North sites are located within the current range of San Joaquin kit fox, although the species is not known to den within these sites (USFWS 1998, CNDDB 2008). Four San Joaquin kit fox sightings have been documented within a 10-mile radius of the project site (CNDDB 2008). The closest of these sightings was in 1999 of an adult foraging within approximately 1 mile of the project site along the Black Rascal Creek drainage. The remaining three records were of foraging or dispersing individuals with only one record involving juvenile kit fox. The nearest documented breeding population was observed in 1999 approximately 15 miles southwest of the project site in the vicinity of Chamberlain Road. It appears likely, based on these recorded occurrences, that individuals dispersing from

populations within the region could use portions of the project site for dispersal to reach suitable habitats to the north and east.

A San Joaquin kit fox habitat suitability model was created as part of the preparation of the *Conservation Strategy* for the Proposed Action. This model facilitated the assessment of the quality and distribution of potential San Joaquin kit fox residence (i.e., breeding) and dispersal habitat in the project site and region. Habitat suitability was evaluated at a landscape scale to assign suitability values to lands for residence and dispersal, and ultimately to assess the potential impacts of the Proposed Action on suitable habitat. This model rated lands within the project site and the project region as primary habitat, secondary habitat, or unsuitable. A detailed description of how the model was developed and how primary and secondary habitat impacts associated with the Proposed Action were determined is contained in the *Conservation Strategy*.

The model identified primary habitat as habitat suitable for denning or residence, which is assumed to support dispersal as well; secondary habitat as habitat suitable for dispersal only (excludes primary habitat areas); and unsuitable habitat as unsuitable for both denning and dispersal. Based on this model, about 49 percent (180,431 acres) of the project region is suitable for San Joaquin kit fox residence and about 41 percent (150, 644 acres) of the project region is suitable for San Joaquin kit fox dispersal only.

The Campus and Community North would result in the direct loss of 804 acres of residence habitat and potential indirect impacts (noise, increased traffic, and other human-related disturbance) to an additional 489 acres and the loss of 610 acres of dispersal-only habitat and potential indirect impacts to an additional 66 acres of adjacent dispersal-only habitat (**Tables 4.4-4** and **4.4-13**). Therefore, the Campus and Community North would affect 0.7 percent of the total amount of residence habitat and 0.5 percent of the total area suitable for dispersal in the approximately 371,000-acre eastern Merced County region (**Table 4.4-18, Regional Effects of the Proposed UC Merced Project and the UC Merced Mitigation Program on the Availability of Habitat for San Joaquin Kit Fox [acres]**).

Through preservation and management of Tier 1 and Tier 2 conservation lands, over 25,918 acres of habitat suitable for kit fox will be conserved, of which 94 percent (24,394 acres) is suitable for residence (**Tables 4.4-4** and **4.4-13**). As a condition of approval for the Proposed Action, the 2002 BO required a minimum 3:1 compensation ratio for the loss of suitable kit fox habitat. Although suitable habitat was divided into suitable residence versus suitable dispersal-only, residence habitat is of greatest importance because it not only provides suitable habitat for kit fox residence (which supports denning and reproduction) but also provides greater dispersal capability than does dispersal-only habitat. Therefore, compensation was focused on residence habitat. Project compensation ratios from Tier 1 conservation lands for the Campus and Community North are 7:1 for residence habitat and 5:1 for all kit fox habitat

(**Table 4.4-13**). With incorporation of Tier 2 conservation lands, compensation ratios are 18:1 for residence habitat and 13:1 for all kit fox habitat. These Conservation Land acquisitions contribute to the recovery plan objectives of conserving 90 percent of existing natural lands along the northeastern valley edge from San Joaquin to Madera Counties (US Fish and Wildlife Service 1998) and establishing a corridor that maintains the potential for dispersal from valley floor habitats to and along the project region (i.e., the Sandy Mush Road Corridor) (US Fish and Wildlife Service 1998).

Table 4.4-18
Regional Effects of the Proposed UC Merced Project and the UC Merced Mitigation Program on the Availability of Habitat for San Joaquin Kit Fox (acres)

Habitat Type		Proposed Action			Conservation Lands		
	Project Region	Campus	Community North	Community South	Tier 1	Tier 2	Total
Residence	180,431 (49%*)	720 (<1%)	573 (<1%)	61(<1%)	9,312 (5%) **	15,082 (8%)	24,394 (13%)
Dispersal	150,644 (41%)	196 (<1%)	480 (<1%)	1,286 (<1%)	94 (<1%)	1,430 (<1%)	1,524 (<1%)
Total	371,493	916 (<1%)	1,053 (<1%)	1,347 (<1%)	9,406 (2%)	16,512 (5%)	25,918 (7%)

** Percents in parenthesis represent percent within the region.*
***Within suitable residence habitat in Tier 1 lands 187 acres of these lands are considered degraded by the project because they are located within 656 feet of the Campus and University Community site boundaries.*

Additionally, environmental commitments requiring the management of Conservation Lands to maintain their habitat value include installing artificial kit fox dens, as specified in the 2002 BO. Strategies 5-7 in the *Conservation Strategy* describe these commitments, as does the *Management Plan for Conservation Lands*, which was prepared for the purpose of implementing these management commitments.

There is low potential for kit foxes to occur in the Campus and Community North sites because kit foxes have not been observed within these lands. However, there is some potential for kit foxes to colonize lands designated for the Campus and Community North prior to full development of these lands. Implementation of the environmental commitments to avoid and minimize impacts to the species will ensure that individuals will not be harmed during construction. Specifically, Strategy 2, contained in the *Conservation Strategy*, describes the University's commitment to implement site-specific design, construction, and operation and maintenance measures, and implementation of USFWS' (1999) *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* would reduce the potential for impacts to the species. The incorporation into the Campus and Community North portions of the Proposed Action of Conservation Lands that preserve suitable residence and dispersal habitat for kit fox in a manner that contributes to the recovery of the species and

complies with the 2002 BO requirements for habitat protection and maintenance, and the University's commitment to implement avoidance and minimization measures during Campus and Community North design, construction, and operation and maintenance, would reduce potential impacts to San Joaquin kit fox to a less than significant level.

Community South

Using the habitat suitability model developed as part of the *Conservation Strategy*, it was determined that development of the Community South site would result in the loss of 19 acres of suitable residence habitat for the kit fox and disturbance to an additional 42 acres of residence habitat and the loss of 1,011 acres of dispersal-only habitat and additional disturbance to 275 acres of dispersal-only habitat on adjacent lands (**Tables 4.4-4 and 4.4-13**). The impact would be potentially significant. **Mitigation Measure BIO-10** (described below) to avoid and minimize impacts to individual kit foxes and compliance with UCP Policy PA 2.3, which would ensure that impacts to suitable habitat within the Community South site would be compensated for in the amount and manner consistent with the 2002 BO requirements and the recovery plan objectives for the species, would reduce potential impacts to San Joaquin kit fox to a less-than-significant level.

Combined Campus and Community Impacts and Conclusion

Development of the Campus and University Community would eliminate 823 acres of kit fox residence habitat and 1,621 acres of dispersal-only habitat and would result in indirect impacts to an additional 531 acres of residence habitat and 341 acres of dispersal-only habitat on adjacent lands. This overall impact represents 0.7 percent of suitable residence habitat and 1.3 percent of dispersal habitat in eastern Merced County (**Table 4.4-17**). Compensation habitat as described under Campus and Community North Impacts section based on the *Conservation Strategy* above will exceed the 3:1 minimum ratios identified in the 2002 BO for residence habitat (18:1) and total residence and dispersal (8:1) (**Table 4.4-13**). As described for the Campus and Community North, measures to avoid and minimize impacts during design, construction, and operations and maintenance will reduce the potential for impacts to individual kit foxes. As described under the Community South discussion above, UCP Policy 2.3 will also avoid and minimize impacts to individual kit foxes. The acquired Conservation Lands for the Proposed Action compensate for the loss of suitable habitat within the Campus and Community North sites in accordance with the 2002 BO requirements and improve the quality of dispersal habitat for the kit fox east and north of the Campus and Community North lands consistent with recovery objectives for the species. The County has committed to require project applicants for Community South to prepare an agency-approved HMP as required by UCP Policy PA 2.3.

Implementation of avoidance, minimization and compensation measures discussed above for the Campus and Community North that are already included in the Proposed Action would reduce potential impacts to San Joaquin kit fox to a less-than-significant level. **Mitigation Measure BIO-10** is proposed specifically for Community South to ensure that all required steps to address kit fox impacts on site are implemented.

MM BIO-10: Avoid and minimize impacts to San Joaquin kit fox.

The County shall ensure that surveys for dens/burrows that could be occupied by vagrant San Joaquin kit fox are surveyed prior to any ground-disturbing activities within the UCP area. These surveys shall be conducted within 2 weeks or less of any ground-disturbing activities. If dens/burrows meeting the criteria suitable for use by San Joaquin kit fox are found, the dens/burrows shall be cleared using the methodologies described in the June 1999 *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance*. Additionally, avoidance and minimization of impacts to kit foxes that could move through the project site will be achieved through implementation of standard protection measures contained in USFWS' 1999 recommendations for kit fox, mentioned above (USFWS 1999). (*Applicability – Community South Only*)

Significance after Mitigation: Less than significant.

Alt 1 – Impact BIO-11: Diversions from the Merced River to recharge the groundwater basin would not adversely affect fish species. (*Less than Significant)*

Campus and Community

As discussed in **Section 4.14, Utilities and Service Systems**, the City of Merced would provide potable water to meet the water supply needs generated by the Campus from either on or off site wells. The University Community would also be provided water from groundwater wells. Surface water would not be used by either project as the water supply source.

MID and the City of Merced are the two primary water agencies in eastern Merced County. As part of its conjunctive use strategy, in wet years, MID can divert surplus surface water to the groundwater basin for storage. In dry years, MID takes the groundwater and discharges it into the Merced River to improve flows for habitat and meet other needs. MID's conjunctive use measures include groundwater recharge and extraction, which may include in-lieu groundwater recharge through strategic use of available surface water, incidental recharge accomplished through use of existing MID facilities, and intentional recharge accomplished through construction and operation of new recharge facilities or modification of

existing facilities. MID actively pursues water conservation, which involves voluntary adoption of on-farm water conservation practices. MID also cooperates with sphere-of-influence pumpers, maintains cooperative relationships to manage groundwater flows, implements pumping restrictions and requires ground extraction fees, if necessary. All of these practices are being implemented independent of the future status of the Proposed Action.

The Merced Water Supply Plan Update (CH2M Hill 2001) analyzed the availability of surface water under three planning/regulatory scenarios in conjunction with projected demand for water through 2040. As further discussed in Section 4.8, Hydrology and Water Quality, under the Water Supply Plan Update, in surplus water years, MID would divert water from the Merced River for recharge of the groundwater basin. The Water Supply Plan Update envisions the diversions would occur primarily during the shoulders of irrigation season, and not during winter periods. Modeling conducted for the update shows that with full implementation of the update's recommendations and under the forecasted water demands, MID will divert an average of 495,000 acre-feet per year, including surface water for intentional recharge (CH2M Hill 2001). During wet years, when excess water is available, MID would divert up to a maximum of 536,000 acre-feet per year, which includes water for intentional recharge. During some years, surface water deliveries and deliveries to recharge the groundwater basin are curtailed due to insufficient surface water availability. However, in all cases addressed in the Water Supply Plan Update, MID will continue to meet the applicable Merced River minimum flow requirements, including those established through the San Joaquin River Agreement (described below) and its Vernalis Adaptive Management Plan flow objectives through 2040 (CH2M Hill 2001). According to MID, the planned diversions would not exceed the licensed amount for diversion. In addition, MID has initiated practices designed to improve fisheries resources and other habitats associated with the Merced River. MID is implementing these practices pursuant to the San Joaquin River Agreement, Federal Energy Regulatory Commission (FERC) license for operation of the New Exchequer project, the Lower Merced Restoration Project, the Upper Merced Watershed Group and a draft Settlement Agreement with the CDFG that includes the Merced River Adaptive Management Plan. The ultimate objective of these agreements and practices is to improve water flows for fisheries and to improve aquatic habitat conditions for wildlife. Pursuant to the existing interagency agreements, MID currently is implementing measures to improve habitat for fisheries, including Chinook salmon and wildlife species in the Merced River.

For example, MID is increasing flows by 100,000 afy into the Merced River and delivering 50,000 afy to wildlife refuges in the San Joaquin River. Pursuant to these agreements, MID is not diverting existing flows from the Merced and San Joaquin Rivers because the water comes from surface water and groundwater storage. These efforts are described in further detail in the Water Supply Plan Update (CH2M Hill 2001). At this time, MID is actually diverting less than in 2001 because of a commitment to

keep water in the river to support the fall salmon run. MID will take water from the river in wet years for groundwater recharge so that in multiple dry years (3 or 4 years of drought conditions) it can provide irrigation water from groundwater. MID will take from the river at a time that benefits the salmon by way of managing the temperature of the river.

The Proposed Action was evaluated to determine if it could result in potential effects to fisheries species or their habitats by affecting surface flow diversions from the Merced River to provide for the water supply demand generated by the Campus and the University Community. For the reasons set forth below, the Campus and the University Community would not affect fisheries species or habitats.

First, MID's and the City of Merced's implementation of the adopted Water Supply Plan and the related City of Merced Urban Water Supply Plan and existing interagency agreements that result in beneficial effects to fisheries resources would not be affected with approval of the Campus and the University Community.

Under the existing agreements, MID has undertaken certain improvements to fisheries habitats, as described above and in the Water Supply Plan Update (CH2M Hill 2001). The City of Merced's provision to serve the Campus would not require a change in MID's existing practices pursuant to the interagency agreements in effect for the San Joaquin and Merced Rivers (CH2M Hill 2001, p. ES-8). The Campus and the University Community would not affect existing and future beneficial effects on fisheries.

Construction of the Campus and the University Community would not affect the Water Supply Plan Update. The total demand for water of the Proposed Action is accounted for in the water supply projections contained in all water planning documents in the Merced area. All estimates are significantly greater than the amount of water that would be needed by the Campus and the University Community. Consequently, the Proposed Action would not create a demand for water that was not anticipated in the 1995 plan, the Water Supply Plan Update, or the 2005 UWMP, and it would not interfere with the 1995 plan or the Update's proposed measures for the recharge of the groundwater basin.

The ability to obtain water to serve the Proposed Action is not contingent upon the measures implemented pursuant to the 1995 Water Supply Plan or those that may be adopted in the future as part of the Update. Activities undertaken pursuant to the 1995 Water Supply Plan and the Update are independent of the water supply demands generated by the Proposed Action. Implementation of the recommendations contained in the Update will meet the region's future water needs and support the assumed water demand associated with the Campus (CH2M Hill 2001, p. ES-8). No additional surface water diversions or practices would need to be implemented to provide the Campus and University Community with a sufficient water supply.

Second, the total water supply demand for the Campus and the University Community represents a negligible amount of the total basin-wide water supply demand, and as a result would not require MID to increase surface water diversions to meet its conjunctive use program.

Although the Campus water supply demand has been accounted for in MID's prior and current planning activities, concern has been expressed that the Campus water demand may contribute to increased surface water diversions affecting habitat for fisheries resources. The total applied water demand projected for the MID service area for the year 2040 is 1,160,000 acre-feet. The 1995 Water Supply Plan assumed a demand associated with Proposed Action -generated uses of approximately 7,400 to 11,700 acre-feet of water. However, as discussed in **Section 4.8, Hydrology and Water Quality**, the projected net groundwater demand generated by the Campus is 2,228 acre-feet per year. The 2,228 acre-feet of water necessary to serve the Campus and about 6,253 acre-feet for the Campus and the University Community combined represent a small fraction of the total annual water demand projected by the Water Supply Plan Update for the groundwater basin. The projected water demand of the Proposed Action does not represent an increase above water demand projections accepted by MID, and will not affect MID's surface water diversions to implement the Plan.

MID may supply the Campus and the University Community with irrigation water. However, it would supply this pursuant to both its existing water rights and under an existing license for diversion from the Merced River. MID would not divert any more water into its system to serve the Proposed Action than it has under historical diversion conditions. Thus, MID is not proposing any new diversions or changes to its existing facilities to accommodate water supply demands from the Campus and the University Community (CH2M Hill 2001).

Because no changes to MID's surface-water diversion program would occur as a result of the Proposed Action, the Proposed Action's water supply demand would not affect fisheries or aquatic habitats in the Merced and San Joaquin Rivers.

Mitigation Measure: No mitigation required.

4.4.6.2 Alternative 2 – Yosemite Avenue Alternative

Wetlands

The Yosemite Avenue Alternative would result in both direct and indirect impacts on wetlands. Construction of the Campus and University Community, infrastructure installation and roadway improvements could result in the removal or fill of all wetlands on the project site. Approximately 29 acres of wetlands could be lost, including approximately 7 acres of vernal pools, 9 acres of swale

wetlands, 6 acres of canal wetlands, 1 acre of intermittent channel, and 6 acres of irrigation wetlands (**Table 4.4-19, Yosemite Avenue Alternative Wetland Impacts)**.

Table 4.4-19
Yosemite Avenue Alternative Wetland Impacts

Wetlands	Campus		Community North		Community South		Conservation Lands	
Wetland Type	**direct**	**indirect**	**direct**	**indirect**	**direct**	**indirect**	**Tier 1**	**Tier 2**
Canal Wetland	5.53	0.61	0.45	0	0	0	0.95	0
Clay Slope Wetland	0	0	0	0	0	0	88.36	0
Intermittent Channel	0	0	0.97	0	0.07	0	0	0
Irrigation Wetland	6.30	2.16	0	0	0	0	0	0
Swale Wetland	8.82	0.46	0	0	0	0	203.08	0
Vernal Pool	6.58	0.10	0.49	0	0	0	258.42	223.69
Clay Playa	0	0	0	0	0	0	28.7	305.46
Juncus	0	0	0	0	0	0	0	3.47
Linear	0	0	0	0	0	0	137.02	0.00
Marsh	0	0	0	0	0	0	6.27	43.35
Mima Mound	0	0	0	0	0	0	0	55.28
Pool/Swale Complex	0	0	0	0	0	0	269.91	569.18
Riparian	0	0	0	0	13.14	1	0	19.94
Seasonal Wetland	0	0	0	0	0	0	30.95	0
Stockpond	0	0	0	0	0	0	24.19	46.83
Tailings	0	0	0	0	0	0	0	1.38
Total	**27.23**	**3.33**	**1.91**	**0**	**13.21**	**0**	**1,047.85**	**1,268.58**

Wetlands that are directly affected would lose all wetland functions, as discussed above for the Proposed Action. Direct and indirect impacts on wetlands would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts would be less because the Yosemite Avenue Alternative site has fewer directly-affected wetlands and fewer indirectly-affected wetlands. These potentially significant impacts would be avoided or reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-1** for the Proposed Action. Similar to the Proposed Action, the Yosemite Avenue Alternative would not result in a substantial adverse impact on wetlands.

Special Status Plant Species

The Yosemite Avenue Alternative would result in both direct and indirect impacts on special-status plants. Construction of the campus would result in the removal of three vernal pools (9 acres as shown in **Table 4.4-20, Yosemite Avenue Alternative Listed Plant and Wildlife Species Impacts [acres]**) comprising Occurrence 90 (succulent owl's clover), which was reported to consist of about 80 plants (CNDDB 2008), and seven stands of shining navarretia, each with 5 to 60 plants (UCP EIR), which comprise Occurrence 37 (CNDDB 2008). The loss of this habitat would constitute a reduction both in numbers of individuals and in the loss of occupied habitat for these species and would be a significant impact. Implementation of environmental commitments identified under **Impact BIO-2** for the Proposed Action would also preserve and protect on-site populations of succulent owl's-clover and shining navarretia under this alternative. Therefore, similar to the Proposed Action, this alternative would not result in a substantial adverse impact on special status plant species.

Table 4.4-20
Yosemite Avenue Alternative Listed Plant and Wildlife Species Impacts (acres)

Species	Campus		Community North		Community South		Conservation Lands	
	Direct	Indirect	Direct	Indirect	Direct	Indirect	Tier 1	Tier 2
Succulent owl's clover	9	<1	0	0	0	0	388	308
Colusa grass	0	0	0	0	0	0	156	0
San Joaquin Valley Orcutt grass	0	0	0	0	0	0	16	0
Conservancy fairy shrimp	0	0	0	0	0	0	14	0
Vernal pool fairy shrimp	13	1	<1	0	0	0	632	516
Midvalley fairy shrimp	11	0	0	0	0	0	261	66
Vernal pool tadpole shrimp	0	0	0	0	0	0	14	<1
Vernal Pool Critical Habitat	0	0	0	0	0	0	393	15,775
California tiger salamander	812	65	0	0	0	0	8,805	11,349
CTS Critical Habitat	0	0	0	0	0	0	8,152	3,954
San Joaquin kit fox residence	336	159	17	31	9	30	9,322	15,082
San Joaquin kit fox dispersal	321	135	742	59	1,052	262	94	1430
San Joaquin kit fox unsuitable lands	36	95	64	70	83	54	94	630

Vernal Pool Species Critical Habitat

No USFWS-designated vernal pool species critical habitat is located within or adjacent to the Campus or University Community portions of the Yosemite Avenue Alternative. Therefore, no critical habitat would be directly or indirectly affected by this alternative. Conservation lands incorporated into this alternative would protect over 16,000 acres of vernal pool species critical habitat (see **Table 4.4-20** above).

Special Status Invertebrate Species

Under the Yosemite Avenue Alternative, development of the campus site would result in the loss of 13 acres of occupied vernal pool fairy shrimp habitat and less than 1 acre of disturbance to adjacent habitat for this species. No direct or indirect impacts to vernal pool tadpole shrimp would occur under this alternative. Development of the Community North site would result in the loss of less than 1 acre of occupied vernal pool fairy shrimp habitat and no additional disturbance to adjacent habitat. The Community South site would not result in any impacts to vernal pool invertebrates due to the absence of wetlands within or adjacent to the site (within 250 feet of the site) (**Table 4.4-20**).

Direct and indirect impacts to these species would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impact (for the alternative as a whole) would be less because the Yosemite Avenue Alternative site has less habitat located on site and adjacent to the site. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-4** for the Proposed Action.

Special Status Amphibians

Construction of the Yosemite Avenue Alternative would not impact (directly or indirectly) critical habitat for the California tiger salamander. Development of the campus site would eliminate one known breeding site for the California tiger salamander and result in the loss of 812 acres of occupied upland habitat (i.e., within 1.75 miles of this and other breeding ponds) and potential indirect impacts to an additional 65 acres. Development of the Community North and South sites would not result in the loss or disturbance of occupied habitat for this species (**Table 4.4-20**).

Direct and indirect impacts to this species would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts (for the alternative as a whole) would be less due to the predominance of agricultural lands within the Yosemite Avenue Alternative site. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-5** for the Proposed Action.

Additionally, as described for the Proposed Action, habitats suitable for California tiger salamander are also suitable for western spadefoot. Thorough surveys were conducted during the appropriate time of the year in suitable habitat and this species is not known to occur on any portion of the Yosemite Avenue Alternative site (Campus, Community North, and Community South), therefore it is not expected that this species will be affected either directly or indirectly by the alternative. Conservation Lands, secured by the University, containing suitable breeding habitat for California tiger salamander will also serve to preserve suitable habitat for western spadefoot.

Western Pond Turtle

Under the Yosemite Avenue Alternative, development of the campus site would result in the loss of 11.83 acres of marshes and wetlands that provide suitable breeding habitat for western pond turtles, and disturbance to an additional 0.26 acre adjacent to the campus site. Development of the Community North site would result in the loss of 1.44 acres of marshes, wetlands, drainages, and riparian habitats that provide suitable breeding habitat for western pond turtles. Development of the Community South site would result in the loss of 17 acres of riparian habitat along Black Rascal Creek and 0.07 acres of intermittent channel that provide habitat and no additional disturbance to suitable habitat on adjacent lands (**Table 4.4-21, Impacts to Suitable Western Pond Turtle Habitat on the Yosemite Avenue Alternative Site and Acres of Suitable Habitat within Conservation Areas,** below). Though not known to occur in the project site, western pond turtle is known to occur in the region.

Direct and indirect impacts to this species would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts would be less because the Yosemite Avenue Alternative site contains a smaller amount of suitable habitat. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-6** for the Proposed Action.

Swainson's Hawk

Under the Yosemite Avenue Alternative, development of the Campus and University Community sites would result in the removal of 1,563 acres of annual grassland, irrigated pasture, and row and field crop communities which provide suitable foraging habitat for Swainson's hawk known to nest within 5 miles of the site (note that about 300 acres of the Yosemite Avenue Alternative site is under orchards which are not suitable foraging habitat for the species). Impacts to suitable foraging habitat are shown by project component in **Table 4.4-22, Impacts to Swainson's Hawk Foraging Habitat and Suitable Habitat within Conservation Areas,** below.

Table 4.4-21
Impacts to Suitable Western Pond Turtle Habitat (acres) on the Yosemite Avenue Alternative Site and Acres of Suitable Habitat within Conservation Areas

Habitat Types	Yosemite Ave Site						Conservation Lands	
	Campus		Community North		Community South			
	Direct	Indirect	Direct	Indirect	Direct	Indirect	Tier 1	Tier 2
Ponds	0	0	0	0	0	0	24	47
Suitable Marsh/Wetland /Drainage Types								
Canal Wetland	5.53	0.61	0.45	0	0	0	1	0
Intermittent Channel	0	0	0.97	0	0.07	0	0	0
Irrigation Wetland	6.30	2.16	0	0	0	0	0	0
Linear	0	0	0	0	0	0	137	0
Marsh	0	0	0	0	0	0	6	43
Riparian	0	0	0.02	0	17	0	0	20
Total Suitable Habitat Lost or Protected	**11.83**	**2.77**	**1.44**	**0**	**17.07**	**0**	**168**	**110**

**All impacts were calculated from the wetlands dataset for the Project obtained from numerous delineation efforts (see Conservation Strategy for methodology used to create this dataset). Ponds within the campus site were not delineated due to their artificial nature and the acres for these ponds were therefore derived from aerial photograph interpretation.*

The impact to Swainson's hawk foraging habitat would be qualitatively similar to the impact described for the Proposed Action, although the magnitude of the impact would be less because the Yosemite Avenue Alternative site contains a smaller amount of suitable foraging habitat. This potentially significant impact would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-7** for the Proposed Action.

Table 4.4-22
Impacts to Swainson's Hawk Foraging Habitat and Suitable Habitat within Conservation Areas (acres)

Suitable Foraging Habitats	Yosemite Avenue Alternative Impacts			Conservation Lands		
	Campus	Community North	Community South	Tier 1	Tier 2	Tier 1 and 2
Annual grassland	417	6	0	8,455	15,753	24,208
Irrigated pasture	366	<1	120	0	76	76
Row and field crops	<1	811	660	0	1	1
Total impacts /or compensation acres	783		780	8,455	15,830	24,285
Mitigation Ratios for Campus and Community North				11:1	20:1	31:1

Special Status Avian Species

The Campus and University Community sites under this alternative contain suitable foraging habitat for numerous special-status avian species including white-tailed kite, northern harrier, golden eagle, ferruginous hawk, Swainson's hawk (discussed above), bald eagle, merlin, prairie falcon, short-eared owl, burrowing owl, loggerhead shrike, California horned lark, tricolored blackbird, and mountain plover. Lands suitable for foraging by special status avian species include the same lands suitable for Swainson's hawk, discussed above, and 13 acres of wetlands that provide marsh habitat.

The impact to special-status avian foraging habitat would be qualitatively similar to the impact described for the Proposed Action, although the magnitude of the impact would be slightly less because the Yosemite Avenue Alternative site contains a smaller amount of suitable foraging habitat. This potentially significant impact would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-8** for the Proposed Action.

Nesting Special Status Bird Species and Non-Special Status Migratory Birds and Raptors

Under the Yosemite Avenue Alternative, the development of the Campus and University Community sites would result in the direct loss of suitable ground and tree/shrub nesting habitat for special status and non-special status migratory birds and raptors through the removal of annual grassland, irrigated pasture, riparian communities, and individual trees and shrubs. Additionally, site development has the

potential to disturb active special-status and non-special-status migratory bird nests if construction occurs during the breeding season (generally February 15 through August 15).

Special-status birds with potential to nest on or adjacent to the Campus and University Community sites under this alternative include western burrowing owl, northern harrier, California horned lark, white-tailed kite, Swainson's hawk, short-eared owl, loggerhead shrike, and tricolored blackbird. These sites and adjacent lands also contain suitable nesting habitat for numerous non-special-status migratory birds, including red-tailed hawk, red-winged blackbird, and cliff swallow, whose nests are protected under the MBTA and CDFG Code Sections 3503 and 3503.5.

Under the Yosemite Avenue Alternative, the potential impacts to nesting special-status and non-special-status migratory bird species would be qualitatively similar to those described for the Proposed Action. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments and mitigation measures identified under **Impact BIO-9** for the Proposed Action.

San Joaquin Kit Fox

Under the Yosemite Avenue Alternative, the Campus and University Community sites are located within the current range of San Joaquin kit fox although the species is not known to den within these sites (USFWS 1998; CNDDB 2008). The closest recorded occurrence of this species to the Yosemite Avenue Alternative site is for a 1999 sighting of an adult foraging within approximately 1 mile of the project site along Black Rascal Creek drainage.

A San Joaquin kit fox habitat suitability model was created as part of the preparation of the *Conservation Strategy* for the Proposed Action and used to rate the suitability of lands within the project region and determine impacts to the species. A brief discussion of this model is described under **Impact BIO-10** for the Proposed Action and is described in greater detail in the *Conservation Strategy*.

Under the Yosemite Avenue Alternative, the Campus would result in the loss of 336 acres of San Joaquin kit fox residence habitat and disturbance to an additional 159 acres and the loss of 321 acres of dispersal only habitat and disturbance to an additional 135 acres. The Community North development would result in the loss of 17 acres of San Joaquin kit fox residence habitat and disturbance to an additional 31 acres and the loss of 742 acres of dispersal only habitat and disturbance to an additional 59 acres. The Community South site would result in the loss of 9 acres of San Joaquin kit fox residence habitat and no additional disturbance to adjacent residence habitat and the loss of 1,052 acres of dispersal only habitat and disturbance to an additional 262 acres of dispersal habitat (**Table 4.4-20**).

Under the Yosemite Avenue Alternative, potential impacts to San Joaquin kit fox would be qualitatively similar to those described for the Proposed Action. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-10** for the Proposed Action.

Water Diversion from the Merced River

Under the Yosemite Avenue Alternative, development of the Campus and University Community would generate the same water demand as Alternative 1. As discussed above, in surplus water years, MID would divert water from the Merced River for recharge of the groundwater basin. According to the MID, the planned diversions would not exceed the licensed amount for diversion. The MID would implement the same practices under this alternative to improve fisheries resources and other habitats associated with the Merced River. The impact to fisheries or aquatic habitats in the Merced River would be same as described above for the Campus and University Community under the Proposed Action and would be a less-than-significant level.

4.4.6.3 Alternative 3 – Bellevue Ranch

Wetlands

The Bellevue Ranch Alternative would result in both direct and indirect impacts on wetlands. Construction of the Campus and University Community, infrastructure installation and roadway improvements could result in the removal or fill of all wetlands on the alternative site. Approximately 25 acres of wetlands could be lost, including 15 acres of vernal pools, 4 acres of marsh wetlands, and 6 acres of pool/swale complex (**Table 4.4-23, Bellevue Ranch Alternative Wetland Impacts**). Approximately 3 acres of vernal pools and 1 acre of marsh wetlands would be indirectly affected.

Wetlands that are directly impacted would lose all wetland functions, as discussed above for the Proposed Action. The nature of wetland impact would be different because this alternative would affect fewer naturally occurring wetlands than the Proposed Action whereas it would affect more non-naturally occurring wetlands than the Proposed Action. The overall magnitude of the impacts would be greater because the Bellevue Ranch Alternative site has more on-site wetlands although fewer adjacent wetlands. These potentially significant impacts would be avoided or reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-1** for the Proposed Action.

Table 4.4-23
Bellevue Ranch Alternative Wetland Impacts

Wetlands	Campus		Community North		Community South		Conservation Lands	
Wetland Type	**Direct**	**Indirect**	**Direct**	**Indirect**	**Direct**	**Indirect**	**Tier 1**	**Tier 2**
Canal Wetland	0	0	0	0	0	0	0.95	0
Clay Slope Wetland	0	0	0	0	0	0	88.36	0
Intermittent Channel	0	0	0	0	0	0	0	0
Irrigation Wetland	0	0	0	0	0	0	0	0
Swale Wetland	0	0	0	0	0	0	203.08	0
Vernal Pool	5.14	<1	1.45	2.26	7.74	0.08	258.42	223.69
Clay Playa	0	0	0	0	0	0	28.7	305.46
Juncus	1.90	0	2.21	0	100.6	0	0	3.47
Linear	0	0	0	0	0	0	137.02	0.00
Marsh	0	0	0	0	4.38	1.07	6.27	43.35
Mima Mound	0	0	0	0	0	0	0	55.28
Pool/Swale Complex	0	0	0	0	6.20	0	269.91	569.18
Riparian	0	0	0	0	0	0	0	19.94
Seasonal Wetland	0	0	0	0	0	0	30.95	0
Stockpond	0.10	0	2.12	0.80	0.56	0	24.19	46.83
Tailings	0	0	0	0	0	0	0	1.38
Total	**7.14**	**<1**	**5.78**	**3.06**	**119.48**	**1.15**	**1,047.85**	**1,268.58**

Special Status Plant Species

No special-status plants are known to occur on the Bellevue Ranch Alternative Project Site (CNDDB 2008). However, the area has not been surveyed for special-status plants. **Table 4.4-24, Bellevue Ranch Alternative Listed Species Impacts,** presents the estimated acres of listed species habitat on the Bellevue Ranch Alternative site. Vernal pools on the site are potentially suitable habitat for succulent owl's clover or other special-status plants species. The loss of this habitat could constitute both a reduction in numbers of individuals and in the reduction of occupied habitat for these species and would be a significant impact. These potentially significant impacts would be avoided or reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-2** for the Proposed Action.

Vernal Pool Species Critical Habitat

None of USFWS designated critical habitat for vernal pool species is located within or adjacent to the Campus or University Community portions of the Bellevue Ranch Alternative. Therefore, no critical habitat would be directly or indirectly impacted by this alternative. Conservation lands incorporated into the alternative would protect over 16,000 acres of vernal pool species critical habitat (see **Table 4.4-24** above).

Special Status Invertebrate Species

Under the Bellevue Ranch Alternative, development of the campus site would result in the loss of 6 acres of occupied vernal pool fairy shrimp habitat and less than 1 acre of disturbance to adjacent habitat. Development of the Community North and South sites would not result in any impacts to vernal pool invertebrates due to the absence of wetlands within or adjacent (within 250 feet) of the sites. No impacts to vernal pool tadpole shrimp would result from development at this alternative site (**Table 4.4-24**).

Table 4.4-24
Bellevue Ranch Alternative Listed Species Impacts (acres)

Species	Campus		Community North		Community South		Conservation Lands	
	Direct	Indirect	Direct	Indirect	Direct	Indirect	Tier 1	Tier 2
Succulent owl's clover	0	0	0	0	5	0	388	308
Colusa grass	0	0	0	0	0	0	156	0
San Joaquin Valley Orcutt grass	0	0	0	0	0	0	16	0
Conservancy fairy shrimp	0	0	0	0	0	0	14	0
Vernal pool fairy shrimp	6	<1	0	0	0	0	632	516
Midvalley fairy shrimp	0	0	0	0	0	0	261	66
Vernal pool tadpole shrimp	0	0	0	0	0	0	14	<1
Vernal Pool Critical Habitat	0	0	0	0	0	0	393	15,775
California tiger salamander	0	0	0	0	0	0	8,805	11,349
CTS Critical Habitat	0	0	0	0	0	0	8,152	3,954
San Joaquin kit fox residence	268	109	325	110	363	115	9,322	15,082
San Joaquin kit fox dispersal	312	34	450	149	658	128	94	1430

Direct and indirect impacts to vernal pool fairy shrimp would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts (for the alternative as a whole) would be less because the Bellevue Ranch Alternative site has fewer vernal pool wetlands located on site and adjacent to the site and the site supports vernal pool fairy shrimp only. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-4** for the Proposed Action.

Special Status Amphibians

Construction of the Bellevue Ranch Alternative would not impact (directly or indirectly) critical habitat for the California tiger salamander. The Bellevue Ranch Alternative site does not contain known occupied breeding or upland habitat for the California tiger salamander (**Table 4.4-24**) but does contain potentially suitable breeding and upland habitat for the species that has not been recently surveyed. Prior to development of the site, focused surveys for California tiger salamander would be required and if found on the project site the impacts to this species would be similar to those identified under Impact BIO-5 for the Proposed Action. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-5** for the Proposed Action.

Western Pond Turtle

Under the Bellevue Ranch Alternative, development of the campus site would result in the loss of 0.10 acre of ponds that provide potentially suitable breeding habitat for western pond turtle. Development of the Community North site would result in the loss of 2.12 acres of stock ponds that provide suitable breeding habitat for western pond turtle and disturbance to an additional 0.80 acre of pond habitat. Development of the Community South site would result in loss of 4.94 acres of potentially suitable breeding habitat for western pond turtle consisting of ponds and riparian areas and disturbance to an additional 1.07 acres of marsh habitat located on adjacent lands (**Table 4.4-25, Impacts to Suitable Western Pond Turtle Habitat [acres] on the Bellevue Ranch Alternative Site and Acres of Suitable Habitat within Conservation Areas**). Though not known to occur on the alternative site, western pond turtle is known to occur in the region.

Table 4.4-25
Impacts to Suitable Western Pond Turtle Habitat (acres) on the Bellevue Ranch Alternative Site and Acres of Suitable Habitat within Conservation Areas

	Bellevue Ranch Alternative Site						Conservation Lands	
	Campus		Community North		Community South			
Habitat Types	Direct	Indirect	Direct	Indirect	Direct	Indirect	Tier 1	Tier 2
Ponds	0.10	0	2.12	0.80	0.56	0	24	47
Suitable Marsh/Wetland/ Drainage Types								
Canal Wetland	0	0	0	0	0	0	1	0
Intermittent Channel	0	0	0	0	0	0	0	0
Irrigation Wetland	0	0	0	0	0	0	0	0
Linear	0	0	0	0	0	0	137	0
Marsh	0	0	0	0	4.38	1.07	6	43
Riparian							0	20
Total Suitable Habitat Lost or Protected	**0.10**	**0**	**2.12**	**0.80**	**4.94**	**1.07**	**168**	**110**

**All impacts were calculated from the wetlands dataset for project region obtained from various wetlands inventories conducted in the region.*

Direct and indirect impacts to this species would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts would be slightly less because the Bellevue Ranch Alternative site contains a smaller amount of suitable habitat. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-6** for the Proposed Action.

Swainson's Hawk

Under the Bellevue Ranch Alternative, development of the Campus and University Community sites would result in the removal of 2,268 acres of annual grassland, irrigated pasture, and row and field crop communities which provide suitable foraging habitat for Swainson's hawk known to nest within 5 miles of the site. Impacts to suitable foraging habitat, according to project component, are shown in **Table 4.4-26, Impacts to Swainson's Hawk Foraging Habitat and Suitable Habitat within Conservation Areas,** below.

Table 4.4-26
Impacts to Swainson's Hawk Foraging Habitat and Suitable Habitat within Conservation Areas (acres)

	Bellevue Ranch Alternative Impacts			Conservation Lands		
Suitable Foraging Habitats	**Campus**	**Community North**	**Community South**	**Tier 1**	**Tier 2**	**Tier 1 and 2**
Annual grassland	395	329	296	8,455	15,753	24,208
Irrigated pasture	59	200	198	0	76	76
Row and field crops	137	156	498	0	1	1
Total impacts /or compensation acres	**1,276**		**992**	**8,455**	**15,830**	**24,285**
Mitigation Ratios for the Campus and Community North				**7:1**	**13:1**	**20:1**

Impacts to Swainson's hawk foraging habitat would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts would be slightly less because the Bellevue Ranch Alternative site contains a smaller amount of suitable foraging habitat that would be removed. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-7** for the Proposed Action.

Special Status Avian Species

The Campus and University Community sites contain suitable foraging habitat for numerous special-status avian species including white-tailed kite, northern harrier, golden eagle, ferruginous hawk, Swainson's hawk (discussed above) bald eagle, merlin, prairie falcon, short-eared owl, burrowing owl, loggerhead shrike, California horned lark, tricolored blackbird, and mountain plover. Lands suitable for foraging by special-status avian species include the same lands suitable for Swainson's hawk, discussed above, and 4 acres of marsh areas.

Impacts to special-status avian foraging habitat would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts would be less because the Bellevue Ranch Alternative site contains a smaller amount of suitable foraging habitat. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-8** for the Proposed Action.

Nesting Special Status Bird Species and Non-Special Status Migratory Birds and Raptors

Under the Bellevue Ranch Alternative, the development of the Campus and University Community sites would result in the direct loss of suitable ground nesting habitat and minimal tree/shrub nesting habitat for special-status and non-special-status migratory birds and raptors through the removal of annual grassland, irrigated pasture communities, and scattered trees and shrubs. Additionally, site development has the potential to disturb active special-status and non-special-status migratory bird nests if construction occurs during the breeding season (generally February 15 through August 15).

Special-status birds with potential to nest on or adjacent to the Campus and University Community sites under this alternative include western burrowing owl, northern harrier, California horned lark, white-tailed kite, Swainson's hawk, short-eared owl, loggerhead shrike, and tricolored blackbird. These sites and adjacent lands also contain suitable nesting habitat for numerous non-special-status migratory birds including red-tailed hawk, red-winged blackbird, and cliff swallow, whose nests are protected under the MBTA and CDFG Code Sections 3503 and 3503.5.

Under the Bellevue Ranch Alternative, potential impacts to nesting special-status and non-special-status migratory bird species would be qualitatively similar to those described for the Proposed Action. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-9** for the Proposed Action.

San Joaquin Kit Fox

Under the Bellevue Ranch Alternative, the Campus and University Community sites are located within the current range of San Joaquin kit fox although the species is not known to den within these sites (USFWS 1998, CNDDB 2008). The closest recorded occurrence of this species to the Bellevue Avenue Alternative site is for a 1999 sighting of an adult foraging within approximately 5 miles southeast of the project site along Black Rascal Creek drainage. A recorded breeding population was also documented in 1999 approximately 5 miles west of this site. This record documented one adult and two juveniles frequenting an exposed concrete pipe opening along the Livingston Canal.

A San Joaquin kit fox habitat suitability model was created as part of the preparation of the *Conservation Strategy* for the Proposed Action and used to rate the suitability of lands within the project region and determine impacts to the species. A brief discussion of this model is described under Impact BIO-10 for the Proposed Action and is described in greater detail in the *Conservation Strategy*.

Under the Bellevue Ranch Alternative, the Campus would result in the loss of 268 acres of San Joaquin kit fox residence habitat and disturbance to an additional 109 acres of residence habitat, and the loss of 312 acres of dispersal only habitat and disturbance to an additional 34 acres of dispersal habitat. The Community North site would result in the loss of 325 acres of San Joaquin kit fox residence habitat and disturbance to an additional 110 acres of residence habitat and the loss of 450 acres of dispersal only habitat and disturbance to an additional 149 acres of dispersal habitat. The Community South site would result in the loss of 363 acres of San Joaquin kit fox residence habitat and disturbance to an additional 115 acres of residence habitat and the loss of 658 acres of dispersal only habitat and disturbance to an additional 128 acres of dispersal habitat (**Table 4.4-24**).

Under the Bellevue Ranch Alternative, potential impacts to San Joaquin kit fox would be qualitatively similar to those described for the Proposed Action. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-10** for the Proposed Action.

Water Diversion from the Merced River

Under the Bellevue Ranch Alternative, development of the Campus and University Community would generate the same water demand as Alternative 1. As discussed above, in surplus water years, MID would divert water from the Merced River for recharge of the groundwater basin. According to the MID, the planned diversions would not exceed the licensed amount for diversion. The MID would implement the same practices under this alternative to improve fisheries resources and other habitats associated with the Merced River. The impact to fisheries or aquatic habitats in the Merced River would be same as described above for the Campus and University Community under the Proposed Action and would be a less-than-significant impact.

4.4.6.4 Alternative 4 – 2002 Proposed Project

Wetlands

The 2002 Proposed Project Alternative would result in both direct and indirect effects on wetlands. Construction of the Campus and University Community, infrastructure installation and roadway improvements could result in the removal or fill of all wetlands on the project site. Approximately 127 acres of wetlands could be lost, including 33.24 acres of vernal pools, 41.04 acres of swale wetlands, 10.47 acres of clay slope wetlands, 12.79 acres irrigation wetlands, and 28.91 acres of canal wetlands. Approximately 10.5 acres of vernal pools, 8.65 acres of vernal swales, and 0.11 acre of clay slope wetlands would be indirectly affected (**Table 4.4-27, 2002 Proposed Project Wetland Impacts**).

Table 4.4-27
2002 Proposed Project Wetland Impacts

Wetlands	Campus		University Community		Campus Land Reserve	Conservation Lands	
Wetland Type	**Direct**	**Indirect**	**Direct**	**Indirect**	**No impact**	**Tier 1**	**Tier 2**
Canal Wetland	18.14	0	10.77	0	0	0.34	0
Clay Slope Wetland	10.36	0.11	0.11	0	6.53	81.38	0
Intermittent Channel	0	0	1	0	0	0	0
Irrigation Wetland	0.54	0	12.25	0	0	0	0
Swale Wetland	32.44	7.82	8.60	0.83	14.79	173.41	0
Vernal Pool	24.73	10.29	8.51	0.21	35.51	205.24	223.69
Clay Playa	0	0	0	0	0	29	305.46
Juncus	0	0	0	0	0	0	3.47
Linear	0	0	0	0	0	137	0.00
Marsh	0	0.27	0	0	0	6	43.35
Mima Mound	0	0	0	0	0	0	55.28
Pool/Swale Complex	0	0	0	0	0	270	569.18
Riparian	0	0	0.02	0	0	0	19.94
Seasonal Wetland	0	0	0	0	0	31	0
Stockpond	0	0	0	0	0	24	46.83
Tailings	0	0	0	0	0	0	1.38
Total	**86.21**	**18.49**	**41.26**	**1.04**	**56.83**	**951.37**	**1268.58**

Directly-affected wetlands would lose all wetland functions, as discussed above for the Proposed Action. Indirect impacts on wetlands would be qualitatively similar to those described for the Project Action, although the magnitude of the impacts would be greater because the 2002 Proposed Project Alternative site has more on-site wetlands and more adjacent wetlands. The loss of wetland function would equal 17.71 FCUs for vernal pools, 22.79 FCUs for vernal swales, and 7.07 FCUs for clay flat wetlands (by comparisons under the Proposed Action the loss of wetland functions would be 10.43 FCUs for vernal pools, 15.09 FCUs for vernal swales, and 0.25 FCUs for clay flat wetlands). All of these potentially significant impacts would not be avoided or reduced to a less-than-significant level through implementation of the environmental commitments identified under the Proposed Action. This is because a high proportion of the additional wetlands affected by the 2002 Proposed Project are concentrated within the land between the Phase 1.1 Campus and Lake Yosemite Regional Park. In 2007, the US EPA determined that a large clay playa within this area represented an Aquatic Resource of National Importance (ARNI) and must be protected from development.

Special Status Plant Species

The 2002 Proposed Project would result in both direct and indirect effects on special-status plants. Construction of the Campus and University Community, infrastructure installation and roadway improvements could result in the removal of 17 vernal pools containing succulent owl's clover, one vernal pool containing dwarf downingia, and 39 stands of shining navarretia. The loss of this habitat would constitute both a reduction in numbers of individuals and in the loss of occupied habitat for these species and would be a significant impact. Implementation of environmental commitments identified under the Proposed Action would preserve, protect and restore off-site populations of succulent owl's clover, dwarf downingia, and shining navarretia. However, the preservation and restoration measures would not adequately compensate for the reduction in numbers of individuals and in the loss of occupied habitat for these species and the impact would remain significant.

Vernal Pool Species Critical Habitat

The designated boundary for critical habitat for vernal pool species adopted by USFWS is located within Campus site of the 2002 Proposed Project. Therefore, development of the Campus under this alternative would result in the loss of 38 acres of critical habitat. This potentially significant impact would be reduced to a less-than-significant level only by redesigning the footprint of the alternative to avoid vernal pool critical habitat.

Special Status Invertebrate Species

Under the 2002 Proposed Project, development of the campus site would result in the loss of 111 acres of occupied vernal pool fairy shrimp habitat and an additional 6 acres of disturbance to adjacent occupied habitat. Development of the University Community would result in the loss of 9 acres of occupied vernal pool fairy shrimp habitat and no additional disturbance to adjacent occupied habitat. Although the Campus Land Reserve also contains 17 acres of occupied vernal pool fairy shrimp habitat, this project component is not considered to be impacted or preserved under this alternative (**Table 4.4-28, 2002 Proposed Project Listed Species Impacts**).

Direct and indirect impacts to these species would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts (for the alternative as a whole) would be greater because the 2002 Proposed Project would impact approximately 95 acres of wetlands in the northern portion of the site that would be protected through the establishment of conservation lands in fee title under the Proposed Action. Additionally, the lands within the Campus Land Reserve under this alternative, though not considered to be impacted, are not contributing to species conservation whereas under the Proposed Action these lands have been incorporated into the Proposed Action as Conservation

Lands. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-4** for the Proposed Action, namely those commitments relating to redesigning the project to minimize impacts to wetlands. Without implementing measures to reduce the footprint in the northern portion of the site, this alternative would result in significant impacts to listed invertebrate species.

Table 4.4-28
2002 Proposed Project Listed Species Impacts

Species	Campus		University Community		Campus Land Reserve	Conservation Lands	
	Direct	Indirect	Direct	Indirect	No impact	Tier 1	Tier 2
Succulent owl's clover	62	9	4	0	14	291	308
Colusa grass	0	0	0	0	0	156	0
San Joaquin Valley Orcutt grass	0	0	0	0	0	16	0
Conservancy fairy shrimp	0	0	0	0	0	14	0
Vernal pool fairy shrimp	111	12	9	0	17	499	516
Midvalley fairy shrimp	70	6	10	0	10	157	66
Vernal pool tadpole shrimp	0	0	0	0	0	14	<1
Vernal Pool Critical Habitat	38	0	0	0	0	393	15,775
California tiger salamander	981	154	1,007	20	241	8,281	11,349
CTS Critical Habitat	342	66	30	6	137	7,800	3,954
San Joaquin kit fox residence	765	320	454	123	101	8,719	15,082
San Joaquin kit fox dispersal	29	4	1,493	333	2	92	1430
San Joaquin kit fox unsuitable lands	187	119	189	90	0	93	630

Special Status Amphibians

Construction of the 2002 Proposed Project would result in the loss of 342 acres of critical habitat for the California tiger salamander and the disturbance of an additional 66 acres of adjacent critical habitat.

Development of the campus site would eliminate one known breeding site for the California tiger salamander and result in the loss of 981 acres of occupied upland habitat (i.e., within 1.75 miles of this and other breeding ponds) and disturbance to an additional 154 acres of occupied habitat. Development of the University Community site would result in the loss of 1,007 acres of occupied upland habitat and disturbance to an additional 20 acres of occupied upland habitat. Although the Campus Land Reserve contains 241 acres of occupied upland habitat, this project component is not considered to be impacted or preserved under this alternative (**Table 4.4-28**).

Direct and indirect impacts to these species would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts (for the alternative as a whole) would be greater because development of the 2002 Proposed Project site would directly impact approximately 300 more acres of occupied aquatic and upland habitat as compared to the Proposed Action. Additionally, the lands considered to be part of the Campus Land Reserve under this alternative, though not considered to be impacted, would not be contributing to species conservation whereas under the Proposed Action these lands have been incorporated into the Proposed Action as Conservation Lands. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-5** for the Proposed Action, namely those commitments relating to redesigning the project to minimize impacts to wetlands in the northern portion of the alternative site. Without implementing measures to reduce the footprint in the northern portion of the site, this alternative would result in potentially significant impacts to this species.

Additionally, as described for the Proposed Action, habitats suitable for California tiger salamander are also suitable for western spadefoot but because thorough surveys were conducted during the appropriate time of year in suitable habitat and this species is not known to occur on any portion of the 2002 Proposed Project site (Campus, University Community, and Campus Land Reserve), it is not expected that this species will be affected either directly or indirectly by the alternative. Conservation lands, secured by the University, containing suitable breeding habitat for California tiger salamander will also serve to preserve suitable habitat for western spadefoot and reduce potential impacts to this species within the project region.

Western Pond Turtle

Under the 2002 Proposed Project, development of the campus site would result in direct and indirect impacts to marshes and ponds that provide suitable breeding habitat for western pond turtles. Additionally, development of the University Community site would result in direct and indirect impacts to marshes and riparian habitat which is also suitable for western pond turtles. Although not known to occur in the project site, western pond turtle is known to occur in the region. The Campus Land Reserve

contains no suitable habitat for pond turtle. **Table 4.4-29, 2002 Proposed Project Western Pond Turtle Habitat Impacts,** below shows direct and indirect impact acreages to suitable habitats by project component.

Table 4.4-29
2002 Proposed Project Western Pond Turtle Habitat Impacts

	2002 Proposed Project Site					Conservation Lands	
	Campus		Comm. North		Campus Land Reserve		
Habitat Types	**Direct**	**Indirect**	**Direct**	**Indirect**	**No impact**	**Tier 1**	**Tier 2**
Ponds	2	0	0	0	0	24	47
Other Suitable Marsh/Wetland /Drainage Types							
Canal Wetland	18.14	0	10.77	0	0	0.56	0
Intermittent Channel	0	0	1	0	0	0	0
Irrigation Wetland	0.54	0	12.25	0	0	0	0
Linear	0	0	0	0	0	137	0
Marsh	0	0.27	0	0	0	6	43.35
Riparian	0	0	0.02	0	0	0	19.94
Total Suitable Habitat Lost or Protected	**20.68**	**0.27**	**24.02**	**0**	**0**	**168**	**110.12**

**All impacts were calculated from the wetlands dataset for the Project obtained from numerous delineation efforts (see Conservation Strategy for methodology used to create this dataset). Ponds within the campus site were not delineated due to their artificial nature and the acres for these ponds were therefore derived from aerial photograph interpretation.*

Direct and indirect impacts to this species would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts would be slightly greater because development of the 2002 Proposed Project site would affect a greater amount of suitable habitat. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-6** for the Proposed Action.

Swainson's Hawk

Under the 2002 Proposed Project, development of the Campus and University Community sites would result in the removal of 2,858 acres of annual grassland, irrigated pasture, and row and field crop communities which provide suitable foraging habitat for Swainson's hawk known to nest within 5 to 10 miles of the site. Impacts to suitable foraging habitat, according to project component, are shown in **Table**

4.4-30, Impacts to Swainson's Hawk Foraging Habitat and Suitable Habitat within Conservation Areas.

Table 4.4-30
Impacts to Swainson's Hawk Foraging Habitat and Suitable Habitat within Conservation Areas (acres)

Suitable Foraging Habitats	2002 Proposed Project Impacts			Conservation Lands		
	Campus	University Community	Campus Land Reserve	Tier 1	Tier 2	Tier 1 and 2
Annual grassland	799	444	266	8,189	15,753	24,208
Irrigated pasture	0	524	0	0	76	76
Row and field crops	0	1091	0	0	1	1
Total impacts /or compensation acres	799	2,059	0	8,455	15,830	24,285
Mitigation Ratios				3:1	5.5:1	8.5:1

Impacts to Swainson's hawk foraging habitat would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts would be greater because development of the 2002 Proposed Project site would affect a greater amount of suitable foraging habitat and would preserve a smaller amount of suitable habitat within Conservation Lands. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-7** for the Proposed Action.

Special Status Avian Species

The Campus and University Community sites contain suitable foraging habitat for numerous special-status avian species, including white-tailed kite, northern harrier, golden eagle, ferruginous hawk, Swainson's hawk (discussed above) bald eagle, merlin, prairie falcon, short-eared owl, burrowing owl, loggerhead shrike, California horned lark, tricolored blackbird, and mountain plover. Lands suitable for foraging by special-status avian species include the same lands suitable for Swainson's hawk, discussed above, and 42 acres of wetlands that provide marsh habitat.

Impacts to special-status avian foraging habitat would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts would be greater because development of the 2002 Proposed Project site would affect a greater amount of suitable foraging habitat and would preserve a smaller amount of suitable habitat within Conservation Lands. These potentially significant impacts

would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-8** for the Proposed Action.

Nesting Special Status Bird Species and Non-Special Status Migratory Birds and Raptors

Under the 2002 Proposed Project, the development of the Campus and University Community sites would result in the direct loss of suitable ground and tree/shrub nesting habitat for special-status and non-special-status migratory birds and raptors through the removal of annual grassland, irrigated pasture, riparian communities, and individual trees and shrubs. Additionally, site development has the potential to disturb active special-status and non-special-status migratory bird nests if construction occurs during the breeding season (generally February 15 through August 15).

Special-status birds with potential to nest on or adjacent to the Campus and University Community sites include western burrowing owl, northern harrier, California horned lark, white-tailed kite, Swainson's hawk, short-eared owl, loggerhead shrike, and tricolored blackbird. These sites and adjacent lands also contain suitable nesting habitat for numerous non-special-status migratory birds, including red-tailed hawk, red-winged blackbird, and cliff swallow, whose nests are protected under the MBTA and CDFG Code Sections 3503 and 3503.5.

Under the 2002 Proposed Project, potential impacts to nesting special-status and non-special-status migratory bird species would be qualitatively similar to those described for the Proposed Action, and the magnitude of the impacts would be slightly greater because the 2002 Proposed Project site contains slightly more lands that contain suitable nesting habitat. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments and mitigation measures identified under **Impact BIO-9** for the Proposed Action.

San Joaquin Kit Fox

Under the 2002 Proposed Project, the Campus and University Community sites would be located within the current range of San Joaquin kit fox although the species is not known to den within these sites (USFWS 1998, CNDDB 2008). The closest recorded occurrence of this species to the 2002 Proposed Project site is a 1999 sighting of an adult foraging within approximately 1 mile of the alternative site along Black Rascal Creek drainage.

A San Joaquin kit fox habitat suitability model was created as part of the preparation of the *Conservation Strategy* for the Proposed Action and used to rate the suitability of lands within the project region and

determine impacts to the species. A brief discussion of this model is described under Impact BIO-10 for the Proposed Action and is described in greater detail in the *Conservation Strategy*.

Under the 2002 Proposed Project, the development of the campus site would result in the loss of 765 acres of San Joaquin kit fox residence habitat and disturbance to an additional 320 acres of residence habitat and the loss of 29 acres of dispersal only habitat and disturbance to an additional l4 acres of dispersal habitat. The development of the University Community site would result in the loss of 454 acres of San Joaquin kit fox residence habitat and disturbance to an additional 123 acres of residence habitat and the loss of 1,493 acres of dispersal only habitat and disturbance to an additional 333 acres of dispersal habitat. The Campus Land Reserve contains 101 acres of residence and 2 acres of dispersal only habitat; that area would not be affected nor preserved under this alternative (**Table 4.4-21**).

Under the 2002 Proposed Project, potential impacts to San Joaquin kit fox would be qualitatively similar to those described for the Proposed Action, although the magnitude of the impacts would be greater because development of the 2002 Proposed Project site would eliminate 410 more acres of residence and 910 more acres of dispersal only habitat as compared to the Proposed Action and would protect fewer acres of lands suitable for this species. These potentially significant impacts would be reduced to a less-than-significant level through implementation of environmental commitments identified under **Impact BIO-10** for the Proposed Action.

Water Diversion from the Merced River

Under the 2002 Proposed Project, development of the Campus and University Community would generate the same water demand as Alternative 1. As discussed above, in surplus water years, MID would divert water from the Merced River for recharge of the groundwater basin. According to the MID, the planned diversions would not exceed the licensed amount for diversion. The MID would implement the same practices under this alternative to improve fisheries resources and other habitats associated with the Merced River. The impact to fisheries or aquatic habitats in the Merced River would be same as described above for the Campus and University Community under the Proposed Action and a less-than-significant impact.

4.4.6.5 Alternative 5 – No Action

Under the No Action Alternative, the USACE would deny the 404 permit application and therefore no wetlands could be filled or otherwise impacted by the Proposed Action. Wetland dependent special-status plants and animals would also not be impacted directly or indirectly. To the extent development could occur on the site, it would need to be limited to areas that either don't contain any wetlands (such as almost the entire Community South) or it would need to be limited to upland areas within the

wetland-upland complex. Under such a scenario, 250-foot construction buffer areas within uplands would be required to achieve complete protection of wetlands that are not filled, which would further reduce the amount of land available to construct the Proposed Action. Due to the density of wetlands, such a scenario would make the development of the Campus at this site infeasible. In the event that the Campus is not developed at this site, Community North would also not be developed. To the extent that Community South is developed by the property owners independent of the campus project, the impacts to biological resources would be similar to those described above for Community South under the Proposed Action.

4.4.6.6 Alternative 6 – No Build

Under the No Build Alternative, construction of the Campus and University Community would not occur, though the existing Phase 1.1 portion of the campus site would remain. The construction of the Phase 1.1 portion of the campus did not result in the fill of wetlands or loss of habitat for wetland dependent plants and animals and was not considered to result in a significant loss of habitat for other special-status species known to occur within the region. If construction of the remaining campus and community portions does not occur, all biological resources located on site and adjacent to the site would not be affected. Therefore, this alternative would not impact wetlands or any special-status plants or animals.

4.4.7 COMPARISON OF ALTERNATIVES

Table 4.4-31, Comparison of Alternatives, presents the relative impacts of all the alternatives evaluated in this Draft EIS/EIR.

Table 4.4-31
Comparison of Alternatives

Resource Impact	Alt – 1 Proposed Action		Alt – 2 Yosemite Avenue		Alt – 3 Bellevue Ranch		Alt-4 2002 Project		Alt-5 No Action		Alt-6 No Build	
	Direct Impacts	Indirect Impacts	Direct Impacts	Indirect Impacts	Direct Impacts	Indirect Impacts	Direct Impacts	Indirect Impacts	Direct Impacts	Indirect Impacts	Direct Impacts	Indirect Impacts
Loss of Wetlands	85.05 acres	9.9 acres	29 acres	3 acres	25 acres	3 acres	127 acres	19.24 acres	None	None	None	None
Impacts to Succulent Owl's-Clover	8 vernal pools		3 vernal pools		None		17 vernal pools		None		None	
Impacts to Dwarf Downingia	1 vernal pool		none		None		1 vernal pool		None		None	
Impacts to Shining Navarretia	21 stands		7 stands		None		39 stands		None		None	
Impacts to Vernal Pool Species Critical Habitat	None	None	None	None	None	None	38 acres	None	None	None	None	None
Impacts to occupied Vernal Pool Invertebrate Habitat	<57 acres	9 acres	13 acres	1 acre	6 acres	<1 acre	120 acres	12 acres	None	None	None	None
Impacts to Occupied Special Status Amphibian (California Tiger Salamander) Habitat	1,648 acres	236	812 acres	65 acres	Not known to be occupied ; current surveys needed	Not known to be occupied; current surveys needed	1,988 acres	174 acres	None	None	None	None
Impacts to California tiger salamander Critical Habitat	178 acres	51 acres	None	None	None	None	372 acres	72 acres	None	None	None	None

Resource Impact	Alt – 1 Proposed Action		Alt – 2 Yosemite Avenue		Alt – 3 Bellevue Ranch		Alt-4 2002 Project		Alt-5 No Action		Alt-6 No Build	
	Direct Impacts	Indirect Impacts	Direct Impacts	Indirect Impacts	Direct Impacts	Indirect Impacts	Direct Impacts	Indirect Impacts	Direct Impacts	Indirect Impacts	Direct Impacts	Indirect Impacts
Impacts to Suitable Western Pond Turtle Habitat	44.02 acres	0.15 acre	30.34 acres	2.77 acres	7.16 acres	2.87 acres	44.70 acres	0.27 acre	4.64 acres	None	None	None
Impacts to Swainson's Hawk Foraging Habitat	2,614 acres	NA	1,563 acres	NA	2,268 acres	NA	2,854 acres	NA	1,100 acres	NA	None	None
Impacts to Special Status Avian Species Foraging Habitat	2,614 acres	NA	1,563 acres	NA	2,268 acres	NA	2,854 acres	NA	1,100 acres	NA	None	None
Impacts to Nesting Migratory Birds	Potential nest loss	Potential nest disturbance	Potential nest loss	Potential nest disturbance	Potential nest loss	Potential nest disturbance	Potential nest loss	Potential nest disturbance	Potential nest loss	Potential nest disturbance	None	None
Impacts to Suitable San Joaquin Kit Fox Habitat (Residence and Dispersal Habitat)	2,444 acres	872 acres	2,477 acres	646 acres	2,376 acres	645 acres	2,741 acres	780 acres	1,030 acres	317 acres	None	None

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4.5 CULTURAL RESOURCES

4.5.1 INTRODUCTION

This section includes a discussion of the cultural resources setting of the project area and an evaluation of the potential for the Proposed Action or its alternatives to result in significant impacts on cultural resources. "Cultural resource" is the term used to describe several different types of resources, including archaeological, architectural, and traditional cultural properties. Archaeological sites include both prehistoric and historic deposits. Architectural properties include buildings, bridges, and infrastructure. Traditional cultural properties (TCPs) include those locations of importance to a particular ethnic group such as Native Americans.

This section provides a brief prehistoric and historical background discussion to better understand the context of the cultural resources associated with the project area. Additionally, this section provides federal, state and local policies and regulations that apply to cultural resources in the project area for the purpose of analyzing potential impacts. Finally, impacts associated with the Proposed Action and its alternatives are identified, and mitigation measures are proposed that would mitigate the significant impacts.

As described in **Section 2.0, Project Description**, the Proposed Action comprises the Campus, Community North, and Community South. The impacts on cultural resources from the development of all three areas are evaluated in this section. However, the Area of Potential Effect (APE), the area subject to the requirements of Section 106 of the National Historic Preservation Act, comprises only UC Merced Campus area (815 acres) and the Community North area (833 acres) as an application for a Section 404 permit has been submitted to the USACE for only these two areas.

No public or agency comments related to cultural resources were received in response to the Notice of Intent and Notice of Preparation issued for this Draft EIS/EIR.

4.5.2 AFFECTED ENVIRONMENT

4.5.2.1 Prehistory

Although few archaeological sites demonstrate evidence of human occupation of the San Joaquin Valley during the late Pleistocene and early Holocene epochs (12,000–6000 B.C.), this is likely a product of the archaeological record itself rather than lack of human habitation in the valley. Most Pleistocene- and Holocene-epoch archaeological sites are deeply buried in accumulated gravels and silts or have eroded away. The earliest sites in the San Joaquin Valley are believed to be the Farmington Complex sites in San

Joaquin and Stanislaus Counties (Riddell 1949; Treganza 1952), the Tranquility site in Fresno County (Riddell 1949; Treganza 1952), and the Witt site in Kings County (Riddell and Olsen 1969; Wallace 1991). Archaeologists have identified fluted projectile points on the margin of Tulare Lake. The points, which are morphologically similar to Clovis points, may date as early as 11,000–12,000 years ago (Wallace 1991). No fluted projectile points have been reported in the Merced vicinity to date.

The closest-available prehistoric chronology for the project area comes from the west side of the San Joaquin Valley as a result of the excavations at several sites during archaeological efforts for reservoir construction of the San Luis, Los Banos, and Little Panoches Reservoirs. The chronology is most clearly presented by Olsen and Payen (1969) and Moratto (1984). This chronology has not been modified significantly by archaeological research at the Los Banos Grandes Reservoir (Mikkelsen and Hildebrandt 1990).

Four cultural complexes were identified in the archaeological data collected during these excavations. These complexes are assigned to timespans for the development of a cultural chronology for the area and are represented by archaeological assemblages that are discussed in greater detail in Moratto (1984) and summarized here. The Positas Complex (5200–4600 B.P.) is characterized by small, shaped mortars; cylindrical pestles; millingstones; perforated flat cobbles; small flake scrapers; handstones; and spire-lopped *Olivella* beads. The perforated cobbles resemble the cog-stones documented at many southern Californian archaeological sites, prompting some researchers to posit a cultural relationship between the Positas Complex and southern Californian cultures. To date, archaeologists have not identified burials or structures associated with the Positas Complex (Mikkelsen and Hildebrandt 1990).

The Pacheco Complex (4600–1600 B.P.) consists of two subcomplexes: Pacheco Complex A (3600–1600 B.P.) and Pacheco Complex B (4600–3600 B.P.). Pacheco Complex B is characterized by foliate bifaces, rectangular shell ornaments, flexed burials, and thick rectangular *Olivella* beads. Sites attributed to Pacheco Complex A exhibit spire-ground *Olivella* beads, perforated canine teeth, bone awls, whistles, grass saws, large stemmed and side-notched points, flexed burials, millingstones, mortars, and pestles. Domestic structure remnants attributed to Pacheco Complex A were probably circular in outline and 10-12 feet in diameter (Mikkelsen and Hildebrandt 1990; Olsen and Payen 1969).

The Gonzaga Complex (1600–1000 B.P.) is characterized by extended and flexed burials; bowl mortars; shaped pestles; squared and tapered-stem points; few bone awls; distinctive shell ornaments; and thin rectangular, split-punched, and oval *Olivella* beads (Mikkelsen and Hildebrandt 1990; Olsen and Payen 1969). Projectile points are rare in comparison to the Pacheco Complex and are predominantly made from silicate stones. Archaeologists have reported a few fragmentary serrated projectile points fashioned from obsidian. Architectural features from the Gonzaga Complex are larger than those reported from earlier

complexes. Archaeologists hypothesize that the Gonzaga Complex marks the arrival of the Yokuts in the San Joaquin Valley (Mikkelsen and Hildebrandt 1990).

The Panoche Complex (400–200 B.P.) is recognized by large circular structures (pits), flexed burials and primary and secondary cremations, varied mortars and pestles, bone awls, whistles, small side-notched points, clamshell disk beads, and other bead types. The Panoche Complex appears to represent Yokuts occupation of the valley (Mikkelsen and Hildebrandt 1990; Olsen and Payen 1969).

4.5.2.2 Ethnography

The aboriginal inhabitants of the area in which the APE is located are known as the Northern Valley Yokuts. "Yokuts" is a term applied to a large and diverse number of peoples inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California. The Yokuts cultures include three primary divisions, corresponding to gross environmental zones: the Southern San Joaquin Valley Yokuts, the Foothill Yokuts, and the Northern San Joaquin Valley Yokuts (Kroeber 1976; Silverstein 1978).

The Yokuts languages, of which there are three subdivisions, belong to the Yokutsan family, Penutian stock (Shipley 1978). Each of the primary divisions included several dialects. The North Valley Yokuts lived in the northern San Joaquin Valley from around Bear Creek north of Stockton to the bend in the San Joaquin River near Mendota (Wallace 1978).

There was no Yokuts tribal organization that encompassed the whole of the peoples speaking Yokutsan languages, or even a tribal organization that encompassed an entire primary division, such as Foothill Yokuts. These are linguistic and geographic designations only. Similar to most Native American groups in California, the largest political entity among the Yokuts was that of the tribelet. A tribelet consisted of a large village and a few smaller surrounding villages. Larger villages and tribelets had a chief or headman—an advisory position that was passed from father to son (Wallace 1978).

In general, the Yokuts were seasonally mobile hunter-gathers with semi-permanent villages. Seasonal movements to temporary camps would occur to exploit food resources in other environmental zones. The primary difference between the various Yokuts groups rests largely on the differences in available resources in their territory. The North Valley Yokuts relied heavily on acorns as a food staple, which was processed into a thick soup, along with salmon and other fish, grass seeds and tule roots (which were processed into meal), and probably water fowl, tule elk, and pronghorn (Wallace 1978).

Principal settlements were located on the tops of low mounds, on or near the banks of the larger watercourses. Settlements were composed of single-family dwellings, sweathouses, and ceremonial assembly chambers. Dwellings were small and lightly constructed, semi-subterranean and oval. The

public structures were large and earth covered. Sedentism was fostered by the abundance of riverine resources in the area (Wallace 1978).

The Yokuts first came into contact with Europeans when Spanish explorers visited the area in the late 1700s, possibly followed by expeditions to recover Native Americans who had escaped from the missions. The North Valley Yokuts were far more affected by the missions than were other groups. The loss of individuals to the missions, the influence of runaway neophytes, various epidemics in the 1800s, and the arrival of settlers and miners all contributed to the disintegration of Yokuts culture (Wallace 1978). Although nearly obliterated, the descendants of the Northern Valley Yokuts still live in Merced County today and continue to rebuild their cultural identity.

4.5.2.3 Regional History

A comprehensive regional history is available in the County of Merced, University Community Plan Draft EIR 2001 and is presented, in part, below.

Regional History

Spanish Period (1806-1822) and Mexican Periods (1822–1848)

The first Spanish expedition to enter the San Joaquin Valley did so in 1806 under the leadership of Gabriel Moraga. Searching for Native Americans who had purportedly taken horses from Mission San Juan Bautista as well as sites for new missions, Moraga was accompanied by Father Pedro Munoz (and) a 25-soldier escort.

After Mexico gained its independence from Spain in 1822, two additional expedition forces entered the area; however, the purpose of these campaigns was no longer exploratory. Soldiers were sent into the interior to recover stolen animals and punish hostile Native Americans in order to reduce the attacks upon towns, missions, and ranchos.

In 1828, Sebastian Rodriguez led an expedition into the interior mainly searching for stolen horses. On April 20, he left San Juan Bautista and entered the valley by way of Little Panoche, reaching the San Joaquin south of modern Dos Palos.

Americans also began transecting the region during the Mexican period. In both 1827 and 1828, Jedediah Smith entered the San Joaquin Valley via Tejon Pass and trapped beaver along the San Joaquin, Kings, and numerous other rivers and streams that flowed down from the Sierra. Smith was followed by fellow trappers such as Peter Ogden, Ewing Young, Kit Carson, and Joseph Walker as well as John Fremont,

who crossed the San Joaquin River on his way south through the Central Valley in 1844. During the same period, Mexican ranchers began to settle in the San Joaquin Valley. Throughout the Spanish era, the land of Alta California remained under sovereign domain; however, under Mexican rule the government systematically began granting large parcels of land to individuals who, to a great extent, engaged in the cattle and tallow trade.

Although grazing livestock from the ranchos, as well as the paths of the early-nineteenth century Spanish expeditions and, later, American fur trappers and explorers, may have traversed the boundaries of the area.

American Period (1848-present)

On January 24, 1848, John Marshall discovered gold in the Sierra foothills; ten days later, on February 2, 1848, the Mexicans and Americans signed the Treaty of Guadalupe-Hidalgo and California became part of the United States. Over the next two years, gold-seekers poured into California from across the nation and around the world. By the early 1850s, trading posts, mining camps, and small settlements had been established along the sloughs and rivers as well as at ferry crossings throughout the southern Sierra foothills and San Joaquin Valley.

As a result of California's increasing population, in February 1850 the territorial legislature passed an act that would divide the province into 27 counties. Mariposa County, which was the largest, contained 30,000 square miles and enveloped one-fifth of the state. This county alone consisted of land that would eventually become part of 10 other counties including Merced. On April 19, 1855, Merced County was carved from the northwest section of Mariposa County and the seat of government established along Mariposa Creek at the Turner and Osborn Ranch. In 1857, the County seat was relocated to Snelling's Ranch. In December 1872, Merced County voters chose to relocate the seat of government from Snelling to the town of Merced.

Not only did the Central Pacific Railroad establish towns and provide transportation throughout the Valley, along with several other factors it also promoted a change in land use from ranching to farming. In addition to the railroad providing a more efficient and reliable method of shipping freight and farm products, as well as transporting passengers, the development of more productive agricultural machinery such as combines and threshers allowed farmers to produce larger harvests.

Although early agriculture in Merced County focused on "dry-farming" methods, during the 1860s many local ranchers and farmers began to develop small-scale irrigation projects. The Robla Canal Company and the Farmer's Canal Company (which eventually absorbed the Robla Canal Company) expanded the extent of irrigation in the area. These irrigation networks relied heavily on existing natural waterways that were modified (i.e., channeled) for the purpose of irrigation. By the early 1880s, Charles H. Huffman, a prominent businessman and landowner instrumental in the formation of the town of Merced, controlled the irrigation system through the Merced Canal and Irrigation Company.

In 1919, Merced County voters approved the creation of the Merced Irrigation District (MID), a publicly owned entity that purchased the Crocker-Huffman system in 1922. Voters soon passed a bond issue funding improvements and expansion of the existing irrigation system, an effort that has continued into the present day.

The MID canals provide irrigation water to local farmers for their crops. The Le Grand Canal is one of the two major canals within the MID system of irrigation canals that draws its water from Lake Yosemite. The MID built the Le Grand Canal sometime between 1922 and 1927. Flowing in a generally southeasterly direction through the eastern portion of Merced County, the Le Grand Canal serves the communities of Planada and Le Grand.

The Crocker-Huffman Land & Water Company constructed the Fairfield Canal between 1903 and 1909. At some point in the mid to late 1920s, following its acquisition by MID, the function, alignment, and geometry of this canal was fundamentally realigned. As originally designed, the canal emptied water into Bear Creek, where it was captured by dams downstream for use in land west of Merced. In the 1920s, Fairfield Canal was realigned to pass under Bear Creek in a siphon and to supply water to canals south and east of Merced. Both Le Grand Canal and Fairfield Canal traverse the project site.

4.5.2.4 Paleoenvironmental Setting

Paleontological resources are the mineralized (fossilized) remains of prehistoric plant and animal organisms, as well as the mineralized impressions (trace fossils) left as indirect evidence of the form and activity of such organisms.

The potential for the development of the Campus and University Community to affect paleontological resources was evaluated in detail in 2002 and 2004 at the time that EIRs for the previously proposed Campus and University Community projects were prepared. Because the site of the Proposed Action

overlaps almost completely[1] with the sites of the previously proposed Campus and University Community, information included in the previous EIRs is summarized below and used to evaluate the impacts of the Proposed Action.

As discussed in the UC Merced 2002 Long Range Development Plan (LRDP) EIR, the San Joaquin Valley region has been subjected to the combined influences of sporadic subsidence of the valley floor, uplift in the area of the Sierra Nevada Range and worldwide sea level changes. It has provided a record of geologic and biologic history spanning more than 120 million years, starting in the late Cretaceous period. Sediments and fossils of marine and terrestrial organisms have accumulated to produce significant but incomplete record of past life and geography. This complex record has been intermittently investigated beginning in the 1860s (UC Merced 2002). For more information regarding the geologic history of the valley, see Section 4.5 in the UC Merced 2002 LRDP EIR.

Surficial sedimentary units of predominantly Cenozoic age underlie the Campus and the University Community sites. These sediments include andesitic mudflow and intervolcanic channel sands of gravels of the Mehrten Formation (*Tm*), the alluvial fan-derived sediments from the North Merced Gravels (*QTnm*), the Riverbank Formation (*Qrb*), and the underlying Laguna Formation (*Ql*). Lithologies include locally derived, coarse pebble or cobble-size gravels, with interbedded sands, silts, and clays, all of which are potentially favorable to the preservation of paleontological resources. All of these formations that occur within the project site are potentially fossiliferous (UC Merced 2002). However, abundance and diversity of fossils can potentially vary widely from place to place, with paleontological resource sensitivity also varying according to geologic rock unit.

No known paleontological resources occur within the project site or within its vicinity. Since paleontological resources most commonly are buried in the substrate, surface examination often cannot reveal whether the paleontological resources are present at a specific project location. Furthermore, the majority of the Campus and the University Community areas are overlain by vegetation and visual detection of fossils would be possible only in those areas where erosion has removed the grassland vegetation cover. A limited field survey of the Campus site was conducted by a qualified paleontologist in 2001 in conjunction with the preparation of the UC Merced 2002 LRDP EIR. That survey found no paleontological deposits in the area surveyed.

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1 The difference between the previously proposed Campus and University Community sites and the current Proposed Action site is that the Proposed Action site includes a 222-acre area called "third pivot" area. Although this area was not included in the footprint of either the previous Campus or University Community in 2002/2004, the underlying geology of this area is identical to the geology of the adjacent Community North lands and therefore the previous evaluation of the University Community site for paleontological resources is applicable to this area.

4.5.3 APPLICABLE LAWS, REGULATIONS, PLANS, AND POLICIES

4.5.3.1 Federal

The Proposed Action will require a permit from the USACE. The USACE has determined that an environmental impact statement (EIS) under the National Environmental Policy Act (NEPA) should be prepared before a decision to issue or deny a permit for the Proposed Action can be made. Under NEPA, federal agencies must "preserve important historic, cultural and natural aspects of our national heritage" (Section 101 (b) (4)). The permitting federal agency is required to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended, and its implementing regulations (36 CFR Part 800).

Section 106 of the National Historic Preservation

Section 106 of the NHPA requires that, before beginning any undertaking, a federal agency must take into account the effects of the undertaking on historic properties and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on these actions. The Section 106 process has four basic steps:

- Identify and evaluate historic properties.
- Assess effects of the project on historic properties.
- Resolve any adverse effects of the project on historic properties in consultation with the State Historic Preservation Officer (SHPO), resulting in a Memorandum of Agreement (MOA) or a Programmatic Agreement (PA), which spells out specific measures to avoid or mitigate impacts to the historic property.
- Proceed in accordance with the MOA or PA.

Specific regulations regarding compliance with Section 106 state that, although the tasks necessary to comply with Section 106 may be delegated to others, the federal agency (in this case, the USACE) is ultimately responsible for ensuring that the Section 106 process is completed according to statute.

4.5.3.2 State

The *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* (Section 15064.5) require public agencies that finance or approve public or private projects must determine the significance of impacts to archaeological and historical resources. The guidelines state that, "a project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." CEQA requires that alternative plans or mitigation

measures be considered if a project would result in significant impacts to important cultural resources. However, only impacts to significant cultural resources need to be addressed. Therefore, prior to the development of mitigation measures, the importance or "significance" of any known cultural resources must be determined. The steps that are normally taken in the course of a cultural resources investigation for CEQA compliance are as follows:

1. Identify known cultural resources.
2. Evaluate the significance of the known resources.
3. Evaluate the impacts of the project on all known resources.
4. Develop and implement measures to mitigate the impacts of the project on significant resources, namely historical resources and unique archaeological resources.

According to the *State CEQA Guidelines* a cultural resource may qualify as a significant historical resource for the purposes of CEQA review if it meets any of the following criteria:

- The resource is listed in or determined eligible for listing in the California Register of Historical Resources (CRHR).
- The resource is included in a local register of historical resources, as defined in PRC 5020.1(k), or is identified as significant in a historical resource survey meeting the requirements of PRC 5024.1(g) unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
- The lead agency determines the resource to be significant as supported by substantial evidence in light of the whole record (14 California Code of Regulations [CCR] 15064.5[a]).

A cultural resource may be eligible for inclusion in the CRHR if it

- is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- is associated with the lives of persons important in our past;
- embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values; or
- has yielded, or may be likely to yield, information important in prehistory or history.

In addition, CEQA distinguishes between two classes of archaeological resources: archaeological resources that meet the definition of a historical resource as above, and unique archaeological resources. An archaeological resource is considered unique if it

- is associated with an event or person of recognized significance in California or American history or of recognized scientific importance in prehistory;

- can provide information that is of demonstrable public interest and is useful in addressing scientifically consequential and reasonable research questions; or has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind. (PRC 21083.2.)

Because the Proposed Action and its alternatives are located on non-federal land in California, it is also necessary to comply with state laws pertaining to the inadvertent discovery of human remains of Native American origin. The procedures that must be followed if burials of Native American origin are discovered on non-federal land in California are described in the Impacts and Mitigation section, below.

4.5.3.3 Local

Merced County Year 2000 General Plan

The County of Merced has adopted several policies designed for the protection of cultural resources through identification and management efforts and can be found in Chapter VI, Section C of the General Plan.

Objective 2.E: Significant archaeological and cultural resources are recognized and managed.

Policies:

21. Projects, which affect archaeological sites and artifacts, should be carefully managed to avoid damage.

- The original architectural character of significant historic structures should be maintained whenever possible.

- To discourage looting and vandalism, significant historical and archaeological resources should be subject to limited or controlled public access.

City of Merced Merced Vision 2015 General Plan

Chapter 8 - Section 8.2.6 - Goal Area SD-2: Cultural Resources

Goals:

- A diverse and rich historic and cultural resource environment

- A long-term community historic preservation/improvement program

Policies:

SD-2.1 Identify and preserve the City's archaeological resources.

Implementing Actions:

2.1.a Utilize the inventory of known archaeological sites maintained [at] the Central California Information Center for the review of development proposals.

2.1.b Utilize standard practices for preserving archaeological materials that are unearthed during construction, as prescribed by the State Office of Historic Preservation.

2.1.c If appropriate, consider reconstruction of archaeological sites in city parks, on school grounds, in open space areas, or other suitable locations where they can serve an educational purpose.

SD-2.2 Identify and preserve the City's historic and cultural resources.

2.2.a Expand City cultural and historic information resources.

2.2.b Support community groups and individuals working to preserve, protect and enhance the City's historic and cultural resources.

2.2.c Review and revise as necessary, the City's development/construction regulations to facilitate the preservation of historic structures.

2.2.d Support, as feasible, efforts to promote the preservation of historically or architecturally significant structures in the City.

2.2.e Support efforts to designate historic districts within the City.

These "Historic Districts" are generally as follows:

1. "Little Snelling" a residential district bounded by the Southern Pacific Railroad tracks to the north, "O" Street to the west, Highway 99 to the south, and the midline of the 600 block between 14th and 15th Streets to the east.

- A residential district in East Central Merced bounded by the Santa Fe Railroad tracks to the north, "G" Street to the east, 18th Street to the south, and Canal Street to the west;

- A residential district in West Central Merced bounded by the 800 block of 23rd Street to the north, "O" Street to the east, 18th Street to the south, and "R" Street to the west;

- A fourth residential district in North East Central Merced bounded by Bear Creek to the north, "G" Street to the east, the Santa Fe Railroad tracks to the south, and "I" Street to the west; and,

- The "Downtown Merced Historic District," which centers on the 300 to 600 blocks of Main Street terminating at the old Golden State Theater on the east and the Hotel Tioga on the west. It also extends up Canal Street, incorporates the 400 block of 18th Street, and includes the western side "M" Street near 16th Street.

SD-2.3 Develop and promote financial incentive programs for historic preservation efforts.

University Community Plan

Goal: Protection of any archaeological, prehistoric, historic, Native American, or other cultural site or structure and paleontological resources that may be found in the University Community.

Objectives: To establish a process for the identification and protection of archaeological resources.

Policies:

C 1.1 Require that an appropriate archaeological survey of the University Community planning area and locations to be developed for off-site infrastructure be conducted concurrent with the preparation of sub-area Specific Plans in accordance with CEQA Section 15064.5. (Imp 2.5)

C 1.2 Require that, prior to ground disturbance, developers shall notify contractors that they are required to watch for potential archaeological sites and artifacts and to notify the County of Merced immediately upon any find. Evidence of potential archaeological sites and artifacts includes, but is not limited to, aboriginal or historic skeletal remains, chipped stone, groundstone, shell and bone artifacts, concentrations of fire cracked rock, shell, bone and historic features such as privies, trash pits or concentrations, and building foundations. (Imp 2.7)

C 1.3 Require that, should a previously unidentified cultural resource be discovered during grading, trenching, or other on-site earthwork, construction activity be stopped within 100 feet of the identified materials until a professional archaeologist certified by the Registry of Professional Archaeologists RDA), and the County of Merced evaluates the significance of the find and suggest appropriate mitigation(s), as determined necessary.

UC Merced 2009 Long Range Development Plan

The UC Merced 2009 LRDP does not contain any specific policies for the protection of cultural resources.

4.5.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

Impact assessments for cultural resources focus on properties eligible for listing in the NRHP (historic properties), the CRHR, or those properties considered significant historic resources or unique archaeological resources under CEQA. The criteria described below are used to determine whether or not the impacts of the Proposed Action on cultural resources would be significant.

4.5.4.1 Federal

Under federal regulations, a project has an effect on an historic property when the undertaking could alter the characteristics of the property that may qualify the property for inclusion in the NRHP, including alteration of location, setting, or use. An undertaking may be considered to have an adverse effect on an historic property when the effect may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to,

- physical destruction or alteration of all or part of the property;
- isolation of the property from or alteration of the property's setting when that character contributes to the property's qualifications for listing in the NRHP;
- introduction of visual, audible, or atmospheric elements that are out of character with the property or that alter its setting;
- neglect of a property resulting in its deterioration or destruction; or
- the transfer, lease, or sale of the property (36 CFR 800.9).

4.5.4.2 State

According to the *State CEQA Guidelines* (California Code of Regulations, Title 14, 15064.5), a project with an effect that may cause a substantial adverse change in the significance of a historic resource, or that would directly or indirectly destroy a unique paleontological resource or site, is a project that may have a significant effect on the environment (California Code of Regulations, Title 14, 15064.5(b)). CEQA further states that a substantial adverse change in the significance of a resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historic resource would be materially impaired. Additionally, the significance of an historical resource is materially impaired when the project would induce actions that would demolish or adversely alter the physical characteristics of a historic resource that convey its historic significance and qualify it for inclusion in the CRHR or in a local register or survey that meet the requirements of Sections 5020.1(k) and 5024.1(g) of the Public Resources Code.

Although CEQA does not explicitly define a "unique paleontological resource," for purposes of this Draft EIS/EIR, the relevant provisions of the statute used to define a "unique archaeological resources" are employed, that is, "a unique paleontological resource" is a fossil or paleontological locality for which it

can be clearly demonstrated that—without merely adding to the current body of knowledge—here is a high probability that it

- contains information needed to answer important scientific questions and there is a demonstrable public interest in that information; or
- has a special and particular quality, such as being the oldest type or the best available example of its type.

It may not be possible to ascertain before project excavation whether significant fossils are present at a specific project location within a formation. This analysis assumes that excavation or other ground disturbance involving rock units in the geologic formations that have a high or moderate potential to contain fossil materials, would likely result in significant impacts on paleontological resources.

4.5.5 METHODOLOGY FOR EVALUATING EFFECTS

4.5.5.1 Cultural Resources Identification Efforts

The efforts to identify cultural resources within the project area consisted of literature reviews and record searches, historic map research, consultation with Native Americans, and intensive pedestrian surveys of the Campus and Community North parcels as illustrated for Alternatives 1 and 5. Additional information on these inventories can be found in the technical documents listed below in **Table 4.5-1, Findings of Records Search Within the Proposed Action Area**.

Cultural Resources Records Search

In March 2008, a request was sent to the Central California Information Center (CCIC) of the California Historical Resources Information System for a records search review of cultural resources information submitted to their data files. The staff of the CCIC housed at CSU Stanislaus in Turlock, California conducted a search of their files and reviewed maps for the project area footprint as presented for the Proposed Action (Alternative 1) and an additional 0.5-mile radius around the project site The records review also included a review of the National Register of Historic Places, the California Register of Historical Resources, the *California Inventory of Historic Resources* (1976), the *California Historical Landmarks* (1996), and the *California Points of Historical Interest* listing (May 1992 and updates), the Historic Property Data File and the Archaeological Determinations of Eligibility (Office of Historic Preservation current computer lists dated 12/04/2007 and 12/03/2007), the *Survey of Surveys* (1989), General Land Office Plat maps, and other pertinent historic maps and data available at the CCIC. The findings of the records search are summarized in **Table 4.5-1** below.

Table 4.5-1
Findings of Records Search Within the Proposed Action Area

Formal Inventory Efforts	Project Description	Identified Resources
2008, ICF Jones & Stokes. *Archaeological Survey Report for UC Merced Campus and Community North.*	Conduct cultural resource survey and inventory of previously unsurveyed portions of proposed UC Merced Campus and Community North project areas as presented in Alternative 1. Survey included east half of Section 3 and most of Section 2.	MCN–1: Prehistoric site, recommended not eligible MCN-2: Historic structure, recommended not eligible MCN-3: Historic structure, recommended not eligible MCN-4: Prehistoric midden site, potentially eligible 1 historic isolate find, not eligible
2001, William Self Associates.	Survey and assessment of approximately 4 miles along the Fairfield and Le Grand Canals	No prehistoric sites. No historic resources other than the Fairfield and Le Grand irrigation canals identified. Canals evaluated and recommended as not eligible
2001, URS Corporation. *University of California Merced Cultural Resources survey*	Proposed UC Merced Campus Development; Areas surveyed included remainder of Section 34 not covered by 1991 Smith et al survey, most of Section 35, and portions of Sections 26 and 27 along with 10 miles of linear road rights-of-way survey on G Street, Bellevue, Lake, and Yosemite Roads for utilities.	P-24-001680: historic fence line; recommended not eligible. P-24-001681: historic farm complex; evaluated and recommended as not eligible (JRP 2001).
2001, URS Corporation. *Draft Archaeological Survey Report Merced Campus Parkway*	Cultural Resources Study conducted for the Merced Campus Parkway, a proposed new expressway. Within the proposed action area, survey included a block area of the west half of Section 3 along with two 300-foot-wide corridors extending southward along the west half of Section 10.	None.
2001, URS Corporation. *Draft Archaeological Survey Report – Addendum 1 Merced Campus Parkway*	Supplemental survey conducted for Proposed Parkway along Yosemite Avenue rights-of-way.	None.
1991, Smith, M.; Baker, S.; and Shoup, L. *Archaeological Reconnaissance of the Merced Community Golf Course Site*	Survey covered most of south half of Section 34 southeast of Yosemite Lake.	None.

No formal cultural resource surveys have been conducted during the last 10 years within the 0.5-mile area surrounding the project site and only one historic isolated artifact was recorded within this 0.5-mile area and was located southeast of Yosemite Lake.

Native American Consultation

On March 18, 2008, ICF Jones & Stokes cultural resources staff contacted the Native American Heritage Commission (NAHC) requesting a search of the NAHC's sacred lands database and a list of Native American contacts for Merced County. On March 20, 2008 the NAHC responded with a list of seven Native American representatives for the Merced County area. The search of the sacred lands database was negative.

ICF Jones & Stokes prepared letters and maps showing the project site for the Alternative 1 footprint, which were sent to the seven Native American representatives to inform them of the project and request their input and concerns. To date, one response has been received. Ed Ketchum of the Amah Mutsun Tribal Band responded by email indicating that he has no personal information concerning the specific site, but that the Amah remain concerned about their heritage and their ancestor's remains.

4.5.5.2 Survey and Results

A Section 404 permit has been requested at this time for the development of only the Campus and Community North areas. No federal approvals are currently being sought for the Community South area. The University proposes to execute a memorandum of understanding (MOU) with the owners of the Community South (LWH Farms, LLC) that would help facilitate the development of the Community South area in support of the Campus, but development plans are not proposed at this time. Therefore, Community South is being analyzed at a level of detail adequate for NEPA and CEQA compliance and thus has not been subjected to a formal cultural resources survey. In May 2008 ICF Jones & Stokes archaeologists conducted the pedestrian survey for the previously unsurveyed portions of the UC Merced Campus and Community North footprints as proposed under Alternative 1, Proposed Action. The area surveyed during this inventory is an approximately 800-acre area covering most of Sections 2 and 3 of the Yosemite Lake USGS 7.5-minute quadrangle and is located south of the extension of Bellevue Road, east of Lake Road, and north of the extension of Cardella Road on the former Flying M Ranch property. The area was subjected to an intensive pedestrian survey consisting of parallel transects spaced 20 meters apart. In addition to the pedestrian survey, the USACE requested that a sample of shovel probes be excavated at varying locations. The locations for the shovel test pits (STPs) were selected based on the potential or higher probability of subsurface cultural deposits and was based on landform and degree of disturbance from agricultural activities. Four shovel test pits were excavated to between 10 and

20 centimeters and screened through 0.25-inch screen, all resulting in negative finds for evidence of subsurface cultural deposits at these locations.

The 2008 ICF Jones & Stokes survey resulted in the identification of four cultural resource sites that included two historic and two prehistoric sites (Sites MCN-1 through MCN-4). One isolated historical resource was also identified. Four of these resources (Sites MCN-1, MCN-2, MCN-3, and the historical isolate) have been evaluated for their eligibility for listing on the NRHP or CRHR, and recommended that they be determined to be ineligible (ICF Jones & Stokes 2008). Site MCN-4, the larger prehistoric midden site, will be evaluated at a later date subject to the stipulations and requirements of the Programmatic Agreement (PA) executed for this project. The PA is an agreement document between the USACE, as the lead federal agency responsible for compliance with Section 106 of the NHPA, and the State Historic Preservation Officer (SHPO). Other agencies and interested parties may also participate in the development of the PA and be asked to sign the document as concurring parties. This agreement document binds signatory parties to the process and measures contained in the PA. A PA may be used to allow completion of the NEPA environmental review process prior to completion of all steps needed to fully comply with Section 106 of the NHPA. However, the NEPA Record of Decision (ROD) will not be signed by the USACE until the PA is fully executed (signed by the signatory parties including the SHPO).

Previous cultural resource investigations resulted in the identification of four historic resources, the Fairfield and Le Grand irrigation canals, a farm complex, and a fence segment with respect to these four resources, it has been recommended that they be determined ineligible for listing on the NRHP or the CRHR. Formal NRHP and CRHR evaluations of all of these resources, review by SHPO, and development of any necessary treatment measures are stipulated as requirements of the PA executed for this project.

Known Cultural Resources

Site MCN-1: This resource is located along the eastern boundary of Community North. MCN-1 is a prehistoric site of indeterminate size with dark brown midden-like soil distinct from surrounding soils on a rise adjacent to a seasonal/intermittent drainage. The area was dense with mature grasses and tar weed and also had ground squirrel activity providing burrows and burrow kick for visibility. The site appears to include a sparse scatter of surface artifacts; however, ground surface visibility was poor and estimated at only 10 percent, making this designation uncertain. Very few artifacts were noted on the surface but what was seen included fire affected rock, lithic debitage of basalt material. Site MCN-1 area (dark soil) appears to continue upslope beyond the project and property boundaries because additional dark soil and a couple of large cores were seen beyond the fenceline to the east. It is likely that Site MCN-1 is the western edge of a larger cultural resource site that is actually located outside the APE to the east. The

portion of Site MCN-1 located within the APE measures approximately 75 meters north-south by 35 meters east-west based on the extent of dark soil that could be seen.

Site MCN-1, within the project area, was evaluated by ICF Jones & Stokes (2008) and found to lack characteristics that would contribute to the potential eligibility for listing on the NRHP or the CRHR**.** Although this site extends outside the project APE and may be potentially eligible for the NRHP and CRHR, the portion of the site within the APE does not contribute to the eligibility of the site. Formal NRHP and CRHR evaluation of this resource, review by SHPO, and development of any necessary treatment measures are stipulated as requirements of the PA executed for this project.

Site MCN-2: This resource is located along the southern edge of Community North as outlined for the Proposed Action. Site MCN-2 is a historic irrigation ditch that appears to be a lateral north-south branch of the Fairfield Canal. The ditch is not lined and measures approximately 30-feet-wide rim to rim and approximately 20 feet wide at water level. This ditch measures approximately 400 yards long and terminates at the property boundary fence along the southern edge of the Community North area, which is on the same line as Cardella Road and appears to feed water to the adjacent fields.

Site MCN-2 was evaluated by ICF Jones & Stokes (2008) and is recommended to be determined ineligible for listing on the NRHP or the CRHR. Formal NRHP and CRHR evaluation of this resource, review by SHPO, and development of any necessary treatment measures are stipulated as requirements of the PA executed for this project.

Site MCN-3: This resource is located along the southern edge of Community North west of the Fairfield Canal. MCN-3 is a historic structure complex that appears to be a concrete water tank along with an adjacent concrete square structure (possibly pump house) measuring approximately 8 feet by 8 feet. The only artifacts noted were two ceramic fragments. One fragment is a ceramic bowl or plate rim fragment identified as Flow Blue and is a very expensive type of ceramic. It probably dates to the 1870s but can be as early as the 1820s and as late as the 1920s. The second ceramic artifact noted is a thick earthenware fragment.

Site MCN-3, within the project area, was evaluated by ICF Jones & Stokes (2008) and is recommended to be determined ineligible for listing on the NRHP or the CRHR. Formal NRHP and CRHR evaluation of this resource, review by SHPO, and development of any necessary treatment measures are stipulated as requirements of the PA executed for this project.

Site MCN-4: This resource is located in the southern half of Community North area along the east side of the Fairfield Canal. MCN-4 is a prehistoric midden site located on top of a rise in an area of rolling pastureland just east of the Fairfield Canal. The site measures approximately 125 meters east-west by

125 meters north-south; currently, the site boundaries are only estimated based on the archaeologist's ability to follow the extent of the dark midden soil. At the time of survey, the area was covered in dense mature grasses and weeds and surface visibility was very poor. However, the area appears well used by burrowing squirrels making some visibility possible. A profile of MCN-4 was visible in the cut bank of the canal located at the west edge of Site MCN-4 and showed an approximately 1 meter-deep layer of dark soil overlaying the red clay layer. Many artifacts were noted on the surface and included 1 bifacial handstone end fragment, 1 possible pestle end fragment, fire-affected rock and approximately 2 dozen pieces of lithic debitage ranging from primary flakes and cores to reduction flakes. Lithic material was a mixture of cherts, basalt, and non specific metavolcanics. Evidence of Site MCN-4 was not seen on the west side of the canal.

Site MCN-4 will be evaluated for NRHP and CRHR eligibility at a later date in accordance with the stipulations and requirements of the PA executed for this project.

Historic Burn Area: Additionally, one historic resource isolate was noted that comprised a discrete burn area containing one 16-penny square nail, one square nail fragment, and a fragment of thick amber glass located in a small area measuring 6 foot by 3 foot. This isolate appears to be the remnants of a single trash burning episode lying approximately 50 feet north of the cattle-holding pen located just north of the bridge crossing the Fairfield Canal in middle of the Community North area.

Because of the lack of artifacts, lack of associated structures, remains, or deposits, this isolated find was recommended to be determined ineligible for listing on the NRHP or the CRHR. Formal NRHP and CRHR evaluation of this resource, review by SHPO, and development of any necessary treatment measures are stipulated as requirements of the PA executed for this project.

Fairfield and Le Grand Canals: These two resources are historic irrigation canals that traverse the project area from northwest to southeast. These canals have been evaluated and are recommended to be determined ineligible for listing in either the NRHP or the CRHR; if the USACE determines that these cultural resources are not eligible for listing and the State Historic Preservation Officer concurs, then these cultural resources would be considered to be not significant resources for the purposes of Section 106 and the project would not substantially affect these resources. These resources are described in the technical documents cited above in **Table 4.5-1** and impacts to these resources are analyzed in the UC Merced 2002 Long Range Development Plan EIR and found to be less than significant. Although previous cultural resource investigations resulted in the identification of these two resources, which were recommended to be determined ineligible for listing on the NRHP or the CRHR, formal NRHP and CRHR evaluations of these resources, review by SHPO, and concurrence by SHPO on these findings will

be sought in accordance with the requirements of the PA. If necessary, development of treatment measures will be stipulated as requirements of the PA executed for this project.

Historic Farm Complex (P-24-1681) and Historic Fence Segment (P-24-1680): These two historic resources are located at the north end of the Campus area north of the current built campus. These resources have been formally evaluated and determined to be not eligible for listing in either the NRHP or the CRHR. Therefore these are not considered significant historic resources for purposes of NEPA or CEQA. These resources are described in the technical document cited above in **Table 4.5-1** and impacts to these resources are analyzed in the UC Merced 2002 LRDP EIR and found to be less than significant. Although previous cultural resource investigations resulted in the identification of these two historic resources, which were recommended to be determined ineligible for listing on the NRHP or the CRHR, formal NRHP and CRHR evaluations of these resources, review by SHPO, and concurrence by SHPO on these findings will be sought in accordance with the requirements of the PA. If necessary, development of treatment measures will be stipulated as requirements of the PA executed for this project.

4.5.5.3 Paleontological Resources

As noted above, since paleontological resources most commonly are buried in the substrate, surface examination often cannot reveal whether the paleontological resources are present at a specific project location. For this reason, assessment of the potential for paleontological impacts of the Proposed Action is based in part on an assessment of the paleontological sensitivity of the geological formations present or likely to be present on and under the Campus and Community University site. The assessment of paleontological sensitivity is based both on the presence of known paleontological sites near the project area, as well as extrapolated biostratigraphic information from rock units in adjacent areas or areas of regional context. To perform this analysis, geological maps of the project area were reviewed to determine the geologic formation likely to be present and previously recorded paleontological localities found in these formations were also reviewed. Then geological formations present or likely to be present on the project site were assigned high, moderate, or low paleontological sensitivity ratings. High Potential, Moderate Potential, and Low Potential ratings are described as follows:

- **High-Potential Rating.** Rock units with a High Potential for significant paleontological resources are known to have yielded vertebrate fossils within the project area or region. This does not necessarily imply that vertebrate fossils will always be recovered from a High-Potential rated rock unit, but only that there are recorded occurrences within the unit. Additional factors that are considered in making a determination pertain to inferred despositional environment and lithology.

- **Moderate-Potential Rating.** A Moderate-Potential rating is applied to rock units possessing some degree of potential, such as favorable depositional environment for resource preservation or possessing characteristics of lithologically similar rock units in the region that have yielded vertebrate

fossils. All Moderate Potential-rated rock units are recommended for field survey and construction monitoring.

- **Low-Potential Rating.** A Low-Potential rating is applied to rock units containing Lithologies that do not commonly preserve significant fossil resources (i.e., coarse boulder conglomerates, or welded (ignimbrite) volcanic ash deposits). Igneous rocks, such as the granodiorite outcrops, are precluded from preservation of paleontological resources, because of their genesis within a magmatic environment.

For impact analysis, it was assumed that if high or moderate sensitivity ratings are assigned to on-site geologic formations, the Proposed Action or an alternative would have the potential to result in potentially significant paleontological impacts.

4.5.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.5.6.1 Alternative 1 –Proposed Action

Alt 1 – Impact CUL-1: Implementation of the Proposed Action could damage or destroy significant historic resources located within the project footprint. (*Potentially Significant; Less than Significant*)

Cultural resources inventories have identified cultural resources located within the UC Merced Campus and University Community project areas. The previous cultural resource investigations (see **Table 4.5-1**) identified four historic resources, which included the Fairfield and Le Grand irrigation canals, a historic farm complex, and a historic fence segment within the footprint of the Campus. Additionally, an ICF Jones & Stokes survey, conducted in 2008, identified four cultural resources sites (See **Known Cultural Resources** above), including two historic structures and two prehistoric sites with dark midden-like soil, and a historic isolate located within the footprint of Community North. The potential for the Proposed Action to result in significant adverse impacts to these resources is evaluated below.

Campus

Previous cultural resource investigations resulted in the identification of four historic resources identified as the Fairfield and Le Grand irrigation canals, a historic farm complex, and a historic fence segment within the footprint of the campus. These resources were formally evaluated and recommended as not eligible for listing in either the NRHP or the CRHR. Concurrence by SHPO on these findings will be sought in accordance with the requirements of the PA. The impact under both NEPA and CEQA on significant historic resources would be less than significant. The potential to affect unidentified buried cultural resources is addressed below under **Impact CUL-2**.

University Community

As noted above, the 2008 ICF Jones & Stokes survey resulted in the identification of five cultural resource sites, comprising two historic and two prehistoric sites as well as a historic isolate on the Community North site. Of the identified cultural resources, only Site MCN-4, a large prehistoric site, is potentially considered a historic resource under NEPA, CEQA, and Section 106 of the NHPA, although it has not yet been evaluated for listing on the NRHP or the CRHR. Ground-disturbing activities, demolition, and clearing associated with the development and construction of the Community North would potentially damage or destroy Site MCN-4. Under federal regulations, a project has an effect on an historic property when the undertaking could alter the characteristics of the property that may qualify the property for inclusion in the NRHP. According to the *State CEQA Guidelines* (California Code of Regulations, Title 14, 15064.5), a project with an effect that may cause a substantial adverse change in the significance of an historic resource would be a significant impact. Therefore, the Proposed Action could potentially result in a significant impact on this resource. Development of the eastern portion of Community North is not anticipated to occur for several years. Given that no development would occur in the area immediately following approval of this Draft EIS/EIR or the issuance of a Section 404 permit by the USACE, the USACE has consulted with the SHPO and has proceeded with the preparation of a Programmatic Agreement (PA) that stipulates the steps that will be implemented by University Community Land Company (UCLC) to evaluate this site and appropriately mitigate any impacts if the site is found to be eligible. **Mitigation Measure CUL-1** is included in this Draft EIS/EIR to disclose the manner in which any adverse impacts to Site MCN-4 will be reduced to a less than significant level.

The Community South parcel has not been inventoried for the presence of cultural resources and therefore may contain significant historic resources for the purposes of NEPA and CEQA. The area is primarily open land used for row crops and pastureland and contains several farm-related structures. These structures may potentially be significant based on their age and other attributes. Ground disturbing activities and construction in unsurveyed areas could result in damage to or destruction of cultural resources that may meet the criteria of historic property, historical resource, or unique archaeological resource. Damage to or destruction of historical resources and unique archaeological resources constitutes a significant impact under CEQA (14 CCR 15064.5) and an adverse effect under Section 106 of the NHPA. However, all future development within Community South would be subject to UCP Policies C1.1 through 1.3, which require that all areas proposed for development are intensively surveyed for cultural resources, and require that cultural resources if encountered during construction are adequately protected. Implementation of UCP Policies C1.1 through 1.3 would reduce this impact to a less than significant level. No further mitigation is required.

As described in **Section 2.0, Project Description**, a proposed high voltage transmission line would be installed to provide electricity to the Campus and University Community in the long run. This power line would be aligned along one of three alternate routes to terminate at a location near Lake Road within Community North. The power line could be aligned along Yosemite Avenue or Cardella Road and then along the future Campus Parkway or would be aligned along the future Campus Parkway from its connection point at the existing power line up through the project site (see **Figure 2.0-6, Off-Site Utility Improvements)**. Similarly, other off-site improvements such as wastewater, natural gas, and water pipelines may be necessary for the development of the Campus and University Community. These improvements would be installed within existing right-of-way roadways and therefore would not damage or destroy significant historic resources within these areas.

Conclusion

The Proposed Action could result in a significant adverse impact on one known prehistoric site within the footprint of Community North (Site MCN-4). **Mitigation Measure CUL-1a** will be implemented to ensure that the impact is reduced to a less than significant level. The Proposed Action could also result in a significant adverse impact on two historic irrigation canals (Fairfield and Le Grand Canals) which traverse the project area from northwest to southeast, a farm complex, a fence line, and another prehistoric archaeological site (MCN-1). Although the canals, the farm complex, the fence line, and the prehistoric site MCN-1 were previously evaluated and were recommended to be found ineligible for listing on the NRHP or the CRHR, formal NRHP and CRHR evaluations of these resources, review by SHPO, and concurrence by SHPO on these findings will be sought in accordance with the requirements of the PA. If SHPO concurs, then these resources would be considered to be not significant resources and the project would not substantially affect these resources, resulting in a less than significant impact. If SHPO does not concur, then implementation of **Mitigation Measure CUL-1b** below would reduce this impact to a less than significant level.

MM CUL-1a: Prior to development, the site developer will evaluate Site MCN-4 in accordance with the stipulations and requirements of the Programmatic Agreement (PA) executed for this project. If Site MCN-4 is found to be eligible for the NRHP and CRHR, a Historic Properties Treatment Plan will be prepared and identified treatment measures will be implemented prior to any direct effects to MCN-4 as required by the PA. (*Applicability – Community North Only*)

MM CUL-1b: Prior to the development of the Campus and Community North, the University shall ensure that the two previously-evaluated historic irrigation canals, Fairfield Canal and the Le Grand Canal, the farm complex, the fence line and prehistoric site MCN-1 which

were recommended to be found ineligible for listing under the NRHP and CRHR, are be formally evaluated. Formal NRHP and CRHR evaluations of these resources will be reviewed by the SHPO for concurrence. If SHPO does not concur with the findings of these previous evaluations, the development of any necessary treatment measures will be stipulated in a Historic Properties Treatment Plan as requirements of the PA executed for this project. Identified treatment measures will be implemented prior to any direct effects to the canals as required by the PA. (*Applicability – University Community and Campus*)

Significance after Mitigation: Less than significant.

Alt 1 – Impact CUL-2: Implementation of the Proposed Action could cause damage to unidentified or buried cultural resources. (*Potentially Significant; Less than Significant*)

Campus and Community

Development under the Proposed Action could potentially inadvertently unearth and damage buried cultural resources that were not identified during pedestrian field surveys of the Campus and Community North, or that may be present within the Community South area. Ground-disturbing construction activities associated with campus and community development, including off-site improvements (i.e., installation of utilities), could result in the demolition of or substantial damage to significant cultural resources.

The 2009 UC Merced LRDP does not contain any policies or other guidance for the protection of cultural resources. Therefore, construction on the Campus site could result in a potentially significant impact on buried cultural resources, should they be encountered during ground-disturbing activities.

The UCP, on the other hand, includes Policies C1.2 and C1.3, which require that, prior to ground disturbance, developers shall notify contractors that they are required to watch for potential archaeological sites and artifacts and to notify the County of Merced immediately upon any find and that cultural resources, if encountered during construction, are adequately protected. Implementation of UCP Policies C1.2 and 1.3 would reduce this impact to a less than significant level. No further mitigation is required.

To address this potentially significant impact from construction activities on the Campus, the University will implement **Mitigation Measure CUL-2** below.

MM CUL-2: If buried cultural resources, such as chipped or ground stone, historic debris, building foundations, or non-human bone are inadvertently discovered during ground-disturbing activities on the campus, work will stop in that area and within 100 feet of the find until a qualified archaeologist can assess the significance of the find and, if necessary, develop appropriate treatment measures. Treatment measures typically include development of avoidance strategies or mitigation of impacts through data recovery programs such as excavation or detailed documentation.

If cultural resources are discovered during construction activities, the construction contractor and lead contractor compliance inspector will verify that work is halted until appropriate treatment measures are implemented in coordination with the USACE and UC Merced. (*Applicability – Campus Only*)

Significance after Mitigation: Less than significant.

Alt 1 – Impact CUL-3: Implementation of the Proposed Action could cause damage to previously unidentified human remains. (*Potentially Significant; Less than Significant*)

Campus and Community

Development under the Proposed Action could potentially inadvertently unearth and damage buried human remains that were not identified during pedestrian field surveys of the Campus and Community North or may be present within the Community South area. Additionally, human remains may also be discovered and damaged during ground-disturbing activities during the installation of the off-site improvements. These could suffer damage from the construction activities. Furthermore, according to California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052).

The UC Merced 2009 LRDP does not contain any policies or other guidance for the protection of cultural resources, including human remains. Therefore, construction on the campus site could result in a potentially significant impact on buried human remains, should they be encountered during ground-disturbing activities.

As noted above, the UCP includes Policies C1.2 and C1.3 which require that, prior to ground disturbance, developers shall notify contractors that they are required to watch for potential archaeological sites and artifacts (including human remains) and to notify the County of Merced immediately upon any find and that cultural resources, if encountered during construction, are adequately protected. Implementation of UCP Policies C1.2 and 1.3 would therefore reduce the potential for an adverse impact on buried human

remains from ground-disturbing activities within the University Community site, and the impact would be less than significant. However, because the two UCP policies do not explicitly note the requirements for consultation if the human remains are of Native American origin, all development on the University Community will be required to implement **Mitigation Measure CUL-3** to further reduce this less than significant impact. In summary, to address this impact to human remains that may be encountered during construction on the Campus or the University Community site, **Mitigation Measure CUL-3** will be implemented.

MM CUL-3: If human remains of Native American origin are discovered during ground-disturbing activities, the Campus and/or developer will comply with state laws relating to the disposition of Native American burials, which falls within the jurisdiction of the California Native American Heritage Commission (Public Resources Code Section 5097). If human remains are discovered or recognized in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until

- the coroner of Merced County has been informed and has determined that no investigation of the cause of death is required; and
- if the remains are of Native American origin;
- the descendants from the deceased Native Americans have made a recommendation to the land owner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98; or
- the California Native American Heritage Commission was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the Commission. (*Applicability – University Community and Campus*)

Significance after Mitigation: Less than significant.

Alt 1 – Impact CUL-4: Development of the Proposed Action would have the potential to disturb or destroy paleontological resources. (*Potentially Significant; Less than Significant)*

Campus

There are no known paleontological resources within the campus site. The closest known Pleistocene-age vertebrate locality is located approximately 3 miles from the campus site. The geologic formations underlying the campus portion of the Proposed Action are judged to either have a moderate (North

Merced Gravels), or a highly potential (Merhten Formation and Riverbank Formation) to contain significant paleontological resources. As defined in CEQA, when a paleontological resource meets eligibility criteria of a "unique paleontological resource," any disturbance to or removal of the resource would constitute a significant impact.

Construction of roadways, installation of off-site utilities, buildings and structures, parking lots and structures, storm water detention basins, and utilities would have the potential to disturb or destroy paleontological resources that might be present in these formations. These direct impacts could also result in the loss of geologic context, which is also used to determine the age and significance of the resources. Indirect impacts of unauthorized collecting of significant fossils could occur or be increased by drawing attention to the presence and location of paleontological sites. While the potential impacts associated with construction activities could result in damage or destruction of undiscovered fossil deposits, their detection before and during the construction process would make these resources accessible until they are again covered over by the development project. The discovery and concomitant salvage of these fossils by professionals would add to paleontological knowledge and would represent a beneficial impact of construction.

The beneficial impact notwithstanding, the improper removal of a significant or unique paleontological resource without controlled data recovery could result in significant impacts to paleontological resources.

University Community

There are no known paleontological resources within the University Community site. The closest known Pleistocene age vertebrate is located approximately 3 miles from this portion of the project site. The geologic formations underlying the University Community are judged to have either a moderate (North Merced Gravels, or a high potential (Merhten Formation and Riverbank Formation) to contain significant paleontological resources. If present, any disturbance to or removal of the resources during construction on the University Community site would constitute a significant impact.

The University Community Plan includes a specific policy that addresses the impacts on paleontological resources. UCP Policy C 2.1 requires that, prior to construction, construction personnel shall be informed of the potential for encountering significant paleontological resources. All construction personnel shall be informed of the need to stop work in the vicinity of a potential discovery until a qualified paleontologist has been provided the opportunity to assess the significance of the find and implement appropriate measures to protect or scientifically remove the find. Construction personnel shall also be informed of the requirement that unauthorized collection of fossil resources is prohibited. All development within the

University Community would be required to comply with UCP Policy C.2.1 and with implementation of the policy; this impact would be less than significant.

Conclusion

The Campus and the University Community sites were both found not to contain any paleontological resources within their boundaries. The closest paleontological resource is located approximately 3 miles from the Proposed Action. However, three of geologic formations underlying the Campus and University Community are considered moderate to highly sensitive for paleontological resources. The University Community Plan has proposed a policy (Policy C 2.1) that would help reduce the potentially significant impacts that could occur should paleontological resources be encountered and disturbed. Additionally, the possible impact associated with potentially finding paleontological resources within the Campus portion of the Proposed Action site would be reduced to a less than significant level with implementation of **Mitigation Measures CUL-4a** and **CUL-4b** as described below.

MM CUL-4a Prior to project construction, construction personnel will be informed of the potential for encountering significant paleontological resources. All construction personnel will be informed of the need to stop work in the vicinity of a potential discovery until a qualified paleontologist has been provided the opportunity to assess the significance of the find and implement appropriate measures to protect or scientifically remove the find. Construction personnel will also be informed of the requirements that unauthorized collection resources are prohibited. (*Applicability – Campus Only*)

MM CUL-4b A qualified paleontologist will be intermittently present to inspect exposures of Merhten Formation, North Merced Gravels, and Riverbank Formation during construction operations to ensure that paleontological resources are not destroyed by project construction. (*Applicability – Campus Only*)

Significance after Mitigation: With implementation of the UCP policy and the proposed mitigation measures, impacts to paleontological resources would be reduced to a less than significant level.

4.5.6.2 Alternative 2 – Yosemite Avenue

Damage or Destroy Historic Resources

Only the portion of the Alternative 2 site north of Cardella Road has been subjected to pedestrian surveys for cultural resources. The remaining portions of the Alternative 2 site south of Cardella Road have not been inventoried for the presence of cultural resources and therefore may contain significant historic

resources for the purposes of NEPA and CEQA. The Alternative 2 footprint includes an area utilized primarily for agriculture, namely row crops and grazing pastureland. Additionally, the Alternative 2 area includes many structures that are most likely more than 50 years old and will need to be inventoried and may be considered significant. Mitigation measure(s) would be required to survey and evaluate the site for historic resources, and to determine eligibility for listing on the NRHP or the CRHR. Depending on the results of the survey and evaluation, consultation with SHPO may be required.

Damage Buried Cultural Resources

Any ground-disturbing or construction activities in unsurveyed areas, including off-site improvements, could result in damage to or destruction of cultural resources that may meet the criteria of historic property, historical resource, or unique archaeological resource. Damage to or destruction of historical resources and unique archaeological resources constitutes a significant impact under CEQA (14 CCR 15064.5) and an adverse effect under Section 106 of the NHPA. However, all future development within the Alternative 2 footprint would be subject to implementation of UCP Policies C1.1 through 1.3 that require all areas proposed for development to be intensively surveyed for cultural resources, and require that cultural resources if encountered during construction are adequately protected. Implementation of UCP Policies C1.1 through 1.3 and **Mitigation Measure CUL-2** would reduce this impact to a less than significant level.

Disturb Paleontological Resources

The impact of this alternative on paleontological resources would be the same as under the Proposed Action because of the similar geologic formations present in the area. The impact would be potentially significant and **Mitigation Measures CUL-4a** and **CUL-4b** would reduce the impact to a less than significant level.

4.5.6.3 Alternative 3 – Bellevue Ranch Alternative

Damage or Destroy Historic Resources

Approximately 50 percent of the Alternative 3 site has been previously surveyed, although these surveys would be considered outdated having occurred 16 years ago in 1992 (Basin Research 1993) and those areas would be considered unsurveyed for cultural resources. However, the 1992 surveys were conducted for the Bellevue Ranch housing development that occupies a large portion of the southeast portion of the Bellevue Ranch project alternative area and has recently been developed with a new planned residential housing area. The 1992 survey resulted in the identification of two historic resources and no prehistoric resources (e.g., midden sites or artifacts). The two historic resources identified were

the abandoned Yosemite Valley railroad grade and the Bellevue Ranch complex. These resources are considered to be significant resources under NEPA and CEQA. Physical damage to these cultural resources or substantial changes to the setting would be significant impacts.

The area of north Merced identified as part of Alternative 3 site has not been inventoried for the presence of cultural resources and therefore may contain significant historic resources for the purposes of NEPA and CEQA. The Alternative 3 area is a mix of rural residential properties and open agricultural use areas and may contain significant historic structures or buildings as well as prehistoric archaeological resources. Mitigation measure(s) would be required to survey and evaluate the site for historic resources, and to determine eligibility for listing on the NRHP or the CRHR. Depending on the results of the survey and evaluation, consultation with SHPO may be required.

Damage Buried Cultural Resources

Any ground-disturbing or construction activities in areas not inventoried for the presence of cultural resources (i.e., historic properties) could result in the damage to or destruction of cultural resources that meet the criteria of historic property, historical resource, or unique archaeological resource. Damage to or destruction of historical resources and unique archaeological resources constitutes a significant impact under CEQA (14 CCR 15064.5) and an adverse effect under Section 106 of the NHPA. Potentially significant impacts would be similar to those described above for Alternative 1 and **Mitigation Measure CUL-2** would be required to reduce the impact to a less than significant level.

Disturb Paleontological Resources

The impact of this alternative on paleontological resources would be the same as under the Proposed Action because of the generally similar geologic formations present in the North Merced area. The impact would be potentially significant and **Mitigations Measure CUL-4a** and **CUL-4b** would be required to reduce the impact to a less than significant level.

4.5.6.4 Alternative 4 – 2002 Proposed Project

Damage or Destroy Historic Resources

Impacts of Alternative 4 would be similar to those described above for Alternative 1, and would be potentially significant and would require implementation of **Mitigation Measures CUL-1a** and **CUL-1b** to reduce the impact to a less than significant level.

Damage Buried Cultural Resources

Any ground-disturbing or construction activities in areas not inventoried for the presence of cultural resources (i.e., historic properties) could result in the damage to or destruction of cultural resources that meet the criteria of historic property, historical resource, or unique archaeological resource. Damage to or destruction of historical resources and unique archaeological resources constitutes a significant impact under CEQA (14 CCR 15064.5) and an adverse effect under Section 106 of the NHPA. Potentially significant impacts would be similar to those described above for Alternative 1 and **Mitigation Measure CUL-2** would be required to reduce the impact to a less than significant level.

Disturb Paleontological Resources

The impact of this alternative on paleontological resources would be the same as under the Proposed Action because of the generally similar geologic formations present in the North Merced area. The impact would be potentially significant and **Mitigation Measures CUL-4a** and **CUL-4b** would be required to reduce the impact to a less than significant level.

4.5.6.5 Alternative 5 – No Action

Under the No Action Alternative, current land uses for rural agricultural uses such as grazing on the Campus and Community North areas would continue. Although damage to or loss of cultural resources would potentially occur under the No Action Alternative, the continued agricultural uses on the Campus and Community North areas will likely engender fewer impacts on cultural resources than would Alternatives 1–4. Community South could be developed similar to the manner under Alternative 1, Proposed Action and the impacts would be the same as described above under Alternative 1.

Damage or Destroy Historic Resources

There would be no ground-disturbing activities under this alternative on the Campus and Community North areas; therefore, there would be no impacts on cultural resources in these areas under this alternative. However, since Community South could be developed similar to the manner under Alternative 1, the impacts of Alternative 4 on historic resources, would be similar to those described above for Alternative 1 for those impacts that pertain to Community South only, and would be potentially significant. Implementation of **Mitigation Measure CUL-1b,** which is applicable to both the Campus and the Community, would be required to reduce the impact to a less than significant level.

Damage Buried Cultural Resources

There would be no ground-disturbing activities under this alternative on the Campus and Community North areas; therefore, there would be no impacts on cultural resources in these areas under this alternative. However, since Community South could be developed similar to the manner under Alternative 1, the impacts of Alternative 4, would be similar to those described above for Alternative 1. **Mitigation Measure CUL-2** would be required to reduce the impact to a less than significant level.

Disturb Paleontological Resources

There would be no ground disturbing activities under this alternative on the Campus and Community North areas; therefore, there would be no impacts on cultural resources in these areas under this alternative. However, since Community South could be developed similar to the manner under Alternative 1, the impacts of Alternative 4 on paleontological resources would be similar to those described above for Alternative 1 because of the generally similar geologic formations present in the North Merced area. The impact would be potentially significant and **Mitigation Measures CUL-4a** and **CUL-4b** would be required to reduce the impact to a less than significant level.

4.5.6.6 Alternative 6 – No Build

Damage or Destroy Historic Resources

Because there would be no ground-disturbing activities under this alternative, there would be no impacts on historic resources under this alternative.

Damage Buried Cultural Resources

Because there would be no ground-disturbing activities under this alternative, there would be no impacts on cultural resources under this alternative.

Disturb Paleontological Resources

Because there would be no ground-disturbing activities under this alternative, there would be no impacts on paleontological resources under this alternative.

4.5.7 SUMMARY COMPARISON OF ALTERNATIVES

Alternative 6, No Build, would cause no damage to cultural resources. Of the build alternatives, Alternative 5 would be the least likely to cause a significant effect to cultural resources. Alternatives 1–4 would all likely cause similar adverse impacts to cultural resources. Impacts caused by Alternatives 1 and

4 would be considered significant, but would be limited to one known cultural resource. Impacts caused by Alternative 3 would be considered significant, impacting two known historic properties. The limited cultural resources inventory that has been conducted for Alternative 2 indicates that historic resources would likely be impacted.

4.5.8 REFERENCES

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4.6 GEOLOGY AND SOILS

4.6.1 INTRODUCTION

This section describes the existing environmental conditions pertaining to the geologic, topographic, and seismic conditions and soils on the project site and its vicinity. A discussion of the regulatory setting follows the description of the environmental setting. The section evaluates and discusses the consequences associated with construction of the project. The primary concerns related to geologic and soil resources are accelerated runoff, erosion, and sedimentation from grading, excavation, and construction activities; and structural damage and injury from development on expansive soils.

Sources of information used in this analysis include:

- Maps and reports by the United States Geological Survey (USGS)
- Maps and reports by the California Geological Survey (CGS)
- Maps and reports by the United Stated Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)
- Engineering Geology and Preliminary Geotechnical University Planning Study, University Community Planning Area, Merced, California (Kleinfelder 2001)
- Photolineament Evaluation, Proposed UC Merced Campus and Community Plan, Merced, California (Kleinfelder 2000)
- Merced County General Plan
- 2002 Long Range Development Plan EIR (UC Merced 2002)
- 2004 University Campus Plan EIR (Merced County 2004)

No public and agency comments related to geology and soils were received in response to the Notice of Preparation or the Notice of Intent for this environmental impact statement/environmental impact report (EIS/EIR)

4.6.2 AFFECTED ENVIRONMENT

4.6.2.1 Regional Geology and Topography

The project is located in the San Joaquin Valley in the Great Valley geomorphic province. The Great Valley of California, also called the Central Valley of California, is a nearly flat alluvial plain extending from the Tehachapi Mountains in the south to the Klamath Mountains in the north and from the Sierra

Nevada on the east to the Coast Ranges on the west. The valley is about 450 miles long and has an average width of about 50 miles. Elevations of the alluvial plain are generally just a few hundred feet above mean sea level (msl), with extremes ranging from a few feet below msl to about 1,000 feet above msl (Hackel 1966).

Geologically, the Great Valley geomorphic province is a large elongate northwest-trending asymmetric structural trough that has been filled with a very thick sequence of sediments ranging in age from Jurassic to Recent. This asymmetric geosyncline has a long stable eastern shelf supported by the subsurface continuation of the granitic Sierran slope and a short western flank expressed by the upturned edges of the basin sediments (Hackel 1966).

4.6.2.2 Regional Seismicity and Seismic Hazards

Seismic hazards include earthquake-related fault ground rupture and ground shaking (primary hazards) and liquefaction and earthquake-induced slope failure (secondary hazards); these are described below.

Regional Fault Systems

The only known fault inside Merced County is the Ortigalita fault (also known as the Telsa-Ortigalita fault), located in the western quarter of Merced County, dissecting the Coast Ranges in a northwesterly direction. This fault is Holocene in age (Jennings 1994) but has not experienced displacement in historic times; however, there is no assurance that it will never rupture or that there would be no displacement along the fault in the future (Merced County Planning Department 1989).

The closest fault or fault system to the study area is the northwest-trending Foothills fault system. The Foothills fault system terminates at its southern extent approximately 15 miles northeast of the Campus site (Kleinfelder 2001). The Foothills fault system is well defined and includes approximately 25 other mapped, but unnamed, smaller faults. According to the California Department of Conservation, Division of Mines and Geology (DMG, now called the California Geological Survey [CGS]), these faults are inactive. Based on mapping and historical seismicity, the seismic hazard of the Foothills fault system to the project site is generally considered low (California Department of Conservation, Division of Mines and Geology 1996).

The nearest active fault (besides the Ortigalita fault) is the San Andreas Fault, located approximately 15 miles west of the Merced County line (approximately 50 miles west of the project site). Also located outside Merced County are the Hayward and Calaveras faults (active faults) to the northwest; the White Wolf fault and the Garlock fault zone (both active) to the south of the county; and the Bear Mountain fault

zone (pre-Quaternary), located approximately 5 miles east of the County's eastern border. These faults would be the primary sources of seismic activity in Merced County (Merced County 2004).

Ground Shaking Hazard

The measurement of the energy released at the point of origin, or epicenter, of an earthquake is referred to as the magnitude, which is generally expressed in the Richter Magnitude Scale or as moment magnitude. The scale used in the Richter Magnitude Scale is logarithmic so that each successively higher Richter magnitude reflects an increase in the energy of an earthquake of about 31.5 times. Moment magnitude is the estimation of an earthquake magnitude by using seismic moment, which is a measure of an earthquake size utilizing rock rigidity, amount of slip, and area of rupture.

The greater the energy released from the fault rupture, the higher the magnitude of the earthquake. Earthquake energy is most intense at the fault epicenter; the farther an area from an earthquake epicenter, the less likely that ground shaking will occur there. Geologic and soil units comprising unconsolidated, clay-free sands and silts can reach unstable conditions during ground shaking, which can result in extensive damage to structures built on them (see "Liquefaction Hazard" below).

Ground shaking is described by two methods: ground acceleration as a fraction of the acceleration of gravity (g) or the modified Mercalli scale, which is a more descriptive method involving 12 levels of intensity denoted by Roman numerals. Modified Mercalli intensities range from I (shaking that is not felt) to XII (total damage).

Liquefaction Hazard and Ground Failure

Liquefaction is a phenomenon in which the strength and stiffness of unconsolidated sediments are reduced by earthquake shaking or other rapid loading. Poorly consolidated, water-saturated fine sands and silts having low plasticity and located within 50 feet of the ground surface are typically considered to be the most susceptible to liquefaction. Soils and sediments that are not water-saturated and that consist of coarser or finer materials are generally less susceptible to liquefaction. Geologic age also influences the potential for liquefaction. Sediments deposited within the past few thousand years are generally much more susceptible to liquefaction than older Holocene sediments; Pleistocene sediments are even more resistant; and pre-Pleistocene sediments are generally immune to liquefaction (California Department of Conservation, Division of Mines and Geology 1997).

No specific liquefaction hazard areas have been identified in Merced County; however, this potential exists throughout the San Joaquin Valley where unconsolidated sediments and a high water table coincide (Merced County Planning Department 1989).

Two potential ground failure types associated with liquefaction are lateral spreading and differential settlement (Association of Bay Area Governments 2001). Lateral spreading involves a layer of ground at the surface being carried on an underlying layer of liquefied material over a nearly level surface toward a river channel or other open face. Differential settlement occurs when the layers that liquefy are not of uniform thickness, a common problem when the liquefaction occurs in artificial fills. Settlement can range from 1 percent to 5 percent, depending on the cohesiveness of the sediments (Tokimatsu and Seed 1984).

4.6.2.3 Subsidence

Historically, land subsidence has been a significant problem in the southern half of the San Joaquin Valley and is a major concern south of the project site. Subsidence occurs in three ways: as a result of groundwater overdraft, compaction and oxidation of peat soils, and hydrocompaction. Land subsidence as a result of groundwater overdraft occurs when an aquifer collapses once the volume of water is depleted. Generally, loose, granular soils in areas where there is a deep groundwater table would be most susceptible ground subsidence. Land subsidence can also occur as a result of farming practices. Tillage of highly organic peat soil, combined with removal of flooding from islands and construction of drainage ditches, exposes the peat soils to oxygen. This creates a chemical reaction that causes the soil to oxidize and consolidate, lowering the land level. Hydrocompaction refers to the loss of water between peat particles as a result of compaction from farming practices. The loss of water helps to lower the surface.

4.6.2.4 Alternative 1, Proposed Action – Project Site Topography, Geology, Seismic Hazards, and Soils

This section presents the existing topography, geologic conditions, seismic hazards and soils present on the project site. The geology and soils of almost the entire project site are fully described in 2002 Long Range Development Plan (LRDP) EIR (UC Merced 2002) and the 2004 University Campus Plan (UCP) EIR (Merced County 2004). That information is summarized below, supplemented by information regarding the additional land that was previously not considered and is now part of Community North.

Campus and Community Topography

The UC Merced Campus, Community North, and Community South areas are located in a geomorphic region of California described by the Soil Conservation Service (now called the Natural Resources Conservation Service) as low to high terraces, with some areas in alluvial fans and floodplains (Arkley 1962). These areas are located in the eastern portion of Merced County on the western flank of the Sierra Nevada foothills, just northeast of the Merced city limits.

The elevation of the UC Merced Campus, Community North, and Community South areas ranges from approximately 245 feet in the northeast section near the Le Grand Canal to 186 feet at the southwest corner of the Community South area near the intersection of Lake Road and Yosemite Avenue, indicating an average slope from the northeast corner to the southwest corner of about 26 feet per mile (0.005 feet per foot); the UC Merced Campus and the northern portion of the Community North areas have slightly steeper gradients than the Community South area (Merced County 2004).

The land surrounding the UC Merced Campus, Community North, and Community South areas consists of gently rolling hills and flatland primarily used for agriculture. The area east and northeast of the UC Merced Campus, Community North, and Community South are characterized by undeveloped, gently rolling hills ranging in elevation from 300 to 750 feet above sea level; most of this area is used for grazing. The topographic gradient in this area greatly depends on the surrounding hills; however, the general gradient is towards the west and southwest, with occasional slopes towards the south and southeast (Merced County 2004).

The western and northern portion of the City of Merced (including the area associated with Alternatives 4 and 5) is flat and urbanized; elevations in this area range from 150 to 300 feet above sea level. Throughout the region, natural creeks, engineered canals, and roadways provide the only significant topographic fluctuations. The beds of the creeks and canals generally lie about 10 to 20 feet below ground surface, and the area roads are usually level or slightly raised above the natural topographic gradient. The often less than noticeable gradient throughout the flatland is primarily towards the west and southwest (Merced County 2004).

UC Merced Campus Geology

For the UC Merced Campus, the 2002 LRDP EIR identified geologic units in order of oldest to youngest, shown on **Figure 4.6-1, Geology of the Proposed Action Site,** and described in Table 4.6-1 of the 2002 LRDP EIR.[1] Geologic descriptions in the EIR were obtained from Marchand and Allwardt (1978), who identified several units of alluvial fan and terrace deposits based on aerial photograph review and correlation with mapped soils (Arkley 1962). Most of the UC Merced Campus is situated on middle and/or lower Pliocene nonmarine sedimentary rocks with some areas situated on Pliocene-Pleistocene nonmarine sedimentary rocks. In most parts of the Campus, the soil and surficial alluvial material forms a thin veneer of no more than a few feet over these bedrock units (Merced County 2004). The geologic formations present on the Campus site are described below.

1 The UCP EIR also describes the geology for a portion of the UC Merced Campus.

The Mehrten formation (designated as Tm on **Figure 4.6-1**) was derived from reworked andesitic volcanic mudflow deposits to the northeast. The Mehrten formation is Late Miocene to Early Pliocene in age and consists of fluvial sand, silt, and minor conglomerates. The Mehrten formation is rich in andesitic detritus and moderately indurated.

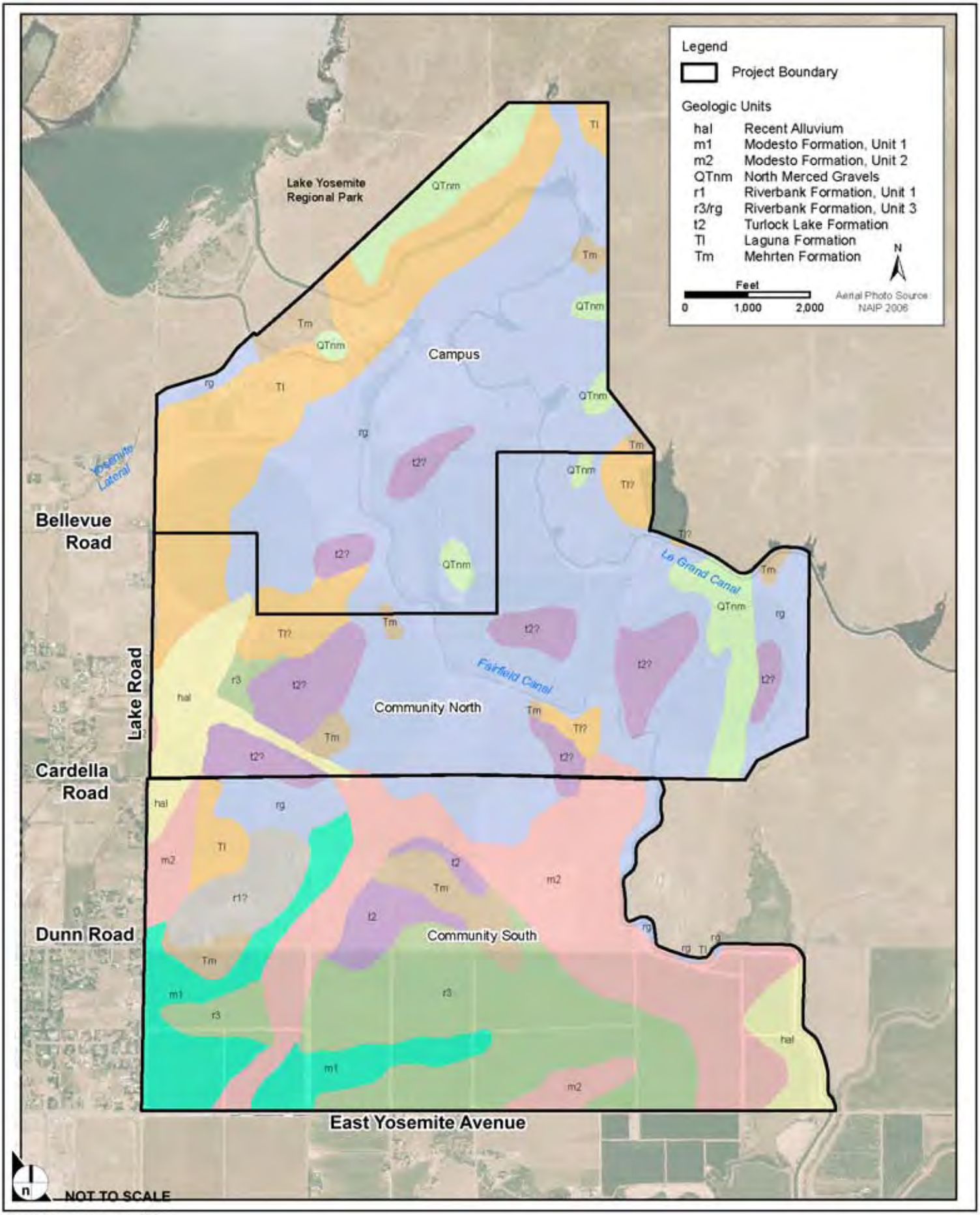
The Pliocene Laguna formation consists of a lower alluvial member (Tl) and an upper gravelly member, called the China Hat Gravel (Tlc). The lower member consists of arkosic (derived from granite) sand, silt, and gravel. It also includes reworked andesitic material from the Mehrten formation. The lower member of the Laguna formation is weakly to moderately indurated. The China Hat Gravel member of the Laguna formation consists of cobble gravel with an arkosic matrix and interbedded arkosic sand and silt.

The North Merced Gravel (QTnm) is Late Pliocene to Early Pleistocene in age. It consists of a veneer of lag gravel capping Tertiary and Pre-Tertiary rocks. The Turlock Lake formation (t2) is also Late Pliocene to Early Pleistocene in age. It consists of fluvial pebbly sand and gravel and interbedded silt and lacustrine clay. The Riverbank formation (rg) is Pleistocene in age. It consists of gravel deposits derived from older reworked formations. The Modesto formation (Qmh) is a younger Pleistocene unit consisting of sand silt and gravel derived from Riverbank and older formations.

Holocene alluvium (Hal) is the youngest geologic material at the UC Merced Campus. It consists of sand, silt, and gravel associated with floodplains, low terraces, and active stream channels.

University Community Geology

Community North is situated entirely on Pliocene-Pleistocene nonmarine sedimentary rocks. Community South is situated on Pliocene-Pleistocene nonmarine sedimentary rocks and recent alluvial fan deposits. For the Community North and Community South areas, the UCP EIR identified geologic units in order of youngest to oldest, shown on **Figure 4.6-1**, and include: the Holocene age recent alluvium (hal); Pleistocene age Modesto formation (m1 or m2); Riverbank formation (r1, r3, or rg); Turlock Lake formation (t2); Pliocene-Pleistocene age North Merced Gravel (QTnm); Pliocene age Laguna formation (Tl); and the Miocene-Pliocene age Mehrten formation (Tm).



SOURCE: Jones & Stokes - 2008

FIGURE **4.6-1**

Geology of the Proposed Action Site

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Recent alluvial and fluvial outwash deposits are mapped at the west-central edge of the Community North area, the most northwestern portion of the Community South area, and at the southeast corner of the Community South, reportedly consisting of sand, gravel, and silt deposits in foothill valley bottoms. The Modesto formation, Riverbank formation, Turlock Lake formation, and North Merced Gravel are alluvial and terrace deposits that cover a majority of both the Community North and Community South areas. They consist of reworked sand, gravel, and cobble parent sediments from uphill (northeast) of the Community North and Community South areas. The Laguna formation consists of small, localized areas of sand and gravel with sand and minor silt overlying sand and silt unit with minor gravel. Finally, the small areas of Mehrten formation soils are believed to be reworked volcanic mudflow deposits such that they contain stream deposited sand, silt, and minor gravel (Kleinfelder 2001).

Campus and Community Seismic Hazards

The project site is not within an Alquist-Priolo Earthquake Fault Zone and there are no active or early Quaternary faults within the boundaries of the project site. The project site is located within Uniform Building Code (UBC) Seismic Hazard Zone 3 and is located in a region of California characterized by locally low historical seismic activity. The UBC recognizes no active seismic sources in the project vicinity (International Conference of Building Officials 1997). Due to its distance from active faults, the risk of surface rupture within the project site is low. Geological studies conducted northeast of the UC Merced Campus, Community North, and Community South areas on a site previously considered for the University Community identified a number of photolineaments on the ground surface. Photolineaments are visible linear surface features that may be seismic in origin and can be surface indicators of subsurface faulting; the locations of these were based primarily on a review of aerial photographs. One of these lineaments is located along the northeast boundary of the 2,000-acre Campus site, and although the lineaments are parallel to the Foothills fault zone, none of the lineaments have been positively identified as a fault (URS 2002).

The project site is located in a region of California characterized by a low ground-shaking hazard. Based on a probabilistic seismic hazard map that depicts the peak horizontal ground acceleration values exceeded at a 10 percent probability in 50 years (Cao et al. 2003; California Geological Survey 2003), the probabilistic peak horizontal ground acceleration values for the project site range from 0.1 to 0.2g, where one g equals the force of gravity, thus indicating that the ground shaking hazard for the project site is low. To estimate the maximum shaking that might occur on the Campus site in a future earthquake, estimates of the ground motion parameter and median values of peak horizontal ground acceleration (PGA) were made using three empirical attenuation relationships and the maximum earthquakes listed in Table 4.6-2 of the 2002 LRDP EIR. The highest median peak value assuming rock site soil conditions is expected to occur from a maximum credible earthquake (MCE) of a magnitude 6.5 event on the Foothills

fault system at a distance of 30 km from the site (Table 4.6-2 of the 2002 LRDP EIR). This generates a PGA of 0.08g. This acceleration would be felt by most people, but would cause little or no damage.

Although portions of the project site have a shallow groundwater table, most of the project site has a clay hardpan and/or impermeable hardpan layer within three feet of the ground surface, thereby significantly reducing the potential of liquefaction (Merced County 2004). The low risk of liquefaction within the project site equates to a low risk of lateral spreading and differential settlement.

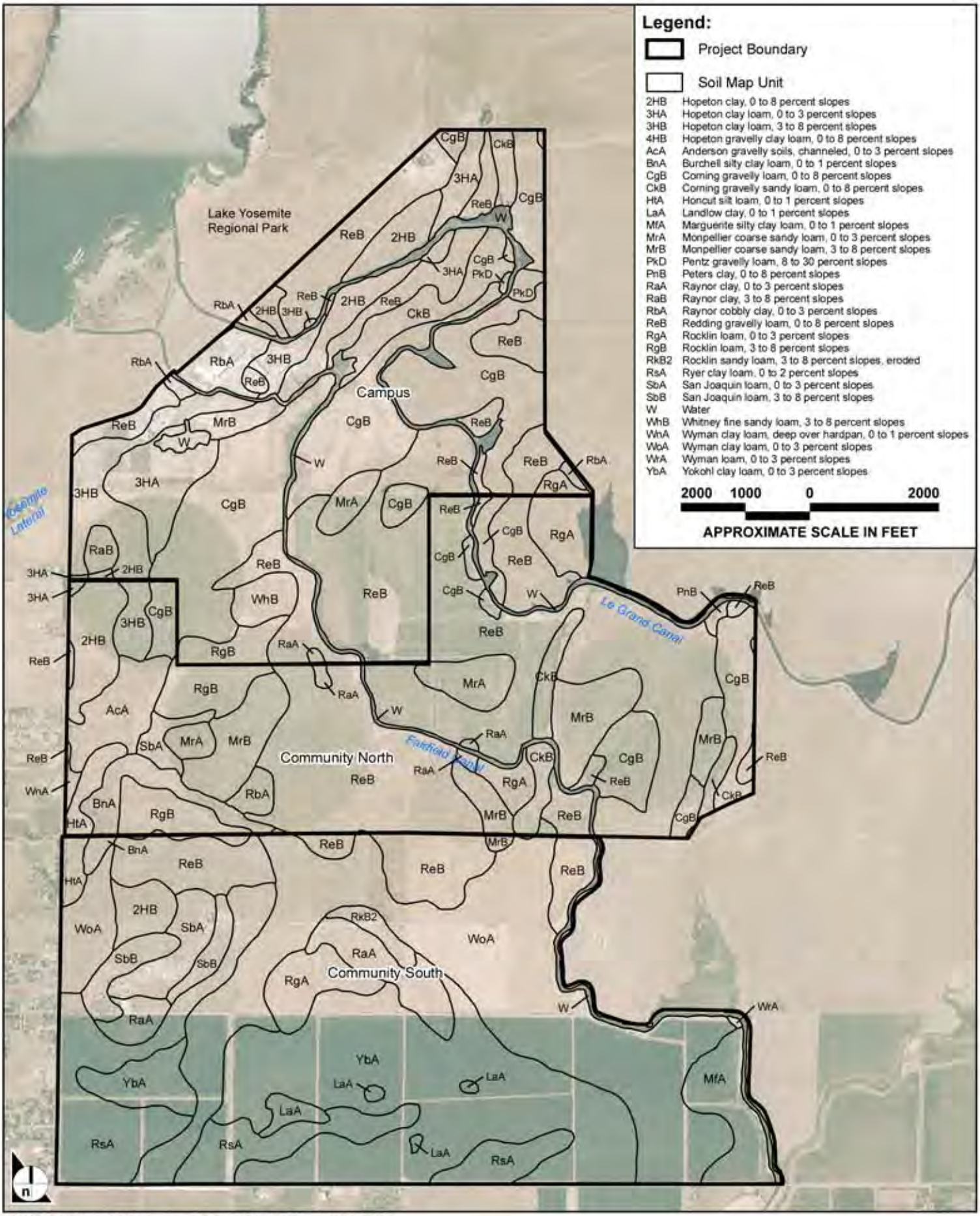
Within the project site, soils are generally not granular, but have high clay content with a clay hardpan underlain by bedrock within several feet of the ground surface. In addition, groundwater in the Merced area is generally shallow. For these reasons, the potential of ground subsidence on the project site is considered to be low (Merced County 2004).

The majority of the project site is occupied by gently rolling flatland that rarely reaches 10 percent slopes. Given the granular, clayey, and relatively consolidated and cemented nature of the soils, the near-surface hardpan, and the gentle slopes throughout the area, the project site is not prone to landslides (Merced County 2004). Stream banks and road cuts are the most likely places for landslides to occur.

UC Merced Campus Soils

For the UC Merced Campus, the 2002 LRDP EIR identified the documented soil series and soil map units. **Figure 4.6-2, Soils on the Proposed Action Site** shows the soil types that occur on the UC Merced Campus. In brief, soils in the UC Merced Campus area generally consist of poorly sorted gravel, sand, silt, and clay. The soils are generally gravelly, acidic, and have low fertility. Clay hardpan within 3 feet of the surface is common (UC Merced 2002).

Expansive soils contain clay that swells when it becomes saturated and shrinks when it is dry. The shrinking and swelling can have an adverse effect on foundations and structures. Soils with moderate expansion potential are fairly common throughout the Campus site (UC Merced 2002). Soft or compressible soils are those that settle when loaded or wet. Soft or compressible soils can cause differential settlement of foundations and structures. These types of soils are not common in the Campus site (UC Merced 2002). The three soil series that occur on the Campus site are described below.



SOURCE: ICF Jones & Stokes - August 2008; Aerial Photo Source: NAIP - 2006

FIGURE **4.6-2**

Soils on the Proposed Action Site

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Redding Soil Series

Redding soils are located on flat to gently sloping terrain. The Redding soil series typically has a surface layer of 14 to 20 inches thickness underlain by a 3- to 10-inch-thick clay zone and an 8- to 24-inch-thick iron-silica hardpan. Cobbles are often scattered throughout this soil series and may be concentrated in depressions between mounds and beneath the mounds but not in them. Due to the clay zone and hardpan, runoff from this soil is slow. The fertility of Redding soils is poor to fair. The Redding soils are strongly acidic, and they have been strongly weathered (UC Merced 2002). Redding soils are associated with Pentz and Peters soils. All three soil series form on andesitic tuff. Fertility of these soil types is fair to poor and the erosion hazard is slight. Peters soils are typically well drained with low permeability. Pentz soils have moderate permeability. Redding soils are present throughout the Campus site. Pentz and Peters soils have a more limited distribution and occur mainly in the central portion of the Campus site (UC Merced 2002).

Corning Soil Series

Corning soils have abundant cobbles and a 2- to 3-foot-thick claypan 12 to 18 inches below the surface. While the Redding soils have a claypan and also a cemented hardpan in their subsoil, the Corning soils have a claypan only. The soil surfaces typically have a "hogwallow" relief (Arkely 1962). These soils are deficient in nitrogen and phosphorus, are typically well drained, and have moderate permeability. The erosion hazard is slight. Corning soils occur throughout the Campus site, with the largest concentration in the eastern half of the Campus site.

Raynor Soil Series

Raynor soils[2] are clay-rich and derived from volcanic rock. Raynor soils are generally well drained, have a dark gray color, a blocky clay texture with large cracks and an accumulation of lime in the subsoil. The permeability in Raynor soils is low. Raynor soils are concentrated along the western side of the Campus.

University Community Soils

For the Community North and Community South areas, the UCP EIR identified the documented soil series and soil map units. In brief, surface soils within the Community North and Community South areas consist of poorly sorted gravel, sand, and silt, which also contain high levels of clay caused by fine-grained materials settling out as surface waters flowed over gently sloping land. Most areas have

2 Raynor is no longer classified as a soil series by NRCS. Raynor soils are closest to Peters Clay which is typically well-drained with low permeability. The Soil Survey of the Merced Area is currently being updated.

a clay hardpan and/or an impermeable hardpan within several feet of the surface. As shown in **Figure 4.6-2**, there are 26 different soils types mapped within the boundaries of the Community North and Community South areas. Of these 26 soil types, five soil series are predominant: Redding, Wyman, Yokohl, Corning, and Raynor. The characteristics of these soils are described in Table 4.6-1 of the UCP EIR. Specific soil types in the Community North and Community South areas are shown on **Figure 4.6-2**.

In the Community North and Community South areas, the Redding soils are characteristic of high alluvial terraces and are found primarily throughout the northern half of the Community North area. The Corning soils are intermixed with the Redding soils and are primarily found in the Community North area adjacent to the Le Grand Canal. Raynor soils are primarily clays of volcanic origin that occupy gentle slopes of the high terraces and the fringe of the foothills (Merced County 2004). The soil characteristics of the Redding, Corning, and Raynor soil series are described above. The two soil series not described above under the Campus site soils that occur on the Community North and Community South areas are described below.

Wyman Soil Series

The Wyman soils are very gently sloping to nearly level and are primarily found throughout the southern half of the Community North and Community South areas. The Wyman soils were formed in basic igneous alluvium that has not received fresh material for a considerable time. These soils have slightly more clay in the subsoil than in the surface layer and are well drained except where an unconforming hardpan blocks moisture penetration for part of the year. The hardpan is part of a Yokohl soil buried by the alluvial parent material of the Wyman soil (Merced County 2004).

Yokohl Soil Series

The Yokohl soils are generally intermixed with the Wyman soils and have been mainly derived from basic igneous rocks. The soils are well drained but have a claypan and a strongly cemented iron-silica hardpan subsoil that inhibits the penetration of water into the deeper layers. The Yokohl soils are more strongly developed than the associated Wyman soils. The surface layer of soil is very hard when dry, and very sticky and plastic when wet (Merced County 2004).

Soils with moderate to high expansion potential are located throughout the entire Community North and Community South areas. Soils having high silt and/or clay content that could be expansive could be found within the Tm, Tl, and Qt earth units (see **Figure 4.6-1, Geology of the Proposed Action Site**). Potentially compressible soils could be present overlying the Qt earth units in the Community North and Community South areas and also within the alleviated tributaries, Qal.

4.6.2.5 Alternative 2, Yosemite Avenue – Topography, Geology, Seismic Hazards, and Soils

Under Alternative 3, the Campus and Community North would be located on UCLC and Hunt Farm lands. The topography, geology, seismic hazards, and soils in these areas are described above under Alternative 2, Proposed Action. Under Alternative 3, Community South would be located south of Yosemite Avenue. The topography, geology and seismic hazards in this area south of Yosemite Avenue are similar to that of Community South identified under Alternative 2 and, in order of youngest to oldest, consists of: Holocene age recent alluvium (mh or hal); the Modesto formation (m); and the Riverbank formation (r). The soils in this area are also similar to those found in Community South, described above.

4.6.2.6 Alternative 3, Bellevue Ranch Alternative – Topography, Geology, Seismic Hazards, and Soils

Topography of the Bellevue Ranch area generally is flat. Elevations in this area range from 150 to 300 feet above sea level. Throughout the area, natural creeks, engineered canals, and roadways provide the only significant topographic fluctuations. The beds of the creeks and canals generally lie about 10 to 20 feet below ground surface, and the area roads are usually level or slightly raised above the natural topographic gradient. The often less than noticeable gradient throughout the flatland is primarily towards the west and southwest (Merced County 2004).

The geology of the Alternative 4 site (commonly identified as the Bellevue Ranch) consists of three geologic map units. Pleistocene nonmarine sedimentary rocks (including the Riverbank formation, discussed above) dominate a majority of this area. Recent basin deposits associated with Farhens Creek are located in the center of this area. A small area of Pliocene-Pleistocene nonmarine sedimentary rocks (including the Turlock Lake formation and the North Merced Gravel, discussed above) exists in the southwestern portion of this alternative site.

Soils at the Bellevue Ranch are similar to those described above for Alternative 1, Proposed Action, and consist of Redding, Pentz, and Peters soils. In addition, the Lewis-Landlow-Burchell soil association covers the western portion of the Bellevue Ranch site. These soil series are described below.

Lewis Soil Series

Lewis soils are hardpan soils that developed from mixed alluvium washed from sedimentary, basic igneous and granitic rocks. They are nearly level but have a low mound micro-relief. They have slow drainage, both internally and externally, and have a high water table. These soils are highly weathered and have a distinct soil profile. The Lewis soils have a lime-silica cemented hardpan at a depth of about

30 to 40 inches, and they contain slight, moderate, or strong concentrations of salts and alkali. The thickness of the hardpan is generally about 4 inches, although it ranges from 1 to 12 inches. Below the hardpan the texture ranges from clay loam to sandy loam (Arkley 1962).

Landlow Soil Series

Landlow soils formed from moderately fine textured alluvium of mixed origin but mainly from basic igneous rocks. They are nearly level and drainage in these soils is imperfect. The water table normally is within 4 feet of the surface. These soils are only slightly weathered. Only a light amount of clay has accumulated in the subsoil, and the lower subsoil is weakly cemented with lime. The associated Burchell soils (discussed below) have less clay in their subsoil and lack the weakly lime-cemented lower subsoil. The profile generally consists of silty clay loam or clay surface soil with a blocky structure (Arkley 1962).

Burchell Soil Series

The parent material of Burchell soils is alluvium derived from mostly basic igneous rocks but partly from slate and sandstone. These soils are kept moist by their imperfect drainage and by their high water table. Their texture ranges through silt loam, silty clay, and clay. The subsoil contains slightly more clay than the surface soil. These soils are generally very deep, but in some places weakly cemented sediments lie at a depth of 4 to 6 feet. These soils are mildly alkaline to moderately alkaline. Distinct accumulations of lime are present in the subsoil (Arkley 1962).

4.6.2.7 Alternative 4, 2002 Proposed Project Alternative – Topography, Geology, Seismic Hazards, and Soils

The topography, geology, seismic hazards, and soils on the Alternative 5 site (identified as the 2002 Proposed Project) are similar to that under Alternative 1, Proposed Action. Soils consist of Redding, Pentz, and Peters soils.

4.6.3 APPLICABLE LAWS, REGULATIONS, AND POLICIES

Laws and regulations related to geology, soils, and seismicity in Merced County are included in federal and state regulations, county ordinances, and plans adopted to protect public safety and to conserve open space. The following is a brief summary of the regulatory context under which soils and geologic hazards are managed. Agencies with responsibility for protecting people and property in the study area from damage associated with soil conditions and geologic hazards are described below.

4.6.3.1 Federal Laws and Regulations

Clean Water Act Section 402/National Pollutant Discharge Elimination System

The Clean Water Act (CWA) is discussed in detail in **Section 4.8, Hydrology and Water Quality**. However, because CWA Section 402 is directly relevant to excavation, information is also summarized below. Amendments in 1987 to the CWA added Section 402p, which establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) program. The US Environmental Protection Agency (US EPA) has delegated to the State Water Resources Control Board (SWRCB) the authority for the NPDES program in California, which is implemented by the state's nine regional water quality control boards. Under the NPDES Phase II Rule, construction activity disturbing 1 acre or more must obtain coverage under the state's General Construction Permit. General Construction Permit applicants are required to prepare a Notice of Intent and a Storm Water Pollution Prevention Plan (SWPPP) and implement and maintain best management practices (BMPs) to avoid adverse effects on receiving water quality as a result of construction activities, including earthwork. UC Merced has filed for coverage under the Phase II requirements; approval is pending per regional board review.

4.6.3.2 State Laws and Regulations

Alquist-Priolo Earthquake Fault Zoning Act

California's Alquist-Priolo Act (PRC 2621 et seq.), originally enacted in 1972 as the Alquist-Priolo Special Studies Zones Act and renamed in 1994, is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults (Earthquake Fault Zones). It also defines criteria for identifying active faults, giving legal weight to terms such as "active," and establishes a process for reviewing building proposals in and adjacent to Earthquake Fault Zones.

Under the Alquist-Priolo Act, fault zones are defined, and construction along or across them is strictly regulated if they are "sufficiently active" and "well-defined." A fault is considered sufficiently active if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for the purposes of the act as within the last 11,000 years). A fault is considered well-defined if its trace can be clearly identified by a trained geologist at the ground surface or in the shallow subsurface, using standard professional techniques, criteria, and judgment (Hart and Bryant 1997).

Seismic Hazards Mapping Act

Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (PRC 2690–2699.6) is intended to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong ground shaking, liquefaction, and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act: The state is charged with identifying and mapping areas at risk of strong ground shaking, liquefaction, landslides, and other corollary hazards, and cities and counties are required to regulate development within mapped Seismic Hazard Zones.

Under the Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Specifically, cities and counties are prohibited from issuing development permits for sites in Seismic Hazard Zones until appropriate site-specific geologic or geotechnical investigations have been carried out, and measures to reduce potential damage have been incorporated into the development plans.

California Building Standards Code

The State of California's minimum standards for structural design and construction are given in the California Building Standards Code (CBSC) (CCR Title 24). The CBSC is based on the UBC (International Code Council 1997), which is used widely throughout United States (generally adopted on a state-by-state or district-by-district basis) and has been modified for California conditions with numerous, more detailed or more stringent regulations. The CBSC requires that "classification of the soil at each building site will be determined when required by the building official" and that "the classification will be based on observation and any necessary test of the materials disclosed by borings or excavations." In addition, the CBSC states that "the soil classification and design-bearing capacity will be shown on the [building] plans, unless the foundation conforms to specified requirements." The CBSC provides standards for various aspects of construction, including but not limited to, excavation, grading, and earthwork construction; fills and embankments; expansive soils; foundation investigations; and liquefaction potential and soil strength loss. In accordance with California law, certain aspects of the project would be required to comply with all provisions of the CBSC.

4.6.3.3 Local Laws, Regulations, Plans and Policies

The Proposed Action consists of the development of the Campus and the University Community. Lands on which the Campus would be built will be acquired by The Regents of the University of California. As such, UC Merced is generally exempted by the state constitution from compliance with local laws and regulations. The University Community lands on the other hand are privately owned and generally are

subject to local laws, regulations, and policies. This section summarizes relevant policies contained in the UC Merced 2002 LRDP, UCP, the Merced County General Plan, and City and County regulations related to geology and soils.

Geotechnical Investigations

Local jurisdictions typically regulate construction activities through a multistage permitting process that may require the preparation of a site-specific geotechnical investigation. The purpose of a site-specific geotechnical investigation is to provide a geologic basis for the development of appropriate construction design. Geotechnical investigations typically assess bedrock and Quaternary geology, geologic structure, soils, and the previous history of excavation and fill placement. The UCP requires that a site-specific soil and geotechnical investigation be performed prior to development for individual construction projects to determine the classification and engineering capabilities and constraints of the soil at each building site. It also requires development applications to include a report detailing the types of soil and locations, erosion potential or soil engineering constraints/opportunities, and erosion control options. Mitigation plans must address methods to be used during all phases of site development, implementation, and operation.

Local Grading and Erosion Control Ordinances

Many counties have grading and erosion control ordinances. These ordinances are intended to control erosion and sedimentation caused by construction activities. A grading permit is typically required for construction-related projects. As part of the permit, the project applicants usually must submit a grading and erosion control plan, vicinity and site maps, and other supplemental information. Standard conditions in the grading permit include a description of BMPs similar to those contained in a SWPPP. Merced County currently does not have a grading ordinance but it is expected that they will develop a grading ordinance during their upcoming general plan update.

Merced County General Plan

The Merced County General Plan contains the following goals, objectives, and policies that would apply to the proposed University Community in the event it is not annexed to the City.

Safety Element

Goal 1: Merced County residents protected from known seismic and geologic hazards.

Objective 1.A: New structures are protected from seismic and geologic hazards.

Policy 2. Special precautions to ensure earthquake resistant design should be considered for proposed critical structures, such as hospitals, fire stations, emergency communication centers, private schools, high occupancy buildings, bridges and freeway overpasses, and dams.

Policy 3. Encourage educational programs to inform the public of earthquake dangers in Merced County.

Goal 3: Merced County residents free from personal injury and property damage resulting from unstable soils.

Objective 3.A: Structures within areas of known or suspected unstable soils are appropriately located, designed, and constructed.

Policy 2. Chapter 70, Volume I of the Uniform Building Code, 1970 Edition, known as the "Model Grading Code," shall be used as a guide for projects subject to hazards from slope instability.

Policy 3. All proposed structures, utilities, or public facilities within recognized near-surface subsidence or liquefaction areas should be located and constructed in a manner to minimize or eliminate damage.

Open Space/Conservation Element

Goal 2: Soil, water, air, mineral, energy, and historical resources are properly managed.

Objective 2.A: Soil resources are protected from erosion, contamination, and other affects that substantially reduce their value.

Policy 1. The removal of vegetative resources which stabilize slopes, reduce surface water runoff, erosion and sedimentation should be minimized.

Merced County Building Codes and Regulations

Merced County Building Ordinance No. 1539 incorporates the following uniform codes into its building requirements to ensure that buildings are designed and sited properly to protect against seismic and

unstable soils conditions: Uniform Building Code, Uniform Housing Code, Uniform Building Code for Abatement of Dangerous Buildings, Uniform Mechanical Code, Uniform Plumbing Code, and National Electric Code. In addition to the above mentioned uniform codes, Merced County (unincorporated) complies with applicable federal requirements and the following State regulations which regulate building construction and site safety: Title 1 (Government Code); Title 8 (Cal/OSHA Safety Code); Title 17 (Structural Code); Title 19 (Health and Safety Code); Title 24 (State Building Codes); and Title 25 (State Housing and Community Development Code).

Merced County's "Guide to Building Permits & Inspections in Merced County" (Merced County Department of Public Works 2008) describes the necessary building permits and inspections required for typical construction activities within the county.

University of California Seismic Policy

The UC Seismic Policy requires new UC facilities to comply with the current seismic provisions of the California Code of Regulations (CCR), Title 24, California Building Standards Code, or local seismic requirements, whichever requirements are more stringent.

UC Merced 2009 LRDP

The UC Merced 2009 LRDP does not contain any specific policies that address hazards associated with site geologic, seismic, and soil conditions.

University Community Plan

Geotechnical conditions throughout the UCP area, such as areas prone to unstable soils, are not consistent. As the UCP area continues to develop, geologic and soil conditions can change significantly due to an alteration of topography, an increase of impervious surfaces creating new drainage paths, increased groundwater withdrawal or reduced recharge, unknown seismic faults, and the simple presence of additional people and structures.

The adopted UCP contains the following policies to protect against geologic and unstable soils hazards:

Policy S 1.1: Require that a site-specific soil and geotechnical investigation be performed prior to development for individual construction projects to determine the classification and engineering capabilities and constraints of the soil at each building site. The standards used during the site investigation shall be, at minimum, the California Building Standards Code, and any other applicable professional standards and Uniform Codes.

Policy S 1.2: Require development applications to include a report detailing the types of soil and locations, erosion potential or soil engineering constraints/opportunities, and erosion control options. Mitigation plans must address methods to be used during all phases of site development, implementation, and operation.

Policy S 1.3: Make site-specific soil and geotechnical information available to the public, developers, and consultants.

To reduce the effects of erosion caused by stormwater discharge, the UCP includes the following policies into its water infrastructure section:

Policy IW 8.9: Require the application of Best Management Practices (BMPs) for storm water quality.

Policy IW 13.6: Require compliance with the National Pollution Discharge Elimination System Phase 2 program and monitoring of storm water.

4.6.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

CEQ guidance for evaluating the types and significance of impacts under NEPA is summarized in **Section 4.0, Affected Environment and Environmental Consequences.** For purposes of this analysis, this EIS/EIR conservatively uses significance criteria derived from Appendix G of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* and the CEQ guidelines regarding the determination of environmental consequences to identify impacts. In accordance with NEPA, the EIS also must evaluate potential effects on the human environment which includes an analysis of the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14). For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. For the purpose of this EIS/EIR, impacts related to geology and soils would be significant if implementation of the Proposed Action or its alternatives would

- expose people or structures to increased risk from rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
- expose people or structures to increased risk related to strong seismic ground shaking;
- expose people or structures to increased risk related to seismically induced ground failure, including liquefaction;
- expose people or structures to increased risk of landslides or other slope failure;

- result in substantial soil erosion or the loss of topsoil;
- be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse; or
- be located on expansive soil, as defined in Table 18-1-B of the UBC (International Conference of Building Officials 1997b), creating substantial risks to life or property; or
- have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

4.6.5 METHODOLOGY FOR EVALUATING EFFECTS

Evaluation of the impacts in this section is based on the results of reports and technical maps prepared for the project and on professional judgment. Much of the information in **Section 4.0, Affected Environment and Environmental Consequences**, is derived from the 2002 LRDP EIR (UC Merced 2002) and the UCP EIR (Merced County 2004). The information presented in both EIRs was reviewed for accuracy and incorporated accordingly into this section.

In the 2002 LRDP EIR, information about soil characteristics was derived from the Soil Conservation Service's Soil Survey of Merced County (Arkley 1962) and from the NRCS Web Soil Survey (Natural Resources Conservation Service 2008). Regional geology and locations of seismic sources were taken from the California Department of Conservation, Division of Mines and Geology (Bortugno et al. 1991; Jennings 1994). More site-specific geologic information was taken from the U.S. Geological Survey (Marchand and Allwardt 1978). Peak ground accelerations were calculated from empirical relationships between source distance, maximum earthquakes, and attenuation models (URS 2002). A site-specific geotechnical study was prepared for the Phase 1.1 Campus, which is described in Volume 2 of the 2002 LRDP EIR.

In the UCP EIR, the analysis of potential geologic, soils, and seismic impacts was based on site-specific geotechnical reports and other available technical reports, as well as published information describing the area and the region's geologic characteristics. The site-specific information sources cited in the UCP EIR included the following: Kleinfelder's *Engineering Geology and Preliminary Geotechnical University Planning Study, University Community Planning Area, Merced, California* (2001); and by Environmental Planning & Design's *Infiltration Testing and Related Tasks* (2001). The information obtained from these sources was reviewed and summarized by EIP Associates to establish existing conditions and to identify potential environmental effects, based on the standards of significance presented in the EIR.

This impact analysis assumes that the project applicants will conform to the latest NPDES requirements, UBC and CBSC standards, county grading ordinances, county building codes and regulations, county general plan safety and open space/conservation standards, and LRDP and UCP policies, as they are applicable.

4.6.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.6.6.1 Alternative 1 – Proposed Action

Alt 1 – Impact GEO-1: The Proposed Action would not expose people or structures to increased risk from fault rupture. (*Less than Significant*)

The site is not subject to significant seismic hazards associated with active faults. No active faults have been identified in the immediate vicinity of the project and the nearest active fault in Merced County is the Ortigalita fault, located in the western quarter of Merced County. The closest seismic source in the vicinity of the Campus and the University Community is the northwest-trending Foothills fault system. The Foothills fault system terminates at its southern extent approximately 15 miles northeast of the project site. According to DMG, the faults associated with the Foothills fault system are inactive.

Campus

For reasons presented above, construction of the proposed campus facilities would not expose people or structures to risk of injury or structural damage from fault rupture. Furthermore, new facilities and structures would be constructed using the current CBSC standards and UC Seismic Policy, which establish requirements for the seismic and structural safety of all structures. This impact is considered less than significant.

University Community

Similarly, for reasons presented above, construction of the facilities and structures in the University Community would not expose people or structures to risk of injury or structural damage from fault rupture. In addition, new facilities and structures within the University Community would be constructed using the current CBSC standards and Merced County and/or the City of Merced Building Codes and Regulations, which establish requirements for the seismic and structural safety of all structures. This impact is considered less than significant.

Conclusion

The combined effect of the development of the Campus and the University Community would also be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact GEO-2: The Proposed Action could expose people or structures to increased risk of structural damage and injury from ground shaking and related hazards. (*Potentially Significant; Less than Significant)*

A large earthquake on a nearby fault could cause ground shaking, potentially resulting in liquefaction and associated ground failure, such as lateral spreading or differential settlement, which in turn could increase the risk of structural loss, injury, or death. However, as discussed earlier in this section, the project site is located in a region of California that is characterized by low seismic activity and the ground-shaking hazard in the project area is low.

Although no specific liquefaction hazard areas have been identified in Merced County, this potential exists throughout the San Joaquin Valley where unconsolidated sediments and a high water table coincide (Merced County Planning Department 1989). While some portions of the project site have a shallow groundwater table, most of the project site has a clay hardpan and/or impermeable hardpan layer within 3 feet of the ground surface, which significantly reduces the potential of liquefaction (Merced County 2004).

Campus

For the reasons presented above, construction of the proposed campus facilities is generally not expected to expose people or structures to risk of injury or structural damage from ground shaking and related hazards such as liquefaction. However, sites could be present within the Campus that have some potential for liquefaction, slope stability issues, or other structural issues that could be aggravated during seismic events. Construction on such sites could expose structures or people to risk of damage or injury. This impact is considered potentially significant.

Another potential concern is the possible adverse effects of seismic shaking on the physical characteristics of Le Grand and Fairfield Canals that traverse the campus site. Because the canals are unlined, seismic shaking could potentially cause levee failure or other adverse effects, allowing water to leak out of the canals and seep into adjacent buildings (UC Merced 2002). However, this is unlikely to occur, because abrupt levee failure associated with seismic shaking occurs mainly when the soil surrounding the canals

is sandy, whereas the soils surrounding the Fairfield and Le Grand Canals are clay-like with some silt (UC Merced 2002). Additionally, the site is expected to be graded such that buildings will be higher than the canals and seepage would be controlled by installing subsurface drains on the outer side of the canal levees (UC Merced 2002). The impact is considered less than significant.

University Community

New facilities and structures would be constructed in the University Community according to the current CBSC standards and Merced County and/or the City of Merced Building Codes and Regulations, which establish requirements for the seismic and structural safety of all structures. In addition, compliance with UCP Policies S 1.1 and 1.2 requires that a site-specific geotechnical investigation be performed prior to each site development. Geotechnical investigations would ensure that subsurface soil characteristics were properly identified to safely design foundations and structures to reduce the potential impacts associated with seismic ground shaking and related hazards. This impact is considered less than significant.

Conclusion

The effect from the development of the Campus related to risk of injury or structural damage from ground shaking and related hazards would be potentially significant.

MM GEO-2: During project-specific building design, a site-specific geotechnical investigation shall be performed by a Certified Engineering Geologist or Licensed Geotechnical Engineer to assess detailed seismic, geologic, and soil conditions at each construction site. The study shall include an evaluation of liquefaction potential, slope stability, landslide potential, expansive and compressible soils, and other structural characteristics and shall identify specific geotechnical recommendations designed to mitigate for the site hazards. The geotechnical recommendations will be followed. (*Applicability – Campus only*)

Significance after Mitigation: Less than significant level.

Alt 1 – Impact GEO-3: The Proposed Action would not expose people or structures to increased risk of structural damage and injury from slope failure. (*Less than Significant*)

The majority of the project site is occupied by gently rolling flatland that rarely reaches 10 percent slopes. Given the granular, clayey, and relatively consolidated and cemented nature of the soils, the near-surface hardpan, and the gentle slopes throughout the area, the project site is not prone to landslides (Merced County 2004). Stream banks and road cuts are the most likely places for landslides to occur; however,

proper grading and protection from toe erosion—implemented in conjunction with the construction of projects—would reduce the likelihood of those small landslides.

Campus

For reasons presented above, construction of the proposed campus facilities would not expose people or structures to risk of injury or structural damage from slope failure. Furthermore, the Campus will implement **Mitigation Measure GEO-2** which requires a site-specific geotechnical investigation and implementation of the recommendation in that study. In addition, new facilities and structures would be constructed using the current CBSC standards, which establish requirements for the structural safety of all structures. This impact is considered less than significant.

University Community

New facilities and structures would be constructed in the University Community according to the current CBSC standards and Merced County Building Codes and Regulations, which establish requirements for the structural safety of all structures. In addition, compliance with UCP Policies S 1.1 and 1.2 requires that a site-specific geotechnical investigation be performed prior to each site development. Geotechnical investigations would ensure that subsurface soil characteristics were properly identified to safely design foundations and structures to reduce the potential impacts associated with slope failure. This impact is considered less than significant.

Conclusion

The effect from the development of the Campus and the University Community related to slope failure would be less than significant.

Mitigation Measure: No mitigation measure is required.

Alt 1 – Impact GEO-4: The Proposed Action would not result in substantial soil erosion or the loss of topsoil from grading activities. (*Less than Significant*)

Grading, excavation, removal of vegetation cover, and loading activities associated with construction activities could temporarily increase erosion and sedimentation. Construction activities could also result in soil compaction and wind erosion effects that could adversely affect soils and reduce the revegetation potential at the construction sites and staging areas. However, according to federal law, all construction projects that involve disturbance of more than 1 acre of land are subject to NPDES regulations for stormwater. All such projects are required by law to prepare and implement a SWPPP during construction. The SWPPP must be kept on site during construction activity and made available upon

request to representatives of the RWQCB. The objectives of the SWPPP are to (1) identify pollutant sources that may affect the quality of stormwater associated with construction activity and (2) identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. The SWPPP is required to include a description of potential pollutants and the manner in which sediments and hazardous materials present on site during construction (including vehicle and equipment fuels) would be managed. The SWPPP must also include details of how the sediment and erosion control BMPs would be implemented.

Campus

All construction projects undertaken so far on the Phase 1.1 Campus have complied with the NPDES requirements and have implemented SWPPPs to control construction site runoff. All future construction projects on the campus that would disturb 1 acre or more would also comply with the NPDES requirements to control discharges from construction sites and would implement SWPPPs. Compliance with NPDES regulation for control of pollutant discharge during construction would reduce the potential for significant soil erosion or sedimentation due to construction on the campus. The impact would be less than significant. For control of erosion from operation of campus facilities, please see **Section 4.8, Hydrology and Water Quality.**

University Community

In addition to NPDES regulations for construction-phase storm water controls, Merced County Building Ordinance No. 1539 incorporates into its site development standards the provisions of the UBC and the CBC. The UBC and CBC require, among other permits, a grading permit prior to construction. As specified in Section 3306 of the UBC, "no person shall do any grading without first having obtained a grading permit from the building official." In addition, UCP Geology Policy S 1.4 would supplement the existing building codes and ordinances by creating a common grading plan to be used during construction. The impact related to erosion and sedimentation from grading activities would be less than significant.

Conclusion

Because construction activities throughout the project site would be regulated by federal and local erosion control regulations, this impact is considered less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact GEO-5: The Proposed Action would not create substantial risks to life or property from development on expansive soils. (*Less than Significant)*

The soils present on the project site have a moderate to high shrink-swell potential (i.e., soil expansiveness). This shrinking (when dry) and swelling (when wet) of these soils can result in differential ground movement. If structures are constructed in areas with expansive and/or weak soils, structural damage could occur. Expansive soils could cause a risk for post-construction heave and cracking of concrete slabs, as well as lightly loaded foundations and pavements.

Campus

Soils on the campus site have a moderate shrink-swell potential and could, on a site-specific basis, have the potential to create risk for life or property. However, the Campus will implement **Mitigation Measure GEO-2** which requires that all construction sites be evaluated for potential geologic hazards, including presence of expansive soils. In addition, new facilities and structures would be constructed using the current CBSC standards, which establish requirements for the structural safety of all structures. This impact is considered less than significant.

University Community

New facilities and structures within the University Community would be constructed using the current CBSC standards and Merced County and/or the City of Merced Building Codes and Regulations, which establish requirements for the structural safety of all structures. In addition, compliance with UCP Policies S 1.1 and 1.2 requires that a site-specific geotechnical investigation be performed prior to each site development. Geotechnical investigations would ensure that subsurface soil characteristics were properly identified to safely design foundations and structures to reduce the potential impacts associated with expansive soils. This impact is considered less than significant.

Conclusion

The effect of the development of the Campus and the University Community under the Proposed Action would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact GEO-6: The Proposed Action would not involve construction on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems. (*No Impact*)

Campus and Community

Under one scenario, both the Campus and University Community would be connected to the City's wastewater collection and treatment system. In the event that they are not served by the City's wastewater treatment plant (WWTP), they would be served by an on-site WWTP. The WWTP would not involve the use of septic tanks or alternative wastewater disposal systems. There would, therefore, be no impact related to septic tanks or alternative wastewater disposal systems.

Mitigation Measure: No mitigation is required.

4.6.6.2 Alternative 2 – Yosemite Avenue

The area to the south of Yosemite Avenue that would be developed under this alternative has similar geologic, seismic, and soil conditions as Community South under the Proposed Action. For these reasons, the impacts under this alternative would be identical to those under Alternative 1, Proposed Action and this alternative would result in impacts related to geology, seismicity, and soils that are either less than significant or less than significant with mitigation.

Exposure to Increased Risk of Fault Rupture

The site is not subject to significant seismic hazards associated with active faults. No active faults have been identified in the immediate vicinity of the Alternative 2 site and the nearest active fault in Merced County is the Ortigalita fault, located in the western quarter of Merced County. The closest seismic source in the vicinity of the Alternative 2 site is the northwest-trending Foothills fault system. The Foothills fault system terminates at its southern extent approximately 15 miles northeast of the project site. According to DMG, the faults associated with the Foothills fault system are inactive. This impact is considered less than significant.

Exposure to Increased Risk of Structural Damage from Ground Shaking

A large earthquake on a nearby fault could cause ground shaking, potentially resulting in liquefaction and associated ground failure, such as lateral spreading or differential settlement, which in turn could increase the risk of structural loss, injury, or death. However, as discussed earlier in this section, the Alternative 2 site is located in a region of California that is characterized by low seismic activity and the ground-shaking hazard in the project area is low.

Although no specific liquefaction hazard areas have been identified in Merced County, this potential exists throughout the San Joaquin Valley where unconsolidated sediments and a high water table coincide (Merced County Planning Department 1989).

The combined effect from the development of the Campus and the University Community on the Alternative 2 site related to risk of injury or structural damage from ground shaking and related hazards would be potentially significant. However, implementation of **Mitigation Measure GEO-2** would reduce the impact to a less than significant level.

Exposure to Increased Risk of Structural Damage from Slope Failure

The majority of the Alternative 2 site is occupied by gently rolling flatland that rarely reaches 10 percent slopes. Given the granular, clayey, and relatively consolidated and cemented nature of the soils, the near-surface hardpan, and the gentle slopes throughout the area, the project site is not prone to landslides (Merced County 2004). Stream banks and road cuts are the most likely places for landslides to occur; however, proper grading and protection from toe erosion—implemented in conjunction with the construction of projects—would reduce the likelihood of those small landslides. The combined effect from the development of the Campus and the University Community on the Alternative 2 site related to slope failure would be less than significant.

Soil Erosion

Grading, excavation, removal of vegetation cover, and loading activities associated with construction activities could temporarily increase erosion and sedimentation. Construction activities could also result in soil compaction and wind erosion effects that could adversely affect soils and reduce the revegetation potential at the construction sites and staging areas. However, according to federal law, all construction projects that involve disturbance of more than 1 acre of land are subject to NPDES regulations for stormwater. All such projects are required by law to prepare and implement a SWPPP during construction. The SWPPP must be kept on site during construction activity and made available upon request to representatives of the RWQCB. The objectives of the SWPPP are to (1) identify pollutant sources that may affect the quality of stormwater associated with construction activity and (2) identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. The SWPPP is required to include a description of potential pollutants and the manner in which sediments and hazardous materials present on site during construction (including vehicle and equipment fuels) would be managed. The SWPPP must also include details of how the sediment and erosion control BMPs would be implemented.

Because construction activities throughout the Alternative 2 site would be regulated by federal and local erosion control regulations, this impact is considered less than significant.

Risks from Development on Expansive Soils

The soils present on the Alternative 2 site have a moderate to high shrink-swell potential (i.e., soil expansiveness). This shrinking (when dry) and swelling (when wet) of these soils can result in differential ground movement. If structures are constructed in areas with expansive and/or weak soils, structural damage could occur. Expansive soils could cause a risk for post-construction heave and cracking of concrete slabs, as well as lightly loaded foundations and pavements. New facilities and structures would be constructed using the current CBSC standards and Merced County and/or the City of Merced Building Codes and Regulations, which establish requirements for the structural safety of all structures. Geotechnical investigations would ensure that subsurface soil characteristics were properly identified to safely design foundations and structures to reduce the potential impacts associated with expansive soils. This impact is considered less than significant.

Construction on Soils Incapable of Supporting Septic Tanks

The Yosemite Avenue Alternative does not include the use of septic tanks or alternative wastewater disposal systems. Both the Campus and University Community would be connected to the regional wastewater collection and treatment system. In the event that there is on-site treatment of wastewater, it would not involve septic tanks. There would, therefore, be no impact related to septic tanks or alternative wastewater disposal systems.

4.6.6.3 Alternative 3 – Bellevue Ranch

The Bellevue Ranch area has similar geologic, seismic, and soil conditions as the Proposed Action. For these reasons, the impacts under this alternative would be similar to those under Alternative 1, Proposed Action and this alternative would result in impacts related to geology, seismicity, and soils that are either less than significant or less than significant with mitigation.

Exposure to Increased Risk of Fault Rupture

The site is not subject to significant seismic hazards associated with active faults. No active faults have been identified in the immediate vicinity of the project and the nearest active fault in Merced County is the Ortigalita fault, located in the western quarter of Merced County. The closest seismic source in the vicinity of the Alternative 3 site is the northwest-trending Foothills fault system. The Foothills fault system terminates at its southern extent approximately 15 miles northeast of the project site. According to

DMG, the faults associated with the Foothills fault system are inactive. This impact is considered less than significant.

Exposure to Increased Risk of Structural Damage from Ground Shaking

A large earthquake on a nearby fault could cause ground shaking, potentially resulting in liquefaction and associated ground failure, such as lateral spreading or differential settlement, which in turn could increase the risk of structural loss, injury, or death. However, as discussed earlier in this section, the Alternative 3 site is located in a region of California that is characterized by low seismic activity and the ground-shaking hazard in the project area is low.

Although no specific liquefaction hazard areas have been identified in Merced County, this potential exists throughout the San Joaquin Valley where unconsolidated sediments and a high water table coincide (Merced County Planning Department 1989).

The combined effect from the development of the Campus and the University Community on the Alternative 3 site related to risk of injury or structural damage from ground shaking and related hazards would be potentially significant. However, implementation of **Mitigation Measure GEO-2** would reduce the impact to a less than significant level.

Exposure to Increased Risk of Structural Damage from Slope Failure

The majority of the Alternative 3 site is occupied by gently rolling flatland that rarely reaches 10 percent slopes. Given the granular, clayey, and relatively consolidated and cemented nature of the soils, the near-surface hardpan, and the gentle slopes throughout the area, the project site is not prone to landslides (Merced County 2004). Stream banks and road cuts are the most likely places for landslides to occur; however, proper grading and protection from toe erosion—implemented in conjunction with the construction of projects—would reduce the likelihood of those small landslides. The combined effect from the development of the Campus and the University Community on the Alternative 3 site related to slope failure would be less than significant.

Soil Erosion

Grading, excavation, removal of vegetation cover, and loading activities associated with construction activities could temporarily increase erosion and sedimentation. Construction activities could also result in soil compaction and wind erosion effects that could adversely affect soils and reduce the revegetation potential at the construction sites and staging areas. However, according to federal law, all construction projects that involve disturbance of more than 1 acre of land are subject to NPDES regulations for

stormwater. All such projects are required by law to prepare and implement a SWPPP during construction. The SWPPP must be kept on site during construction activity and made available upon request to representatives of the RWQCB. The objectives of the SWPPP are to (1) identify pollutant sources that may affect the quality of stormwater associated with construction activity and (2) identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. The SWPPP is required to include a description of potential pollutants and the manner in which sediments and hazardous materials present on site during construction (including vehicle and equipment fuels) would be managed. The SWPPP must also include details of how the sediment and erosion control BMPs would be implemented.

Because construction activities throughout the project site would be regulated by federal and local erosion control regulations, this impact is considered less than significant.

Risks from Development on Expansive Soils

The soils present on the Alternative 3 site have a moderate to high shrink-swell potential (i.e., soil expansiveness). This shrinking (when dry) and swelling (when wet) of these soils can result in differential ground movement. If structures are constructed in areas with expansive and/or weak soils, structural damage could occur. Expansive soils could cause a risk for post-construction heave and cracking of concrete slabs, as well as lightly loaded foundations and pavements. New facilities and structures would be constructed using the current CBSC standards and Merced County and/or the City of Merced Building Codes and Regulations, which establish requirements for the structural safety of all structures. Geotechnical investigations would ensure that subsurface soil characteristics were properly identified to safely design foundations and structures to reduce the potential impacts associated with expansive soils. This impact is considered less than significant.

Construction on Soils Incapable of Supporting Septic Tanks

The Bellevue Ranch Alternative does not include the use of septic tanks or alternative wastewater disposal systems. Because the project site is almost entirely within the City of Merced SUDP both the Campus and University Community would be connected to the regional wastewater collection and treatment system. There would, therefore, be no impact related to septic tanks or alternative wastewater disposal systems.

4.6.6.4 Alternative 4 – 2002 Proposed Project

Impacts under the 2002 Proposed Project Alternative would be similar to those under Alternative 1, Proposed Action. The proposed "Campus Land Reserve" and the "Campus Natural Reserve" under

Alternative 4 would both remain undeveloped. Accordingly, this alternative would not include any ground-disturbing activities that could result in changes in geology, seismicity, or soils in these reserve areas. The remaining area under this alternative that would be subject to ground disturbance (3,043 acres) is generally similar in location to that of Alternative 1, Proposed Action. For these reasons, all of the impacts of this alternative related to geology, seismicity and soils would be either less than significant or less than significant with mitigation.

Exposure to Increased Risk of Fault Rupture

The site is not subject to significant seismic hazards associated with active faults. No active faults have been identified in the immediate vicinity of the project and the nearest active fault in Merced County is the Ortigalita fault, located in the western quarter of Merced County. The closest seismic source in the vicinity of the Campus and the University Community is the northwest-trending Foothills fault system. The Foothills fault system terminates at its southern extent approximately 15 miles northeast of the Alternative 4 site. According to DMG, the faults associated with the Foothills fault system are inactive. This impact is considered less than significant.

Exposure to Increased Risk of Structural Damage from Ground Shaking

A large earthquake on a nearby fault could cause ground shaking, potentially resulting in liquefaction and associated ground failure, such as lateral spreading or differential settlement, which in turn could increase the risk of structural loss, injury, or death. However, as discussed earlier in this section, the project site is located in a region of California that is characterized by low seismic activity and the ground-shaking hazard in the project area is low.

Although no specific liquefaction hazard areas have been identified in Merced County, this potential exists throughout the San Joaquin Valley where unconsolidated sediments and a high water table coincide (Merced County Planning Department 1989). While some portions of the Alternative 4 site have a shallow groundwater table, most of the Alternative 4 site has a clay hardpan and/or impermeable hardpan layer within 3 feet of the ground surface, which significantly reduces the potential of liquefaction (UC Merced 2004).

The combined effect from the development of the Campus and the University Community on the Alternative 4 site related to risk of injury or structural damage from ground shaking and related hazards would be potentially significant. However, implementation of **Mitigation Measure GEO-2** would reduce the impact to a less than significant level.

Exposure to Increased Risk of Structural Damage from Slope Failure

The majority of the Alternative 4 site is occupied by gently rolling flatland that rarely reaches 10 percent slopes. Given the granular, clayey, and relatively consolidated and cemented nature of the soils, the near-surface hardpan, and the gentle slopes throughout the area, the Alternative 4 site is not prone to landslides (Merced County 2004). Stream banks and road cuts are the most likely places for landslides to occur; however, proper grading and protection from toe erosion—implemented in conjunction with the construction of projects—would reduce the likelihood of those small landslides. The combined effect from the development of the Campus and the University Community on the Alternative 4 site related to slope failure would be less than significant.

Soil Erosion

Grading, excavation, removal of vegetation cover, and loading activities associated with construction activities could temporarily increase erosion and sedimentation. Construction activities could also result in soil compaction and wind erosion effects that could adversely affect soils and reduce the revegetation potential at the construction sites and staging areas. However, according to federal law, all construction projects that involve disturbance of more than 1 acre of land are subject to NPDES regulations for stormwater. All such projects are required by law to prepare and implement a SWPPP during construction. The SWPPP must be kept on site during construction activity and made available upon request to representatives of the RWQCB. The objectives of the SWPPP are to (1) identify pollutant sources that may affect the quality of stormwater associated with construction activity and (2) identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. The SWPPP is required to include a description of potential pollutants and the manner in which sediments and hazardous materials present on site during construction (including vehicle and equipment fuels) would be managed. The SWPPP must also include details of how the sediment and erosion control BMPs would be implemented.

Because construction activities throughout the project site would be regulated by federal and local erosion control regulations, this impact is considered less than significant.

Risks from Development on Expansive Soils

The soils present on the Alternative 4 site have a moderate to high shrink-swell potential (i.e., soil expansiveness). This shrinking (when dry) and swelling (when wet) of these soils can result in differential ground movement. If structures are constructed in areas with expansive and/or weak soils, structural damage could occur. Expansive soils could cause a risk for post-construction heave and cracking of concrete slabs, as well as lightly loaded foundations and pavements. New facilities and structures would

be constructed using the current CBSC standards and Merced County and/or the City of Merced Building Codes and Regulations, which establish requirements for the structural safety of all structures. Geotechnical investigations would ensure that subsurface soil characteristics were properly identified to safely design foundations and structures to reduce the potential impacts associated with expansive soils. This impact is considered less than significant.

Construction on Soils Incapable of Supporting Septic Tanks

The 2002 Proposed Project Alternative does not include the use of septic tanks or alternative wastewater disposal systems. Both the Campus and University Community would be connected to the regional wastewater collection and treatment system. In the event that wastewater is treated on-site it would not involve septic systems. There would, therefore, be no impact related to septic tanks or alternative wastewater disposal systems.

4.6.6.5 Alternative 5 – No Action

Under this alternative, with the exception of the existing Phase 1.1 Campus, the Campus and Community North would not be built. However, Community South could develop based on development plans not related to the establishment of a UC Campus in Merced. All of the impacts from the development of the Community South area under this alternative would generally be similar to the impacts under the Proposed Action from the development of the same area.

Exposure to Increased Risk of Fault Rupture

The Community South site is not subject to significant seismic hazards associated with active faults. No active faults have been identified in the immediate vicinity of the project and the nearest active fault in Merced County is the Ortigalita fault, located in the western quarter of Merced County. The closest seismic source in the vicinity of the Campus and the University Community is the northwest-trending Foothills fault system. The Foothills fault system terminates at its southern extent approximately 15 miles northeast of Community South. According to DMG, the faults associated with the Foothills fault system are inactive. This impact is considered less than significant.

Exposure to Increased Risk of Structural Damage from Ground Shaking

A large earthquake on a nearby fault could cause ground shaking, potentially resulting in liquefaction and associated ground failure, such as lateral spreading or differential settlement, which in turn could increase the risk of structural loss, injury, or death. However, as discussed earlier in this section, the

Community South site is located in a region of California that is characterized by low seismic activity and the ground-shaking hazard in the project area is low.

Although no specific liquefaction hazard areas have been identified in Merced County, this potential exists throughout the San Joaquin Valley where unconsolidated sediments and a high water table coincide (Merced County Planning Department 1989).

The development of the Community South site related to risk of injury or structural damage from ground shaking and related hazards would be potentially significant. However, implementation of **Mitigation Measure GEO-2** would reduce the impact to a less than significant level.

Exposure to Increased Risk of Structural Damage from Slope Failure

The majority of the project site is occupied by gently rolling flatland that rarely reaches 10 percent slopes. Given the granular, clayey, and relatively consolidated and cemented nature of the soils, the near-surface hardpan, and the gentle slopes throughout the area, the project site is not prone to landslides (Merced County 2004). Stream banks and road cuts are the most likely places for landslides to occur; however, proper grading and protection from toe erosion—implemented in conjunction with the construction of projects—would reduce the likelihood of those small landslides. The effect from the development of Community South related to slope failure would be less than significant.

Soil Erosion

Grading, excavation, removal of vegetation cover, and loading activities associated with construction activities could temporarily increase erosion and sedimentation. Construction activities could also result in soil compaction and wind erosion effects that could adversely affect soils and reduce the revegetation potential at the construction sites and staging areas. However, according to federal law, all construction projects that involve disturbance of more than 1 acre of land are subject to NPDES regulations for stormwater. All such projects are required by law to prepare and implement a SWPPP during construction. The SWPPP must be kept on site during construction activity and made available upon request to representatives of the RWQCB. The objectives of the SWPPP are to (1) identify pollutant sources that may affect the quality of stormwater associated with construction activity and (2) identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. The SWPPP is required to include a description of potential pollutants and the manner in which sediments and hazardous materials present on site during construction (including vehicle and equipment fuels) would be managed. The SWPPP must also include details of how the sediment and erosion control BMPs would be implemented.

Because construction activities throughout the Community South site would be regulated by federal and local erosion control regulations, this impact is considered less than significant.

Risks from Development on Expansive Soils

The soils present on the Community South site have a moderate to high shrink-swell potential (i.e., soil expansiveness). This shrinking (when dry) and swelling (when wet) of these soils can result in differential ground movement. If structures are constructed in areas with expansive and/or weak soils, structural damage could occur. Expansive soils could cause a risk for post-construction heave and cracking of concrete slabs, as well as lightly loaded foundations and pavements. New facilities and structures would be constructed using the current CBSC standards and Merced County and/or the City of Merced Building Codes and Regulations, which establish requirements for the structural safety of all structures. Geotechnical investigations would ensure that subsurface soil characteristics were properly identified to safely design foundations and structures to reduce the potential impacts associated with expansive soils. This impact is considered less than significant.

Construction on Soils Incapable of Supporting Septic Tanks

No information is available as to how site wastewater from Community South would be treated under the No Action Alternative and whether septic tanks or alternative wastewater disposal systems would be used. However, it is unlikely that septic systems or other alternate wastewater disposal systems that involve percolation of wastewater into soils would be allowed by the Regional Water Quality Control Board for any development within Community South other than for the development of one or two single-family rural residences. Therefore, a significant impact related to this issue is considered unlikely.

4.6.6.6 Alternative 6 – No Build

The No Build Alternative would not include any direct ground-disturbing activities that could result in changes in geology, seismicity, or soils.

Exposure to Increased Risk of Fault Rupture

The No Build Alternative would not include any development activities that could result in increased risk of fault rupture. Therefore, there would be no impact from the implementation of this alternative.

Exposure to Increased Risk of Structural Damage from Ground Shaking

The No Build Alternative would not include any development activities that could result in structural damage from ground shaking. Therefore, there would be no impact from the implementation of this alternative.

Exposure to Increased Risk of Structural Damage from Slope Failure

The No Build Alternative would not include any development activities that could result in structural damage from slope failure. Therefore, there would be no impact from the implementation of this alternative.

Soil Erosion

The No Build Alternative would not include any development activities that could result in soil erosion. Therefore, there would be no impact from the implementation of this alternative.

Risks from Development on Expansive Soils

The No Build Alternative would not include any development activities on expansive soils. Therefore, there would be no impact from the implementation of this alternative.

Construction on Soils Incapable of Supporting Septic Tanks

The No Build Alternative would not include any development activities that would require septic tanks. Therefore, there would be no impact from the implementation of this alternative.

4.6.7 SUMMARY COMPARISON OF ALTERNATIVES

The implementation of Alternatives 1 through 6 would result in similar types of impacts related to geology and soils. The magnitude of these impacts, however, differs slightly between the alternatives. The total area included in Alternative 6 is smaller (1,187 acres) as it encompasses Community South only and therefore a smaller population. All other alternatives involve areas that are comparable to the total area of the Proposed Action and involve similar populations; therefore, the magnitude of the impact would generally be similar and would be either less than significant or less than significant with mitigation.

In brief, new facilities and structures would be constructed using the current CBSC standards, Merced County Building Codes and Regulations, City of Merced and/or the City of Merced Building Codes and Regulations, and the UC Seismic Policy, which establish requirements for the seismic and structural

safety of all structures. In addition, compliance with UCP Policies S 1.1 and 1.2 require that a site-specific geotechnical investigation be performed prior to each site development within the University Community. Similarly, **Mitigation Measure GEO-2** requires that a site-specific geotechnical investigation be performed for all projects on the Campus prior to design or construction. Geotechnical investigations would ensure that subsurface soil characteristics were properly identified to safely design foundations and structures to reduce the potential impacts associated with expansive soils. Furthermore, construction activities would be regulated by state and local erosion control plans, grading plans, stormwater pollution prevention plans, and post-construction activities would be required to implement site-specific erosion-controlling BMPs. Accordingly, impacts to geology, seismic hazards, and soils are considered less than significant under every alternative.

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4.7 HAZARDOUS MATERIALS AND PUBLIC SAFETY

4.7.1 INTRODUCTION

This section describes existing conditions with respect to hazardous materials and public safety in the project vicinity, including soil and groundwater contamination from previous activities and wildland fires, and analyzes the potential for the development of the Campus and the University Community (Proposed Action) to expose people or structures to increased hazards or increase the risk associated with the use, generation, and disposal of hazardous materials. This section also addresses impacts related to the use of certain scientific materials that do not meet the criteria for hazardous materials but could be a matter of concern for the surrounding community.

Information presented in the discussion and the analysis presented below is based on the UC Merced 2002 Long Range Development Plan (LRDP) EIR, University Community Plan (UCP) Environmental Impact Report (EIR), and previous California Environmental Quality Act (CEQA) documents prepared for UC Merced. A government records search was performed by Environmental Data Resources, Inc., (EDR) for the project site as well as for sites of Alternative 2 (Yosemite Avenue Alternative) and Alternative 5 (2002 Proposed Project Alternative). No public or agency comments related to hazards and hazardous materials were received in response to the Notice of Intent and Notice of Preparation issued for this EIS/EIR.

4.7.2 AFFECTED ENVIRONMENT

4.7.2.1 Hazardous Materials

The term "hazardous material" is defined in Section 25501 of the California Health and Safety Code as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment. Based on their properties, hazardous materials are grouped into the following four categories: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases).

Numerous hazardous materials, including non-radioactive hazardous chemicals (solvents, organic compounds, reagents) and radioactive materials, are used in research activities on university campuses and in business parks that include research and development (R&D) uses. Hazardous materials are used in facility operations and maintenance, including vehicle and landscape maintenance. Hazardous material use in turn generates hazardous and mixed wastes (i.e., radioactive wastes with hazardous waste components). In addition to the above, several sources of non-ionizing radiation (e.g., lasers,

magnets, and microwave generators) are also used on university campuses and in R&D facilities to conduct research. Certain scientific materials that are not hazardous materials by definition are also used in research and include laboratory animals, genetically modified organisms (GMOs) and nano-scale research materials (nanomaterials). University campuses, especially those with a medical focus, also perform a wide range of biological and related research involving recombinant technology, recombinant genomic materials, and GMOs. Recombinant research is commonly performed using microbiological agents (e.g., bacteria and viruses), human and animal cells, and other organisms, such as mice.

4.7.2.2 Regional Conditions Relative to Hazards

The proposed Campus and University Community would be located in eastern Merced County approximately 2 miles northeast of the City of Merced limits. The proposed UC Merced Campus is located southeast of Lake Yosemite Regional Park with the University Community to the south of the Campus. The site of the Campus and the University Community is bounded on the west by Lake Road and on the south by Yosemite Avenue. The project site is shown in **Figure 3.0-1, Alternative 2 – Yosemite Avenue Alternative Location Map**. With the exception of 104 acres of the Campus site and a couple of rural residences in the southern portion of the University Community site, the project site is undeveloped with approximately two-thirds of the site in agricultural uses.

Surrounding Land Uses

Land uses surrounding the project site are either rural residential, open space, or agricultural in nature. There is rolling grassland along the northern and eastern boundaries of the Campus and the northern portion of the University Community. Most of the area surrounding the University Community is either used for agriculture or developed with low-density rural residential properties, which are mainly located west and southwest of the community area. South of Yosemite Avenue, the land is under intensive agriculture.

A small private airstrip is located adjacent to the southeast portion of the University Community on the east side of the Fairfield Canal. The airstrip is primarily used by nearby farmers for crop-dusting planes and helicopters. Crop-dusting airplanes apply dry materials, such as fertilizers and seed, while helicopters apply wet materials, such as pesticides and herbicides. During the past year, the airstrip has supported approximately 200 flights, which includes commercial and crop-dusting flights (James Hunt, LWH Farms, personal communication with George Lu, June 11, 2008.) Night flights occur only in periods of potential frost; two helicopters are generally used for frost protection.

Fire Hazards

The California Department of Forestry (CDF) is responsible for handling wildland fires whereas the County of Merced fire department is responsible for protection to structures within unincorporated areas. The CDF and Fire and Resource Assessment Program (FRAP) categorizes the northern portion of the Campus site as a moderate Fire Hazard Severity Zone, whereas the rest of the Campus and University Community site is categorized as a non-wildland fuels zone. The southwest portion of Community South is located in a moderate Fire Hazard Severity Zone. The CDF also includes the northern portion of the Campus site in a state responsibility area (SRA), which is defined as part of the state where the CDF is the primary service agency responsible for providing basic wildland fire protection assistance. The remainder of the Campus site and the University Community site are located in an unincorporated area that is considered a local responsibility area (LRA) where fire hazards are generally reduced because of available fire prevention measures. However, the Merced County Fire Department is administered by CDF. CDF provides fire suppression personnel through a contract with the Merced County Fire Department; however, support staff for the department are Merced County employees. Therefore, although the remaining portion of the project site is unincorporated, it is serviced by the state (i.e., CDF).

East of the Fairfield and Le Grand Canals, the land area is designated a Very High Severity Zone, indicating either that firefighting measures are inadequate or highly flammable vegetation is present; this area consists of non-irrigated grass covered grazing land with gently rolling hills.

4.7.2.3 Alternative 1, Proposed Action – Hazards

The existing Phase 1.1 Campus encompasses 104 acres of the previous 197-acre Merced Hills Golf Course site and is developed with campus facilities. The developed facilities include research and instructional laboratories, which generate small quantities of biohazardous and chemical waste per year (about 1.6 tons and 2.5 tons respectively). The Phase 1.1 Campus also generates about 2.25 tons of Universal Waste (U-waste), including batteries, fluorescent bulbs, and electronics. Campus hazardous waste is centrally stored for pick up by a licensed hazardous waste contractor. Existing on-site fuel storage is limited to 20,000 gallons of diesel fuel in an underground tank at the Central Plant, 600 gallons in tanks associated with two emergency generators, and a tank for an emergency generator at the pump station. Two additional tanks are planned at this time for the Phase 1.1 Campus. The remainder of the campus site is undeveloped. There are no known areas with soil or groundwater contamination on the campus site.

The University Community would be constructed adjacent to and directly south of the UC Merced Campus. The UCP area would be bounded by Lake Road to the west, East Yosemite Avenue to the south, and grazing lands to the east. The Community North land is open rangeland or under irrigated pasture,

and the Community South land is under cultivation by LWH Farms, LLC. The farm includes a main residence, three smaller residences, barns, and equipment shops on the south side of the project site east of Lake Road. There are no known areas with soil or groundwater contamination on the University Community site. The project site is not located in a 100-year floodplain and would not normally be subject to on-site flooding. The Le Grand Canal and Fairfield Canal traverse the project site, creating a potential safety hazard for residents and visitors.

4.7.2.4 Alternative 2, Yosemite Avenue – Hazards

The Yosemite Avenue Alternative would develop the UC Merced Campus and the University Community south of the existing Phase 1.1 Campus. The Campus and Community North would be located between Phase 1.1 Campus and Yosemite Avenue, whereas Community South would be located south of Yosemite Avenue. As with the Proposed Action, there are no known areas with soil or groundwater contamination present at this alternative site. Under the Yosemite Avenue Alternative, a portion of the University Community would be located in a floodplain.

4.7.2.5 Alternative 3, Bellevue Ranch – Hazards

The Bellevue Ranch Alternative would develop the Campus and University Community along Bellevue Road, north of the City of Merced. Implementation would require the demolition of 39 ranch structures and displacement of new residential units. Furthermore, about 600 acres of the Bellevue Ranch Alternative (277 acres of the proposed Campus and 324 acres of the proposed University Community) are located in 100-year floodplains identified on the Federal Emergency Management Agency's (FEMA's) Flood Insurance Rate Maps.

4.7.2.6 Alternative 4, 2002 Proposed Project – Hazards

This alternative would develop 910 acres for the UC Merced Campus and 2,133 acres for the University Community in eastern Merced County. The site under this alternative is substantially the same as that under the Proposed Action, except that the Campus site is larger by about 166 acres and extends farther north into open rangeland areas that have a very high wildland fire hazard. No areas with soil and groundwater contamination are known to exist on site.

4.7.3 APPLICABLE LAWS, REGULATIONS, AND POLICIES

4.7.3.1 Federal Regulations related to Hazardous Materials

The primary federal agencies responsible for hazardous materials management include the US EPA and US Department of Transportation (DOT). Federal laws require detailed planning to ensure that

hazardous materials are properly handled, used, stored, and disposed of, and in the event that such materials are accidentally released, to prevent or mitigate injury to health or the environment. These laws require hazardous materials users to prepare written plans, such as a hazardous materials management plan.

The federal Resource Conservation and Recovery Act of 1976 (RCRA) created a major new federal hazardous waste "cradle-to-grave" regulatory program administered by US EPA. Under RCRA, US EPA regulates the generation, treatment, and disposal of hazardous waste, and the investigation and remediation of hazardous waste sites. Individual states may apply to US EPA for authorization to implement their own hazardous waste programs in lieu of RCRA, as long as the state program is at least as stringent as federal RCRA requirements. California has been authorized by US EPA to implement its own hazardous waste program, with certain exceptions. In California, the Department of Toxic Substances Control (DTSC) regulates the generation, transportation, treatment, storage, and disposal of hazardous waste, and the investigation and remediation of hazardous waste sites. The California DTSC program incorporates the provisions of both federal and state hazardous waste laws.

The US Department of Transportation (DOT) regulates the transportation of hazardous materials between states and foreign countries. DOT regulations govern all means of transportation (except packages sent by mail, which are governed by US Postal Service [USPS] regulations). The State of California has adopted DOT regulations for the intrastate movement of hazardous materials. In addition, the State of California regulates the transportation of hazardous waste originating in the state and passing out of the state. The Hazardous Materials Transportation Act (HMTA) requires that carriers report accidental releases of hazardous materials to the DOT at the earliest practical moment (49 CFR Subchapter C). Incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding $50,000.

The Federal Emergency Planning and Community Right-to-Know Act of 1986 requires detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of to prevent or minimize adverse effects to human health or the environment in the event such materials are accidentally released. California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local government and private agencies.

Responding to hazardous materials incidents is one part of this plan. The plan is administered by the State Office of Emergency Services, which coordinates the responses of other agencies, including the California Environmental Protection Agency, the CHP, the Department of Fish and Game, the Central Valley Regional Water Quality Control Board (RWQCB), and the County Fire Department. UC Merced intends to have a fire station on site by 2020; however, the fire station would not solely service the

Campus and UCP. It should be noted that the existing Merced County Fire Department provides response services and mitigation for emergency hazardous materials spills.

The UC Merced Hazardous Materials Management Program manages a variety of environmental issues in compliance with federal, state, and local hazardous material regulations. These include the Campus chemical inventory program, liaison for the Merced County Certified Unified Program Agency (CUPA), hazardous materials management, chemical waste management, medical waste management, radioactive waste management, and waste minimization consulting.

4.7.3.2 State Regulations related to Hazardous Materials

State agencies that regulate the use of hazardous materials include the California Environmental Protection Agency (Cal/EPA), the Office of Emergency Services (OES), the Department of Health Services (DHS), the DTSC, and the RWQCB. The DTSC administers US EPA's standards regarding public health effects of soil contamination, while the RWQCB administers state water quality standards for surface and groundwater. Lead responsibility for remediation depends on the proposed use of a parcel, the character of waste contaminants, and the need for site monitoring. In January 1996, Cal/EPA adopted regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program). The program has six elements: hazardous waste generators and hazardous waste on-site treatment, underground storage tanks, aboveground storage tanks, hazardous materials release response plans and inventories, risk management and prevention programs, and Unified Fire Code hazardous materials management plans and inventories.

The two state agencies that have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans). The CHP is responsible for vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation. In addition, the CHP conducts regular inspections of licensed transporters to assure regulatory compliance. The CHP enforces hazardous material and hazardous waste labeling and packing regulations to prevent leakage and spills of material in transit and to provide detailed information to clean-up crews in the event of an accident. Caltrans has emergency chemical spill identification teams throughout the state that can respond quickly in the event of a spill.

4.7.3.3 Occupational Safety

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. The California and federal Occupational Safety and

Health Administration (Cal/OSHA and US OSHA, respectively) are generally responsible for assuring worker safety in the handling and use of chemicals in the workplace.

Federal OSHA regulations 29 CFR 1910 and 1926 contain requirements concerning the use of hazardous materials in the workplace and during construction that mandate employee safety training, safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, emergency action and fire prevention plan preparation, and a hazard communication program. The hazard communication program regulations contain training and information requirements, including procedures for identifying and labeling hazardous substances and for communicating hazard information relating to hazardous substances and their handling. The hazard communication program also requires that material safety data sheets (MSDS) or equivalent safety information be available to employees, and that employee information and training programs be documented. These regulations also require preparation of emergency action plans (escape and evacuation procedures, rescue and medical duties, alarm systems, and training in emergency evacuation).

Federal OSHA regulations include special provisions for hazard communication to employees in research laboratories, including training in chemical work practices. Specific, more detailed training and monitoring is required for use of carcinogens, ethylene oxide, lead, asbestos, and other chemicals listed in 29 CFR. Emergency equipment and supplies, such as fire extinguishers, safety showers, and eye washes, must also be provided and maintained in accessible places.

Federal and California OSHA regulations also include extensive, detailed requirements for worker protection applicable to any activity that could disturb asbestos-containing materials, including maintenance, renovation, and demolition. These regulations are also designed to ensure that people working near the maintenance, renovation, or demolition activity are not exposed to asbestos.

4.7.3.4 Biosafety Standards

Federal and state laws establish standards for working with biohazardous materials. A hazardous biological material is any potentially harmful biological material (including infectious agents, oncogenic [cancer-causing] viruses, and recombinant DNA) or any material contaminated with potentially harmful biological material. The US Public Health Service, the National Institutes of Health (NIH), and the Centers for Disease Control and Prevention (CDC) establish standards for working with biohazardous materials. The CDC and NIH have issued federal guidelines that address biological safety, including containment and handling guidelines to be used in microbiological and biomedical laboratories. These guidelines identify four biosafety levels with which laboratories are required to comply, depending on the risk group of the agent used. Biosafety Level 1 is for the least hazardous biological agent and

Biosafety Level 4 is for the most hazardous biological agents. Similarly, four biosafety levels have been identified for research involving transgenic plants. The US Department of Agriculture (USDA) Animal and Plant Health Inspection Services inspects greenhouses and laboratories using transgenic plants to ensure no unintentional release of transgenic organisms or harm caused by transgenic or recombinant DNA technology has occurred due to their operation.

4.7.3.5 Local Plans and Policies

University Community Plan

The UCP contains policies that help prevent impacts related to potential hazards and hazardous materials. These policies are listed below.

Hazardous Materials

S 3.1: Conduct a preliminary site investigation in accordance with ASTM Standard Practice E 1527-00 (or the most current site assessment standard) by an environmental professional to determine the potential for on- and off-site hazardous materials contamination prior to site preparation and construction activities.

S 3.2: If, during the preliminary site investigation, or during construction activities following completion of the site investigation, evidence of hazardous materials contamination is observed or suspected through either obvious or implied measures (i.e., stained or odorous soil, or oily or discolored water), construction activities shall cease in the affected area and an environmental professional shall assess the situation. If necessary, the environmental professional shall prepare a sampling plan to collect soil and/or groundwater samples to determine whether or not the site has been adversely affected by past activities. The samples shall be analyzed for the contaminants determined to be a potential health concern by the environmental professional. Depending on the nature of the contamination (if any), the Merced County Division of Environmental Health and appropriate federal and state agencies shall be notified.

S 4.1: Prepare a "Hazardous Materials Management Plan" to provide residential, commercial, and industrial properties with necessary information regarding the use, transportation, storage, and disposal of hazardous materials and hazardous wastes within the University Community and Merced County.

S 4.2: Require that all projects within the University Community comply with the Hazardous Materials Management Plan and the programs established by the Merced County Division of Environmental Health.

Airport Safety

AS 1.1: Require that development in the University Community maintains airspace safety and distance ratio requirements established by the Federal Aviation Administration and the Caltrans Division of Aeronautics as long as the airstrip adjacent to the University Community remains operational.

Wildland Fire Safety

S 5.1: Implement brush clearing and other fire suppression programs in adjacent lands, thereby reducing the possibility for the encroachment of wildland fires onto inhabited areas (consistent with maintenance programs for important plant and animal habitats).

S 5.2: Encourage the use of non-combustible roofing materials within 200 feet from area designated a very high hazard severity zone.

S 5.3: Prohibit the planting of "highly combustible" landscape materials, such as pines or eucalyptus trees, along the University Community's border within a very high severity zone for brush fires.

Land Use

LU 9.7: Integrate the Le Grand and Fairfield canals into the University Community's open space network, preserving and protecting their primary function as a conduit of agricultural water, consistent with the requirements and to the satisfaction of the Merced Irrigation District (MID).

LU 9.8: Design any uses, landscape, trails, and improvements located in proximity to MID canals to protect the physical integrity of the canals, levees, and related water conveyance systems.

LU 9.9: Incorporate barriers, such as fencing, and other elements to ensure public safety and prevent public access to the canal, to the satisfaction of MID. Collaborate with the MID in the use of landscape, fencing, and other elements that assure a high level of public safety and visual quality that complements the open space system.

UC Merced 2009 Long Range Development Plan

No policies regarding hazards or hazardous materials are contained in the 2009 UC Merced LRDP.

4.7.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

Although the President's Council on Environmental Quality (CEQ) regulations (40 CFR 1508.27) provide guidance as to the requirement to evaluate impacts in an EIS, CEQ guidance generally does not identify the specific categories of impacts that must be evaluated, nor does it specify the significance criteria to be used to evaluate the significance of the specific impacts of the Proposed Action. Under the National Environmental Policy Act (NEPA), impacts must be identified based on the potential environmental consequences of the Proposed Action. Further, "significantly," as used in NEPA, requires considerations of both context and intensity. Context means that the significance must be analyzed in several contexts, such as the human environment, affected region, affected interests, and the local setting. Additionally, "intensity" refers to the severity of the impact. Impacts must be evaluated that may be both beneficial and adverse.

For purposes of this analysis, this EIS/EIR conservatively uses significance criteria derived from Appendix G of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* and the CEQ guidelines for both CEQA and NEPA regarding the determination of environmental consequences to identify impacts. For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. For the purpose of this EIS/EIR, impacts related to hazards and hazardous materials would be significant if implementation of the Proposed Action or its alternatives would

- create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;

- be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;

- for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area;

- for a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area;

- impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;

- expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands; or

- place people or property in locations that would create or exacerbate a public safety hazard.

4.7.5 METHODOLOGY FOR EVALUATING EFFECTS

The potential impacts of hazards in the project area were evaluated using information specific to the alternatives and information from the 2002 UC Merced LRDP EIR and 2004 UCP EIR. Although the 2002 UC Merced LRDP EIR and Phase 1.1 Campus EIR evaluated hazardous materials impacts associated with the proposed project, a full analysis of Alternative 1 (Proposed Action) was conducted for this section in order to provide a complete analysis of hazardous materials impacts for CEQA and NEPA purposes. For each subsequent alternative, a separate analysis was conducted if the impact under the alternative would differ from Alternative 1. However, if the alternative would not result in different impacts, a reference to the Alternative 1 analysis was provided. In addition, within each impact analyzed for Alternative 1, the impacts associated with the Campus and the University Community were evaluated separately and the combined effect of both components of the Proposed Action was also evaluated.

4.7.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.7.6.1 Alternative 1 – Proposed Action

Alt 1 – Impact HAZ-1: The Proposed Action would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. (*Less than Significant*)

Routine transport, use, and disposal of hazardous materials would be associated with the construction and operation of the Campus and University Community. Hazardous materials in the form of fuels, paints, etc., would be used during project construction; once the facilities are constructed, some hazardous materials use would be associated with the operation of the Campus and the University Community. The potential for routine use of hazardous materials to result in a hazard to the public or the environment is evaluated below for each area.

Campus

The Proposed Action would include development of uses on the campus such as research and instructional laboratories, central plant, vehicle maintenance facilities, and other facilities that could involve the transport, use, or dispose of hazardous materials. The Proposed Action would dedicate approximately 114 acres for academic and laboratory uses and 75 acres for R&D uses. These types of uses (i.e., laboratory and R&D) would be concentrated in the portion of the campus near the intersection of Lake Road and Bellevue Road adjacent to the Gateway Area of Community North. The operation of the research laboratories could include the use of various chemicals, biohazards, radioactive materials, and animal testing procedures and waste that may pose different levels of hazards with their use. The Proposed Action would also develop up to four central plants, which would be located throughout the Campus at project buildout. Employees and students at the proposed Campus could potentially be exposed to hazardous materials in the course of their work or study.

Biohazards

As a scientific research facility, UC Merced cannot predict every possible biological agent or research application it might conceivably use in the future. However, it is expected that small quantities of various biologically hazardous substances would be used for research at the campus. Biohazardous materials would be used in research facilities associated with the medical school and in laboratories involved in biotechnology research, among others. UC Merced uses and would continue to use the US Department of

Health and Human Services guidelines, *Biosafety in Microbiological and Biomedical Laboratories*, put forth by the NIH and the CDC, to classify biohazardous agents used on site.

Biohazardous materials have the potential to affect project employees and students through air (i.e., inhalation of aerosols), water (i.e., release to the sewer or surface waters), waste disposal, and accidents. Biological aerosols can be generated during mixing, shaking, and other disruptive handling of biological organisms. Campus policies would require that these activities be conducted within biosafety cabinets, which would be equipped with high-efficiency particulate air (HEPA) filters to remove biohazardous materials. In accordance with Cal/OSHA requirements, HEPA-filtered ventilation systems and biological safety cabinets would be tested and certified annually by the UC Merced Environmental Health and Safety (EH&S) Department. Most HEPA filters for biosafety cabinets recirculate air into laboratories and are 99.97 percent effective in screening out particles at 0.3 micron in size. HEPA filter particle-removal efficiency does not decrease greatly for particle sizes below 0.3 micron. Therefore, HEPA filters would effectively remove biohazardous particles. Laboratory equipment that could generate aerosols, such as shakers and centrifuges, would be sealed or contained during use. In the laboratory, aerosols deposit within relatively short distances from point sources. Potential aerosol emissions, if not controlled by a biosafety cabinet, would be controlled by splash guards and decontamination of surrounding work surfaces. When a laboratory activity is finished, most tissues, fluids, and cell cultures would be treated as infectious waste. This infectious material would be disposed of in biohazard-labeled bags, autoclaved, and sent to a landfill once sterilized.

The presence of biohazardous agents such as bacteria, parasites, and viruses in wastewater generated by animal and human carriers could pose a potential health risk. The risk to effluent streams due to the use of biohazardous agents appears minimal with current wastewater treatment technologies because of the characteristics of typical agents, the implementation and enforcement of disposal procedures, laboratory research protocols, and because potential exposure to the community is extremely limited by the nature of university laboratory operations, which are conducted in secure campus buildings located relatively far from the general community. Many of the potential pathogens that could enter the waste stream, such as *Giardia* sp., *Cryptosporidium* sp., and *Campylobacter* sp., are also common in domestic animals, wildlife, and asymptomatic humans in the general population (URS 2002). Any biohazardous agents that survived the disinfectant process required for infectious waste would also be highly diluted in the treatment plant influent. Assuming the implementation and enforcement of required appropriate disposal procedures and sewage treatment processes, the public health risk associated with the potential for increased biohazardous agents contained in campus wastewater is considered less than significant.

Research laboratories and animal care activities at UC Merced would produce biohazardous waste. Most laboratory tissues, fluids, and cultures are considered to be potentially infectious waste. Potentially

infectious animal care wastes can include animal excreta, bedding, uneaten food, cage washing solutions, animal carcasses and tissues, worker's disposable protective clothing, and sharp objects (including needles, scalpels, broken glass, etc.). In accordance with the requirements of the California Medical Waste Management Act, most research-generated biohazardous waste would be placed in a biohazard-labeled bag and autoclaved, a procedure that renders the waste nonhazardous by applying steam under high pressure. Autoclaving is typically performed in the generating laboratory immediately after the biohazardous waste is created. Biohazardous waste that also contains hazardous chemicals or radioactive waste would be categorized and handled as hazardous or radioactive waste; items without remaining hazardous constituents, once decontaminated, may be considered nonhazardous solid waste and disposed of off site. In accordance with applicable federal and state laws and UC Merced practice, generated wastes would be segregated, handled, labeled, stored, transported, and disposed of to minimize direct or indirect exposure of personnel.

All biohazardous waste would be rendered nonhazardous before disposal, and existing health and safety practices would minimize the potential for adverse health effects before disposal. Therefore, potential impacts related to campus biohazardous waste generation are considered less than significant.

To minimize workers' and students' exposure to hazards, the Campus has established a biosafety program similar to that of other UC campuses. The biosafety program covers all research activities involving biohazardous materials such as human or primate tissues, animal tissues exposed to infectious organisms, recombinant DNA, and transgenic plants and animals among others. UC Merced's Institute Biosafety Committee (IBC) oversees the use of biohazardous materials by creating and enforcing policies and procedures, reviewing biohazardous materials use, and monitoring construction and use of biohazardous containment facilities. The UC Merced IBC must approve all projects involving biohazardous materials and grant a biological use authorization (BUA) prior to beginning work. The UC Merced IBC complies with all University policies, national guidelines, industry guidelines, federal, state, and County regulations. In addition, as mentioned above, engineering controls (i.e., biohazardous containment facilities) would provide a degree of containment of biological agents and minimize personnel contact with these agents. These safety features would be built into facility and equipment design and operation. The most significant engineering control that can be implemented is observation of the correct biosafety level criteria of laboratory and equipment design.

Every California employer is required to have an effective Injury and Illness Prevention Program in writing in accord with Title 8 CCR Section 3203 of the General Industry Safety Orders to provide a safe and healthful workplace. OSHA also mandates methods of documenting, investigating, and controlling accidents that result in skin penetration. Evidence presented during OSHA rule-making procedures indicates that safety and health program measures like those described above are effective in reducing the

number and severity of injuries and illness in the workplace. Compliance with injury and illness prevention guidelines would serve to minimize potential hazards. For this reason, impacts related to biohazard risks to worker and student health and safety are considered less than significant.

Radioactive Material

Some radioactive substances may be used on the campus for research purposes in facilities associated with the medical school, energy research, biotechnology research, and general R&D. The potential human health effects from radiation exposure range from no known health effects to minor skin irritations or headaches to cancerous tumors. Radiation could pose a health risk to those who are exposed, but exposure can be prevented with proper protective equipment and procedures. The Radiological Safety Division of EH&S at UC Merced is responsible for the development and oversight of a comprehensive radiation safety program. The radiation safety program has been created to ensure the safe handling, transport, use, and disposal of radiological materials, lasers, and x-ray machines. Compliance with the radiation safety program would require the necessary protective measures to avoid exposing visitors, students, faculty, staff, and the community to any radioactive materials. Furthermore, radioactive materials would be monitored closely by the EH&S. For example, before obtaining radioactive materials, each principal investigator would require a Radiation Use Authorization from the Radiation Safety Officer, which will specify the particular radioisotopes to be used and maximum quantities to be possessed. Compliance with regulations for radiation safety would reduce this impact to a less than significant level.

Similar to other UC campuses, radioactive wastes are and would continue to be segregated, sealed, and labeled by the generating researcher who would then call EH&S for pickup. EH&S would remove radioactive materials from laboratories and take them to the Environmental Services Facility to prepare them for eventual disposal by one of three methods. The material would be (1) held for decay followed by disposal as nonradioactive, (2) released to the sanitary sewer on campus, which would require approval from the City of Merced, or (3) incinerated off site. UC Merced policy would be to release no more than half the legal limit of radioactivity to the sewer provided under 17 CCR Section 30253(a) and 10 CFR Section 20.2003. On the basis of these regulations, EH&S would calculate daily limits and dispose of no more than half of these calculated limits. Radioactive waste to be treated or disposed would be shipped off campus. Compliance with applicable laws would reduce any related impact to a less than significant level. Because radioactive waste landfill capacity is currently limited for California low-level radioactive waste generators, and the long-term, legal disposal of all classes of radioactive waste is not guaranteed, UC Merced will prepare and implement a campus-wide waste minimization plan that will develop feasible programs to reduce generation of low-level radioactive wastes and mixed wastes in accordance with SB 14, the Hazardous Waste Source Reduction and Management Review Act of 1989.

Implementation of a Campus-wide radioactive waste minimization plan would further reduce this less than significant impact.

Animal Research

The use of animals in UC Merced research laboratories could pose potential hazards to workers, students, and the neighboring community if contact between humans and animals is not properly managed. An infected animal can spread disease and present a physical safety hazard through bites and scratches. Exposure to infectious agents can occur through animal bites or by infectious agents being spread to the neighboring community, which can occur if animals escape or if infectious agents are transmitted by vectors. Vectors are organisms that carry diseases from infected animals to others in the community (for example, a mosquito could carry malaria from an infected person to an uninfected person). The possible health effects would depend on the species housed in campus facilities and the types of research pursued.

Before any research involving live vertebrate animals can be initiated on a UC campus, an animal care and use protocol for the activity must be prepared by the principal investigator and approved by the Campus Animal Care and Use Committee. Research involving hazardous agents also goes through a safety committee approval process that addresses safety and waste management practices. Approved protocols must comply with federal and state requirements as well as the Institutional Animal Care and Use Committee (IACUC). The IACUC for UC Merced is located at the Lawrence Livermore National Laboratory. Vertebrate animals cannot be obtained for research until experimental protocols are approved. Animal housing facilities must also conform to the National Institutes of Health guidelines and the Animal Welfare Act. Rats and mice are not currently regulated under the act, but they are covered by the IACUC.

Potential off-site effects of animal use are primarily controlled by containing the animals, either in cages or behind fences, or by blocking them behind doors, depending on the appropriate method for the species as prescribed. Pest control programs would be implemented at UC Merced when necessary to reduce the potential for vectors. Furthermore, animal facilities would be subject to the design approval oversight of the Campus veterinarian. Facilities constructed are expected to meet these guidelines. For these reasons, no significant impacts are expected to result from animal escapes or disease transmission via pests.

Similar to other campuses, to further minimize risks to the community, animal cages would be washed regularly with detergent and treated with a disinfectant solution. Depending on the circumstances, cages may be steam cleaned with a steam gun, put through a cage washer at an elevated temperature, autoclaved, or washed by hand with detergent. Cages would then be rinsed with a disinfectant.

Infectious agents generally cannot survive disinfectant cage washing. The effluent from these washing processes would undergo further treatment at the wastewater treatment plant and would be greatly diluted before reaching the plant.

Controls intended to ensure the safety of animal care workers would also minimize opportunities for infectious agents to be spread from workers to individuals off site. NIH animal care guidelines specify the use of protective wear and safe handling procedures for work with animals to decrease the chance of disease transmittal and other work-related hazards through incidents such as bites or needle sticks. Training would be provided to workers to ensure proper animal and cage handling, surgical procedures, and personal hygiene. Compliance with animal care and use guidelines would minimize any potential hazards. For this reason, impacts related to animal research are considered less than significant.

Hazardous Material Handling

UC Merced policies and procedures would address the procurement, handling, and disposal of carcinogenic, controlled, volatile, flammable, and explosive substances. The Campus EH&S department would be responsible for implementing measures designed to ensure compliance with applicable laws and regulations and to impose additional, more stringent UC Merced policies to further reduce the potential for human harm. Students, researchers, and staff would be required to take standard procedural precautions, such as working under fume hoods while working with hazardous chemicals, to minimize the risk of potential exposure. Fume hoods and other engineering controls would also be required to meet Cal/OSHA requirements. Proper use of engineering controls would keep indoor laboratory air toxics concentrations below the legal limits of the OSHA permissible exposure levels.

To prevent exposure through skin contact, Campus policies and procedures require that protective clothing, such as laboratory coats, gloves, and safety glasses be worn while handling hazardous materials and wastes. Proper washing after handling chemicals would also be required in all laboratories. In addition, in accordance with state laws and Campus policy, eating, drinking, applying cosmetics, and chewing gum or tobacco would not be allowed in laboratories using radioactive, carcinogenic, or biohazardous materials.

Campus departments would primarily be responsible for ensuring and educating employees of safe work practices. The Campus EH&S department would support departments with this responsibility and provide proper training and safety guidelines. Furthermore, the EH&S department would also review proposed laboratory designs for nonstructural seismic safety concerns and compliance with Cal/OSHA requirements to provide appropriate protection for building occupants.

No direct public exposure to hazardous wastes generated at the UC Merced campus is anticipated. The extent to which students and workers could be exposed to hazardous waste is related to the training they receive, how conscientiously they follow safety procedures, how well engineering controls are maintained and operated, and the extent to which compliance is supervised and enforced. Compliance with all state and federal laws and regulations, as well as Campus policies, would reduce the potential impacts of hazardous materials use on campus to a less than significant level.

UC Merced would prepare guidelines for proper disposal of hazardous wastes based on regulations established by the US EPA and the California DTSC. To facilitate safe management, hazardous wastes would be subcategorized into groups (e.g., flammable, corrosive, oils, and oxidizers) with similar or closely related properties. All materials are required to be properly package and labeled, which includes placing them in appropriate sealed containers, segregating incompatible materials, and identifying all components with approximate concentrations. Chemical wastes, once packed for disposal, would be further categorized according to their off-campus disposal methods. UC Merced would also prepare guidelines for labeling, storage, and transportation of hazardous materials on and off site. Compliance with hazardous waste storage and transportation regulations would reduce the potential impacts of hazardous materials disposal to a less than significant level.

In addition to operational uses of hazardous materials, hazardous materials could also be used in varying amounts during construction activities associated with implementation of the proposed Campus. Construction and maintenance activities would use hazardous materials, such as fuels (gasoline and diesel), oils and lubricants, paints and paint thinners, glues, cleaners (which could include solvents and corrosives in addition to soaps and detergents), and pesticides and herbicides. However, construction activities are required to comply with all applicable regulations and codes, including, but not limited to, Titles 8 and 22 of the Code of California Regulations, Uniform Fire Code, and Division 20 of the California Health and Safety Code. In addition, all transportation of hazardous materials to and from the site during construction activities must comply with DOT and Caltrans regulations. Compliance with all state, federal, and local hazardous materials regulations would reduce any construction and maintenance-related hazardous materials impacts to a less than significant level.

University Community

Storage and use of hazardous materials associated with the residential, retail, and recreational uses in the University Community would involve small volumes of common hazardous materials. Typical household hazardous materials would include oils (e.g., motor oil and hydraulic oil), fuels (e.g., gasoline and diesel), paints (both latex and oil-based), solvents (e.g., degreasers, paint thinners, and aerosol propellants), acids and bases (e.g., automobile battery fluids, swimming pool chemicals, and many

cleaners), disinfectants, metals (e.g., mercury in thermometers, batteries, and photography chemicals), and pesticides and herbicides. Businesses would use materials similar to households, and some (e.g., gas stations, dry cleaners, and photo processors) would use hazardous materials in larger quantities specifically related to their business activities. For example, supermarkets and gas stations stock hazardous materials, such as motor oil, antifreeze, and other fluids, for sale to consumers. Supermarkets could handle automotive fluids, cleaners, pesticides, and batteries. In addition, dry cleaners handle perchloroethylene, and photo processors handle fixer and developer chemicals. Hazardous wastes associated with residential, retail, and recreational uses typically involve empty or partially filled containers of liquid chemical products, fertilizers, used motor oil, automotive or electronic batteries, unused computers, etc. In each case, the potential hazard would depend on multiple factors, such as what types of materials would be used, where the materials would be used, how they would be used, and who would use them. Households and certain businesses, such as office-based businesses, would use relatively small quantities of hazardous materials when compared to certain other businesses, such as those engaged in R&D or light manufacturing.

Community North would include a business park with a focus on research. The Proposed Action would dedicate up to 75 acres of Community North for research uses. The business park would be located in the Gateway area and would include up to 2.3 million square feet of building space. The types of research conducted in the Community North business park would be similar to those performed on the campus and majority of the research would be directly associated with research conducted on the campus. R&D facilities would involve larger quantities and a wider variety of hazardous materials, which could include less common materials and acutely hazardous materials. However, businesses that handle larger quantities of hazardous materials and acutely hazardous materials would be subject to more regulation and oversight than businesses that handle smaller quantities of more common materials. Similar to the Campus, application of federal and state laws related to hazardous wastes would be required for R&D uses on the Community North. In accordance with applicable federal and state laws, including regulations established by the US EPA and the California DTSC, generated wastes would be segregated, handled, labeled, stored, transported, and disposed of to minimize direct or indirect exposure of personnel. Furthermore, employees of such businesses would also be required to receive special training (often required by law under OSHA) to help them understand the hazards they face.

Although individual households and many businesses use relatively small volumes of hazardous materials, the total volume of the hazardous materials managed by all of the households and businesses in the University Community could be substantial. The Merced County Division of Environmental Health has a household hazardous waste collection program that safely collects, transports, and disposes of residual hazardous wastes; the residential neighborhoods would be provided these services by the

County. Businesses that generate hazardous wastes would be required to use, store, transport, and dispose of their wastes in accordance with all federal, state, and local regulations and standards. Compliance with these regulations and standards and proper hazardous waste collection by the Merced County Division of Environmental Health would reduce any potential impacts with respect to the routine use, transport, or disposal of hazardous materials to a less than significant level.

Conclusion

As discussed above, construction and operation of the UC Merced Campus and Community project would comply with all applicable regulations regarding the transport, use, or disposal of hazardous materials. All movement and use of any hazardous materials on the project site would be conducted with proper controls. All employees, staff, and researchers handling hazardous materials would be properly trained to safely use, dispose, and label all hazardous materials to avoid any mishandling of hazardous materials. The applicable regulations discussed above would also require containment control measures against potential spills, such as filtering of air ducts, proper materials packaging, and sterilization of any apparatus that has contacted potentially hazardous animal tissue. These containment measures would minimize impacts resulting from a potential release. Furthermore, the proper labeling of all hazardous materials would be required as part of DOT, Caltrans, federal, and state regulations. Proper labeling would ensure that any emergency response teams would be able to quickly identify and contain any potential release of hazardous materials. Full compliance with federal, state, and local standards and regulations would reduce the potential impacts on the public and environment through transport, use, or disposal of hazardous materials to a less than significant level.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HAZ-2: The Proposed Action would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (*Less than Significant*)

Campus

The transport of any hazardous materials to or within the campus would be conducted in accordance with UC Merced policies and procedures. Nonradioactive chemicals, biohazardous materials, and other packages for offices and laboratories may be delivered by outside carriers directly to receiving entrances at individual buildings. Alternatively, incoming packages may be delivered at the Campus main receiving facility for UC Merced personnel to deliver to campus locations. However, transportation of hazardous materials around the campus would increase the possibility of accidents capable of exposing

people on and off campus to hazardous materials. To minimize the potential for accidental spills of hazardous materials during transit, suppliers and transporters are and would continue to be required to follow stringent US DOT and USPS regulations for packaging and handling.

Hazardous waste leaving the campus would be packaged in drums and containers that meet US DOT requirements. Due to the strict requirements of the US DOT, containers are unlikely to release their contents in the event of an accident. Although transportation of hazardous materials has associated risks of spills or leaks, appropriate management of transported wastes in compliance with applicable laws and regulations found in the Code of Federal Regulations, Title 4, would minimize these risks.

As all incoming and outgoing hazardous material shipments would be packaged according to strict US DOT and USPS specifications, the likelihood of an accident involving hazardous materials in transport would be minimal. In addition, it is not anticipated the operation of the Campus would require a substantial amount of hazardous waste movement. Therefore, due to the relatively small amounts of hazardous materials involved and compliance with applicable transport regulations, the impact with respect to creating a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment would be less than significant.

University Community

As discussed above in Alt 1 – Impact HAZ-1, most uses in the University Community would not involve large quantities of hazardous materials. Research and Development activities would involve the use of hazardous materials. These would be transported in accordance with US DOT and USPS regulations for packaging and handling. It is expected that residential and commercial uses will use relatively small amounts hazardous materials for household cleaning and business activities. However, the Merced County Division of Environmental Health has a household hazardous waste collection program that safely collects, transports, and disposes of residual hazardous wastes. In addition, any businesses in the University Community that generate hazardous wastes would be required to dispose of their wastes in accordance with all federal, state, and local regulations and standards. Compliance with these regulations and standards and proper hazardous waste collection by the Merced County Division of Environmental Health would reduce any potential impacts with respect to reasonably or foreseeable accident conditions involving the release of hazardous materials into the environment to a less than significant level.

Conclusion

As discussed above, compliance with all US DOT and USPS hazardous waste packaging requirements and with all federal, state, and local regulations regarding the transport of hazardous materials would

reduce any potential impacts with respect to an accidental release of hazardous materials to a less than significant impact. In addition, businesses in the University Community that involve hazardous materials and the campus would be provided oversight by the Merced County Division of Environmental Health, which is the CUPA for the County. Compliance with all of the aforementioned practices would reduce any impacts with respect to this criterion to a less than significant level.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HAZ-3: The Proposed Action would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. (*No Impact)*

Campus

There are no existing schools within 0.25 mile of the proposed campus site. Therefore, there would be no impact to schools from emissions of hazardous materials on the project site. Development of the proposed UCP would, however, include the construction of schools for the UCP residents. The siting of a proposed school would be required to comply with all applicable Education Codes regarding hazardous materials. The full compliance with these codes, which are discussed in detail below, would avoid exposing any proposed schools to hazardous emissions or hazardous materials. Therefore, any potential impact would be reduced to a less than significant level.

University Community

Section 17213 of the Education Code stipulates that prior to commencing the acquisition of property for a new school site, an environmental site investigation must be completed to determine the health and safety risks (if any) associated with a site. In addition, Public Resources Code Sections 21151.2, 21151.4, and 21151.8 require that no EIR be certified for a project involving the construction or alteration of a facility that might be reasonably anticipated to result in hazardous air emissions within 0.25 mile of a school unless the lead agency has consulted with the school district having jurisdiction regarding the potential impact of the project on the school, or the school has been given written notification of the project not less than 30 days prior to approval of the EIR. The Logistical Support/Service Facilities building, which provides for hazardous material handling and storage on the UC Merced campus, is approximately 1 mile from the proposed location of the nearest school in the University Community. Furthermore, the UCP policies would ensure that schools are not placed on sites containing hazardous materials or hazardous wastes. These site investigation requirements of the school siting code would reduce any potential impacts to a less than significant level.

Conclusion

As discussed above, the Campus and the University Community would not be located within 0.25 mile of any existing or proposed school. Furthermore, current Public Resources Code and Education Code require that an EIR not be certified if any reasonably foreseeable hazardous air emissions would occur within 0.25 mile of a school, unless consultation or notification has been conducted. The impact with respect to this criterion is considered less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HAZ-4: The Proposed Action could be located on a site that contains hazardous materials and, could create a significant hazard to the public or the environment. (*Potentially Significant; Less than Significant*)

As discussed **Section 4.7.1, Introduction**, a government records search was conducted by EDR for the project site. The report identified multiple sites/businesses on the project site that currently or previously handled hazardous materials. However, all of these sites were found to have no recorded violations and, therefore, would not be expected to create a significant hazard to the public or the environment. Some sites that handled hazardous wastes were closed and, therefore, would also not pose any significant hazard to the public or environment. Four underground storage tanks (USTs) were identified on the project site with one of the tanks on the campus site and three within the Community South site. The EDR report verified that these USTs were either not leaking or not active anymore. The remaining active USTs on the project site would be removed or properly closed prior to construction of the proposed project.

Campus

As discussed above, all known hazardous material sites on the campus were found to have no recorded violations and, therefore, would not be expected to create a significant hazard to the public or the environment. Although there is one underground fuel storage tank on the campus, that tank was recently installed in compliance with all applicable laws and regulations and has not released any fuels to the environment. The EDR report prepared for the project site did not identify any other USTs on the campus site. There are no known areas of soil or groundwater contamination within the campus site.

Although the southern portion of the campus has been used historically for agricultural purposes, agricultural use has been limited to irrigated pasture; therefore, use of herbicides and pesticides is unlikely to have occurred within this area, and residues of these materials in the soil is not a major concern for this area. However, it is possible that not all environmental conditions, such as non-permitted disposal sites, trash burn pits, wells, or other underground storage devices, have been reported or

identified in the southern area of the campus. The presence of any of these, either within or adjacent to the campus site, could generate conditions that could be a hazard to public health and the environment. A significant impact from hazardous materials associated with non-permitted disposal sites, trash burn pits, wells, or other underground storage devices could potentially occur if contaminated soils and groundwater associated with these sites are encountered during construction.

University Community

A portion of the LWH Farms, LLC, property located on the proposed University Community site is included on a UST regulatory database maintained by the State Water Resources Control Board (SWRCB). However, according to the information provided by EDR in their environmental regulatory database report, the contents of the USTs operated by LWH Farms are not known to have leaked into soil or groundwater (County of Merced 2004). The EDR report also identified three additional USTs on the University Community site. It should be noted that the regulatory databases that identified these USTs (i.e., Historical UST and California Facility Inventory Database UST) were last updated in 1990 and 1994 and, therefore, these USTs may have been removed. Nevertheless, these USTs would be properly identified and removed prior to development of the University Community to avoid any potential hazard impacts. No addresses within a 1-mile radius of the University Community boundary that were identified on hazardous materials database lists were reported to have contamination that has not been properly remediated or investigated by appropriate regulatory agencies. There are no known areas of soil or groundwater contamination located within the University Community area.

Because a majority of the proposed University Community site is undeveloped and has been historically used for agricultural purposes, there is the potential that soil and groundwater in the University Community area has been contaminated by the ongoing application of pesticides, herbicides and other agricultural chemicals, or illegal debris disposal. In addition, it is possible that not all environmental conditions, such as non-permitted disposal sites, trash burn pits, septic tanks, wells, or other underground storage devices, have been reported or identified in the University Community area or in adjacent areas. The presence of any of these, either within or adjacent to the University Community area, could generate conditions that could be a hazard to public health and the environment. On- and off-site disposal areas or unknown underground storage devices could have contaminated soil and groundwater in the University Community area. Therefore, a potentially significant impact could result if previously unknown hazardous materials are encountered during construction on the University Community site.

All development within the University Community would be required to comply with UCP policies. UCP Policy S 3.1, which specifies preliminary site investigation procedures to investigate the potential of hazardous materials contamination in the University Community, and UCP Policy S 3.2, which requires

that construction activities cease if unknown hazardous materials are encountered, would ensure that contaminated areas, if any are identified, are remediated prior to development of the Proposed Action. In addition, compliance with UCP Policy S 3.2 would ensure that an environmental professional assesses the construction site and provides recommendations regarding materials sampling and coordination with the Merced County Division of Environmental Health. UCP policies would further strengthen the California Education Code, which requires site investigations be performed prior to construction of schools. Compliance with state and County requirements, and implementation of UCP policies, would reduce the risk associated with exposure to potential hazardous material contamination. Therefore, this impact would be less than significant.

Conclusion

Although the Proposed Action would not create a significant hazard to the public or the environment through a site included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, impacts related to unreported hazardous material sites within the campus could be potentially significant. As discussed above, during development of the Proposed Action, construction activities would be temporarily halted if any unknown hazardous materials are encountered. Contaminated areas would be identified and remediated (or removed) before construction activities were allowed to continue. Full implementation of UCP Policies S 3.1, 3.2, and **Mitigation Measure HAZ-4** would ensure that the project site is properly evaluated for potential hazards during construction activities. Site investigations, compliance with state and County requirements, and implementation of UCP Policies S 3.2 and 3.2 would reduce potential impacts to a less than significant level.

MM HAZ-4: In the event that non-permitted disposal sites, trash burn pits, wells, underground storage devices, or unknown hazardous materials are encountered during construction on the campus site, construction activities would cease until all contaminated areas are identified, and remediated or removed. This process of identification and remediation or removal would be coordinated with the Merced County Division of Environmental Health. (*Applicability – Campus only*)

Alt 1 – Impact HAZ-5: The Proposed Action would not be located within an airport land use plan or within 2 miles of a public airport or public use airport. (*No Impact*)

Campus

The proposed UC Merced Campus site is not located within an airport land use plan or within 2 miles of a public or public use airport. (The small private airstrip adjacent to the project site is not a public or public-use airport; it is discussed under **Impact HAZ-6** below.) The campus site is more than 8 miles from

the Castle Airport, the nearest public airport located at the site of the former Castle Air Force Base. Therefore, no impact is anticipated to occur with respect to this criterion.

University Community

The proposed University Community is not located within 2 miles of a public airport or public use airport. Therefore, no impact would occur with respect to this criterion.

Conclusion

As discussed above, neither the Campus nor the University Community would be located within an airport land use plan or within 2 miles of public airport or public use airport. Therefore, no impact would occur with respect to this criterion.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HAZ-6: The Proposed Action would not result in a safety hazard for people residing or working in the project area due to the project's proximity of a private airstrip. (*Less than Significant*)

Campus

The proposed campus would be located within 2 miles of the LWH Farms, LLC, private airstrip. Operations at the private airstrip could potentially create a safety hazard for people residing or working in the project area, including employees and students on campus. At takeoff or landing, airplanes could fly at low levels over some portions of the campus, which could create a safety hazard for people under the airplane flight paths. However, the University would be required to comply with applicable Federal Aviation Administration (FAA) and Caltrans Division of Aeronautics regulations and permits, such as adjacent building height restrictions and ratios, minimum distances from the runway to adjacent property lines, and airspace safety requirements. Compliance with these requirements would reduce the safety hazards associated with airstrip operations to an acceptable level. The potential impact with respect to this criterion is considered less than significant.

University Community

The proposed University Community site is adjacent to the LWH Farms, LLC, private airstrip. Operations at the private airstrip could potentially create a safety hazard for people residing or working in the project area. At takeoff or landing, airplanes could fly at low levels over the University Community area, which could create a safety hazard for people under the airplane flight paths. However, under UCP

Policy AS 1.1, all developers would be required to comply with applicable FAA and Caltrans Division of Aeronautics regulations and permits, such as adjacent building height restrictions and ratios, minimum distances from the runway to adjacent property lines, and airspace safety requirements. Compliance with these requirements would reduce the safety hazards associated with airstrip operations to an acceptable level. The potential impact with respect to this criterion is considered less than significant.

Conclusion

For reasons presented above, the impact related to the presence of a private airstrip adjacent to the project site would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HAZ-7: The Proposed Action would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (*Less than Significant*)

Campus

UC Merced has an emergency operations plan in place for the existing Phase 1.1 Campus, and will prepare a plan for the entire campus in accordance with California Health and Safety Code Section 25503. The Campus emergency response team is trained and equipped to respond to hazardous materials emergencies. UC Merced will provide sufficient resources to respond to a Level A hazardous materials incident (the most hazardous level), in coordination with the County of Merced if necessary. In addition, UC Merced will prepare (or update) safety planning documents in accordance with California Health and Safety Code Section 25517.5, as well as applicable laws, regulations, and Campus policies. The Campus will implement safety training programs upon occupying each new building to ensure efficient implementation of any emergency response plan.

In addition, each department will be responsible for preparing and implementing its own emergency action plan. These plans would contain detailed procedures for building occupants to follow in the event of various emergencies and evacuations. Each new building will be assigned a building safety coordinator who will address emergency planning and safety training for the occupants, employees, staff, and students of new buildings. The building safety coordinator would coordinate emergency response planning and implementation efforts for the building and implement required Cal/OSHA regulations related to developing an evacuation plan. For example, emergency drills would be coordinated so that all of the building's occupants would participate at the same time, regardless of their departmental affiliations. The evacuation plan and emergency response plans would provide general guidelines and

procedures to be followed during emergencies and disasters. The plans would address the evacuation of occupants and the establishment of temporary meeting areas in the event of an emergency. Project occupants would be trained to implement the plans, as well as all other required safety procedures. In the case of a regional emergency such as a wildland fire, large hazardous material release, or a threat of an explosion, the UC Merced Police Department would determine and conduct the appropriate evacuation. Any minor spill or release of hazardous materials would be handled by EH&S during normal business hours and by the UC Merced Police Department during after-hours or weekends. The UC Merced Police Department would make the necessary contact with EH&S in the event of a minor spill or release. Therefore, development of the campus would not impair implementation or physically interfere with any emergency response plan or emergency evacuation plan and the impact with respect to this criterion is considered less than significant.

University Community

The proposed University Community would include residential, commercial, and retail uses as well as a business park focused on research associated with the types of research that would be conducted on the campus. In the event of an emergency evacuation at any of the University Community's residential, commercial (i.e., non-research), and retail buildings, the appropriate authorities (e.g., Fire Department, UC Merced Police Department) would coordinate and help lead any necessary evacuation. In addition, as required by local fire codes, each building would be required to post an emergency evacuation plan in the case of a fire.

Facilities within the business park would contain hazardous materials. In compliance with state and federal laws, an emergency response plan would be developed for each building involving the use and storage of hazardous materials, and employees would be trained on proper evacuation and emergency procedures. With implementation of these requirements, the impact with respect to this criterion would be considered less than significant.

Conclusion

As discussed above, emergency response plans and emergency evacuation plans would be established for all proposed buildings on the campus. Emergency and evacuation plans would be coordinated between Campus buildings to ensure proper procedures in the case of a massive emergency or evacuation. The uses planned for the University Community would not impair or physically interfere with any emergency response plan or emergency evacuation plan. Therefore, the impact with respect to this criterion is considered less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HAZ-8: The Proposed Action would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. (*Less than Significant*)

Campus

Because high-fire-risk grazing pastures surround the campus site on all sides, the growth in population due to the project would translate into a greater potential for wildland and urban fires along with a greater number of people exposed to fires on and off campus. Adequate wildland fire defenses and responses to wildland fires are a priority for the State of California. In recognition of the severity of wildland fire hazards in certain areas of California, the state has enacted legislation (i.e., California PRC Section 4291) requiring local jurisdictions to adopt minimum recommended road standards for fire equipment access; standards for identifying streets, roads, and buildings with minimum private water supply reserves for emergency fire use; and standards for fuel breaks and greenbelts to achieve fuel reductions. The Campus has been designed to minimize human intrusion into the adjacent Campus Natural Reserve (CNR) lands by way of landscaping and fencing. UC Merced would take additional measures to minimize the risk of injury and property damage from wildland and urban fires. All buildings would have adequate sprinkler systems, emergency exits, and fire routes that give access to and from each building. In addition to the automatic fire extinguishing system, manual fire extinguishers would be made available throughout the campus. Grassy and landscaped areas surrounding the campus buildings would be irrigated and maintained at a low height to create a buffer area. Fire breaks would be installed within the campus as it develops. As campus development moves to the eastern and northern boundaries of the campus, it would not be possible to use firebreaks for protection, because the construction of firebreaks in the CNR could affect sensitive biological resources there. The Campus would use the *Management Plan for Conservation Lands* as a guide to balance fire prevention and suppression methods with protection of natural resources and biodiversity. The *Management Plan for Conservation Lands* has four distinct goals regarding fire protection and management: (1) develop fire protection that emphasizes public safety and protection of university properties, especially in the interface areas; (2) prevent a substantial increase in fire frequency from "preuniversity" (i.e., before development of Phase 1.1 Campus and the Proposed Action) conditions to maintain the natural habitat; (3) minimize ground-disturbing fire prevention and suppression methods (e.g., fuel breaks); and (4) use prescribed fire as a management tool to control invasive weeds that threaten biodiversity (Airola 2008). With the implementation of fire prevention measures noted above and adherence to the guidelines of the Management Plan for Conservation Lands, the impact with respect to wildland fires would be reduced to a less than significant level.

University Community

The southern portion of the University Community is irrigated for agricultural production and is generally covered with crops or fallow; therefore, this area does not have the fuel, such as dense forests or thick underbrush, to spread wildland fires. However, the northern half of the University Community is covered with annual grasses, like the lands to the east and northeast, which provide fuel for wildland fires. In addition, there is the potential for fires to occur within the University Community and for the fire to spread to the adjacent, non-irrigated grazing land. The University Community is located adjacent to land categorized as a Very High Severity Zone for wildland fires; these areas are generally located on the east side of the Fairfield and Le Grand canals.

The proposed University Community is located within a SRA, as designated by CDF; therefore, in accordance with Public Resources Code 4291, the area would be required to comply with fire defensibility measures, such as firebreaks around structures, clearance of combustible vegetation, and roadway standards to ensure emergency access and egress. The County Fire Code would require that developers provide approved water supplies capable of delivering adequate fire flows for fire protection to all premises upon which buildings or portions of buildings are constructed. In addition, the Merced County General Plan incorporates policies to minimize risk of injury and property damage resulting from wildland and urban fires in its wildland fire policy section (Public Safety Chapter, Goal 5). These policies include establishing water supplies for firefighting, installing sprinkler systems where applicable, providing adequate access to rural areas, and maintaining "clear zones" around new and existing residential structures. These state and Merced County policies would be applicable to the University Community. Development within the University Community would also be required to implement Policy S 5.1, S 5.2, and S 5.3 regarding wildland fires that would further protect the University Community and adjacent lands from wildland fire hazards. Therefore, due to state SRA requirements, County regulations, and UCP policies, sufficient control measures would be taken to ensure that adequate wildland fire defenses are incorporated into development of the University Community and the impact with respect to this criterion is considered less than significant.

Conclusion

As discussed above, proper control measures would be taken by UC Merced and within the University Community to minimize the potential for a wildland fire. Although implementation of the Proposed Action would, by its nature, expose a greater number of people to wildland fire risk, development of the Proposed Action would be complemented by sufficient fire control measures. In addition, as discussed above, proper emergency response emergency evacuation plans would be established to provide efficient and comprehensive support in the case of an emergency. Therefore, implementation of the Proposed

Action would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HAZ-9: The Proposed Action would not expose people to a significant public safety hazard associated with irrigation canals. (*Less than Significant*)

This discussion involves the potential public safety hazards associated with irrigation canals present within the Campus and University Community sites. The Le Grand Canal and Fairfield Canal traverse the project site, creating a potential safety hazard for residents and visitors. The University would implement various measures to reduce potential hazards to public safety. UCP policies include limiting access to the canals with a combination of fencing and landscaping. High hazard areas (e.g., the concrete grade-change chute on the Fairfield Canal) would be fenced to prevent access (UC Merced 2002). UC Merced would install landscaping to further screen and limit access to unfenced portions of the canals.

The existing Phase 1.1 Campus has been developed in a manner that ensures the safety of the Campus population. Development on the University Community site would be required to comply with Policy LU 9.7, LU 9.8, and LU 9.9, which would require fencing or other equally effective barriers along the canals bordering the UCP area (County of Merced 2004). The implementation of the Proposed Action would therefore result in a less than significant impact on public safety associated with the on-site canals.

Mitigation Measure: No mitigation is required.

4.7.6.2 Alternative 2 – Yosemite Avenue

Impacts under this alternative would be identical to those under Alternative 1, Proposed Action. The area to the south of Yosemite Avenue that would be developed with Community South has similar hazard conditions as Community South under the Proposed Action.

Transport, Use, or Disposal of Hazardous Materials

As discussed under Alternative 1, construction and operation of the UC Merced campus and the University Community under Alternative 2 would comply with all applicable regulations regarding the transport, use, or disposal of hazardous materials. All movement and use of any hazardous materials on the project site would be conducted with proper controls. All employees, staff, and researchers handling hazardous materials would be properly trained to safely use, dispose, and label all hazardous materials to avoid any mishandling of hazardous materials. The applicable regulations discussed above would also require containment control measures against potential spills, such as filtering of air ducts, proper

materials packaging, and sterilization of any apparatus that has contacted potentially hazardous animal tissue. These containment measures would minimize impacts resulting from a potential release. Furthermore, the proper labeling of all hazardous materials would be required as part of DOT, Caltrans, federal, and state regulations. Proper labeling would ensure that any emergency response teams would be able to quickly identify and contain any potential release of hazardous materials. Full compliance with federal, state, and local standards and regulations would reduce the potential impacts on the public and environment through transport, use, or disposal of hazardous materials to a less than significant level.

Upset and Accident Conditions

Similar to Alternative 1, compliance with all US DOT and USPS hazardous waste packaging requirements and with all federal, state, and local regulations regarding the transport of hazardous materials would reduce any potential impacts of Alternative 2 with respect to an accidental release of hazardous materials to a less than significant impact. In addition, businesses in the University Community that involve hazardous materials and the campus facilities under this alternative would be provided oversight by the Merced County Division of Environmental Health, which is the CUPA for the County. Compliance with all of the aforementioned practices would reduce any impacts of this alternative with respect to this criterion to a less than significant level.

Proximity of Hazards to Proposed or Existing Schools

As discussed under Alternative 1, the Campus and the University Community under this alternative would not be located within 0.25 mile of any existing or proposed school. Furthermore, current Public Resources Code and Education Code require that an EIR not be certified if any reasonably foreseeable hazardous air emissions would occur within 0.25 mile of a school, unless consultation or notification has been conducted. The impact with respect to this criterion is considered less than significant.

Hazardous Material Site

Although the Yosemite Avenue Alternative would not create a significant hazard to the public or the environment through a site included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, impacts related to unreported hazardous material sites within the Yosemite Avenue Alternative site could be potentially significant. As discussed under Alternative 1, during development of the Yosemite Avenue Alternative, construction activities would be temporarily halted if any unknown hazardous materials are encountered. Contaminated areas would be identified and remediated (or removed) before construction activities would be allowed to continue. Full implementation of UCP Policies S 3.1, 3.2, and **Mitigation Measure HAZ-4** would ensure that the Yosemite Avenue Alternative site is properly evaluated for potential hazards during construction

activities. Site investigations, compliance with state and County requirements, and implementation of UCP policies would reduce potential impacts to a less than significant level.

Proximity to Airports/Private Airstrips

Similar to Alterative 1, neither the Campus nor the University Community under Alternative 2 would be located within an airport land use plan or within 2 miles of public airport or public use airport. Therefore, no impact would occur with respect to this criterion.

The Yosemite Avenue Alternative is located within 2 miles of the LWH Farms, LLC, private airstrip. Operations at the private airstrip could potentially create a safety hazard for people residing or working in the project area. At takeoff or landing, airplanes could fly at low levels over the Campus or University Community area, which could create a safety hazard for people under the airplane flight paths. However, under UCP Policy AS 1.1, all developers would be required to comply with applicable FAA and Caltrans Division of Aeronautics regulations and permits, such as adjacent building height restrictions and ratios, minimum distances from the runway to adjacent property lines, and airspace safety requirements. Compliance with these requirements would reduce the safety hazards associated with airstrip operations to an acceptable level. The potential impact with respect to this criterion is considered less than significant.

Interference with Emergency Response Plan or Emergency Evacuation Plan

Similar to Alternative 1, under the Yosemite Avenue Alternative emergency response plans and emergency evacuation plans would be established for all proposed buildings on the campus. Emergency and evacuation plans would be coordinated between campus buildings to ensure proper procedures in the case of a massive emergency or evacuation. Facilities in the University Community would have an emergency response plan developed for each building involving the use and storage of hazardous materials to be in compliance with state and federal laws. Employees would be trained on proper evacuation and emergency procedures. The uses planned for the University Community would not impair or physically interfere with any emergency response plan or emergency evacuation plan. Therefore, the impact with respect to this criterion is considered less than significant.

Risk of Wildland Fires

Similar to Alternative 1, under the Yosemite Avenue Alternative, proper control measures would be taken by UC Merced and within the University Community to minimize the potential for a wildland fire. Although implementation of the Yosemite Avenue Alternative would, by its nature, expose a greater number of people to wildland fire risk, development of the Yosemite Avenue Alternative would be

complemented by sufficient fire control measures. In addition, as discussed above, proper emergency response emergency evacuation plans would be established to provide efficient and comprehensive support in the case of an emergency. Therefore, implementation of the Yosemite Avenue Alternative would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

Irrigation Canal Safety Hazard

There are no irrigation canals present within the area to the south of Yosemite Avenue that would be developed under this alternative. The Le Grand Canal and Fairfield Canal, however, traverse the Campus and Community North sites, thereby creating a potential safety hazard for residents and visitors. Therefore, similar to the Proposed Action, UC Merced would implement various measures to reduce the hazard to public safety. Development under this alternative would be required to comply with UCP Policies LU 9.7 through 9.9, as described above. For these reasons, the impacts under this alternative would be comparable to those impacts associated with Alternative 1, Proposed Action. Thus, Alternative 2 would result in less than significant impacts related to public safety.

4.7.6.3 Alternative 3 – Bellevue Ranch

Impacts under this alternative would be similar to those under Alternative 1, Proposed Action. The Alternative 3 project site would be located north of downtown Merced and west of Lake Yosemite. This area is predominately undeveloped and used for agricultural and grazing land although some new residential developments have been constructed in the southeastern portion of the site.

Transport, Use, or Disposal of Hazardous Materials

Similar to Alternative 1, construction and operation of the UC Merced Campus and the University Community under Alternative 3 would comply with all applicable regulations regarding the transport, use, or disposal of hazardous materials. All movement and use of any hazardous materials on the Alternative 3 site would be conducted with proper controls. All employees, staff, and researchers handling hazardous materials would be properly trained to safely use, dispose, and label all hazardous materials to avoid any mishandling of hazardous materials. The applicable regulations discussed above would also require containment control measures against potential spills, such as filtering of air ducts, proper materials packaging, and sterilization of any apparatus that has contacted potentially hazardous animal tissue. These containment measures would minimize impacts resulting from a potential release. Furthermore, the proper labeling of all hazardous materials would be required as part of DOT, Caltrans, federal, and state regulations. Proper labeling would ensure that any emergency response teams would be able to quickly identify and contain any potential release of hazardous materials. Full compliance with

federal, state, and local standards and regulations would reduce the potential impacts on the public and environment through transport, use, or disposal of hazardous materials to a less than significant level.

Upset and Accident Conditions

As discussed under Alternative 1, compliance with all US DOT and USPS hazardous waste packaging requirements and with all federal, state, and local regulations regarding the transport of hazardous materials would reduce any potential impacts of Alternative 3 with respect to an accidental release of hazardous materials to a less than significant impact. In addition, businesses in the University Community and campus facilities that involve hazardous materials would be provided oversight by the Merced County Division of Environmental Health, which is the CUPA for the County. Compliance with all of the aforementioned practices would reduce any impacts with respect to this criterion to a less than significant level.

Proximity of Hazards to Proposed or Existing Schools

There are two existing schools located approximately 0.25 mile to the south and east of the proposed Community South boundary. However, the proposed residential and commercial uses proposed for Community South would be consistent with land uses in the vicinity of the schools and would not involve storage of hazardous materials. There would be no schools on the Campus or Community North within 0.25 mile of any existing or proposed school. As discussed under Alternative 1, current Public Resources Code and Education Code require that an EIR not be certified if any reasonably foreseeable hazardous air emissions would occur within 0.25 mile of a school, unless consultation or notification has been conducted. The impact with respect to this criterion is considered less than significant.

Hazardous Material Site

Although the Bellevue Ranch Alternative would not create a significant hazard to the public or the environment through a site included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, impacts related to unreported hazardous material sites within the Alternative 3 site could be potentially significant. As discussed under Alternative 1, during development of the Bellevue Ranch Alternative, construction activities would be temporarily halted if any unknown hazardous materials are encountered. Contaminated areas would be identified and remediated (or removed) before construction activities were allowed to continue. Full implementation of UCP Policies S 3.1, 3.2, and **Mitigation Measure HAZ-4** would ensure that the Alternative 3 site is properly evaluated for potential hazards during construction activities. Site investigations, compliance with state and County requirements, and implementation of UCP policies would reduce potential impacts to a less than significant level.

Proximity to Airports/Private Airstrips

As discussed under Alternative 1, neither the Campus nor the University Community would be located within an airport land use plan or within 2 miles of public airport or public use airport. The campus and University Community sites are more than 2.5 miles from the Castle Airport, the nearest public airport located at the site of the former Castle Air Force Base. Therefore, no impact would occur with respect to this criterion. The Bellevue Ranch Alternative would not be located within 2 miles of a private airstrip. No impact is expected to occur with respect to this criterion.

Interference with Emergency Response Plan or Emergency Evacuation Plan

Similar to Alternative 1, under Alternative 3, emergency response plans and emergency evacuation plans would be established for all proposed buildings on the campus. Emergency and evacuation plans would be coordinated between Campus buildings to ensure proper procedures in the case of a massive emergency or evacuation. Facilities in the University Community would have an emergency response plan developed for each building involving the use and storage of hazardous materials to be in compliance with state and federal laws. Employees would be trained on proper evacuation and emergency procedures. The uses planned for the University Community would not impair or physically interfere with any emergency response plan or emergency evacuation plan. Therefore, the impact with respect to this criterion is considered less than significant.

Risk of Wildland Fires

As discussed under Alternative 1, proper control measures would be taken by UC Merced and within the University Community to minimize the potential for a wildland fire. Although implementation of the Bellevue Ranch Alternative would, by its nature, expose a greater number of people to wildland fire risk, development of the Bellevue Ranch Alternative would be complemented by sufficient fire control measures. In addition, as discussed above, proper emergency response emergency evacuation plans would be established to provide efficient and comprehensive support in the case of an emergency. Therefore, implementation of the Bellevue Ranch Alternative would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

Irrigation Canal Safety Hazard

Although there are no irrigation canals that cross the Bellevue Ranch site, Fahrens Creek bisects the Bellevue Ranch area from north to south. Similar public safety issues would be involved in the development of the Campus and the University Community at this site, although the effect's magnitude would be less because of the limited length of the creek within the Bellevue Ranch site compared to the

length of the two canals within the Proposed Action site. Therefore, the impacts under this alternative would be somewhat less than those under Alternative 1, Proposed Action, and this alternative would result in less than significant impacts related to public safety.

4.7.6.4 Alternative 4 – 2002 Proposed Project

Impacts under this alternative would be similar to those under Alternative 1, Proposed Action, and as described in the 2002 UC Merced LRDP EIR and the 2004 UCP EIR. The Alternative 4 project site would be located in approximately the same location as the Proposed Action and would have similar hazard conditions as those under the Proposed Action.

Transport, Use, or Disposal of Hazardous Materials

Similar to Alternative 1, construction and operation of the UC Merced campus and the University Community under Alternative 4 would comply with all applicable regulations regarding the transport, use, or disposal of hazardous materials. All movement and use of any hazardous materials on the Alternative 4 site would be conducted with proper controls. All employees, staff, and researchers handling hazardous materials would be properly trained to safely use, dispose, and label all hazardous materials to avoid any mishandling of hazardous materials. The applicable regulations discussed above would also require containment control measures against potential spills, such as filtering of air ducts, proper materials packaging, and sterilization of any apparatus that has contacted potentially hazardous animal tissue. These containment measures would minimize impacts resulting from a potential release. Furthermore, the proper labeling of all hazardous materials would be required as part of DOT, Caltrans, federal, and state regulations. Proper labeling would ensure that any emergency response teams would be able to quickly identify and contain any potential release of hazardous materials. Full compliance with federal, state, and local standards and regulations would reduce the potential impacts on the public and environment through transport, use, or disposal of hazardous materials to a less than significant level.

Upset and Accident Conditions

As discussed under Alternative 1, compliance with all US DOT and USPS hazardous waste packaging requirements and with all federal, state, and local regulations regarding the transport of hazardous materials would reduce any potential impacts with respect to an accidental release of hazardous materials to a less than significant impact. In addition, businesses in the University Community and campus facilities that involve hazardous materials would be provided oversight by the Merced County Division of Environmental Health, which is the CUPA for the County. Compliance with all of the aforementioned practices would reduce any impacts with respect to this criterion to a less than significant level.

Proximity of Hazards to Proposed or Existing Schools

Similar to Alternative 1, the Campus and the University Community under Alternative 4 would not be located within 0.25 mile of any existing or proposed school. Furthermore, current Public Resources Code and Education Code require that an EIR not be certified if any reasonably foreseeable hazardous air emissions would occur within 0.25 mile of a school, unless consultation or notification has been conducted. The impact with respect to this criterion is considered less than significant.

Hazardous Material Site

Although the 2002 Proposed Project Alternative would not create a significant hazard to the public or the environment through a site included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, impacts related to unreported hazardous material sites within the 2002 Proposed Project Alternative site could be potentially significant. As discussed under Alternative 1, during development of the 2002 Proposed Project Alternative, construction activities would be temporarily halted if any unknown hazardous materials are encountered. Contaminated areas would be identified and remediated (or removed) before construction activities would be allowed to continue. Full implementation of UCP Policies S 3.1, 3.2, and **Mitigation Measure HAZ-4** would ensure that the Alternative 4 site is properly evaluated for potential hazards during construction activities. Site investigations, compliance with state and County requirements, and implementation of UCP policies would reduce potential impacts to a less than significant level.

Proximity to Airports/Private Airstrips

Similar to Alterative 1, neither the Campus nor the University Community under Alternative 4 would be located within an airport land use plan or within 2 miles of a public airport or public use airport. Therefore, no impact would occur with respect to this criterion.

The 2002 Proposed Project Alternative would be located within 2 miles of the LWH Farms, LLC, private airstrip. Operations at the private airstrip could potentially create a safety hazard for people residing or working in the project area. At takeoff or landing, airplanes could fly at low levels over the Campus or University Community area, which could create a safety hazard for people under the airplane flight paths. However, under UCP Policy AS 1.1, all developers would be required to comply with applicable FAA and Caltrans Division of Aeronautics regulations and permits, such as adjacent building height restrictions and ratios, minimum distances from the runway to adjacent property lines, and airspace safety requirements. Compliance with these requirements would reduce the safety hazards associated with airstrip operations to an acceptable level. The potential impact with respect to this criterion is considered less than significant.

Interference with Emergency Response Plan or Emergency Evacuation Plan

Similar to Alternative 1, emergency response plans and emergency evacuation plans would be established for all proposed buildings on the campus under Alternative 4. Emergency and evacuation plans would be coordinated between campus buildings to ensure proper procedures in the case of a massive emergency or evacuation. Facilities in the University Community would have an emergency response plan developed for each building involving the use and storage of hazardous materials to be in compliance with state and federal laws. Employees would be trained on proper evacuation and emergency procedures. The uses planned for the University Community would not impair or physically interfere with any emergency response plan or emergency evacuation plan. Therefore, the impact with respect to this criterion is considered less than significant.

Risk of Wildland Fires

As discussed under Alternative 1, proper control measures would be taken by UC Merced and within the University Community to minimize the potential for a wildland fire. Although implementation of the 2002 Proposed Project Alternative would, by its nature, expose a greater number of people to wildland fire risk, development of the 2002 Proposed Project Alternative would be complemented by sufficient fire control measures. In addition, as discussed above, proper emergency response emergency evacuation plans would be established to provide efficient and comprehensive support in the case of an emergency. Therefore, implementation of the 2002 Proposed Project Alternative would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

Irrigation Canal Safety Hazard

Impacts under this alternative would be similar to those under Alternative 1, Proposed Action. The proposed Campus Land Reserve and the Campus Natural Reserve under Alternative 4 would both remain undeveloped. The remaining area under this alternative is generally similar in location to that of Alternative 1, Proposed Action. The Le Grand Canal and Fairfield Canal traverse the site, creating a potential safety hazard for residents and visitors. UC Merced would implement various measures to reduce the hazard to public safety. Development under this alternative would be required to comply with UCP Policies LU 9.7 through 9.9, as described above. For these reasons, all of the impacts of this alternative related to public safety would be less than significant.

4.7.6.5 Alternative 5 – No Action

Under the No Action Alternative, the United States Army Corps of Engineers (USACE) would not grant the wetlands permit required to develop the Campus and Community North; therefore, these areas

would not be developed. The Community South area potentially could be developed under this alternative with land uses similar to those contemplated in the UCP which are almost entirely residential and commercial in nature, consistent with other development near the Community South site.

Transport, Use, or Disposal of Hazardous Materials

As Community South would likely be developed with residential and commercial land uses, hazardous materials would be limited. Furthermore, construction and operation of Community South would comply with all applicable regulations regarding the transport, use, or disposal of hazardous materials. Therefore, the impact related to transport, use and disposal of hazardous materials would be less than significant.

Upset and Accident Conditions

For the same reasons presented above, the impact with respect to an accidental release of hazardous materials would be less than significant.

Proximity of Hazards to Proposed or Existing Schools

As discussed under Alternative 1, Community South would not be located within 0.25 mile of any existing or proposed school. Furthermore, current Public Resources Code and Education Code require that an EIR not be certified if any reasonably foreseeable hazardous air emissions would occur within 0.25 mile of a school, unless consultation or notification has been conducted. The impact with respect to this criterion is considered less than significant.

Hazardous Material Site

Although Alternative 5 would not create a significant hazard to the public or the environment through a site included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, impacts related to unreported hazardous material sites within the Alternative 5 site could be potentially significant. As discussed under Alternative 1, during development of Community South, construction activities would be temporarily halted if any unknown hazardous materials are encountered. Contaminated areas would be identified and remediated (or removed) before construction activities were allowed to continue. Full implementation of UCP Policies S 3.1, 3.2, and **Mitigation Measure HAZ-4** would ensure that the project site is properly evaluated for potential hazards during construction activities. Site investigations, compliance with state and County requirements, and implementation of UCP policies would reduce potential impacts to a less than significant level.

Proximity to Airports/Private Airstrips

As discussed under Alterative 1, Community South would not be located within an airport land use plan or within 2 miles of a public airport or public use airport. Therefore, no impact would occur with respect to this criterion.

Community South development would be located within 2 miles of the LWH Farms, LLC, private airstrip. Operations at the private airstrip could potentially create a safety hazard for people residing or working in the project area. At takeoff or landing, airplanes could fly at low levels over the Community South area, which could create a safety hazard for people under the airplane flight paths. However, under UCP Policy AS 1.1, all developers would be required to comply with applicable FAA and Caltrans Division of Aeronautics regulations and permits, such as adjacent building height restrictions and ratios, minimum distances from the runway to adjacent property lines, and airspace safety requirements. Compliance with these requirements would reduce the safety hazards associated with airstrip operations to an acceptable level. The potential impact with respect to this criterion is considered less than significant.

Interference with Emergency Response Plan or Emergency Evacuation Plan

Facilities in the University Community would have an emergency response plan developed for each building involving the use and storage of hazardous materials to be in compliance with state and federal laws. Employees would be trained on proper evacuation and emergency procedures. The uses likely to develop within Community South would not impair or physically interfere with any emergency response plan or emergency evacuation plan. Therefore, the impact with respect to this criterion is considered less than significant.

Risk of Wildland Fires

As discussed under Alternative 1, proper control measures would be taken within Community South to minimize the potential for a wildland fire. Although implementation of Alternative 5 would, by its nature, expose a greater number of people to wildland fire risk, development of Alternative 5 would be complemented by sufficient fire control measures. In addition, as discussed above, proper emergency response emergency evacuation plans would be established to provide efficient and comprehensive support in the case of an emergency. Therefore, implementation of the No Action Alternative would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

Irrigation Canal Safety Hazard

Under this alternative, although the existing Phase 1.1 Campus development would remain in place, no development would occur on the remainder of the Campus and all of Community North. Community

South could develop based on development plans not related to the establishment of a UC Campus in Merced. Because the irrigation canal would be present along the eastern boundary of Community South development and would not traverse through the site, the safety hazard under this alternative would be of a lesser magnitude. However, some safety measures such as fencing and landscaping would still be required to reduce the hazard to public safety. This alternative's impacts related to public safety would be less than significant.

4.7.6.6 Alternative 6 – No Build

Under the No Build Alternative, there would be no development anywhere on the project site. Therefore, under the No Build Alternative, no impacts associated with hazards or hazardous materials would occur.

4.7.7 SUMMARY COMPARISON OF ALTERNATIVES

Implementation of the Proposed Action (Alternative 1) would not generate any significant impacts with respect to hazards or hazardous materials. Similarly, implementation of the Yosemite Avenue Alternative (Alternative 2), 2002 Proposed Project Alternative (Alternative 4), and No Action Alternative (Alternative 5) would all have less than significant impacts or no impact with respect to **Impacts HAZ-1** through **8**. It should be noted that Alternatives 1, 2, 4, and 5 would all be located in the same approximate location and the magnitude of impacts under these alternatives would only differ slightly.

Implementation of the Bellevue Avenue Alternative (Alternative 3) would generate similar impacts as the Proposed Action. However, the Alternative 3 project site would not be located in proximity of any private airstrip; therefore, no impact would occur with respect to that criterion.

4.7.8 REFERENCES

Airola, D. A. 2008. Management Plan for Conservation Lands and Adjacent Campus Buildout Lands for the University of California, Merced. Prepared for University of California, Merced.

Environmental Data Resources, Inc. 2008. *UC Merced Alternative[s] The EDR Radius Atlas with Geocheck*.

County of Merced. 2004. *County of Merced University Community Plan*, Final Environmental Impact Report. Prepared for the County of Merced.

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UC Merced. 2002. *Long Range Development Plan*, Final Environmental Impact Report. Prepared by URS Corporation.