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CITY OF HOPE CAMPUS PLAN DRAFT EIR

City of Duarte

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PLACEWORKS

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ABBREVIATIONS AND ACRONYMS

AAQS	ambient air quality standards
AB	Assembly Bill
ACM	asbestos-containing materials
afy	acre-feet per year
amsl	above mean sea level
AQMP	air quality management plan
AR4	*Fourth Assessment Report: Climate Change 2007* (Intergovernmental Panel on Climate Change)
BAU	business as usual
bcfd	billion cubic feet per day
bgs	below ground surface
BMP	best management practices
Cal Am	California American Water
CalARP	California Accidental Release Prevention Program
CalEPA	California Environmental Protection Agency
CALGreen	California Green Building Standards Code
Cal/OSHA	California Occupational Safety and Health Administration
CalRecycle	California Department of Resources, Recycling, and Recovery
Caltrans	California Department of Transportation
Caltrans TIS Guide	Guide for the Preparation of Traffic Impact Studies
CARB	California Air Resources Board
CAW	California American Water Company Duarte Service Area
CBC	California Building Code
CCR	California Code of Regulations
CDE	California Department of Education
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CESA	California Endangered Species Act
CFC	California Fire Code
CFR	Code of Federal Regulations

Abbreviations and Acronyms

cfs	cubic feet per second
CGP	Construction General Permit
CMP	congestion management program
CNEL	community noise equivalent level
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
COH	City of Hope
Corps	US Army Corps of Engineers
CRHR	California Register of Historical Resources
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DEIR	draft environmental impact report
DOF	California Department of Finance
DPF	diesel particulate filter
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
DUSD	Duarte Unified School District
EAP	Energy Action Plan
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
°F	degrees Fahrenheit
FAR	floor area ratio
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIRM	flood insurance rate map
FTA	Federal Transit Administration
FY	fiscal year
g	acceleration of gravity
GHG	greenhouse gases
gpd	gallons per day

Abbreviations and Acronyms

GWh	gigawatt hour
GWP	global warming potential
HCD	Housing and Community Development Department
HCM	Highway Capacity Manual
HHMD	Health Hazardous Materials Division (LA County Fire Dept.)
HRA	health risk assessment
ICU	intersection capacity utilization
IPCC	Intergovernmental Panel on Climate Change
IPD	Irwindale Police Department
IRRP	Indirect Reuse Replenishment Project
kBTU	thousand British thermal units
kV	kilovolt
kW	kilowatt
kWh	kilowatt hour
L_{dn}	day-night noise level
L_{eq}	equivalent continuous noise level
LACFCD	Los Angeles County Flood Control District
LACFD	Los Angeles County Fire Department
LACM	Los Angeles County Natural History Museum
LACSD	Los Angeles County Sheriff's Department
LACSD	Sanitation Districts of Los Angeles County
LBP	lead-based paint
LEED	Leadership in Energy Efficiency and Design (U.S. Green Building Council)
LID	low impact development
LOS	level of service
LQG	large quantity generator
LST	localized significance thresholds
M_W	moment magnitude
Ma	million years old
MATES	Multiple Air Toxics Exposure Study
MBTA	Migratory Bird Treaty Act
MER	maximum exposed receptor
Metro	Metropolitan Transportation Authority of Los Angeles County

Abbreviations and Acronyms

mgd	million gallons per day
MMBTU	million British thermal units
MMI	modified Mercalli intensity
MMT	million metric tons
MOE	measure of effectiveness
MPO	metropolitan planning organization
MS4	municipal separate storm sewer system
MSGB	Main San Gabriel Basin
MT	metric ton
MUTCD	California Manual on Uniform Traffic Control Devices
MVA	mega-volt-ampere
MW	megawatt
MWD	Metropolitan Water District of Southern California
NAHC	Native American Heritage Commission
NHPA	National Habitat Preservation Authority
NIOSH	National Institute of Occupational Safety and Health
NO_X	nitrogen oxides
NPDES	National Pollution Discharge Elimination System
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
OHP	Office of Historic Preservation
OPR	Governor's Office of Planning and Research
OSHA	Occupational Safety and Health Administration (US)
OSHPD	Office of Statewide Health Planning and Development
OSY	operating safe yield
PCBs	polychlorinated biphenyls
PCE	passenger car equivalent
PDF	project design feature
PM	particulate matter
PPV	peak particle velocity
RCRA	Resource Conservation and Recovery Act
RHNA	Regional Housing Needs Assessment
RMF	Residential Medical Flex (Campus Plan district)

RPS	renewable portfolio standard
RTP/SCS	regional transportation plan / sustainable communities strategy
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCGC	Southern California Gas Company
SCS	sustainable communities strategy
sf	square foot
SGVCOG	San Gabriel Valley Council of Governments
SIP	state implementation plan
SJCWRP	San Jose Creek Water Reclamation Plant
SoCAB	South Coast Air Basin
SO_X	sulfur oxides
SP/yr	service population per year
SQG	small quantity generator
SRA	source receptor area [or state responsibility area]
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminants
TCR	tribal cultural resource
TMDL	total maximum daily load
tpd	tons per day
TTCP	traditional tribal cultural places
UFPs	ultrafine particulates
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
UWMP	urban water management plan
V/C	volume-to-capacity ratio
VCP	vitrified clay pipe

Abbreviations and Acronyms

VdB	velocity decibels
VMT	vehicle miles traveled
VOC	volatile organic compound
WSA	water supply assessment

1. Executive Summary

1.1 INTRODUCTION

This draft environmental impact report (DEIR) addresses the environmental effects associated with the implementation of the proposed City of Hope Campus Plan. The California Environmental Quality Act (CEQA) requires that local government agencies consider the environmental consequences before taking action on projects over which they have discretionary approval authority. An environmental impact report (EIR) analyzes potential environmental consequences in order to inform the public and support informed decisions by local and state governmental agency decision makers. This document focuses on impacts determined to be potentially significant in the Initial Study completed for this project (see Appendix A).

This DEIR has been prepared pursuant to the requirements of CEQA and the City of Duarte's CEQA procedures. The City of Duarte, as the lead agency, has reviewed and revised all submitted drafts, technical studies, and reports as necessary to reflect its own independent judgment, including reliance on City technical personnel from other departments and review of all technical subconsultant reports.

Data for this DEIR was obtained from onsite field observations, discussions with affected agencies, analysis of adopted plans and policies, review of available studies, reports, data and similar literature, and specialized environmental assessments (air quality, biological resources, cultural resources, hazards and hazardous materials, hydrology and water quality, noise, transportation and traffic, and utilities and service systems).

1.2 ENVIRONMENTAL PROCEDURES

This DEIR has been prepared pursuant to CEQA to assess the environmental effects associated with implementation of the proposed project, as well as anticipated future discretionary actions and approvals. CEQA established six main objectives for an EIR:

1. Disclose to decision makers and the public the significant environmental effects of proposed activities.
2. Identify ways to avoid or reduce environmental damage.
3. Prevent environmental damage by requiring implementation of feasible alternatives or mitigation measures.
4. Disclose to the public reasons for agency approval of projects with significant environmental effects.
5. Foster interagency coordination in the review of projects.
6. Enhance public participation in the planning process.

1. Executive Summary

An EIR is the most comprehensive form of environmental documentation in CEQA and the CEQA Guidelines; it is intended to provide an objective, factually supported analysis and full disclosure of the environmental consequences of a proposed project with the potential to result in significant, adverse environmental impacts.

An EIR is one of various decision-making tools used by a lead agency to consider the merits and disadvantages of a project that is subject to its discretionary authority. Before approving a proposed project, the lead agency must consider the information in the EIR; determine whether the EIR was prepared in accordance with CEQA and the CEQA Guidelines; determine that it reflects the independent judgment of the lead agency; adopt findings concerning the project's significant environmental impacts and alternatives; and adopt a statement of overriding considerations if significant impacts cannot be avoided.

1.2.1 EIR Format

Chapter 1. Executive Summary: Summarizes the background and description of the proposed project, the format of this EIR, project alternatives, any critical issues remaining to be resolved, and the potential environmental impacts and mitigation measures identified for the project.

Chapter 2. Introduction: Describes the purpose of this EIR, background on the project, the notice of preparation, the use of incorporation by reference, and Final EIR certification.

Chapter 3. Project Description: A detailed description of the project, including its objectives, its area and location, approvals anticipated to be required as part of the project, necessary environmental clearances, and the intended uses of this EIR.

Chapter 4. Environmental Setting: A description of the physical environmental conditions in the vicinity of the project as they existed at the time the notice of preparation was published, from local and regional perspectives. These provide the baseline physical conditions from which the lead agency determines the significance of the project's environmental impacts.

Chapter 5. Environmental Analysis: Each environmental topic is analyzed in a separate section that discusses: the thresholds used to determine if a significant impact would occur; the methodology to identify and evaluate the potential impacts of the project; the existing environmental setting; the potential adverse and beneficial effects of the project; the level of impact significance before mitigation; the mitigation measures for the proposed project; the level of significance after mitigation is incorporated; and the potential cumulative impacts of the proposed project and other existing, approved, and proposed development in the area.

Chapter 6. Significant Unavoidable Adverse Impacts: Describes the significant unavoidable adverse impacts of the proposed project.

Chapter 7. Alternatives to the Proposed Project: Describes the alternatives and compares their impacts to the impacts of the proposed project. Alternatives include the No Project/No Development Alternative, No Project/Existing General Plan Alternative, and Reduced Intensity Alternative.

Chapter 8. Impacts Found Not to Be Significant: Briefly describes the potential impacts of the project that were determined not to be significant by the Initial Study and were therefore not discussed in detail in this EIR.

Chapter 9. Significant Irreversible Changes Due to the Proposed Project: Describes the significant irreversible environmental changes associated with the project.

Chapter 10. Growth-Inducing Impacts of the Project: Describes the ways in which the proposed project would cause increases in employment or population that could result in new physical or environmental impacts.

Chapter 11. Organizations and Persons Consulted: Lists the people and organizations that were contacted during the preparation of this EIR.

Chapter 12. Qualifications of Persons Preparing EIR: Lists the people who prepared this EIR for the proposed project.

Chapter 13. Bibliography: The technical reports and other sources used to prepare this EIR.

Appendices: The appendices for this document (in PDF format on a CD attached to the front cover) comprise these supporting documents:

- Appendix A: Initial Study/Notice of Preparation (NOP)
- Appendix B: NOP Comments
- Appendix C1: Air Quality and GHG Modeling Data
- Appendix C2: Health Risk Assessment
- Appendix D: Biological Report
- Appendix E1: Cultural Resources Technical Report
- Appendix E2: Paleontological Resources Assessment Report
- Appendix F: Geotechnical Report
- Appendix G: Hazardous Materials Information
- Appendix H1: Hydrology Report
- Appendix H2: Low Impact Development Study
- Appendix I: Noise Modeling Data
- Appendix J1: Transportation Impact Study
- Appendix J2: City of Hope Memorandum
- Appendix J3: Parking Study
- Appendix J4: Parking Demand Rate Memorandum
- Appendix K1: Wastewater Analysis
- Appendix K2: Water Analysis

- Appendix L: Water Supply Assessment
- Appendix M: Public Services Correspondence

1.3 PROJECT LOCATION

The 116-acre project site is located primarily in the City of Duarte (approximately 89.5 acres), and the remainder is within the City of Irwindale (26.5 acres). Less than one-half acre of the project site is not owned by City of Hope. Figure 3-1, *Regional Location*, shows the project site in the regional context of Los Angeles County. The cities of Duarte and Irwindale are in the eastern portion of the San Gabriel Valley, approximately 16 miles northeast of downtown Los Angeles. The City of Duarte is situated at the base of the San Gabriel Mountains and is bordered by the City of Irwindale to the south, City of Monrovia to the west, City of Bradbury and the Angeles National Forest for the north, and the City of Azusa to the east.

As shown in Figures 3-2, *Local Vicinity*, and 3-3, *Aerial Photograph*, the project site is generally bounded by Duarte Road to the north; Cinco Robles Drive, the Duarte Flood Control Channel, and Buena Vista Street to the west; and the Santa Fe Flood Control Basin to the east and south. The project site encompasses the City of Hope campus and other properties along Cinco Robles Drive. Regional access to the project site is via Interstates 210 and 605 (I-210 and I-605). Local access is provided primarily from Duarte Road, with secondary access provided from Buena Vista Street.

1.4 PROJECT SUMMARY

City of Hope Campus Plan would provide direction for the enhancement and development of the 116-acre project site over a period of approximately 20 years. City of Hope is an independent, nonprofit, comprehensive medical center and research facility. The proposed Campus Plan provides the vision, guidance, and implementation tools to govern the future of the campus. City of Hope endeavors to expand its research and treatment capabilities while accommodating the needs of its patients and their families, faculty, staff, and the community. The proposed Specific Plan is part of City of Hope's commitment to transform the future of medicine.

The proposed Specific Plan contains required elements to encourage a broad range of design solutions to guide development and improvements. The proposed Specific Plan addresses the replacement of existing outdated and/or obsolete buildings with modern facilities, including outpatient (clinic), inpatient (hospital), research, office, industrial, warehouse, and hospitality uses. The Specific Plan also allows the development of parking structures, surface parking lots, internal roadways, pedestrian amenities, landscaping, open space, and other related improvements. Ultimately, City of Hope Campus Plan would create a more walkable and compact campus core that builds upon and enhances existing inpatient and outpatient facilities, research, office, assembly, parking, and open space uses. In addition, the Specific Plan proposes to consolidate modular buildings that are currently dispersed throughout the campus, demolish outdated buildings, and construct new floor area within larger development sites.

The Specific Plan would act as a bridge between Duarte and Irwindale's general plans and campus development activity. Jurisdictions may adopt specific plans by resolution or ordinance. When a specific plan is adopted by ordinance, it replaces portions or all of the current zoning regulations for specified parcels and becomes an independent set of zoning regulations that govern use and development of properties within the bounds of that specific plan.

The Specific Plan is proposed to be adopted by ordinance by the Duarte City Council and subsequently by the Irwindale City Council. The Specific Plan will function as the regulatory document for implementing zoning for the entire project site, ensuring the orderly and systematic implementation of those cities' general plans. The Specific Plan would establish the necessary land use plan, development standards, regulations, design guidelines, infrastructure systems, and implementation strategies on which subsequent, project-related development activities would be founded. Upon adoption of the Specific Plan, subsequent project-specific design review plans, detailed site plans, grading and building permits, or any other actions requiring either ministerial or discretionary approvals would be required to demonstrate consistency with the Specific Plan.

There are six residences—located east of Cinco Robles Drive—within the proposed Specific Plan area that are not owned by City of Hope and not part of its campus. Following adoption of the Specific Plan, these residential uses may continue as residential uses. However, no new residential uses are proposed.

The maximum development capacity has been calculated to provide a conservative estimate of potential environmental impacts from full buildout. As shown in Table 1-1, maximum buildout would consist of approximately 2,639,350 square feet of gross development (1,038,500 net new square feet following the proposed demolition of 387,500 square feet of existing structures). The Specific Plan would allow for the demolition of portable or out-of-date structures, including 335,500 gross square feet within the Core Medical District and 52,000 gross square feet in the Infrastructure and Utility District. No buildings would be demolished in the Cultural Amenity District. This would result in the potential for up to 387,500 gross square feet of structures to be demolished.

Table 1-1 Proposed Buildout by Land Use District

Land Use District	Existing Conditions (GSF)	Proposed Demolition (GSF)	Proposed New Buildings (GSF)	Proposed Net New Development (GSF)	Existing With Net New (GSF)
Core Medical (CM)[1]	1,421,417	335,500	1,366,000	1,030,500	2,451,917
Transition Medical (TM)	5,958[2]	0		0	5,958
Cultural Amenity (CA)	40,322	0	0	0	40,332
Infrastructure and Utility (IU)	133,153	52,000	60,000	8,000	141,153
Total[3]	**1,600,850**	**387,500**	**1,426,000**	**1,038,500**	**2,639,350**

Source: City of Hope 2016.
Notes: GSF = Gross Square Feet
1 Buildout of the RMF District is accounted for in the CM District. The RMF District is intended to allow flexibility for the existing residential units to continue to operate as campus housing for students, faculty, and guests at the campus, or to transition to new uses over time, such as hospitality or open space. This designation is not intended for new development of market-rate, for-sale housing or rental housing that is not part of campus operations.
2 The existing development in the TM District consists of four housing units, four of which are rented by graduate students attending City of Hope's Irell & Manella Graduate School of Biological Sciences.
3 Total square footage includes residential uses allowed within the RMF District but does not include parking structure square footage.

Buildout of the proposed Specific Plan would increase population and employment by approximately 9,393 people (employees, patients and visitors) and 6,474 employees.

A detailed project description, including potential development scenario by phase is provided in Section 3.3.1, *Description of the Project*, of this EIR.

1.5 SUMMARY OF PROJECT ALTERNATIVES

The CEQA Guidelines (Section 15126.6[a]) state that an EIR must address "a range of reasonable alternatives to the project, or to the location of the project, which could feasibly attain the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project and evaluate the comparative merits of the alternatives." The alternatives were based, in part, on their potential ability to reduce or eliminate the impacts determined to be significant and unavoidable for the proposed Specific Plan. The following three alternatives have been determined to represent a reasonable range of alternatives which have the potential to feasibly attain most of the basic objectives of the project but which may avoid or substantially lessen any of the significant effects of the project. These alternatives are analyzed in detail in Chapter 7, *Alternatives to the Proposed Project*, of this DEIR.

- No Project/No Development Alternative
- No Project/Existing General Plan Alternative
- Reduced Intensity Alternative

An EIR must identify an "environmentally superior" alternative, and where the No Project Alternative is identified as environmentally superior, the EIR is then required to identify as environmentally superior an alternative from among the others evaluated. Each alternative's environmental impacts are compared to the proposed project and determined to be environmentally superior, neutral, or inferior. However, only impacts found significant and unavoidable are used in making the final determination of whether an alternative is environmentally superior or inferior to the proposed project. Only the impacts involving greenhouse gas emissions, noise, and traffic were found to be significant and unavoidable. Section 7.8 identifies the environmentally superior alternative.

Table 1-2 provides a summary of square footage and employment buildout figures for each of the three alternatives and the proposed project. This table was developed as a tool to better understand the differences between the proposed project and the alternatives.

Table 1-2 Alternatives Comparison

	Proposed Campus Plan	No Project/No Development Alternative	No Project/Existing General Plan Alternative[1]	Reduced Intensity Alternative
Square Footage	2,639,350	1,600,850	2,944,670	2,243,448
Employment	6,474	3,633	7,223	5,559
Population[2]	9,393	6,448	10,479	8,374

1. Buildout of the existing general plan was calculated based on the assumption that: 1) For Duarte: 1.5 FAR is allowed with a height limit of 75 feet; 50 percent of the site is developable; and the FAR excludes parking structures (2,874,960 sf); 2) For Irwindale, assumed the existing square footage (69,709 sf); and 3) employees prorated based on square feet.
2. Population includes all persons traveling to the project site: employees, patients, visitors, contractors, physicians, and residents.

1.5.1 No Project/No Development Alternative

This alternative evaluates what would occur if the project is not approved, and is based upon existing conditions and available infrastructure. The project site is developed with 1,600,850 square feet of medical and research facilities, landscaped gardens, open spaces, two-lane roadways, drive aisles, and associated parking. Under this alternative, City of Hope would make minor fixes and modification to its aging buildings and support facilities, including repairing outdated utility and service systems over time. Many of the City of Hope buildings are more than 50 years old and reaching the end of their expected life span for this type of construction and use. The electrical, mechanical, and plumbing systems have surpassed a reasonably expected 30-year life span and are costly and difficult to maintain. Under this alternative, no demolition of existing buildings or construction of new medical and research facilities would occur. Compared to the project, this alternative would result in a reduction of 1,038,500 square feet of medical and research uses and 2,841 employees.

1.5.2 No Project/Existing General Plan Alternative

Section 15126.6(e) of the CEQA Guidelines requires that an EIR evaluate and analyze the impacts of the "No-Project" Alternative. When the project is the revision of an existing land use or regulatory plan, policy, or ongoing operation, the no-project alternative is the continuation of the plan, policy, or operation into the future. Therefore, under the No Project/Existing General Plan Alternative, the current general plan land uses and zoning would remain in effect. All proposed changes to land uses and boundaries in the Campus Plan area would not occur. Development in accordance with the existing zoning would continue to occur, allowing for a total of 2,944,670 square feet of hospital uses and 7,223 employees. This represents an increase of 305,320 total nonresidential square feet and 749 employees compared to the proposed project. Buildout of the existing general plan was calculated based on the assumption that: 1) For Duarte: 1.5 floor area ratio (FAR) is allowed with a height limit of 75 feet; 50 percent of the site is developable; and the FAR excludes parking structures (2,874,960 sf); 2) For Irwindale, assumed the existing square footage (69,709 sf); and 3) employees prorated based on square feet (see Table 7-1 footnote).

The area of the project site within Duarte (89.5 acres) is designated as Hospital (encompasses the majority of the project site), Single-Family Residential, Medium-Density Residential, High-Density Residential, Research and Development, and Public Facilities in the general plan and zoned H (Hospital), R-1 (One-Family Residential), R-2 (Two-Family Residential), R-4 (Multiple Family Residential High Density), and O (Open

Space). The area of the project site within Irwindale (26.5 acres) is designated as Industrial/Business Park (IBP), Open Space/Easements (OSE), and Commercial in the general plan and zoned A-1 (Agricultural), M-1 (Light Manufacturing), and C-2 (Heavy Commercial).

1.5.3 Reduced Intensity Alternative

This Reduced Intensity Alternative was selected to avoid or substantially lessen significant unavoidable impacts related to GHG emissions, noise (construction), and traffic. In order to eliminate a significant and unavoidable transportation impact an approximate 25 percent reduction in daily trips would be required, a net increase of 3,565 trips. Based on the trip generation rates established in the traffic analysis (see Appendix J1), the campus population generates 1.85 daily trips per person, which translates to an allowable net increase of 1,926 population (an approximate 35 percent reduction in population compared to the proposed project) (see Table 7-1). This reduction in trips and population would result in a proportional decrease in building square footage of 15 to 25 percent, which would occur proportionally across the campus. This reduction in building square footage and overall intensity would also reduce impacts related to GHG emissions, and noise. Implementation of the Specific Plan provisions would still apply.

1.6 ISSUES TO BE RESOLVED

Section 15123(b)(3) of the CEQA Guidelines requires that an EIR contain issues to be resolved, including the choice among alternatives and whether or how to mitigate significant impacts. With regard to the proposed Specific Plan, the major issues to be resolved include decisions by the lead agency as to:

1. Whether this DEIR adequately describes the environmental impacts of the project.
2. Whether the benefits of the project override those environmental impacts which cannot be feasibly avoided or mitigated to a level of insignificance.
3. Whether the proposed land use changes are compatible with the character of the existing area.
4. Whether the identified goals, policies, or mitigation measures should be adopted or modified.
5. Whether there are other mitigation measures that should be applied to the project besides the Mitigation Measures identified in the DEIR.
6. Whether there are any alternatives to the project that would substantially lessen any of the significant impacts of the proposed project and achieve most of the basic project objectives.

1.7 AREAS OF CONTROVERSY

Prior to the preparation of the DEIR, the City of Duarte circulated a Notice of Preparation (NOP) and Initial Study on October 15, 2015 (see Appendix A). Comments received during the initial study's public review period, from October 15, 2015, to November 16, 2015, are in Appendix B. A public scoping meeting was also held on October 19, 2015, at the Duarte Community Center, 1600 Huntington Drive, to determine the concerns of interested parties regarding the environmental analysis. A summary of comments received on the NOP are provided in Table 2-1. The table provides references to the sections of the DEIR in which these issues are evaluated. No other areas of controversy are known to the lead agency.

1.8 SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND LEVELS OF SIGNIFICANCE AFTER MITIGATION

Table 1-3 summarizes the conclusions of the environmental analysis contained in this EIR. Impacts are identified as significant or less than significant, and mitigation measures are identified for all significant impacts. The level of significance after imposition of the mitigation measures is also presented.

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1. Executive Summary

Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
5.1 AESTHETICS			
Impact 5.1-1: Implementation of the Campus Plan would alter the visual appearance and character of the project site.	**Potentially Significant**	Mitigation Measures AQ-1 and N-1 in Sections 5.2, *Air Quality*, and 5.10, *Noise*, respectively, apply.	Less Than Significant
Impact 5.1-2: Implementation of the Campus Plan could cause shade and shadow impacts on surrounding uses.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.1-3: Buildout of the proposed Campus Plan would generate additional light and glare at the project site.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impact	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.2 AIR QUALITY			
Impact 5.2-1: The proposed project would be consistent with the South Coast Air Quality Management District's Air Quality Management Plan.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.2-2: Construction activities associated with the proposed project would not generate short-term emissions in exceedance of SCAQMD'S regional threshold criteria.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.2-3: Long-term operation of the project would not generate additional emissions in exceedance of SCAQMD's regional significance thresholds.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.2-4: Construction of the proposed project during Phase I would exceed the SCAQMD screening-level LST for $PM_{2.5}$ and potentially expose sensitive receptors to substantial pollutant concentrations.	**Potentially Significant**	AQ-1 During construction, the construction contractor shall water open exposed surfaces a minimum of three times per day or apply other soil stabilizers on inactive construction areas consistent with the Best Available Control Measures identified in South Coast Air Quality Management District (SCAQMD) Rule 403 to minimize fugitive dust emissions generated from ground disturbing activities. Prior to issuance to construction permits, the	Less Than Significant

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Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		construction contractor shall note the watering and/or soil stabilization requirement on all construction plans submitted to the entity with jurisdiction over the project, i.e., either the City of Duarte, City of Irwindale, and/or Office of Statewide Health Planning and Development.	
Impact 5.2-5: Project-related construction activities could result in potentially significant cancer risk impacts to nearby off-site residences.	**Potentially Significant**	AQ-2 The project construction contractor(s) shall use construction equipment fitted with Level 3 Diesel Particulate Filters (DPF) for all construction equipment of 50 horsepower or more. Prior to any construction, the construction contractor(s) shall ensure that all construction plans submitted to the entity with jurisdiction over the project, i.e., either the City of Duarte, City of Irwindale, and/or Office of Statewide Health Planning and Development, clearly show the requirement for Level 3 DPF for construction equipment over 50 horsepower. During construction, the construction contractor(s) shall maintain a list of all operating equipment in use on the project site for verification by the entity with jurisdiction over the project, i.e., either the City of Duarte, City of Irwindale, and/or Office of Statewide Health Planning and Development. The construction equipment list shall state the makes, models, and number of construction equipment on site. Equipment shall be properly serviced and maintained in accordance with manufacturer recommendations. The construction contractor(s) shall ensure that all non-essential idling of construction equipment is restricted to five minutes or less in compliance with California Code of Regulations Title 13, Article 4.8, Chapter 9, Section 2449.	Less Than Significant
Impact 5.2-6: Implementation of the proposed City of Hope Campus Plan would not expose sensitive receptors to substantial pollutant concentrations.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impact	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.3 BIOLOGICAL RESOURCES			
Impact 5.3-1: Implementation of the Campus Plan would not impact habitat for sensitive wildlife or plant species; however, construction noise could impact adjacent sensitive wildlife.	**Potentially Significant**	Mitigation Measure N-1 in Section 5.10, *Noise*, applies.	Less Than Significant

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Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact 5.3-2: Implementation of the Campus Plan would not cause the loss of riparian habitats or sensitive natural communities.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.3-3: Implementation of the Campus Plan would not impact jurisdictional waters or wetlands jurisdictional to the Corps, CDFW, or LARWQCB.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.3-4: Tree removal during the course of Campus Plan buildout could cause loss of active bird nests.	**Potentially Significant**	BIO-1 Prior to issuance of permits for any construction activity, the project applicant shall demonstrate compliance with the federal MBTA and submit required nesting bird surveys to the City of Duarte. Construction outside the nesting season (between September 1st and February 15th) does not require pre-removal nesting bird surveys. If construction is proposed between February 16th and August 31st, a qualified biologist must conduct a nesting bird survey(s) no more than three (3) days prior to initiation of grading to document the presence or absence of nesting birds within or directly adjacent (100 feet) to the project site. The preconstruction survey(s) shall focus on identifying any raptors and/or passerines nests that may be directly or indirectly affected by construction activities. If active nests are documented, species-specific measures shall be prepared by a qualified biologist and implemented to prevent abandonment of the active nest. At a minimum, grading in the vicinity of a nest shall be postponed until the young birds have fledged. A minimum exclusion buffer shall be maintained during construction, depending on the species and location per the discretion of the qualified biologist. The perimeter of the nest setback zone shall be fenced or adequately demarcated with stakes and flagging at 20-foot intervals, and construction personnel and activities restricted from the area. A survey report by a qualified biologist verifying that no active nests are present or that the young have fledged, shall be submitted to the City of Duarte prior to initiation of grading in the nest-setback zone. The qualified biologist shall serve as a biological monitor during those periods when construction activities occur near active nest areas to ensure that no inadvertent impacts on these nests occur. A final report of the findings, prepared by a qualified biologist, shall be submitted to the City of Duarte prior	Less Than Significant

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Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		to construction-related activities that have the potential to disturb any active nests during the nesting season. Any nest permanently vacated for the season would not warrant protection pursuant to the MBTA.	
Cumulative Impact	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.4 CULTURAL RESOURCES			
Impact 5.4-1: Buildout of the Campus Plan could impact an identified historic resource.	**Potentially Significant**	CUL-1 Prior to the issuance of any permits allowing development within the Specific Plan area that involves demolition or alteration to properties (buildings, structures, and landscape areas) that are at least 45 years of age at the time of such activity, and that were not previously identified for evaluation in the 2016 historical resources survey (GPA 2016), the City of Duarte or City of Irwindale, as applicable, shall require the applicant to prepare a Historical Resources Evaluation Report (HRER) to evaluate such properties. The HRER shall be prepared by a qualified architectural historian or historian who meets the Secretary of the Interior's Professional Qualifications Standards in architectural history or history. The qualified architectural historian or historian shall conduct an intensive-level evaluation in accordance with the guidelines and best practices promulgated by the State Office of Historic Preservation to identify any potential historical resources within the proposed development area. All evaluated properties shall be documented on Department of Parks and Recreation Series 523 Forms. For all properties determined to qualify as potential historical resources, the HRER shall include a discussion of those properties' character defining features. The character-defining features documented will include site plan features, overall massing, scale, and spatial relationships between buildings and landscaping/circulation corridors, architectural details and design composition, and all contributing materials, features, and finishes. Properties with interiors that were historically accessible to the public will also be evaluated for potential historic significance. The HRER shall be submitted to the City of Duarte or City of Irwindale, as applicable, for review and concurrence. • Secretary's Standards Project Review Memorandum: For all properties identified as potential historical resources in the HRER, during the planning phase for the development in the Campus Plan area that may impact such properties (prior to any construction activities), input shall	Less Than Significant

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Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

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		be sought from a California architectural historian or historic architect meeting the Secretary of the Interior's Professional Qualifications Standards to ensure that the development complies with the Secretary's Standards for the Treatment of Historic Properties (Standards). The findings and recommendations of the architectural historian or historic architect shall be documented in a Secretary's Standards Project Review Memorandum (Memorandum), at the schematic design phase. This Memorandum shall analyze all components of the development for compliance with the Standards. Components to be analyzed shall include direct and indirect changes to historical resources and their setting. Should design modifications be necessary to bring the development into compliance with the Standards, the Memorandum will document those recommendations. The intent of the Memorandum is to ensure that the development complies with the Standards in order to avoid significant adverse direct or indirect impacts to historic resources, such that no further environmental review is required. The Memorandum shall be submitted to the City of Duarte or City of Irwindale, as applicable, for review. • To avoid impacts to the two historical resources identified in the 2016 historical resources survey (the City of Hope Visitor's Center and the House of Hope/Temple Beth Hatikvah), any alterations to either property shall comply with the Standards and be carried forward for analysis and documentation through a Secretary's Standards Project Review Memorandum, as discussed above. No new additions shall be added to these buildings except for any potential changes for complying with applicable accessibility requirements. A minimum 20-foot buffer shall be maintained around the two historical resources. This will preserve the immediate setting and spatial relationships between the properties. No new construction shall be completed between the buildings and open space shall be maintained to preserve their immediate setting.	
Impact 5.4-2: Buildout of the Campus Plan could impact archaeological resources.	**Potentially Significant**	CUL-2 Prior to issuance of any permits allowing ground-disturbing activities within the Campus Plan area, the City of Duarte and/or City of Irwindale, as appropriate, shall ensure that an archeologist who meets the Secretary of the Interior's Standards for professional archaeology has been retained for the project and will be on call during all grading and other significant ground-disturbing	Less Than Significant

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Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation

		activities. The Qualified Archaeologist shall ensure that the following measures are followed for the project:
		• Prior to any ground disturbance, the Qualified Archaeologist, or their designee, shall provide Worker Environmental Awareness Protection (WEAP) training to construction personnel regarding regulatory requirements for the protection of cultural (prehistoric and historic) resources. As part of this training, construction personnel shall be briefed on proper procedures to follow should unanticipated cultural resources be made during construction. Workers will be provided contact information and protocols to follow in the event that inadvertent discoveries are made. The WEAP training can be in the form of a video or PowerPoint presentation. Printed literature (handouts) can accompany the training and can also be given to new workers and contractors to avoid the necessity of continuous training over the course of the project.
		• In the event that unanticipated cultural material is encountered during any phase of project construction, all construction work within 50 feet (15 meters) of the find shall cease and the Qualified Archaeologist shall assess the find for importance. Construction activities may continue in other areas. If, in consultation with the appropriate City, the discovery is determined to not be important, work will be permitted to continue in the area.
		  • If a find is determined to be important, additional work may be warranted, or the find can be preserved in place and construction allowed to proceed.
		  • Additional work can include scientific recording and excavation of that portion of the find making the find important.
		  • If excavation of a find occurs, the Qualified Archaeologist shall draft a report within 60 days of conclusion of excavation that identifies the find and summarizes the analysis conducted. The completed report shall be approved by the City and filed with the County and with the South Central Coastal Information Center at California State University, Fullerton.
		  • Excavated finds shall be curated at a repository determined by the	

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Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures		Level of Significance After Mitigation
			Qualified Archaeologist and approved by the City.	

Impact 5.4-3: Buildout of the Campus Plan could impact paleontological resources or a unique geologic feature.	**Potentially Significant**	CUL-3	Prior to the issuance of any permits allowing ground-disturbing activities within the Campus Plan area, the City of Duarte and/or City of Irwindale, as appropriate, shall ensure that a paleontological monitor has been retained for the project. If ground-disturbing activities will exceed a depth of 6 feet below the ground surface, prior to the issuance of grading permits, the City of Duarte and/or City of Irwindale, as appropriate, shall ensure that a qualified paleontologist has been retained for the project. The paleontologist shall prepare a paleontological monitoring program. All grading and other significant ground-disturbing activities more than 6 feet below the ground surface will be monitored by a paleontological monitor. If any evidence of paleontological resources is discovered, the following measures shall be taken:
			• All below-grade work shall stop within a 50-foot radius of the discovery. Work shall not continue until the discovery has been evaluated by a qualified paleontologist.
			• A qualified paleontologist in coordination with the City shall assess the find(s) and determine if they are scientifically important. If the find(s) are of value then:
			  ◦ Scientifically important fossils shall be prepared by the paleontologist and/or his/her designee(s) to the point of identification, identified to the lowest taxonomic level possible, and curated in a museum repository with permanent, retrievable storage.
			  ◦ Significant paleontological resources found shall be preserved as determined necessary by the paleontological monitor.
			  ◦ Excavated finds shall be offered to the Los Angeles County Museum of Natural History or its designee for curation on a first-refusal basis. After which, finds shall be offered to an accredited and permanent scientific institution for the benefit of current and future generations.
			  ◦ Within 60 days of completion of the end of earth-moving activities, the paleontologist shall draft a report summarizing the finds and shall include the inspection period, an analysis of any resources found, and the present repository of the items.
				Less Than Significant

Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		• The paleontologist's report shall be approved by the City. Any resulting reports shall also be filed with the permanent scientific institution where the resources are curated.	
Cumulative Impact	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.5 GEOLOGY AND SOILS			
Impact 5.5-1: Project workers, visitors, and structures would be subject to strong ground shaking.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.5-2: Project workers, visitors, and structures would not be subjected to substantial hazards from ground subsidence, or collapsible or expansive soils.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.6 GREENHOUSE GAS EMISSIONS			
Impact 5.6-1: Buildout of City of Hope Campus Plan would generate a substantial increase in GHG emissions compared to existing conditions and would have a significant impact on the environment.	**Potentially Significant**	GHG-1 Prior to the issuance of building permits for new development projects under the City of Hope Specific Plan, the City of Hope shall adhere to and comply with the following sustainable development features for all components of the project that are not subject to the jurisdiction of the Office of Statewide Health Planning and Development (OSHPD): • Future Alternative Energy Production, Roof Layout Plan. Building orientation and layout shall be designed to facilitate future alternative energy production on-site. The City of Hope shall provide a roof layout plan that illustrates how future installation of a photovoltaic system could be accommodated, including plans that identify installation of conduit from the roof to the electrical room—or to electrical panels if no electrical room is provided—to accommodate future photovoltaic system or other collector/power generation installation. • Energy Efficient Appliances. Projects shall incorporate energy-efficient appliances, such as tankless or solar water heaters and energy-efficient heating and cooling systems. • Transit Stop Improvements. Building entrances and pedestrian	**Significant and Unavoidable**

Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		walkways shall be designed to provide safe and efficient access to nearby public transit stops. Buildings that abut a transit stop shall install a bus pad, turnouts, benches, trash receptacles (and service), shade/shelter, security lighting, bike racks, water features, and/or landscaping. When practical, the bus stop shall be built into the project and be compatible with the development. • Alternative Fuel Vehicles. The City of Hope shall provide preferential parking for alternative-fuel vehicles in the parking structures. The alternative-fuel vehicle parking space shall be provided with a sign that identifies the parking space as designated for use by alternative fuel vehicles. Preferential parking spaces shall be as close as possible to the primary entrance without conflicting with parking provided to meet the Americans with Disability Act requirements or preferential parking provided for carpool/vanpools. • Energy Efficiency, Medium Sized Projects (i.e., nonresidential new construction or modifications of 25,000 to 49,999 square feet of gross floor area). At minimum, the City of Hope shall design medium-sized projects to meet the Tier 1 energy performance standard (Section A5.203.1.2.1) of the 2016 California Green Building Standards Code. If there are applicable local or state standards in effect at the time of project development that would provide higher building energy efficiency than the aforementioned CALGreen Tier 1 performance standard, development projects shall meet those local or state standards. • Energy Efficiency, Large Sized Projects (i.e., nonresidential new construction or modifications of 50,000 or more square feet of gross floor area). At minimum, the City of Hope shall design large-sized projects to meet the Tier 2 energy performance standard (Section A5.203.1.2.2) of the 2016 California Green Building Standards Code. If there are applicable local or state standards in effect at the time of project development that would provide higher building energy efficiency than the aforementioned CALGreen Tier 2 performance standard, development projects shall meet those local or state standards. • Energy Efficient Outdoor Lighting. The City of Hope shall provide overnight security and safety lighting or outdoor lighting on timers or motion detection sensors, or otherwise have the capacity to switch to a	

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Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		dimmer, less energy-intensive mode during hours of reduced activity. • Shading, Medium and Large Size Projects. The City of Hope shall require medium- and large-sized projects to incorporate window shading devices into project design. Window shading devices could include any single or combination of elements, such as extended roof overhangs (i.e., greater than 12 inches), window awnings, decorative sail shades, trellises, or similar elements. Nonglare window tinting may, in appropriate circumstances, function as shading. • Leadership in Energy and Environmental Design (LEED) Certification. The City of Hope shall design small projects (i.e., nonresidential new construction or modifications of less than 25,000 square feet of gross floor area) and medium projects so that they are built to achieve LEED certification (or its equivalent for design features). The City of Hope shall design large projects so that they are built to achieve LEED Silver compliance (or its equivalent for design features). • Heat Island Effect. The City of Hope shall use lighter-colored paving or open-grid paving materials for surface parking areas, or break up large expanses of paved area with shade trees or shade structures, or use light colored roofing materials. • All project design features related to the above listed sustainable development features shall be noted on all building plans of future specific projects submitted to the City of Duarte or City of Irwindale, based on the location of the specific project. Adherence to and implementation of all applicable sustainable development features shall be verified by the City of Duarte or City of Irwindale prior to the issuance of a certificate of occupancy. GHG-2 Components of future development projects within the City of Hope Specific Plan that are subject to the jurisdiction of the Office of Statewide Health Planning and Development (OSHPD) shall be required to comply with Mitigation Measure GHG-1 unless the requirements in these two mitigation measures are in direct conflict with the applicable regulations and building code requirements specific to components/facilities under OSHPD jurisdiction.	
Impact 5.6-2: Implementation of the proposed City of Hope Campus Plan would not conflict	Less Than Significant	No mitigation measures are required.	Less Than Significant

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Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
with plans adopted for the purpose of reducing GHG emissions.			
Cumulative Impacts	**Potentially Significant**	Mitigation Measures GHG-1 and GHG-2 apply.	Less Than Significant
5.7 HAZARDS AND HAZARDOUS MATERIALS			
Impact 5.7-1: Project construction and operations would involve the transport, use, and/or disposal of hazardous materials.	**Potentially Significant**	HAZ-1 Prior to the initiating any ground-disturbing activities pursuant to the Campus Plan, the project applicant shall prepare and submit a Phase I Environmental Site Assessment (ESA) for the entire Campus Plan area to the City of Duarte and City of Irwindale, to assess the existing environmental conditions of the Campus Plan area and evaluate the potential for contamination to be present. The Phase I ESA shall be prepared by an Environmental Professional in accordance with the American Society for Testing and Materials (ASTM) Standard E 1527.13, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process." Prior to issuance of a grading permit or building permit for new construction in the Campus Plan area, an Environmental Professional shall review the relevant portions of the site-wide Phase I ESA and may visit the individual development site to evaluate whether any recognized environmental conditions (RECs) related to soils or groundwater identified in the Phase I ESA are present at the site. If no RECs are identified for that individual development site, no further assessment or remediation shall be required. If RECs are identified for that individual development site, the project applicant shall take additional action, which shall include either (i) a Phase II subsurface investigation for that site, or (ii) localized soil removal/remediation activities in accordance with all applicable regulatory requirements. If a Phase II subsurface investigation is conducted, soil, soil gas, and/or groundwater sampling shall be performed. If contamination is confirmed at concentrations exceeding applicable regulatory thresholds, the project applicant shall perform a screening level risk assessment to evaluate if remedial actions are necessary. The project applicant will also consider the need to consult with the appropriate regulatory agency (e.g., California Department of Toxic Substances Control, Regional Water Quality Control Board, Los Angeles County Fire Department, etc.). All contaminated soils and/or material encountered that is confirmed by sampling to be hazardous under California or federal law shall be disposed of appropriately at a regulated site and in accordance with applicable laws and regulations prior to the completion of grading. The Phase I ESA conducted pursuant to this Mitigation Measure also shall include an assessment of	Less Than Significant

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Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		the possible existence of lead-based paint and asbestos-containing materials in the Campus Plan area. Each individual development site that involves demolition activities shall include an inspection for lead-based paint conducted by a licensed or certified lead inspector/assessor and a survey for asbestos-containing materials conducted by a California Certified Asbestos Consultant. Prior to the issuance of a grading permit or a building permits, a report documenting the completion, results, and follow-up remediation on the recommendations, if any, shall be provided to the City of Duarte Community Development Director and/or City of Irwindale Community Development Director, as appropriate, evidencing that all site remediation activities have been completed.	
Impact 5.7-2: The project site is on a list of hazardous materials sites	**Potentially Significant**	Mitigation Measure HAZ-1 applies.	Less Than Significant
Impact 5.7-3: Implementation of the Campus Plan would not interfere with an adopted emergency response plan or emergency evacuation plan.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.7-4: A designated fire hazard zone in the Santa Fe Flood Control Basin abuts the southeast site boundary. Project buildout would not expose people or structures to substantial wildfire hazards.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.8 HYDROLOGY AND WATER QUALITY			
Impact 5.8-1: Implementation of the Campus Plan would not violate any water quality standards or waste discharge requirements or otherwise degrade water quality.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.8-2: Implementation of the Campus Plan would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there	Less Than Significant	No mitigation measures are required.	Less Than Significant

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Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
would be a net deficit in aquifer volume or a lowering of the local groundwater table.			
Impact 5.8-3: Implementation of the Campus Plan would not substantially alter the existing drainage pattern to result in adverse flooding impacts, create or contribute runoff water that would exceed the capacity of existing or planned stormwater systems, or provide substantial additional sources of polluted runoff.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.8-4: Implementation of the Campus Plan would not expose people or structures to a significant risk of loss, injury, or death involving flooding, as a result of the failure of a levee or dam.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.9 LAND USE AND PLANNING			
Impact 5.9-1: Campus Plan implementation would not conflict with applicable plans adopted for the purpose of avoiding or mitigating an environmental effect.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.10 NOISE			
Impact 5.10-1: Implementation of the Campus Plan would result in temporary noise increases in the vicinity of construction activities.	**Potentially Significant**	N-1 Prior to issuance of permits to perform construction, a construction noise mitigation plan shall be prepared, reviewed, and approved by the City of Duarte Community Development Director or the Irwindale Community Development Director, as applicable. The plan shall be implemented during project construction per the following methods: 1. At least 90 days prior to the start of construction activities, residents within 250 feet of the project site shall be notified of the planned construction activities. The notification shall include a brief description of	**Significant and Unavoidable**

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Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		the project, the activities that would occur, the duration and hours when construction would occur. The notification should include the telephone number of the City's authorized representative to respond in the event of a vibration or noise complaint. 2. At least 10 days prior to the start of construction activities, a sign shall be posted at the entrance to the job site, clearly visible to the public, which contains a contact name and telephone number of the City's authorized representative to respond in the event of a vibration or noise complaint. If the authorized representative receives a complaint, he/she shall investigate, take appropriate corrective action, and report the action to the City. 3. During the entire active construction period and to the extent feasible, limit construction-related trips (including worker commuting, material deliveries, and debris/soil hauling) from residential areas around the project site. For example, such construction-related trips should maximize site access along Village Road (from either Duarte Road from the north or from Buena Vista Street from the south), while minimizing trips along either Cinco Robles Road (south of Duarte Road) or Buena Vista Street (north of Village Road) since both these segments are adjacent to residential/ school receptors). 4. During the entire active construction period, all heavy construction equipment used on the proposed project shall be maintained in good operating condition, with all internal combustion, engine-driven equipment fitted with intake and exhaust mufflers, air intake silencers, and engine shrouds no less effective than as originally equipped by the manufacturer. 5. During the entire active construction period and to the extent feasible, use electrically powered equipment instead of pneumatic or internal combustion powered equipment, since the former are generally quieter than the latter. For example, operating temporary lighting masts using construction-dedicated power blocks/outlets would be preferable to lighting masts that were powered by an on-board, gasoline-fueled generator. Likewise, electric drills (either battery- or outlet-powered) are generally quieter than air-driven drills. 6. During the entire active construction period and to the extent feasible, all	

Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		stationary noise-generating equipment shall be located as far away as possible from neighboring property lines, onsite sensitive receptors (i.e. hospital and hospitality uses), and the Santa Fe Flood Control Basin (which generally delineates the noise-sensitive biological resources to the southeast of the Specific Plan Area) 7. During the entire active construction period and to the extent feasible, limit all internal combustion engine idling both on the site and at nearby queuing areas to no more than five minutes for any given vehicle or machine (as is consistent with state air quality requirements per In-Use Off-Road Diesel Idling Restriction [Code of Regulations Title 13, Article 4.8, Chapter 9, Section 2449] and as required by Mitigation Measure AQ-2). Signs shall be posted at the job site and along queueing lanes to reinforce the prohibition of unnecessary engine idling. 8. During the entire active construction period and to the extent feasible, the use of noise producing signals, including horns, whistles, alarms, and bells will be for safety warning purposes only. Use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with human spotters. 9. Erect a temporary noise barrier/curtain between residential receptors that (a) share a boundary with the project site and any project construction zones within 100 feet of the shared boundary and (b) when such a nearby construction zone will use any equipment items rated at 80 dBA or above per FTA Manual Table 12-1. A temporary noise barrier/curtain shall also be placed between a construction zone within 100 feet (or a distance recommended by a qualified biologist) of the southeast boundary and the Santa Fe Flood Control Basin to minimize construction noise impacts to sensitive biological resources in the basin. The temporary sound barrier would block line of sight noise levels to adjacent properties and substantially reduce noise levels at the Santa Fe Flood Control Basin due to its elevation which is lower than the project site. The sound barrier shall have a minimum height of 12 feet and be free of gaps and holes and must achieve a Sound Transmission Class (STC) of 35 or greater. The barrier can be (a) a ¾-inch-thick plywood wall or (b) a hanging blanket/curtain with a surface density or at least 2	

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Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		pounds per square foot. For either configuration, the construction side of the barrier shall have an exterior lining of sound absorption material with a Noise Reduction Coefficient (NRC) rating of at least 0.7. 10. During the entire active construction period and to the extent feasible, high noise-producing activities shall be scheduled so as to minimize disruption at both onsite and offsite sensitive land uses. The above conditions shall be implemented by the construction contractor(s) via a designated health, safety and environmental coordinator or a similar person. The details of the construction noise mitigation plan, including those listed above, shall be included as part of the permit application drawing set and as part of the construction drawing set. Verification shall be performed by the City building inspection staff.	
Impact 5.10-2: Campus Plan implementation would result in long-term operation-related noise that would not exceed local standards.	Less Than Significant	No mitigation measures are required.	Less Than Significant

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Environmental Impact	Level of Significance Before Mitigation		Mitigation Measures	Level of Significance After Mitigation
Impact 5.10-3: Implementation of the Campus Plan would create short-term groundborne vibration and groundborne noise.	**Potentially Significant**	N-2	Prior to issuance of permits to perform demolition, construction, grading, foundation, and erection activities that would use vibration-producing equipment, a construction vibration mitigation plan shall be prepared, reviewed, and approved by the City of Duarte Community Development Director or the Irwindale Community Development Director, as applicable. The plan shall be implemented during project construction per the following methods: 1. Prior to the start of construction activities, the construction contractor shall document, the pre-construction baseline conditions by inspecting and reporting on the then-current foundation and structural condition of the buildings and/or structures with ground-based foundations (including pools, hot-tubs, and spas) within 50 feet of any construction site boundaries. Such inspections and documentation may be needed at offsite, private properties. In such cases, the Contractor shall make a good-faith, reasonable effort to contact the owners of these private properties and request their permission to conduct such inspection/documentation efforts (to establish the pre-construction baseline). If such good-faith, reasonable efforts be rejected by any given property owner (or if such contact attempts are met with no cooperation or silence from the property owner), the implementation at such a property shall be considered as not feasible at that given property. 2. During the entire active construction period and to the extent feasible, vibratory rollers shall not be operated within 30 feet of buildings or other structures, and large bulldozers and loaded trucks shall not be operated within 15 feet of buildings or other structures. This measure ensures that vibratory rollers or large bulldozers do not exceed the potential damage threshold and eliminates the source of any potentially significant vibration impact. 3. During the entire active construction period, if any vibration levels cause cosmetic or structural damage to the offsite buildings within 50 feet of the project site and that were previously inspected and documented [per point 1 above], City staff shall immediately issue "stop-work" orders to the construction contractor to prevent further damage. Such cosmetic or structural damage shall include, but not limited to, cracks in walls or ceilings [particularly around doors and windows], sticking/rubbing doors	Less Than Significant

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		or openable windows, fallen or displaced ceiling tiles, and/or items displaced from shelving. Work shall not restart until the buildings are stabilized and/or preventive measures are implemented to relieve further damage to the building(s). The above conditions shall be implemented by the construction contractor(s) via a designated health, safety and environmental coordinator or a similar person. The details of the construction vibration mitigation plan, including those listed above, shall be included as part of the permit application drawing set and as part of the construction drawing set. Verification shall be performed by the City building inspection staff.	
Cumulative Impacts	**Potentially Significant**		**Significant and Unavoidable**
5.11 POPULATION AND HOUSING			
Impact 5.11-1: Implementation of the Campus Plan could result in population growth in the project area.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.11-2: Project implementation could result in the replacement of housing for other uses allowed within the Campus Plan.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.12 PUBLIC SERVICES			
FIRE PROTECTION AND EMERGENCY SERVICES			
Impact 5.12-1: Implementation of the Campus Plan would introduce new structures, workers, patients, and visitors into the LACFD service boundaries. The LACFD estimates that it can serve the completed project with existing firefighting resources in and near the project site.	Less Than Significant	No mitigation measures are required.	Less Than Significant

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Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
POLICE PROTECTION			
Impact 5.12-2: Implementation of the Campus Plan would introduce new structures, workers, patients, and visitors into the service area of the LACSD and IPD, thereby increasing the demand on police protection facilities and personnel.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
OTHER SERVICES			
Impact 5.12-3: The proposed project would not generate new residents that would impact school or library facilities or services	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.13 RECREATION			
Impact 5.13-1: Implementation of Campus Plan would generate additional employees that would increase the use of existing park and recreational facilities.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.14 TRANSPORTATION/TRAFFIC			
Impact 5.14-1: Project-related trip generation would impact levels of service for the existing area roadway system.	**Potentially Significant**	TRAF-1 Prior to the issuance of the first certificate of occupancy for a new building constructed pursuant to the City of Hope Campus Plan, the project applicant shall install signals for the intersections listed below or prepare a signal warrant study pursuant to Caltrans' California Manual on Uniform Traffic Control Devices. If a signal warrant study prepared in coordination with the responsible agency, shows that signalization is warranted, the project applicant shall install the required signal(s). If signalization is not warranted, an updated signal warrant study for each of the unsignalized intersections identified below shall be prepared every five years until project buildout.	**Significant and Unavoidable**

1. Executive Summary

Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Signal installation and/or signal warrant analyses shall be conducted for the following intersections[1]: • 8. I-605 Northbound Off-Ramp & Live Oak Avenue • 16. Buena Vista Street & Village Road • 17. I-210 Westbound Off-Ramp & Central Avenue • 19. Village Road & Duarte Road • 22. Circle Road & Duarte Road TRAF-2 Prior to the issuance of building permits, the project applicant shall make fair-share payments to the City of Irwindale toward the construction of traffic improvements to Avenida Barbosa at Arrow Highway (#6) as follows: • Modify the eastbound approach on Arrow Highway to provide a second eastbound left-turn lane within the existing roadway width. • Restriping the approach to change from one left-turn lane and two through lanes into two left-turn lanes and two through lanes. TRAF-3 Prior to issuance of permits for any construction activity, the project applicant shall prepare a construction management plan. The Construction Management Plan shall be approved by the Cities of Duarte and Irwindale Public Works Department. The construction management plan shall identify construction hours, truck routes, travel patterns for haul routes, staging and parking areas, staggered worker arrival times, and safety procedures for pedestrians and bicyclists. The construction management plan shall prohibit the use of heavy construction vehicles during peak hours; establish requirements for the loading, unloading, and storage of materials on the project site; and establish requirements for the temporary removal of parking spaces, time limits for the reduction of travel lanes, and closing or diversion of pedestrian facilities to ensure the safety of pedestrian and access to local businesses. The plan shall also require the construction contractor to implement the following measures during construction activities, which shall	

1 Intersections # 16, 17, 19, and 22 meet peak hour signal warrant criteria under the future baseline scenario; intersection #8 meets warrant criteria at a 43 percent net increase in population.

Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		be discussed at the pre-grading conference/meeting: • A flagman shall be placed at the truck entry and exit from the project site onto Duarte Road and Buena Vista Street to control the flow of exiting trucks. • The preferred haul route to and from the project site shall be Duarte Road, Buena Vista Street (south of Village Road), Avenida Barbosa, and Arrow Highway for inbound and outbound trucks to north I-605. Trucks shall not be permitted to travel along local residential streets. • Deliveries and pick-ups of construction materials shall be scheduled during non-peak travel periods and coordinated to reduce the potential of trucks waiting to load or unload for protracted periods of time. • Access shall remain unobstructed for land uses in proximity to the project site during construction. • In the event of a lane or sidewalk closure, a worksite traffic control plan, shall be implemented to route traffic or pedestrians around any such lane or sidewalk closures. • Coordinate with the Cities and emergency service providers to ensure adequate access is maintained to the project site and neighboring businesses. • Schedule vehicle movements to minimize vehicles waiting off-site and impeding public traffic flow on the surrounding streets.	
Impact 5.14-2: Project-related trip generation in combination with existing and proposed cumulative development would not result in designated road and/or highways exceeding county congestion management agency service standards.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.14-3: Project circulation improvements would not create hazardous conditions (sharp curves, etc.), potential conflicting uses, and emergency access.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.14-4: The proposed project would not	Less Than Significant	No mitigation measures are required.	Less Than Significant

1. Executive Summary

Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
result in inadequate emergency access.			
Impact 5.14-5: The proposed project complies with adopted policies, plans, and programs for alternative transportation.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	**Potentially Significant**	Mitigation Measure TRAF-1 applies.	**Significant and Unavoidable**
5.15 TRIBAL CULTURAL RESOURCES			
Impact 5.15-1: Grading activities associated with implementation of the Campus Plan have the potential to encounter tribal cultural resources.	**Potentially Significant**	Mitigation Measure CUL-2 in Section 5.4, *Cultural Resources*, applies.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.16 UTILITIES AND SERVICE SYSTEMS			
WASTEWATER TREATMENT AND COLLECTION			
Impact 5.16-1: Wastewater generated by buildout of the proposed Campus Plan would be adequately conveyed by existing infrastructure and adequately treated by the wastewater service provider for the project site.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
WATER SUPPLY AND DISTRIBUTION SYSTEMS			
Impact 5.16-2: Adequate water supply is available to meet water demands of the proposed project; however additional water infrastructure is required to increase groundwater production capacity.	**Potentially Significant**	USS-1 Prior to issuance of building permits for a new building that increases water demand in the project area, the project applicant shall provide a conditional "will serve" letter from the water provider to the City of Duarte and City of Irwindale, as applicable, evidencing that upon compliance with all rules and regulations of the California Public Utilities Commission (CPUC), and all applicable water provider tariffs on file with the CPUC there will be adequate water supply and/or well capacity to serve the demands of that building. Prior to the issuance of a certificate of occupancy for such a new building, the project applicant shall provide a final "will serve" letter from the water provider	Less Than Significant

1. Executive Summary

Table 1-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		to the City of Duarte and/or City of Irwindale, as applicable, confirming that all conditions set forth in the conditional "will serve" letter have been satisfied.	
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
SOLID WASTE			
Impact 5.16-3: Existing and proposed facilities would accommodate project-generated solid waste and comply with related solid waste regulations.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant
5.17 ENERGY			
Impact 5.17-1: Existing and planned electricity and natural gas supplies would be able to accommodate project-generated utility demands.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Impact 5.17-2: The proposed project would not result in inefficient, wasteful and unnecessary consumption of energy.	Less Than Significant	No mitigation measures are required.	Less Than Significant
Cumulative Impacts	Less Than Significant	No mitigation measures are required.	Less Than Significant

1. Executive Summary

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2. Introduction

2.1 PURPOSE OF THE ENVIRONMENTAL IMPACT REPORT

The California Environmental Quality Act (CEQA) requires that all state and local governmental agencies consider the environmental consequences of projects over which they have discretionary authority before taking action on those projects. This draft environmental impact report (DEIR) has been prepared to satisfy CEQA (Public Resources Code, §§ 21000 et seq.) and the State Guidelines for Implementation of CEQA (CEQA Guidelines), as amended (California Code of Regulations, §§ 15000 et seq.). The environmental impact report (EIR) is the public document designed to provide decision makers and the public with an analysis of the environmental effects of the proposed project, to indicate possible ways to reduce or avoid environmental damage and to identify alternatives to the project. The EIR must also disclose significant environmental impacts that cannot be avoided; growth inducing impacts; effects not found to be significant; and significant cumulative impacts of all past, present, and reasonably foreseeable future projects.

The intent of the DEIR is to provide sufficient information on the potential environmental impacts of the proposed City of Hope Campus Plan to allow the City of Duarte to make an informed decision regarding approval of the project. Specific discretionary actions to be reviewed by the City are described in Section 3.4, *Intended Uses of the EIR*.

The overall purpose of this DEIR is to inform the lead agency, responsible agencies, decision makers, and the general public about the environmental effects of the development and operation of the proposed City of Hope project. This DEIR addresses effects that may be significant and adverse, evaluates alternatives to the project, and identifies mitigation measures to reduce or avoid adverse effects.

2.1.1 CEQA Tiering and Streamlining

CEQA establishes a number of procedures that future projects may rely on to narrow and streamline future environmental review in order to reduce duplicative analysis. When an EIR is certified, future projects consistent with the density established by the general plan and zoning shall not require future environmental review. CEQA Guidelines Section 15183(a) states:

> CEQA mandates that projects which are consistent with the development density established by existing zoning, community plan, or general plan policies for which an EIR was certified shall not require additional environmental review, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site. This streamlines the review of such projects and reduces the need to prepare repetitive environmental studies.

Future environmental review should be limited to and analysis significant effects or potentially significant impacts that were not addressed in the prior EIR (CEQA Guidelines Section 15183(b)). If future planned development changes from the project analyzed in the prior EIR, future environmental review would be guided by Public Resources Code Section 21166.

The City of Hope Campus Plan EIR analyzes the environmental impacts of buildout of the Campus Plan and associated entitlements (see Section 3.3.1 of this DEIR), including changes that would occur to the environment during all phases of planning, construction, and operation. This EIR is intended to cover the environmental analysis for future development on the campus that is consistent with the City of Hope Specific Plan.

2.1.2 Lead Agency

Pursuant to CEQA in Public Resources Code Section 21067 and Guidelines Section 15051, the lead agency means "the public agency which has the principal responsibility for carrying out or approving a project which may have a significant effect upon the environment."

The Cities of Duarte and Irwindale are responsible for approving the City of Hope project, including the requisite environmental review process. Although the project site is within Duarte and Irwindale, the majority of the project site and future development applications would be in Duarte. Therefore, the City of Duarte is the lead agency under CEQA, and the City of Irwindale is a responsible agency.

2.2 NOTICE OF PREPARATION AND INITIAL STUDY

The City of Duarte determined that an EIR would be required for this project and issued a Notice of Preparation (NOP) and Initial Study on October 15, 2015 (see Appendix A). Comments received during the initial study's public review period, from October 15 to November 16, 2015, are in Appendix B.

The NOP process helps determine the scope of the environmental issues to be addressed in the DEIR. Based on this process and the initial study for the project, certain environmental categories were identified as having the potential to result in significant impacts. Issues considered Potentially Significant are addressed in this DEIR, but issues identified as Less Than Significant or No Impact are not. Refer to the initial study in Appendix A for discussion of how these initial determinations were made.

Ten agencies/interested parties responded to the NOP. This DEIR has taken those responses into consideration. Table 2-1 summarizes the issues identified by commenting agencies or persons and a reference to the section(s) of this DEIR where the issues are addressed.

2. Introduction

Table 2-1 NOP Comment Summary

Commenting Agency/Person	Date	Comment Type	Comment Summary	Issue Addressed In:
Agencies				
California Department of Transportation (Caltrans)	11/3/2015	Traffic	▪ Requests presentation of assumptions and methods used to develop trip generation, choice of travel mode, and assignment of trips. ▪ Coordinate with Caltrans to identify and confirm off-ramp study locations and methodologies. ▪ Traffic modeling should be consistent with other regional and local data. ▪ Trip generation rates should be based on recommendations in "Trip Generation" manual, 9th edition, published by the Institute of Transportation Engineers. ▪ Requests analysis of ADT and AM and PM peak-hour volumes for existing and future conditions in the affected area with and without project. ▪ Analysis should include existing traffic, traffic generated by the proposed project, and cumulative traffic combined with other approved developments. ▪ Mitigation measures. Any mitigation involving transit or transportation demand management (TDM) should be justified and the results conservatively estimated. ▪ Notes that a fair share contribution toward preestablished or future improvements on the State Highway System is considered acceptable mitigation.	▪ Section 5.15, *Transportation and Traffic*
City of Irwindale	11/16/2015	Land use Traffic	▪ Notes that the existing GP land use designations and zoning listed in the initial study are incorrect, and requests to see source maps to confirm where information came from. ▪ Requests specific language when discussing that a traffic study will be conducted. ▪ Requests that the City of Irwindale General Plan and Zoning Code be added into the References section of the Initial Study.	▪ *Initial Study* ▪ Section 5.9, *Land Use and Planning* ▪ Section 5.14, *Transportation and Traffic*
County of Los Angeles Fire Department	11/2/2015	General	▪ Fire Chief Daryl L. Osby notes that the County of Los Angeles Fire Department will reserve comments for the DEIR.	▪ Section 5.12, *Public Services*
County Sanitation Districts of Los Angeles County	11/16/2015	Wastewater Sewage systems	▪ The project may require an amendment to a Districts permit for Industrial Wastewater Discharge. ▪ Modifications to existing sewer connections will require submittal of sewer plans for review and approval by the Districts.	▪ Section 5.16, *Utilities and Service Systems*

2. Introduction

Table 2-1 NOP Comment Summary

Commenting Agency/Person	Date	Comment Type	Comment Summary	Issue Addressed In:
			▪ All biosolids and wastewater flows that exceed the capacity of the San Jose Creek Water Reclamation Plant are diverted to and treated at the Joint Water Pollution Control Plant in Carson. ▪ Notes location of a website link for a copy of the Districts' average wastewater generation factors. ▪ A connection fee will be charged to connect to the Districts' sewerage system or to increase the strength or quantity of wastewater discharged from connected facilities. ▪ All expansions of Districts facilities must be sized and service phased consistent with the SCAG regional growth forecast for the county of Los Angeles.	
Los Angeles County Metropolitan Transportation Authority (Metro)	11/10/2015	Public transportation	▪ Notes that Metro bus lines 272 and 267/264 operate on Duarte Rd, adjacent to the proposed project. ▪ The bus stop must be maintained as part of the final project. ▪ During construction, the stop must be maintained or relocated consistent with the needs of Metro bus operations. ▪ Encourages the installation of bus shelters, benches, and other amenities that would improve rider experience as part of the development of the site. ▪ Final design of bus stop and surrounding sidewalk must be compliant with the Americans with Disabilities Act (ADA). ▪ Notes that the proposed project is adjacent to Metro right-of-way for the Gold Line Foothill Extension Phase 2A. ▪ Requests opportunity to review and comment on design documents related to City of Hope development to identify and address potential impacts to the Metro right-of-way. ▪ Notes that a transportation impact analysis is required and lists what must be included. ▪ Attached a separate appendix, "Guidelines for CMP Transportation Impact Analysis."	▪ Section 5.15, *Transportation and Traffic*
Southern California Association of Governments	11/16/2015	Land use RTP/SCS	▪ Analyze consistency with the RTP/SCS goals and strategies and regional growth forecasts. ▪ Mitigation measures. Example mitigation measures are in Ch. 6 of the 2012 Regional Transportation Program/Sustainable Communities Strategy Final Program EIR.	▪ Section 5.6, *Greenhouse Gas Emissions*

Table 2-1 NOP Comment Summary

Commenting Agency/Person	Date	Comment Type	Comment Summary	Issue Addressed In:
South Coast Air Quality Management District	10/28/2015	Air quality	▪ Methodology for air quality analysis. ▪ Mitigation measures: recommends several sources with information relevant to crafting mitigation measures.	▪ Section 5.2, *Air Quality*
Southern California Gas Company	11/2/2015	Natural gas	▪ Notes the presence of a medium pressure distribution pipeline extending into the western project area. ▪ Recommends discussion of activities associated with the extension of new natural gas service and lists topics to discuss.	▪ Section 5.16, Utilities and Service Systems
State Clearinghouse	10/14/2015	General	▪ Copy of the State Clearinghouse "courtesy notice" to reviewing agencies as a reminder to submit comments within the review period.	▪ Appendix B
Individuals				
Arlene Miller	10/19/2015	General	▪ Supports the proposed project.	Comment noted.

2.3 SCOPE OF THIS DEIR

The scope of the DEIR was determined based on the City's initial study, comments received in response to the NOP, and comments received at the scoping meeting conducted by the City. Pursuant to Sections 15126.2 and 15126.4 of the CEQA Guidelines, the DEIR should identify any potentially significant adverse impacts and recommend mitigation that would reduce or eliminate these impacts to levels of insignificance.

The information in Chapter 3, *Project Description*, establishes the basis for analyzing future, project-related environmental impacts.

2.3.1 Impacts Considered Less Than Significant

During preparation of the Initial Study, the City of Duarte determined that two environmental impact categories were not significantly affected by or did not affect the proposed Campus Plan project. These categories are not discussed in detail in this DEIR.

- Agriculture and Forestry Resources
- Mineral Resources

This DEIR determined that the following environmental categories were less than significant:

- Geology and Soils

- Hydrology and Water Quality
- Land Use and Planning
- Population and Housing
- Public Services
- Recreation
- Energy

2.3.2 Potentially Significant Adverse Impacts

This DEIR determined that ten environmental factors have potentially significant impacts if the proposed project is implemented.

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Noise
- Transportation and Traffic
- Tribal Cultural Resources
- Utilities and Services Systems

2.3.3 Unavoidable Significant Adverse Impacts

This DEIR identifies three significant and unavoidable adverse impacts, as defined by CEQA, that would result from implementation of the proposed project. Unavoidable adverse impacts may be considered significant on a project-specific basis, cumulatively significant, and/or potentially significant. The City must prepare a "statement of overriding considerations" before it can approve the project, attesting that the decision-making body has balanced the benefits of the proposed project against its unavoidable significant environmental effects and has determined that the benefits outweigh the adverse effects, and therefore the adverse effects are considered acceptable. The impacts that were found in the DEIR to be significant and unavoidable are related to:

- Greenhouse Gas Emissions
- Noise
- Transportation/Traffic

2.4 INCORPORATION BY REFERENCE

Some documents are incorporated by reference into this DEIR, consistent with Section 15150 of the CEQA Guidelines, and they are available for review at the City of Duarte.

- **City of Duarte 2005-2020 General Plan (2007).** The General Plan serves as the major blueprint for directing growth within the City of Duarte and presents a comprehensive plan to accommodate the City's growing needs. Currently this document regulates the existing land uses on the proposed project site. The General Plan analyzes existing conditions in the City, including physical, social, cultural, and environmental resources and opportunities. It also looks at trends, issues, and concerns that affect the region; describes City goals and objectives; and provides policies to guide development and change. The Duarte General Plan consists of eight elements including the seven elements required by California Government Code Sections 65300 et seq.—land use, circulation, housing, open space and conservation, safety, and noise—as well as two optional elements, economic development and historic preservation. The City of Duarte General Plan is available at http://www.accessduarte.com/dept/cd/planning/general_plan.htm.

- **City of Duarte Development Code:** The Development Code is a set of laws covering zoning, permitted uses and standards, and various development requirements. Where applicable, code sections are referenced throughout the DEIR. The City of Duarte Development Code is available at https://www.municode.com/library/ca/duarte/codes/development_code.

- **City of Irwindale General Plan Update (2008):** The General Plan serves as the blueprint for future planning and development in the City. The General Plan indicates the City's vision for the future through policies and plans that are designed to shape the physical development of the community. This General Plan acknowledges the City's previous planning efforts, the established land use patterns in the community, and adopted development policy.

  The Irwindale General Plan consists of an integrated and internally consistent set of policies and programs that addresses the seven state-mandated issue areas: land use, circulation, housing, noise, safety, conservation, and open space. In addition, the General Plan addresses issues of concern to the community, including economic development, urban design, and recreation. The Irwindale General Plan consists of six elements that comply with the requirements of California Government Code Section 65300, et. seq.—community development, housing, infrastructure, resource management, public safety, and implementation elements. The City of Irwindale General Plan Update is available at http://ci.irwindale.ca.us/DocumentCenter/View/38.

- **City of Irwindale Municipal Code:** The municipal code is a set of laws governing Irwindale and covers all aspects of City regulations, including zoning, permitted uses and standards, and various development requirements. Zoning district standards are also included in the code. Where applicable, code sections are referenced throughout the DEIR. The City of Irwindale Municipal Code is available at https://www.municode.com/library/ca/irwindale/codes/code_of_ordinances?nodeId=IRWINDALE_CALIFORNIA_MUNICIPAL_CODE.

In each instance where a document is incorporated by reference for purposes of this report, the DEIR shall briefly summarize the incorporated document or briefly summarize the incorporated data if the document cannot be summarized. Chapter 13, *Bibliography*, provides a complete list of references used in preparing this DEIR.

2.5 FINAL EIR CERTIFICATION

This DEIR is being circulated for public review for 45 days. Interested agencies and members of the public are invited to provide written comments on the DEIR to the City address shown on the title page of this document. Upon completion of the 45-day review period, the City of Duarte will review all written comments received and prepare written responses for each. A Final EIR (FEIR) will incorporate the received comments, responses to the comments, and any changes to the DEIR that result from comments. The FEIR will be presented to the City of Duarte for potential certification as the environmental document for the project. All persons who comment on the DEIR will be notified of the availability of the FEIR and the date of the public hearing before the City.

The DEIR is available to the general public for review at these locations:

- Duarte City Hall, 1600 Huntington Drive, Duarte, CA 91010
- Duarte Library, 1301 Buena Vista Street, Duarte, CA 91010.
- Duarte Public Safety Office, 1042 Huntington Drive, Duarte, CA 91010

The DEIR is also available to view online on the City of Duarte website, at www.accessduarte.com.

2.6 MITIGATION MONITORING

Public Resources Code, Section 21081.6, requires that agencies adopt a monitoring or reporting program for any project for which it has made findings pursuant to Public Resources Code 21081. Such a program is intended to ensure the implementation of all mitigation measures adopted through the preparation of an EIR.

The Mitigation Monitoring Program for the City of Hope Campus Plan will be completed as part of the Final EIR, prior to consideration of the project by the City of Duarte Planning Commission and City Council.

3. Project Description

3.1 PROJECT LOCATION

The 116-acre project site encompasses the City of Hope campus and is located primarily in the City of Duarte (approximately 89.5 acres) and the remainder is within the City of Irwindale (26.5 acres). Less than one-half acre of the project site is not owned by City of Hope. Figure 3-1, *Regional Location*, shows the project site in the regional context of Los Angeles County. The cities of Duarte and Irwindale are in the eastern portion of the San Gabriel Valley, approximately 16 miles northeast of downtown Los Angeles. The City of Duarte is situated at the base of the San Gabriel Mountains and is bordered by the City of Irwindale to the south, City of Monrovia to the west, City of Bradbury and the Angeles National Forest for the north, and the City of Azusa to the east.

As shown in Figures 3-2, *Local Vicinity*, and 3-3, *Aerial Photograph*, the project site is generally bounded by Duarte Road to the north; Cinco Robles Drive, the Duarte Flood Control Channel, and Buena Vista Street to the west; and the Santa Fe Flood Control Basin to the east and south. Regional access to the project site is via Interstates 210 and 605 (I-210 and I-605). Local access is provided primarily from Duarte Road, with secondary access provided from Buena Vista Street.

3.2 STATEMENT OF OBJECTIVES

The following goals and objectives for City of Hope Campus Plan project will aid decision makers in their review potential associated environmental impacts:

1. Allow for the flexible, long-term development and enhancement of the entire City of Hope campus in order to augment hospital, outpatient services, research uses, office space and support services, and meet the evolving needs of the community, while minimally disrupting the surrounding neighborhood.

2. Facilitate the replacement and/or enhancement of existing medical buildings and support facilities in order to accommodate the projected increase in regional demand for outpatient services through 2035.

3. Maximize the creation of construction jobs and new permanent jobs in the Cities of Duarte and Irwindale and the surrounding community through the long-term expansion and enhancement of the campus, such that at full project buildout there is a jobs-housing balance in the City of Duarte at the top end of the desirable range of jobs to housing (between 1.3:1 and 1.7:1) recommended by the American Planning Association so that Duarte remains a regional employment center with a multitude of jobs in the health care industry that reinforces Duarte's brand as the "City of Health."

4. Develop enhanced and expanded open space on the campus to serve the needs of City of Hope patients, employees and visitors, while concentrating development footprints.

5. Provide a modern, cohesive and contemporary design complemented by landscaping and public art, to create a dynamic relationship between existing and new buildings.

6. Modernize or replace obsolete or outdated buildings and facilities with more efficient development that meets the needs of City of Hope patients, physicians, researchers and other employees.

7. Reinforce public investment in and encourage use of public transit, and maximize employee density in proximity to public transit, including the Gold Line station at Duarte/City of Hope and regional bus lines.

8. Improve and streamline multimodal transportation and access throughout the campus, including by foot, bicycle, car, and shuttle.

9. Maximize employee density in proximity to public transit while reducing or mitigating all net new greenhouse gas emissions from construction and operation to zero.

10. Incorporate sustainable design elements to the maximum extent possible throughout the campus, including compliance with green building standards, water and energy efficient design elements, electricity generation, adaptive reuse of buildings, and minimization of solid waste generation.

11. Support proximate parking for patients, visitors and employees, between parking structures and surface lots, and the variety of buildings intended to serve campus populations.

12. Upgrade and expand utilities and infrastructure necessary to support campus growth, while minimizing impacts to the greater community.

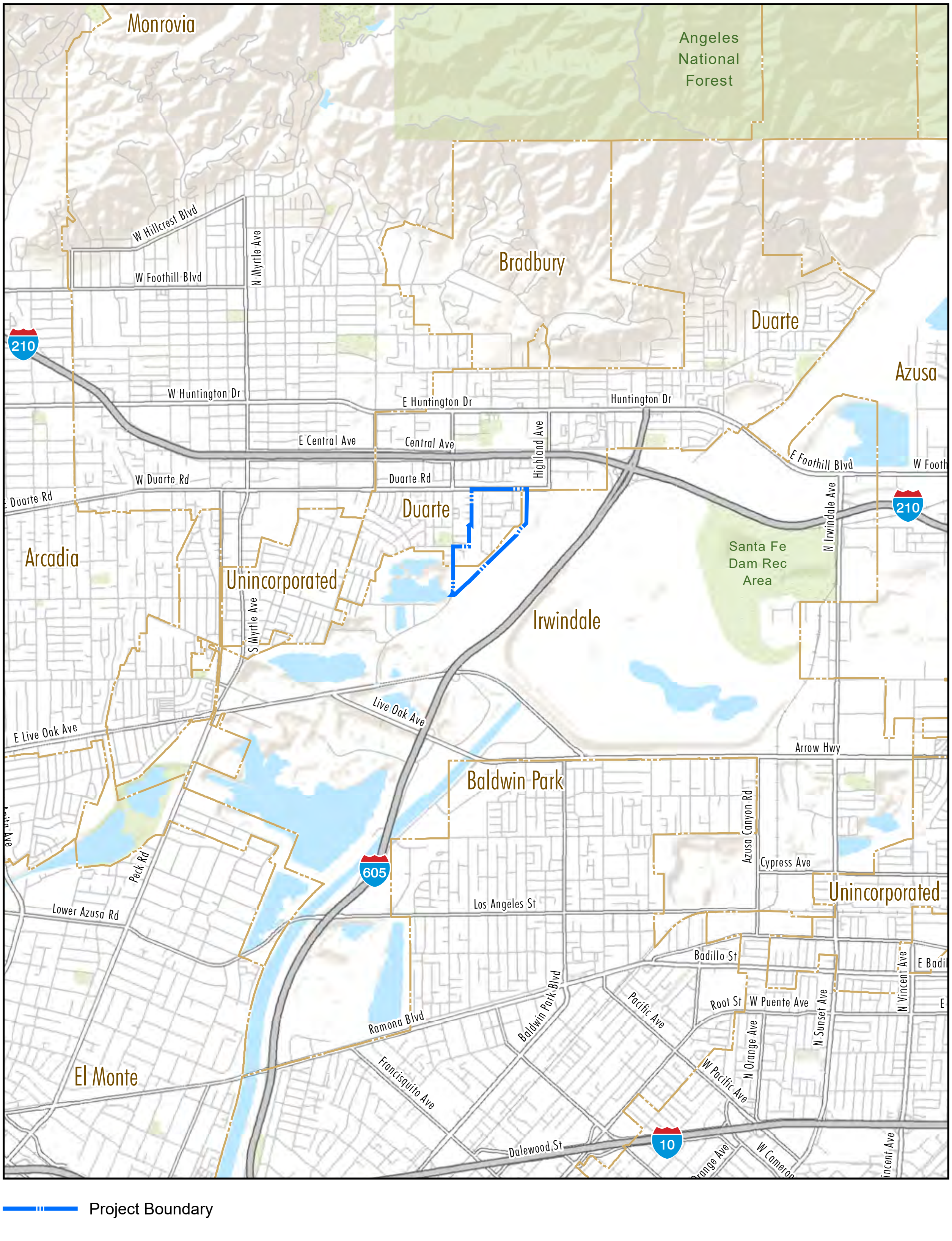
13. Augment site improvements, signage and wayfinding to foster a more accessible campus for all populations

3.3 PROJECT CHARACTERISTICS

"Project," as defined by the CEQA Guidelines, means:

> ... the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and that is any of the following: (1)…enactment and amendment of zoning ordinances, and the adoption and amendment of local General Plans or elements thereof pursuant to Government Code Sections 65100–65700. (14 Cal. Code of Reg. § 15378[a])

Figure 3-1 - Regional Location
3. Project Description



Source: ESRI, 2015

3. Project Description

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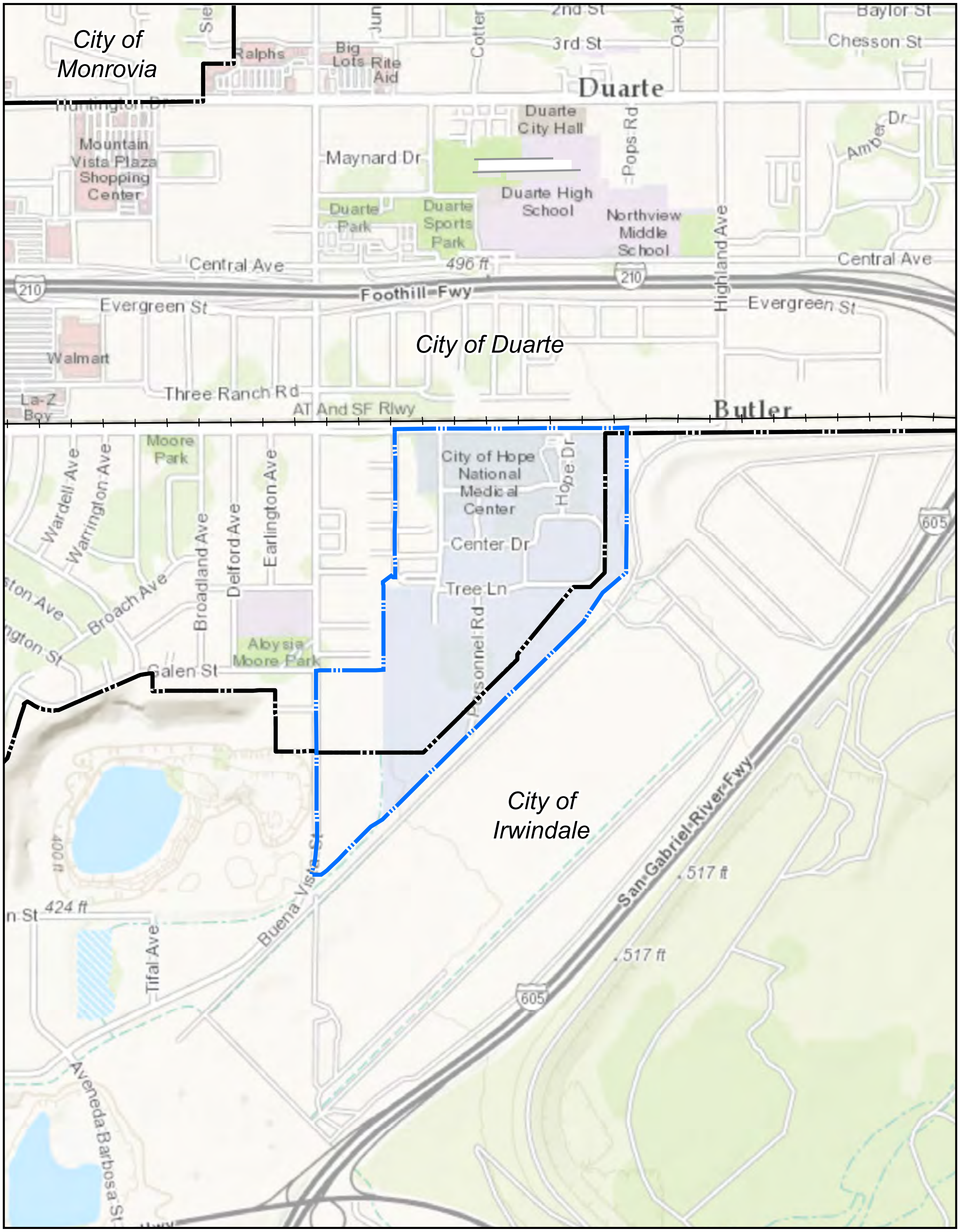
Figure 3-2 - Local Vicinity
3. Project Description



Project Boundary
City Boundary

0 800
Scale (Feet)

Source: ESRI, 2015

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Figure 3-3 - Aerial Photograph

Project Boundary

City Boundary

0 700

Scale (Feet)

Source: ESRI, 2015

3. Project Description

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3.3.1 Description of the Project

The City of Hope Campus Plan (Campus Plan) would provide direction for the enhancement and development of the 116-acre project site, which encompasses the City of Hope campus and properties along Cinco Robles Drive, over a period of approximately 20 years. The Campus Plan includes the adoption of a Specific Plan entitled "City of Hope Specific Plan" (described throughout as Specific Plan), general plan amendments (see Section 3.3.1.2), zone changes (see Section 3.3.1.3), and a development agreement (see Section 3.3.1.4).

City of Hope is an independent, nonprofit, comprehensive medical center and research facility. The proposed Campus Plan provides the vision, guidance, and implementation tools to govern the future of the campus. City of Hope endeavors to expand its research and treatment capabilities while accommodating the needs of its patients and their families, faculty, staff, and the community. The proposed Campus Plan is part of City of Hope's commitment to transform the future of medicine.

The proposed Campus Plan contains required elements to encourage a broad range of design solutions to guide development and improvements. The proposed Campus Plan addresses the replacement of existing outdated and/or obsolete buildings with modern facilities, including outpatient (clinic), inpatient (hospital), research, office, industrial, warehouse, and hospitality uses. The Campus Plan also allows the development of parking structures, surface parking lots, internal roadways, pedestrian amenities, landscaping, open space, and other related improvements. Ultimately, City of Hope Campus Plan would create a more walkable and compact campus core that builds upon and enhances existing inpatient and outpatient facilities, research, office, assembly, parking, and open space uses. In addition, the Campus Plan proposes to consolidate modular buildings that are currently dispersed throughout the campus, demolish outdated buildings, and construct new floor area within larger development sites.

3.3.1.1 CITY OF HOPE SPECIFIC PLAN

The Specific Plan would act as a bridge between Duarte and Irwindale's general plans and campus development activity. Jurisdictions may adopt specific plans by resolution or ordinance. When a specific plan is adopted by ordinance, it replaces portions or all of the current zoning regulations for specified parcels and becomes an independent set of zoning regulations that govern use and development of properties within the bounds of that specific plan.

The Specific Plan is proposed to be adopted by ordinance by the Duarte City Council and subsequently by the Irwindale City Council. The Specific Plan will function as the regulatory document for implementing zoning for the entire project site, ensuring the orderly and systematic implementation of those cities' general plans. The Specific Plan would establish the necessary land use plan, development standards, regulations, design guidelines, infrastructure systems, and implementation strategies on which subsequent, project-related development activities would be founded. Upon adoption of the Specific Plan, subsequent project-specific design review plans, detailed site plans, grading and building permits, or any other actions requiring either ministerial or discretionary approvals would be required to demonstrate consistency with the Specific Plan.

3. Project Description

There are seven residences located east of Cinco Robles Drive within the proposed Specific Plan area that are not owned by City of Hope and not part of its campus. Following adoption of the Specific Plan, these residential uses may continue as residential uses. However, no new residential uses are proposed.

Specific Plan Land Use Districts

To accomplish the vision and goals of City of Hope, the proposed Specific Plan divides the site into five land use designations and two overlays as shown in Figure 3-4, *Campus Land Use Plan*.

Core Medical District (CM). The 59.9-acre Core Medical District would be the most development-intense part of campus, with taller building heights and prominent architecture. The CM District would contain inpatient (hospital), outpatient (clinic), office and research facilities, open spaces, and short-term lodging for campus guests, patients, and their families to stay on-site. The CM District is located primarily in the center of campus and away from established residential neighborhoods. The campus circulation loop will be around the perimeter of the CM District, providing a logical framework for the location of existing and future buildings and activities

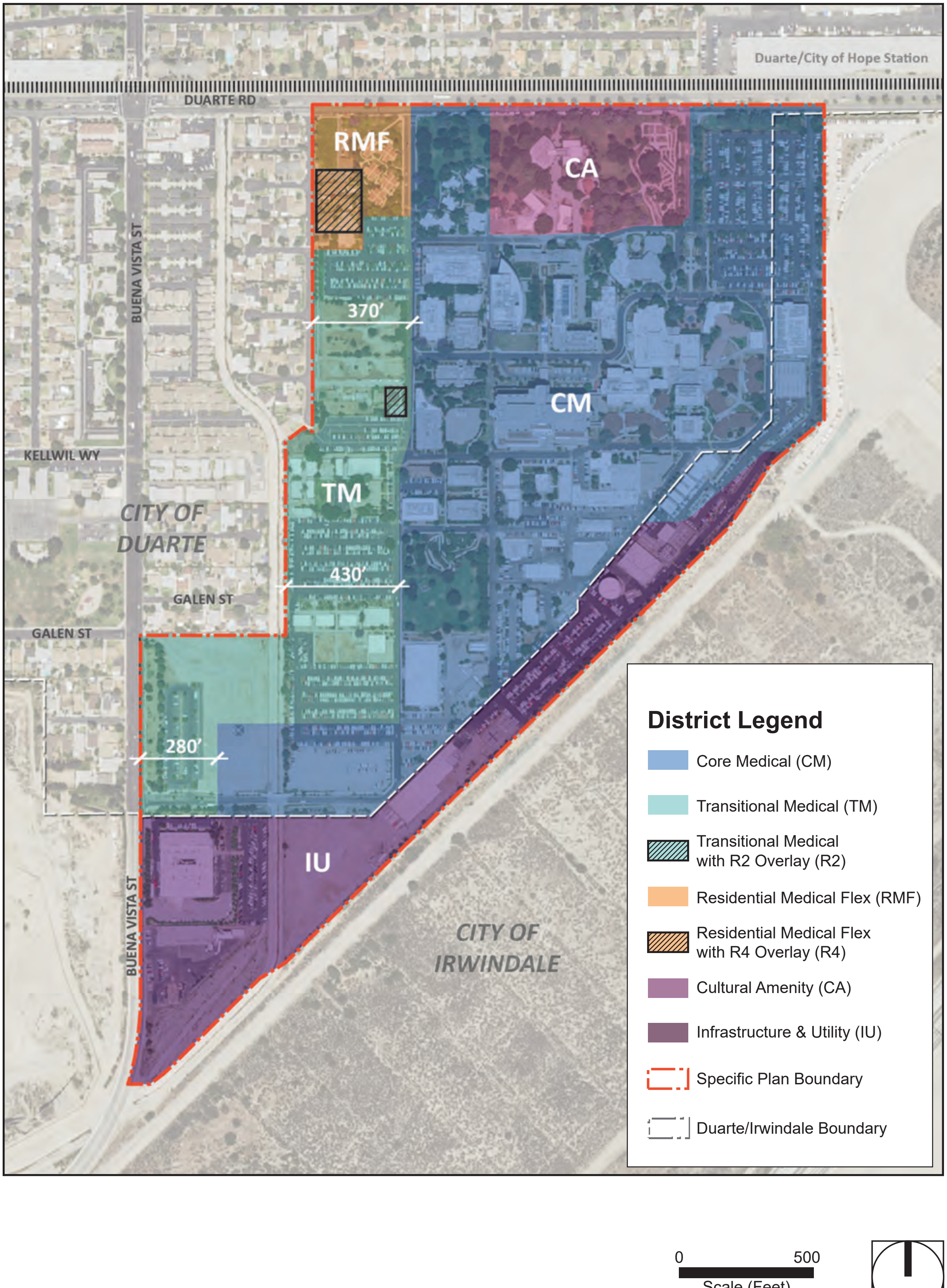
Transition Medical District (TM). The 23.4-acre Transition Medical District forms the western edge of the project area, adjacent to the Cinco Robles neighborhood. This district is intended to provide a buffer area of lower intensity and lower-scale development in the areas adjacent to established residential neighborhoods.

TM District with R-2 Overlay (R2). The R-2 Overlay recognizes the existing R-2 property on the western edge of the Specific Plan Area, directly adjacent to the southern portion of the Cinco Robles neighborhood and that all uses permitted in the R-2 zone are allowed on the property if it remains owned by an individual or entity that is not City of Hope. If the residential property is purchased by City of Hope in the future, then no new R-2 uses are permitted, and existing R-2 uses are permitted to remain for a period not to exceed 36 months after which only uses in the TM District are permitted.

Cultural Amenity District (CA). The 8.2-acre Cultural Amenity District is the historic and ceremonial entrance to the campus and the primary location for assembly and open space functions. Assembly, cultural and open space, and ancillary office uses are the primary permitted uses in the CA District. Existing cultural facilities and open spaces in this district include: the Rose Garden, Pioneer Park, Cooper Auditorium, Visitor Center, the Author & Rosalie Kaplan Family Pavilion, and the La Kretz House of Hope. The CA District is at the northern, central boundary of the campus along Duarte Road.

Infrastructure and Utility District (IU). The Infrastructure and Utility District would be the intended location for campus-related utility services and infrastructure, including storage warehouses and the campus's central plant. The uses permitted in the TM District are also permitted in the IU District, subject to general development standards of the IU District. The 19.9-acre IU District is along the southeastern edge of the campus, adjacent to the Santa Fe Flood Control Basin.

Figure 3-4 - Campus Land Use Plan
3. Project Description



Base Map Source: ESRI, 2017

3. Project Description

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Residential Medical Flex District (RMF). The 5.1-acre Residential Medical Flex District allows existing residential uses to continue to operate as campus housing for students, faculty, and guests at the campus, or to transition to new uses over time, such as hospitality or open space. The RMF District is not intended for new development of market-rate, for-sale housing or rental housing that is not part of campus operations.

RMF District with R-4 Overlay. This district overlay recognizes the existing R-4 zoned residential properties not owned by City of Hope on the northwestern edge of the Specific Plan area and that all uses permitted in the R-4 zone are allowed on the properties if they remain owned by individuals or entities that are not City of Hope. If one of these residential properties are purchased by City of Hope in the future, then no new R-4 uses are permitted, and existing R-4 uses are permitted to remain for a period not to exceed 36 months after which only uses in the RMF District are permitted.

Specific Plan Buildout

The Specific Plan would allow flexibility for design, use, intensity and density. Figure 3-5, *Illustrative Site Plan*, shows a potential development scenario at full buildout within the framework of the Specific Plan. This scenario is one example of how the campus could be built out in compliance with the development regulations and design guidelines in the Specific Plan. Actual development and building footprints may change as long as the development is consistent with the applicable land use district and adheres to the development regulations and design guidelines. As described in Section 7.1 of the Specific Plan, future development projects that implement the Specific Plan are fundamentally controlled by two factors, which serve as development controls for the full buildout of the Campus: 1) a limitation on the maximum floor area of 2,639,350 gross square feet (see Table 3-1) and 2) a limitation on the average daily population of the Campus of 9,393 persons (see Table 3-3). These two development controls form the basis of the environmental analysis and shall not be exceeded without additional environmental analysis and an amendment to the Specific Plan.

The maximum development capacity has been calculated to provide a conservative estimate of potential environmental impacts from full buildout. As shown in Table 3-1, maximum buildout would consist of approximately 2,639,350 square feet of gross development (1,038,500 net new square feet following the proposed demolition of 387,500 square feet of existing structures). The Specific Plan would allow for the demolition of portable or out-of-date structures, including 335,500 gross square feet within the CM District and 52,000 gross square feet in the IU District. No buildings would be demolished in the Cultural Amenity District. This would result in the potential for up to 387,500 gross square feet of structures to be demolished.

3. Project Description

Table 3-1 Proposed Buildout by Land Use District

Land Use District	Existing Conditions (GSF)	Proposed Demolition (GSF)	Proposed New Buildings (GSF)	Proposed Net New Development (GSF)	Existing With Net New (GSF)
Core Medical (CM)[1]	1,421,417	335,500	1,366,000	1,030,500	2,451,917
Transition Medical (TM)	5,958[2]	0		0	5,958
Cultural Amenity (CA)	40,322	0	0	0	40,332
Infrastructure and Utility (IU)	133,153	52,000	60,000	8,000	141,153
Total[3]	**1,600,850**	**387,500**	**1,426,000**	**1,038,500**	**2,639,350**

Source: City of Hope 2016.
Notes: GSF = Gross Square Feet
[1] Buildout of the RMF District is accounted for in the CM District. The RMF District is intended to allow flexibility for the existing residential units to continue to operate as campus housing for students, faculty, and guests at the campus, or to transition to new uses over time, such as hospitality or open space. This designation is not intended for new development of market-rate, for-sale housing or rental housing that is not part of campus operations.
[2] The existing development in the TM District consists of four housing units, four of which are rented by graduate students attending City of Hope's Irell & Manella Graduate School of Biological Sciences.
[3] Total square footage includes residential uses allowed within the RMF District but does not include parking structure square footage.

Buildout by Jurisdiction

Up to 1,038,500 gross square feet of new structures would be allowed by implementing the maximum buildout of the proposed Specific Plan. Most of the new development would occur within the City of Duarte, although some new structures are proposed on campus within the City of Irwindale, as described in Table 3-2.

Table 3-2 Approximate Proposed Buildout by Jurisdiction

Jurisdiction	Proposed Demolition GSF	Proposed New Building GSF	Proposed Net New Building GSF
Duarte	(342,660)	1,307,000	964,340
Irwindale	(44,840)	119,000	74,160
Total	**(387,500)**	**1,426,000**	**1,038,500**

Source: City of Hope 2016.

Population Buildout

Table 3-3 shows the existing, proposed (buildout), and net new population on the campus. The population includes inpatients, outpatients, full-time and part-time employees, contractors, physicians, and residents. The existing population was provided by the City of Hope in a memorandum to the City of Duarte (see Appendix J2, Response 6) and consists of an average over three days, November 17, 18, and 19, 2015. Survey data included (1) the inpatient bed census for that day; (2) outpatient visits for the entire campus; (3) total number of employees at the campus on the survey day, including (i) the total number of individuals employed by COH on a full-time basis on that day; (ii) the total number of individuals employed by COH on a part-time basis on that day; and (iii) the total number of non-employee "contractors" to COH; and (4) the total number of physicians employed by COH as of that day (noting that these physicians were likely not all on campus at the same time) (see Appendix J3 at pp. 21-22.).

Table 3-3 Proposed Population Buildout

User Group	Existing	Proposed	Net New
Patients[1]	1,046	2,110	1,064
Employees[2]	4,944	6,474	1,530
Physicians	418	729	311
Residents[3]	40	80	40
Total	**6,448**	**9,393**	**2,945**

Source: Fehr & Peers (Appendix J2, Response 6); Walker 2016 (Appendix J3).
Notes:
1 Patients include inpatients and outpatients.
2 Employees include full-time and part-time employees and contractors.
3 The R2 overlay area in the TM District retains the same permitted uses as the TM District, with the addition of single-family dwelling uses permitted. If the residential property is purchased by City of Hope in the future, then no new R-2 uses are permitted (see pg. 25 of the Specific Plan). The R4 overlay area in the RMF District retains the same permitted uses as the TM District, with the addition of multifamily dwelling uses permitted, see pg. 25. Residential uses shall be counted as part of the overall proposed population buildout.

The projected population at buildout of the campus was derived from the Parking Study (Appendix J3 of this DEIR). Projections assume the following changes to employment and patient activity during the 2030-2035 timeframe:

- The average daily bed census remains unchanged from 2030;
- Outpatient volumes increase at a 4.2 percent growth rate per year for five years;
- Full-time employees are added at a 3.5 percent growth rate per year for five years;
- The number of part-time employees and contractors remains constant;
- Physicians are added at a 3.5 percent growth rate per year for five years;
- The number of hotel rooms remains at 80.
- Due to the completion of the Duarte Gold Line Station and Gold Line extension in 2016 employee and physicians parking demand at COH will decrease by 3.5 percent.

Please refer to Appendix J3 for assumptions used for each phase (see pp. 21–23, 27, 34, 40, 45 and Tables 13, 14, 17, 22, 27, and 32).

Circulation and Parking

Figure 3-6, *Proposed Vehicular Circulation and Access System*, illustrates the proposed roadway network through the Campus Plan area that supports a variety of potential development scenarios. It includes existing and proposed primary and secondary internal roadways, service and emergency roadways, signalized and unsignalized intersections, campus access points, transit stops, and the campus shuttle route and stop locations. The Illustrative Development Scenario (Figure 3-5) is also depicted on Figure 3-6 to show how the circulation and access system integrates with the potential future development under full buildout.

Under the proposed Campus Plan, an expanded internal loop road and other roadways, pedestrian pathways, and sidewalk improvements, as well as new structured parking lots with nearly 3,000 new parking spaces, would enhance onsite circulation and meet City of Hope's parking needs. Specifically, the expanded campus

3. Project Description

loop road along the existing Village Road would provide improved north–south circulation throughout the project site. Two new parking structures would be constructed—one consisting of approximately 1,750 parking spaces and one consisting of 1,230 parking spaces in the northeast corner and western edge of the project site (see Figure 19, *Proposed Parking System*, of City of Hope Campus Plan).

The existing surface parking lot adjacent to the building at 2144 Buena Vista Street would be expanded to provide additional parking for employees during construction of the new parking structure in the northeast corner of the campus and to serve as possible construction worker parking.

The proposed Campus Plan emphasizes sustainable streetscaping by requiring all street perimeter and landscape buffer areas to use permeable materials, except for walkways, driveways, and irrigation infrastructure.

Other Infrastructure

Improvements utilities would be required to support future development. The proposed Specific Plan describes non-structural and structural best management practices to reduce potential impacts on infrastructure.

Water service is provided by California American Water's Los Angeles County District. Potential on-site water infrastructure improvements, include rerouting existing water lines and extending the existing water system to the southwest corner of the campus if new facilities would be located there. If new structures are located there, a new water main would be required to connect to an existing 12-inch water main to the north.

Sewer services in both Duarte and Irwindale are provided by the Los Angeles County Department of Public Works, which operates and maintains Duarte's wastewater conveyance infrastructure. This system connects to the Sanitation Districts of Los Angeles County's regional trunk sewer lines. Existing sewer lines may need to be rerouted to accommodate proposed development. If new structures are built in the southwest corner of the campus, extensions of the sewer system would be necessary to connect to an existing line to the north.

The existing drainage system flows to the Duarte Flood Control Channel, owned and maintained by the Los Angeles County Flood Control District. The channel runs north to south along the Specific Plan's western boundary. Infiltration systems are proposed to address any potential increases in runoff caused by implementation of the Specific Plan.

Development Standards

The Specific Plan establishes development regulations to guide the development of the physical components of the City of Hope campus. These regulations apply only to new development in the Specific Plan area, not to existing development that will remain unchanged. They are intended to provide for programmatic flexibility and creative design solutions, provide a buffer for adjacent property owners, and produce an environment that is consistent with City of Duarte's and City of Irwindale's goals and City of Hope's mission. Development regulations for each land use district are required for new development and provide regulations for building placement and orientation, height, setbacks, open space, landscaping, modular structures, and utilities and service areas.

Figure 3-5 - Illustrative Site Plan
3. Project Description

Source: ESRI, 2016; Gensler, 2016

3. Project Description

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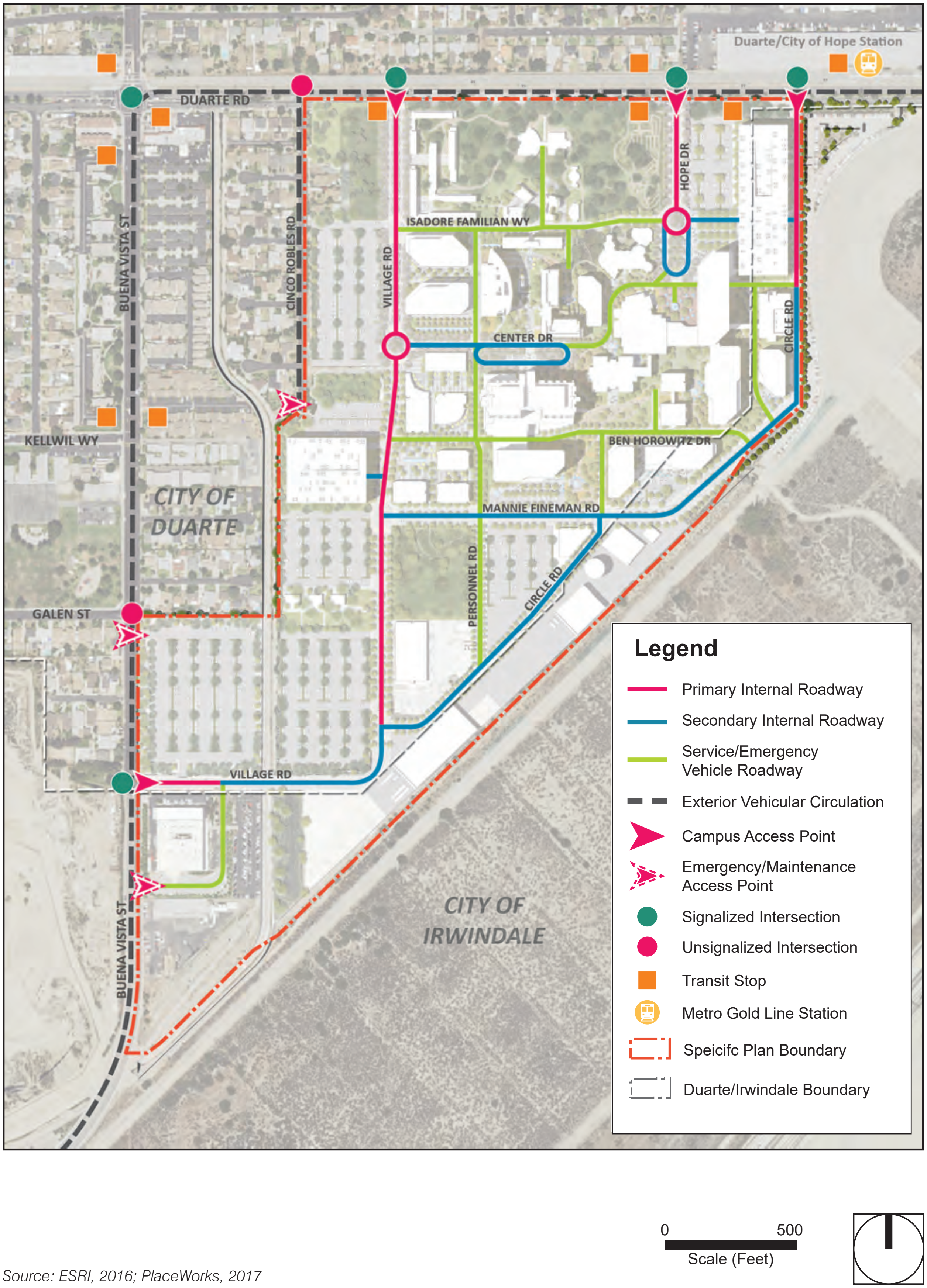
Figure 3-6 - Proposed Vehicular Circulation and Access System



Source: ESRI, 2016; PlaceWorks, 2017

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Design Guidelines

Future development accommodated by the proposed Specific Plan would be required to comply with the Specific Plan's design guidelines. Design guidelines provide direction for architecture, signage, public art, parking, landscape, irrigation, circulation, and lighting features. The purpose is to establish visual themes that are aesthetically pleasing and will create a cohesive "sense of place" for people who work or visit the campus, and to ensure that the City of Hope campus remains compatible with surrounding residential areas to the west and north. These design guidelines include both mandatory standards and interpretive design guidelines.

The proposed Specific Plan's landscape guidelines would incorporate sustainable site design practices and focus on enhancing and improving landscaping features throughout the City of Hope campus. The landscape guidelines would emphasize the use of native species and replenishment of groundwater. Specific projects developed pursuant to the Specific Plan will also be developed in compliance with the City of Duarte's sustainable development practices (Duarte Municipal Code, Chapter 19.52).

Public Art

Public art at City of Hope enhances the character, spirit and personality of the campus. Art is currently installed in publicly accessible or visible places throughout the campus, both indoors and outdoors to help create a healing environment for patients and their families.

Section 5.8 of the Specific Plan Design Guidelines, Campus Public Art, requires that public art be installed on the campus concomitant with the certificate of occupancy for any new building of over 5,000 square feet outside of the IU District. Public art may be placed in exterior or interior spaces in areas of relatively high public activity. The value of the public art shall be at least 0.25 percent of the value of the new building per the City of Duarte's building permit fee schedule. In lieu of providing public art on a building-by-building basis, City of Hope may elect to collect and retain Public Art funds for larger and more substantial artworks.

Project Design Features

Table 3-4 lists the project design features (PDFs) that would reduce environmental impacts associated with the proposed project. These PDFs are analyzed as part of the project throughout this DEIR.

Table 3-4 Proposed Project Design Features

Environmental Impact Area	Proposed Project Design Features
Air Quality/ Greenhouse Gas Emissions	
Energy Efficiency and Conservation	Exceeding local and state energy-efficiency building requirements is encouraged.
	Energy-efficient design and natural lighting and ventilation should be used wherever possible.
	The use of materials that reduce heat transfer into and out of buildings (such as light-colored roofing materials) is encouraged.
	Whenever possible, building articulation and form should be expressive of and driven by environmental and site conditions, such as solar orientation, views, noise, prevailing winds, and local climate. South- and west-facing windows should either be tinted or shaded with an overhang, deciduous trees, or awnings to reduce summer exposure.
	Buildings are encouraged to integrate sustainable design features such as photovoltaic panels (especially on

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Table 3-4 Proposed Project Design Features

Environmental Impact Area	Proposed Project Design Features
	top of parking decks), renewable materials with proven longevity, and stormwater treatment where feasible.
	Green roofs may be considered as alternatives to active spaces and to help reduce the urban heat island effect.
	Planting of trees along southern and western building walls is encouraged to reduce the urban heating effect.
	Large specimen trees should be incorporated near major new buildings to provide a signature landscape element and to help increase the building's energy efficiency through additional shading.
	Lighting design should consider the use of control systems that reduce light levels during low-usage times whole not sacrificing uniformity or safety.
Healthy Design	Recreational amenities should be incorporated on campus, including community gardens, gathering spaces, campus walking paths/routes, and areas for physical activity.
	Buildings should provide visibility and access to active/recreational areas.
	Bicycle storage and infrastructure should be secure, easily accessible and identifiable, and near building entrances.
	To facilitate pedestrian movement, a continuous, unobstructed path of travel must be maintained in any pathway.
	Pedestrian pathways can be used to connect less active outdoor spaces with more active uses.
Water Conservation	Irrigation systems should use water-conserving methods and water-efficient technologies such as drip emitters, evapotranspiration controllers, and moisture sensors.
	Irrigation systems shall be operated automatically using an electric controller and low-voltage remove control valves.
	Plant material should incorporate native and low-water-use species consistent with the plant palettes recommended by the City of Duarte and City of Irwindale landscape regulations.
	Landscaping areas should use plants that require minimal water resources. Drought-tolerant grasses should be used for lawn areas where possible.
Public Services	
Police Protection	City of Hope is required to maintain security service levels to that provided at the time of Specific Plan adoption (Section 6.5 of the City of Hope Specific Plan).
Transportation and Traffic	
	Circulation and Access: In order to ensure sufficient and convenient parking, access, and internal circulation through each phase of campus development, interim parking and circulation improvements are required prior to building permit issuance. (see Figure 15 of the Specific Plan). Improvements include: • Improve connectivity throughout and around the campus with the introduction of an internal roadway system which safely accommodates bicycling, as well as improved bike and pedestrian connections to the Duarte/City of Hope Metro Gold Line station. • In addition to the four primary campus access points that are maintained (including three on Duarte Road and one on Buena Vista Street) three additional points of access will be provided for emergency and maintenance vehicle access only. One at the southeastern end of Cinco Robles Drive cul-de-sac and the other two along Buena Vista Street, north and south of the Village Road access. • Currently unsignalized access points at Circle Road and Village Road (one access point on Duarte Road and the other on Buena Vista St.) will be signalized.
	Internal Roadway System: Roadways will be improved and widened as new development is built and phased in over time. The goal of improving the internal roadway system is to create landscaped, complete streets accommodating pedestrians, bicyclists, automobiles, and a campus shuttle. Parking structures and new asphalt paved parking areas will be constructed with enhanced access, circulation, and streetscape improvements. Refer to the Chapter 4 of the City of Hope Specific Plan regarding the proposed improvements to Village Road, Circle Road, Hope Drive, Mannie Fineman Road, Isadore Familian Way, and

Table 3-4 Proposed Project Design Features

Environmental Impact Area	Proposed Project Design Features
	Center Drive.
	Bicycle Network: Many hospital employees and visitors currently ride their bikes alongside cars in the roadway or alongside pedestrians on the sidewalk through and around campus. Improving bicycle safety, circulation, and access are important objectives of the City of Hope Specific Plan. Figure 17 of the Specific Plan illustrates proposed bike improvements and the internal roadways which will accommodate those upgrades. These improvements include: • Shared lane treatments • Bike parking facilities • Connections to the Emerald Necklace Recreational Trail System (with an access point immediately east of campus) • Bike lanes/sharrows along Duarte Road and Buena Vista Street.
	Pedestrian Connectivity: The Specific Plan strives to enhance the pedestrian experience throughout campus with a combination of landscape design elements, improved signage, lighting, and wayfinding, and the provision of safe, accessible, and well-marked pathways to all building entrances. The circulation design guidelines and standards in the Specific Plan contain regulations and guidelines that aim to create a welcoming and accessible pedestrian environment throughout campus. This environment is to be achieved through connections between the main campus entrances and public streets, and through internal pathways that provide pedestrian linkages between buildings and uses.

Phasing

Development of City of Hope campus would occur over an extended period of time and therefore would need to be flexible enough to respond to changing demands in medical research and patient service needs, as well as funding opportunities. It is anticipated that demolition and development would occur in multiple phases. Phasing estimates are provided in Table 3-5. The proposed Specific Plan would be implemented on a project-by-project basis as future development applications are submitted by City of Hope to the appropriate jurisdiction (City of Duarte or City of Irwindale). For purposes of environmental analysis, buildout of the project site under the Specific Plan is anticipated to occur through 2035 in four phases. The following calculations were based on the land use plan and information provided by City of Hope.

Table 3-5 Proposed Buildout by Phase

Phase	Land Use District	Proposed Use	Proposed New Building GSF	Proposed Demolition GSF	Proposed Net New Building GSF
1 (2017–2020)	CM	Outpatient (Clinic)	280,000	(30,000)	250,000
	CM	Research	180,000	(23,500)	156,600
	CM	Office	60,000	(44,500)	15,500
	CM	Parking Structure	1,750 spaces		
Total Phase 1			**520,000**	**(98,000)**	**422,000**
2 (2021–2025)	CM	Inpatient (Hospital)	210,000	0	210,000
	CM	Research	61,000	(17,500)	43,500
	CM	Office	0	(60,500)	(60,500)
	RMF	Hospitality	0	(3,500)	(3,500)
	IU	Warehouse	0	(22,000)	(22,000)

3. Project Description

Table 3-5 Proposed Buildout by Phase

Phase	Land Use District	Proposed Use	Proposed New Building GSF	Proposed Demolition GSF	Proposed Net New Building GSF
	IU	Industrial	20,000	(3,500)	16,500
	TM	Parking Structure	1,230 spaces		
Total Phase 2			**291,000**	**(107,000)**	**184,000**
Phase 3 (2026–2030)	CM	Outpatient (Clinic)	180,000	0	180,000
	CM	Inpatient (Hospital)	0	(70,500)	(70,500)
	CM	Office	70,000	(13,000)	57,000
	CM	Assembly	0	(29,000)	(29,000)
	RMF, CM	Hospitality	75,000	(14,500)	60,500
	IU	Industrial	40,000	0	40,000
	IU	Warehouse	0	(26,500)	(26,500)
Total Phase 3			**365,000**	**153,500**	**211,500**
Phase 4 (2031–2036)	CM	Research	130,000	(29,000)	101,000
	CM	Office	120,000	0	120,000
Total Phase 4			**250,000**	**(29,000)**	**221,000**
Proposed Specific Plan Total			1,426,000	(387,500)	1,038,500

Source: City of Hope 2016.

Central Utilities Plant

Buildout of the City of Hope campus requires improvements to the existing central utilities plant. The specific planned future improvements–equipment, fuel type, and installation methods– are unknown at this time and speculative. Expansion of the central utilities plant will be required to undergo separate CEQA review under the South Coast Air Quality Management District (SCAQMD) and future discretionary action by SCAQMD per SCAQMD Regulation XIII, New Source Review. For informational purposes, worst case buildout assumptions of the central utilities plant are provided in Table 3-6 for the purposes of providing energy and emissions data in the environmental analysis of this EIR.

Table 3-6 Proposed Central Utility Plant

	Boilers	Centrifugal Chillers	Steam Absorption Chiller (not currently in service)	Thermal Energy Tank	Emergency Generator
Area Served	2.5 million sf				n/a
Number of Units	6	4	1	1	6
Design Capacity	4 MMBtu per hour	1,750 tons	2,000 tons	1,500 tons	2,000 kW
Fuel Type	CNG	Electric	Electric	Electric	Diesel

Source: City of Hope August 2017.

CNG = compressed natural gas
kW = kilowatt
MMBtu = million British Thermal Units
n/a = not applicable
sf = square feet

3.3.1.2 GENERAL PLAN AMENDMENT

The proposed project requires general plan amendments in the cities of Duarte and Irwindale to change existing general plan land uses within each jurisdiction to Specific Plan.

Duarte

The general plan amendment would change the current General Plan land use designations (Hospital, Single-Family Residential, Medium-Density Residential, High-Density Residential, and Research and Development, and Public Facilities) to Specific Plan; this would require a revision to the Duarte General Plan land use map. The general plan amendment would also include a narrative amendment to the Duarte General Plan, adding City of Hope Specific Plan to the list of approved specific plans.

Irwindale

Adoption of the Specific Plan would also require a general plan amendment and zone change from the City of Irwindale. Under the general plan amendment, the current land use designations (Industrial/Business Park, Open Space/Easements, and Commercial) of this portion of the project site would be changed to Specific Plan; this would require a revision to the Irwindale General Plan land use map.

3.3.1.3 ZONE CHANGE

Zone changes would be required to provide consistency with the proposed general plan land use designations of the cities of Duarte and Irwindale.

Duarte

The zone change would change the zoning designations (H [Hospital], R-1 [One-Family Residential], R-2 [Two-Family Residential], R-4 [Multiple Family Residential High Density], and O [Open Space]) to Specific Plan and would require a revision to the Duarte zoning map.

Irwindale

Under the zone change, the zoning designations (A-1 [Agricultural], M-1 [Light Manufacturing], C-2 [Heavy Commercial]) of this portion of the project site would be changed to Specific Plan and would require a revision to the Irwindale zoning map.

3.3.1.4 DEVELOPMENT AGREEMENT

It is anticipated that the project could include development agreements between the City of Hope and the cities of Duarte and Irwindale pursuant to California Government Code Sections 65864 et seq.

3.4 INTENDED USES OF THE EIR

This Draft EIR examines the environmental impacts of the proposed City of Hope Campus Plan. This DEIR also addresses various actions by the City of Duarte and others to adopt and implement the proposed

3. Project Description

Campus Plan. It is the intent of this DEIR to evaluate the environmental impacts of the proposed Campus Plan, thereby enabling the City of Duarte and City of Irwindale, other responsible agencies, and interested parties to make informed decisions with respect to the requested entitlements. In order to implement the proposed Campus Plan, the cities of Duarte and Irwindale must approve the proposed Specific Plan, zone changes, and amendments to their general plans.

The anticipated approvals required for this project are:

Lead Agency	Action
Duarte City Council	• Certification of City of Hope Specific Plan EIR; along with adoption of mitigation monitoring and reporting program, findings of fact, and statement of overriding considerations. • Adoption of City of Hope Specific Plan • Approval of a General Plan Amendment from Hospital, Medium-Density Residential, High-Density Residential, and Research and Development to Specific Plan • Approval of a Zone Change from H (Hospital), R-2 (Two-Family Residential), and R-4 (Multiple Family Residential High Density) to Specific Plan • Approval of a Development Agreement
Responsible Agencies	**Action**
Irwindale City Council	• Certification of City of Hope Specific Plan EIR along with adoption of mitigation monitoring and reporting program, findings of fact, and statement of overriding considerations. • Adoption of the City of Hope Specific Plan • Approval of a General Plan Amendment from Industrial/Business Park, Open Space/Easements, and Commercial to Specific Plan • Approval of a Zone Change from A-1 (Agricultural), M-1 (Light Manufacturing), and C-2 (Heavy Commercial) to Specific Plan
Los Angeles Regional Water Quality Control Board	• Issuance of a National Pollution Discharge Elimination System Permit for future construction activities
California Department of Transportation (Caltrans)	• Approval of an encroachment permit for roadway improvements

4. Environmental Setting

4.1 INTRODUCTION

This section provides a "description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, ... from both a local and a regional perspective" (CEQA Guidelines § 15125[a]), pursuant to provisions of the California Environmental Quality Act (CEQA) and the CEQA Guidelines The environmental setting provides the baseline physical conditions from which the lead agency will determine the significance of environmental impacts resulting from the proposed project.

4.2 REGIONAL ENVIRONMENTAL SETTING

4.2.1 Regional Location

The City of Hope campus (project site) is in the regional context of Los Angeles County and the local context of the cities of Duarte and Irwindale. The cities of Duarte and Irwindale are in the eastern portion of the San Gabriel Valley, approximately 16 miles northeast of downtown Los Angeles. The City of Duarte is at the base of the San Gabriel Mountains and is bordered by Irwindale to the south, Monrovia to the west, Bradbury and the Angeles National Forest to the north, and Azusa to the east. Regional access to the project site is via Interstates 210 and 605 (I-210 and I-605) and via the Metro Gold Line light rail line.[1] Local access is provided primarily from Duarte Road, with secondary access provided from Buena Vista Street. The Duarte Gold Line Station is along the north side of Duarte Road just east of the northeast corner of the City of Hope campus.

4.2.2 Regional Planning Considerations

4.2.2.1 SOUTH COAST AIR BASIN AIR QUALITY MANAGEMENT PLAN

The cities of Duarte and Irwindale are in the South Coast Air Basin (SoCAB), which is managed by the South Coast Air Quality Management District. Pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state law, and standards are detailed in the air quality management plan (AQMP). Air pollutants for which ambient air quality standards (AAQS) have been developed are known as criteria air pollutants—ozone (O_3), carbon monoxide (CO), volatile organic compounds (VOC), nitrogen oxides (NO_x), sulfur dioxide, coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead. Air basins are classified as attainment/nonattainment areas for particular pollutants depending on whether they meet AAQS for that pollutant. Based on the AQMP, the SoCAB is designated nonattainment for O_3, $PM_{2.5}$, PM_{10}, and lead (Los Angeles County only) under the California and National AAQS and nonattainment for NO_2 under the California AAQS.

[1] The Metro Gold Line extends from Azusa west and southwest to downtown Los Angeles, and then east to East Los Angeles.

4. Environmental Setting

The proposed project's consistency with the applicable AAQS is discussed in Section 5.2, *Air Quality*.

4.2.2.2 GREENHOUSE GAS EMISSIONS REDUCTION LEGISLATION

Current State of California guidance and goals for reductions in greenhouse gas (GHG) emissions are generally embodied in Executive Order S-03-05; Executive Order B-30-15; Assembly Bill 32 (AB 32), the Global Warming Solutions Act (2008); and Senate Bill 375 (SB 375), the Sustainable Communities and Climate Protection Act.

Executive Order S-03-05, signed June 1, 2005, set the following GHG reduction targets for the State of California:

- 2000 levels by 2010
- 1990 levels by 2020
- 80 percent below 1990 levels by 2050

AB 32 was passed by the state legislature on August 31, 2006, to place the state on a course toward reducing its contribution of GHG emissions. AB 32 follows the emissions reduction targets established in Executive Order S-3-05. SB 32 was passed September 8, 2016, and set an interim target consistent with AB 32. Executive Order B-30-15 also established an interim goal of a 40 percent reduction below 1990 levels by 2030.

In 2008, SB 375 was adopted to connect GHG emissions reductions targets for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce vehicle miles traveled and vehicle trips. SCAG's targets are an 8 percent per capita reduction from 2005 GHG emission levels by 2020 and a 13 percent per capita reduction from 2005 GHG emission levels by 2035.

In September 2016, Governor Brown signed Senate Bill 32 and Assembly Bill 197, making the Executive Order goal for year 2030 into a statewide mandated legislative target. AB 197 established a joint legislative committee on climate change policies and requires CARB to prioritize direction emissions reductions rather than the market-based cap-and-trade program for large stationary, mobile, and other sources.

The project's ability to meet these regional GHG emissions reduction target goals is analyzed in Section 5.6, *Greenhouse Gas Emissions*.

Senate Bill 743

The legislature found that with the adoption of the SB 375, the state had signaled its commitment to encourage land use and transportation planning decisions and investments that reduce vehicle miles traveled (VMT) and thereby contribute to the reduction of greenhouse gas emissions (GHG), as required by the California Global Warming Solutions Act of 2006 (Assembly Bill [AB 32]). Additionally, AB 1358, described above, requires local governments to plan for a balanced, multimodal transportation network that meets the needs of all users.

On September 27, 2013, SB 743 was signed into law. SB 743 started a process that could fundamentally change transportation impact analysis as part of CEQA compliance. These changes will include the elimination of auto delay, level of service (LOS), and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts in many parts of California (if not statewide). As part of the new CEQA Guidelines, the new criteria "shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses" (Public Resources Code Section 21099(b)(1)).

The State Office of Planning and Research (OPR) is currently developing revisions to the CEQA Guidelines under Senate Bill (SB) 743 for projects located in transit priority areas. The revised CEQA Guidelines will establish new criteria for determining the significance of transportation impacts and define alternative metrics to replace level of service (LOS). SB 743 replaces LOS with Vehicle Miles Traveled (VMT) related metric(s) and provides guidance on potential significance thresholds related to development projects, land use plans, and transportation infrastructure projects. However, until OPR revises the CEQA Guidelines and adopts VMT as the new metric for determining transportation impacts, LOS metrics will still be utilized, as is the case for the proposed project. Further, the legislation does not preclude the application of local general plan policies, zoning codes, conditions of approval, or any other planning requirements. Project information on VMT is analyzed in Section 5.14, *Transportation and Traffic*.

4.2.2.3 SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

The Southern California Association of Governments (SCAG) is a council of governments representing Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. SCAG is the federally recognized metropolitan planning organization for this region, which encompasses over 38,000 square miles. SCAG is a regional planning agency and a forum for addressing regional issues concerning transportation, the economy, community development, and the environment. SCAG is also the regional clearinghouse for projects requiring environmental documentation under federal and state law. In this role, SCAG reviews proposed development and infrastructure projects to analyze their impacts on regional planning programs. SCAG has developed regional plans to achieve specific regional objectives, as discussed below.

Regional Transportation Plan/Sustainable Communities Strategy

The 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) was adopted in April 2016 (SCAG 2016). Major themes in the 2016 RTP/SCS include integrating strategies for land use and transportation; striving for sustainability; protecting and preserving existing transportation infrastructure; increasing capacity through improved systems managements; providing more transportation choices; leveraging technology; responding to demographic and housing market changes; supporting commerce, economic growth, and opportunity; promoting the links between public health, environmental protection, and economic opportunity; and incorporating the principles of social equity and environmental justice.

The SCS portion of the RTP/SCS outlines a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce GHG emissions from transportation (excluding goods movement). The SCS is meant to provide growth strategies that will achieve the regional GHG emissions reduction targets identified by the California Air Resources Board. The SCS does not require that local general plans, specific plans, or zoning be consistent with the SCS, but provides incentives to governments and developers for consistency.

The proposed project's consistency with the applicable 2016-2040 RTP/SCS policies is analyzed in detail in Sections 5.6, *Greenhouse Gas Emissions*, and 5.9, *Land Use and Planning*.

4.2.2.4 LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY (METRO)

The Los Angeles Metropolitan Transit Authority (Metro) is Los Angeles County's designated congestion management agency. Metro is responsible for conformance monitoring and updating the Los Angeles County Congestion Management Program (CMP), a multimodal program. The most recent CMP was issued by Metro in 2010. The goals of the CMP are to link local land use decisions with their impacts on regional transportation and air quality and to develop a partnership among transportation decision makers on devising appropriate transportation solutions that include all modes of travel. To meet these goals, the CMP provides:

- Tracking and analysis to determine how the regional highway and transit systems are performing.
- Local analysis of the impacts of local land use decisions on regional transportation.
- Local implementation of Transportation Demand Management (TDM) design guidelines that ensure new development includes improvements supportive of transit and TDM.
- Tracking of new building activity throughout Los Angeles County (Metro 2010).

The proposed project's consistency with the CMP is provided in Section 5.14, *Transportation and Traffic*.

4.3 LOCAL ENVIRONMENTAL SETTING

4.3.1 Location and Land Use

4.3.1.1 PROJECT LOCATION

The project site is primarily in the City of Duarte (approximately 89.5 acres), with a smaller portion at its eastern and southern edges in the City of Irwindale (approximately 26.5 acres). The project site is generally bounded by Duarte Road to the north; Cinco Robles Drive, the Duarte Flood Control Channel, and Buena Vista Street to the west; and the Santa Fe Flood Control Basin to the east and south.

4. Environmental Setting

4.3.1.2 EXISTING LAND USE

Onsite Uses

Figure 4-1, *Existing Land Uses*, shows existing land uses on the City of Hope campus. City of Hope is an independent, nonprofit, comprehensive medical center and research facility. The 116-acre campus consists of landscaped gardens and open spaces that surround leading-edge medical and research facilities. Existing improvements throughout the project site include stop-controlled, two-lane roadways; driveways and drive aisles; asphalt-paved parking areas; parking structures; walkways and sidewalks; and other hardscape improvements. The Duarte Flood Control Channel is owned, operated, and maintained by the Los Angeles County Department of Public Works and is not part of the project site.

City of Hope operates a central utilities plant. Operation of a central utilities plant is more energy efficient and reliable and offers operational savings compared to having decentralized boilers and chillers. Both boilers and chillers are operated as efficiently as possible to reduce energy cost while ensuring that all campus facilities are adequately served.

City of Hope's central utilities plant produces steam and chilled water on the campus. The steam produced is used for heating, humidification, sterilization, and testing. The chilled water produced is used for climate control and equipment cooling. Steam and chilled water are distributed to campus buildings through steam and chilled water pipes. Additionally, the City of Hope campus maintains emergency generators for back-up power to support critical services. Table 4-1 provides a summary of the equipment, design capacity, and fuel type of the central utilities plant.

Table 4-1 Existing Central Utility Plant

	Boilers	Centrifugal Chillers	Steam Absorption Chiller (not currently in service)	Thermal Energy Tank	Emergency Generator
Area Served	1.1 million sf	1.1 million sf			n/a
Number of Units	4	3	1	1	4
Design Capacity	4 MMBtu per hour	1,750 tons	2,000 tons	1,500 tons	2,000 kW
Fuel Type	CNG	Electric	Electric	Electric	Diesel

Source: City of Hope August 2017.
CNG = compressed natural gas
kW = kilowatt
MMBtu = million British thermal units
n/a = not applicable
sf = square feet

Surrounding Land Use

The project site is in an urbanized area. One- and two-story single- and multifamily residential uses are directly west of the project site; similar residential uses are to the north across Duarte Road and the Los Angeles County Metropolitan Transportation Authority (Metro) railroad right-of-way for the Gold Line. The City of Duarte recently approved the Duarte Station Specific Plan, which would allow the construction of a transit-oriented, mixed-use development with high-density residential, office, hotel, and commercial uses. The

Duarte/City of Hope Gold Line station, which opened in March 2016, is north of the project site across Duarte Road on the southern boundary of the Duarte Station Specific Plan. To the south and east of the project site lie the Santa Fe Dam and San Gabriel River flood control facilities owned by the US Army Corps of Engineers (see Figure 3-3, *Aerial Photograph*). These areas are used for flood control, groundwater recharge, and community recreation.

4.3.2 Existing Physical Conditions and Infrastructure

4.3.2.1 SCENIC FEATURES

Scenic vistas are panoramic views of features such as mountains, forests, the ocean, or urban skylines. Partially obstructed views of limited portions of the San Gabriel Mountains, which are approximately eight miles (by road) north of the project site, are available to motorists and passersby along Duarte Road. Partial views of these mountains are also visible from the Santa Fe Flood Control Basin, which is south of the project site and abuts its southern boundary.

The visual character of the campus is dominated by leading-edge medical and research buildings surrounded by landscaped gardens, open spaces, surface parking, and vacant lots. Prominent facilities on-site include:

- City of Hope Helford Clinical Research Hospital (inpatient)
- Geri and Richard Brawerman Center for Ambulatory Care (outpatient)
- Michael Amini Transfusion Medicine Center (blood donor center and outpatient surgery)
- Rita Cooper Finkel and J. William Finkel Building
- Sheri & Les Biller Patient and Family Resource Center
- Arnold and Mabel Beckman Center for Cancer Immunotherapeutics & Tumor Immunology
- Leslie & Susan Gonda (Goldschmied) Diabetes & Genetic Research Center

The project site is developed, and therefore light and glare are present in the area. In particular, substantial traffic along the I-210, I-605, and Duarte Road contributes vehicular light and glare on the roads. Ambient lighting exists from surrounding uses. Lighting is also present within the campus for external building lighting and safety and security lighting associated with internal streets, pathways, and parking lots.

Section 5.1, *Aesthetics*, provides a detailed analysis of the City's scenic vistas, visual resources, and aesthetic character as well as the potential impact to the visual character and lighting from buildout of the proposed project.

Figure 4-1 - Existing Land Uses

0 600
Scale (Feet)

Base Map Source: ESRI, 2016

4. Environmental Setting

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4.3.2.2 CLIMATE AND AIR QUALITY

The project site is in the SoCAB, which includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The annual average temperature varies little throughout the SoCAB, ranging from the low to middle 60s in degrees Fahrenheit. In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all rain falls from November through April (WRCC 2016). Although the SoCAB has a semiarid climate, the air near the earth's surface is typically moist because of a shallow marine layer.

Wind patterns across the south coastal region are characterized by westerly or southwesterly onshore winds during the day and by easterly or northeasterly breezes at night. Wind speed is somewhat greater during the dry summer months than during the rainy winter season. In conjunction with the two characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed.

An air quality analysis was performed for the project, and the results are discussed in Section 5.2, *Air Quality*. Additionally, project-related impacts from GHG emissions are discussed in Section 5.6, *Greenhouse Gas Emissions*.

4.3.2.3 BIOLOGICAL RESOURCES

Part of the Santa Fe Dam Recreational Area east of the project site is critical habitat for the southwestern willow flycatcher. The project site and the portion of the Santa Fe Flood Control Basin next to the southeast site boundary are outside of critical habitat.

The majority of the 116-acre project site is developed areas (82.1 acres or 71 percent of the site) consisting of existing roads; concrete-lined Duarte Flood Control Channel; hospital-related uses, including office, industrial, warehouse, assembly, and hospitality housing facilities; and residences. The developed areas of the project site (21.1 acres or 18 percent) are landscaped with an extensive assortment of ornamental plantings. Disturbed areas of the project site (10.9 acres or 9 percent), mostly in the southwest part of the site, are generally devoid of vegetation. A 1.9-acre (1.6 percent of the site) patch of ruderal vegetation is at the extreme southwestern tip of the project site.

No sensitive or native habitats are within the project site, which is characterized as developed, ornamental, disturbed, and ruderal. Furthermore, the site does not have suitable habitat for sensitive plant species or federal or state threatened/endangered wildlife species.

Refer to Section 5.3, *Biological Resources*, for additional information regarding the project site's biological resources and an analysis of project-related impacts to those resources.

4.3.2.4 CULTURAL RESOURCES

Twenty-five buildings on the project site were identified as potential historical resources because they are over 45 years of age. None of the buildings in the project site are currently listed in the National or California Registers.

4. Environmental Setting

During a survey performed by SWCA, one line of repurposed wood utility poles and one isolated historic-era glass jar (34076-ISO-1001) were identified. The wood utility poles retain no diagnostic temporal information and cannot be dated. Therefore, these were not formally recorded as a resource (SWCA 2016b). No additional cultural resources were identified within the project area.

A summary of the data provided by the Los Angeles County Natural History Museum (LACM) indicates that there are no known fossil localities within the project site. The nearest fossil locality that is known to the LACM occurs approximately 24 kilometers (15 miles) west of the project area in Eagle Rock. Two significant fossils are known from this locality, a turkey (*Parapavo californicus*) and a nearly complete mammoth (*Mammuthus*). These fossils occurred in geologic deposits similar to those present in the subsurface of the project area—Pleistocene alluvium—at depths of approximately 5 meters (15 feet) below the surface (SWCA 2016a).

Refer to Section 5.4, *Cultural Resources*, and Section 5.15, *Tribal Cultural Resources,* for an analysis of project impacts on cultural and tribal cultural resources.

4.3.2.5 GEOLOGY AND LANDFORM

The project site is near the northern edge of the Los Angeles Basin, a coastal plain extending from the Pacific Ocean on the south to the Santa Monica Mountains and Puente Hills on the north. The Los Angeles Basin is at the northern end of the Peninsular Ranges Geomorphic Province, a northwest-trending series of mountain ranges and valleys. The San Gabriel Mountains, which are about 1.3 miles north of the project site, are part of the Transverse Ranges Geomorphic Province, an east-west-trending series of steep mountain ranges and valleys extending from Santa Barbara County on the west to Riverside County on the east.

The nearest known active faults to the project site are the Duarte Fault, about 0.9 mile to the north; the Sierra Madre Fault Zone, about 1.5 miles to the north; the Raymond Fault, about 2.5 miles to the northwest; the Whittier Fault, about 10.5 miles to the south; and the Cucamonga Fault, about 17 miles to the east (CGS 2016).[2]

The project site is flat with a southwest grade of about 1.3 percent. Elevations onsite range from about 460 feet above mean sea level (amsl) at the northwest corner of the site, to 485 feet amsl at the northeast corner, to 435 feet asml at the south corner. The project site is underlain by alluvial soils ranging in particle size from silty sand to boulders, and most soils are sand and gravel. Artificial fill up to 4.5 feet thick overlies native alluvial soils. Groundwater was not observed under the project site in borings to depths of up to 50 feet below ground surface (bgs). Historical high groundwater levels are approximately 150 feet bgs.

Refer to Section 5.5, *Geology and Soils*, for additional information concerning geological and soil conditions and an analysis of project impacts on geology and soils.

[2] Distances to faults are measured from the edge of the City of Hope campus, and thus differ slightly from distances in the above-cited geotechnical reports, which are for specific areas within the campus.

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4.3.2.6 HYDROLOGY

Existing site stormwater was found to flow from the northeast to the southwest of the project site. There is an approximately 50-foot elevation difference between the highest point and the lowest point of the project site. The existing storm drain system consists of inlets and pipes that discharge to the private, on-site storm drain lines; one 30- to 36-inch storm drain main runs from east to west near the center of the project site, and the other 24- to 30-inch storm drain main runs along the southern border of the project site (KPFF 2016).

Additionally, a Los Angeles County Flood Control Chanel (aka the Duarte Flood Control Channel) runs from north to south and passes through the southern portion of the campus. The existing hydrology is such that all of the stormwater on the campus east of the channel eventually ends up in the channel, either by sheet flow or through a pipe network that connects to the flood control channel at the southern corner of the site (KPFF 2016).

Under existing conditions, the total runoff caused by a 10-year storm and a 50-year storm is estimated to be 136 cubic feet per second (cfs) and 221 cfs, respectively, for the entire campus (KPFF 2016).

Refer to Section 5.8, *Hydrology and Water Quality*, for additional information regarding hydrological conditions and an analysis of project impacts on hydrology and water quality.

4.3.2.7 NOISE

Community noise levels are measured in terms of the "A-weighted decibel" (dBA). A-weighting is a frequency correction that correlates overall sound pressure levels to the frequency response of the human ear. The noise rating scale used in California for land use compatibility assessment is the Community Noise Equivalent Level (CNEL). The CNEL scale represents a time-weighted, 24-hour average noise level based on the A-weighted decibel.

Noise levels in the project site area are influenced primarily by motor vehicle traffic in and around the City of Hope campus area, including along I-210, I-605, Duarte Road, and Buena Vista Street, which is a steady source of ambient noise. Noise from the existing operational equipment (e.g., HVAC system) of the existing City of Hope campus buildings and parking lot noise (idling cars, people talking) also add to the noise levels in the project site area.

Refer to Section 5.10, *Noise*, for additional information concerning the noise environment and an analysis of project-related noise impacts.

4.3.2.8 PUBLIC SERVICES AND UTILITIES

The project site is in an urbanized area of Duarte and Irwindale, with existing public services and utilities available to the site. Local utilities and service systems that serve the existing City of Hope are available to serve the proposed project. Public services and utilities are provided to the Campus Plan area by providers listed in Table 4-2.

4. Environmental Setting

Table 4-2 Public Service and Utility Providers

Public Services	
Police	Los Angeles County Sheriff's Department [Duarte]
	Irwindale Police Department [Irwindale]
Fire Protection and Emergency Medical Services	Los Angeles County Fire Department [Duarte and Irwindale]
Public Schools	Duarte Unified School District [Duarte and Irwindale]
Library	Los Angeles County Public Library [Duarte] City of Irwindale Public Library [Irwindale]
Parks	City of Hope (private onsite parks and open space) City of Duarte Parks and Recreation Department [Duarte] Irwindale Recreation Department [Irwindale]
Utilities	
Water	California American Water [Duarte and Irwindale]
Wastewater Collection	Sanitation Districts of Los Angeles County [Duarte and Irwindale]
Wastewater Treatment	Sanitation Districts of Los Angeles County [Duarte and Irwindale]
Solid Waste Collection	Burrtec Waste [Duarte] Athens Services [Irwindale]
Solid Waste Disposal (Landfills)	Sanitation Districts of Los Angeles County [Duarte and Irwindale]
Electricity	Southern California Edison [Duarte and Irwindale]
Natural Gas	Southern California Gas Company [Duarte and Irwindale]

Refer to Sections 5.12, *Public Services*, and 5.16, *Utilities and Service Systems*, for additional information regarding public services and utilities and service systems, respectively, and an analysis of project impacts on services and utilities.

4.3.2.9 ENERGY

The project site is in Southern California Edison (SCE)'s service area, which spans much of southern California from Orange and Riverside counties on the south to Santa Barbara County on the west to Mono County on the north. An electrical SCE substation is located near the middle of the project site's southern boundary.

The Southern California Gas Company (SCGC) provides natural gas to the Plan Area. SCGC's service area spans much of the southern half of California, from Imperial County on the southeast to San Luis Obispo County on the northwest to part of Fresno County on the north to Riverside County and most of San Bernardino County on the east. A distribution pipeline extends east-west in Duarte Road along the project site's northern boundary.

Refer to Section 5.17, *Energy*, for additional information regarding electricity and natural gas services and an analysis of project impacts on these services.

4.3.3 General Plan and Zoning

The existing general plan land use designations in the Campus Plan area are shown in Figure 4-2, *Existing General Plan Designations*. Existing zoning districts in the Campus Plan area are shown in Figure 4-3, *Existing Zoning*.

4.3.3.1 DUARTE GENERAL PLAN AND ZONING DESIGNATIONS

For the portion of the project site in the City of Duarte (89.5 acres), the Duarte General Plan identifies this area under six land use designations: Hospital (encompasses the majority of the project site), Single-Family Residential, Medium-Density Residential, High-Density Residential, Research and Development, and Public Facilities.

Per the City of Duarte zoning map, the majority of the project site in Duarte is zoned H (Hospital), which permits general hospitals (excluding sanitariums, nursing homes, convalescent homes, maternity homes, or rest homes); medical professional offices; and attendant medical facilities, including, but not limited to, pharmacies, physical therapy offices, laboratories, and clinics. Portions of the project site on the western part of the campus are zoned for residential uses, with the current zoning designations of R-1 (One-Family Residential), R-2 (Two-Family Residential), R-4 (Multiple Family Residential High Density), and O (Open Space).

4.3.3.2 IRWINDALE GENERAL PLAN AND ZONING DESIGNATIONS

The portion of the project site in the City of Irwindale (26.5 acres) is categorized under two General Plan land use designations, Industrial/Business Park (IBP), Commercial, and Open Space/Easements (OSE).

Per the City of Irwindale zoning map, the portion of project site within Irwindale is zoned A-1 (Agricultural), C-2 (Heavy Commercial), and M-1 (Light Manufacturing). Agricultural uses have not historically occurred onsite; the Agricultural zoning designation is due to the adjacent Santa Fe Flood Control Basin.

4.4 ASSUMPTIONS REGARDING CUMULATIVE IMPACTS

Section 15130 of the CEQA Guidelines states that cumulative impacts shall be discussed where they are significant. It further states that this discussion shall reflect the level and severity of the impact and the likelihood of occurrence, but not in as great a level of detail as that necessary for the project alone. Section 15355 of the Guidelines defines cumulative impacts as "...two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Cumulative impacts represent the change caused by the incremental impact of a project when added to other proposed or committed projects in the vicinity.

The CEQA Guidelines (Section 15130 [b][1]) state that the information utilized in an analysis of cumulative impacts should come from one of two sources:

A. A list of past, present and probable future projects producing related cumulative impacts, including, if necessary, those projects outside the control of the agency.

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B. A summary of projections contained in an adopted General Plan or related planning document designed to evaluate regional or area-wide conditions.

The cumulative impact analysis in this DEIR uses both Method A and Method B. The City of Duarte's 2005-2020 Comprehensive General Plan and Land Use Element were adopted by the Duarte City Council on August 14, 2007. The City of Irwindale's General Plan Update and Community Development Element were adopted by the Irwindale City Council in June 2008. Cumulative impact analyses will use the projections in the Duarte and Irwindale General Plans and other long-range planning documents—such as the urban water master plan for water supply and SCAG's 2016–2040 RTP/SCS for land use and planning. This information was supplemented with a list of related projects, described in detail below.

The land use intensities allowed by the adopted general plan and the growth projections in the land use elements as well as population and housing estimates for the year 2035 (estimated Campus Plan buildout) gathered from SCAG's 2016–2040 RTP/SCS for Duarte and Irwindale, are detailed in Tables 4-3 and 4-4, respectively. Table 4-3 shows the 2020 Duarte General Plan has a buildout capacity of 25,418 estimated population, 7,702 estimated units, and 9,953,071 estimated nonresidential square footage (Duarte 2007). This buildout includes the planned land use and development intensity for the "City Center" and "Gold Line Station" Special Planning Areas.

Table 4-3 Duarte General Plan Buildout Capacities

Land Use Designation	Intensity/Density	Acres	Theoretical Buildout		Estimated Population (2020)
Residential Classification					
Very Low Density	2.5 du/acre	120	–	300 du	990
Low Density	6 du/acre	645	–	3,870 du	12,771
Medium Density	15 du/acre	89	–	1,335 du	4,406
High Density	23 du/acre	52	–	1,196 du	3,947
Subtotal	–	**906**	–	**6,701 du**	**22,114**
Commercial Classification					
Neighborhood	0.25:1 FAR/acre	3	32,670 sf	–	–
General	0.5:1.0 FAR/acre	92	2,003,760 sf	–	–
Administrative Professional	0.5:1 FAR/acre	4	87,120 sf	–	–
Subtotal	–	**99**	**2,123,550 sf**	–	**–**
Hospital Use Classification					
Hospital	1.5:1 FAR/acre	78	5,096,520 sf	–	–
Research and Development	1.5:1 FAR/acre	15	980,100 sf	–	–
Subtotal	–	**93**	**6,076,620 sf**	–	–
Industrial Classification					
Industrial	0.5:1 FAR/acre	53	1,154,340 sf	–	–
Subtotal	–	**53**	**1,154,340 sf**	–	–
Public/Quasi Public Classification					
Public School	–	80	**–**	–	–
City-Owned Facilities	–	12	**–**	–	–

4. Environmental Setting

Table 4-3 Duarte General Plan Buildout Capacities

Land Use Designation	Intensity/Density	Acres	Theoretical Buildout		Estimated Population (2020)
County-owned Facilities	–	2	–	–	–
Utility Easements	–	95	–	–	–
Streets, Freeway	–	478	–	–	–
Subtotal	–	**667**	–	–	–
Open Space Classification					
Parks	–	39	–	–	–
Wilderness Area	–	42	–	–	–
National Forest	–	1,909	–	–	–
Subtotal	–	**1,989**	–	–	–
Specific Plan Areas Classification					
Planned community and areas	–	131	333,561 sf	716 du	2,363
City Center Mixed Use Area	varies	11	165,000 sf	165 du	545
Gold Line Station Area Development	varies	20	100,000 sf	120 du	396
Subtotal	–	**162**	**598,561 sf**	**1,001 du**	**3,304**
TOTAL	–	**6,410.4**	**9,953,071 sf**	**7,702 du**	**25,418**

Source: Duarte General Plan Land Use Element.
Notes: FAR = floor area ratio; du = dwelling units; sf = square feet

Buildout statistics for the City of Irwindale are based on SCAG growth projections since the Irwindale General Plan does not contain buildout statistics. Table 4-4 shows the estimated growth of housing units, population, and employment throughout the City of Duarte and the City of Irwindale from 2012 until 2035 (estimated Campus Plan buildout date).

Table 4-4 City of Duarte and City of Irwindale Growth Projections

Year	Population	Households	Employment
City of Duarte			
2012	21,500	7,000	10,100
2020	22,100	7,400	10,900
2035	23,600	8,000	11,600
Difference	**2,100**	**1,000**	**1,500**
City of Irwindale			
2012	1,400	400	18,800
2020	1,500	400	20,300
2035	1,800	500	21,000
Difference	**400**	**100**	**2,200**
TOTAL DIFFERENCE	**2,500**	**1,100**	**3,700**

Source: Southern California Association of Governments (SCAG) 2016.

4. Environmental Setting

Cumulative impact analyses for several topical sections are also based on the most appropriate geographic boundary for the respective impact. For example, cumulative hydrological impacts are based on the area's watershed (Rio Hondo/San Gabriel River Watershed), and wastewater impacts are based on the Sanitation Districts of Los Angeles County's service boundary, which includes other jurisdictions besides Duarte and Irwindale. The approach is further discussed below and in each respective topical section. Several potential cumulative impacts that encompass regional boundaries (e.g., air quality, greenhouse gases, traffic) have been addressed in the context of various regional plans and defined significance thresholds. Following is a summary of the approach and extent of cumulative impacts, which is further detailed in each topical environmental section.

- **Aesthetics**. Review of Duarte General Plan and Irwindale General Plan land use designations and cumulative projects relative to open space preservation on the project site and adjacent development.

- **Air Quality**. Based on the regional boundaries of the South Coast Air Basin.

- **Biological Resources**. Regional evaluation considering regional habitat loss, protected species, and wildlife corridors, based primarily upon the San Gabriel Valley area.

- **Cultural Resources**. Cultural resources impacts are site specific and generally do not combine to result in cumulative impacts. The cumulative analysis of historical resources includes the project site and immediately surrounding area.

- **Geological Resources**. Geologic and soils impacts are site specific and generally do not combine to result in cumulative impacts.

- **Greenhouse Gas (GHG) Emissions**. Potential GHG impacts are not bounded by geography but affect global climate change. The assessment of cumulative GHG impacts, therefore, is based on consistency with regional plans and per-capita GHG reduction thresholds to achieve targeted reductions.

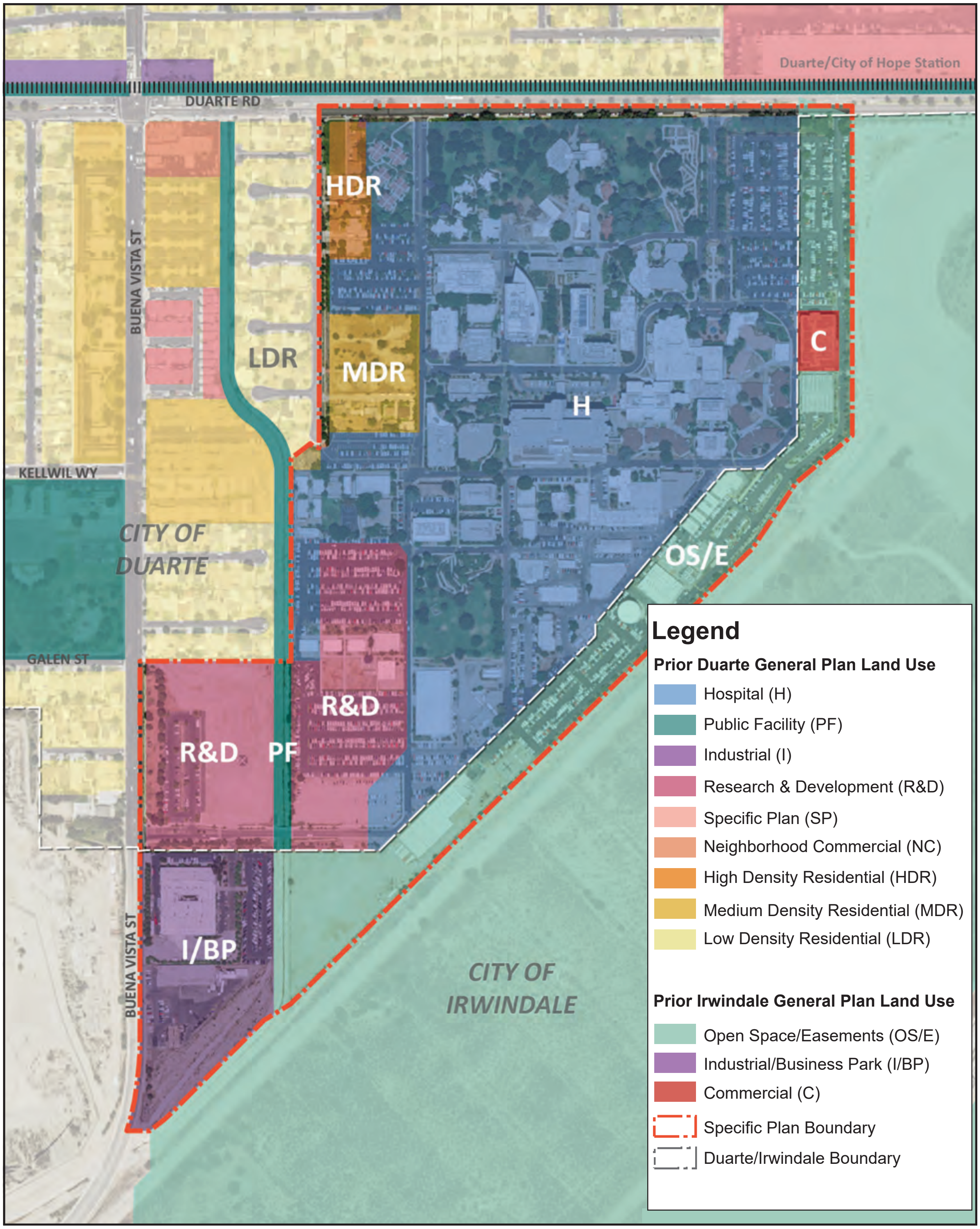
- **Hazards and Hazardous Materials**. Cumulative analysis highlights the regulatory requirements related to both airport hazards and wildfire hazards. Project impacts, however, are site specific, and would not combine with impacts of other projects to result in cumulatively considerable impacts.

- **Hydrology and Water Quality**. Cumulative hydrological impacts are based on the Buena Vista subwatershed of the Los Angeles River Watershed, and water quality impacts are based on potential cumulative impacts on the Los Angeles Coastal Plan (Central Subbasin) of the San Gabriel Valley Groundwater Basin.

- **Land Use and Planning**. Cumulative analysis is based on applicable jurisdictional boundaries and related plans, including the Duarte General Plan, Irwindale General Plan, and regional land use planning based on the Southern California Association of Governments (SCAG).

Figure 4-2 - Existing General Plan Designations

4. Environmental Setting



Base Map Source: Google Earth Pro, 2016; City or Duarte, City of Irwindale

0 500
Scale (Feet)

4. Environmental Setting

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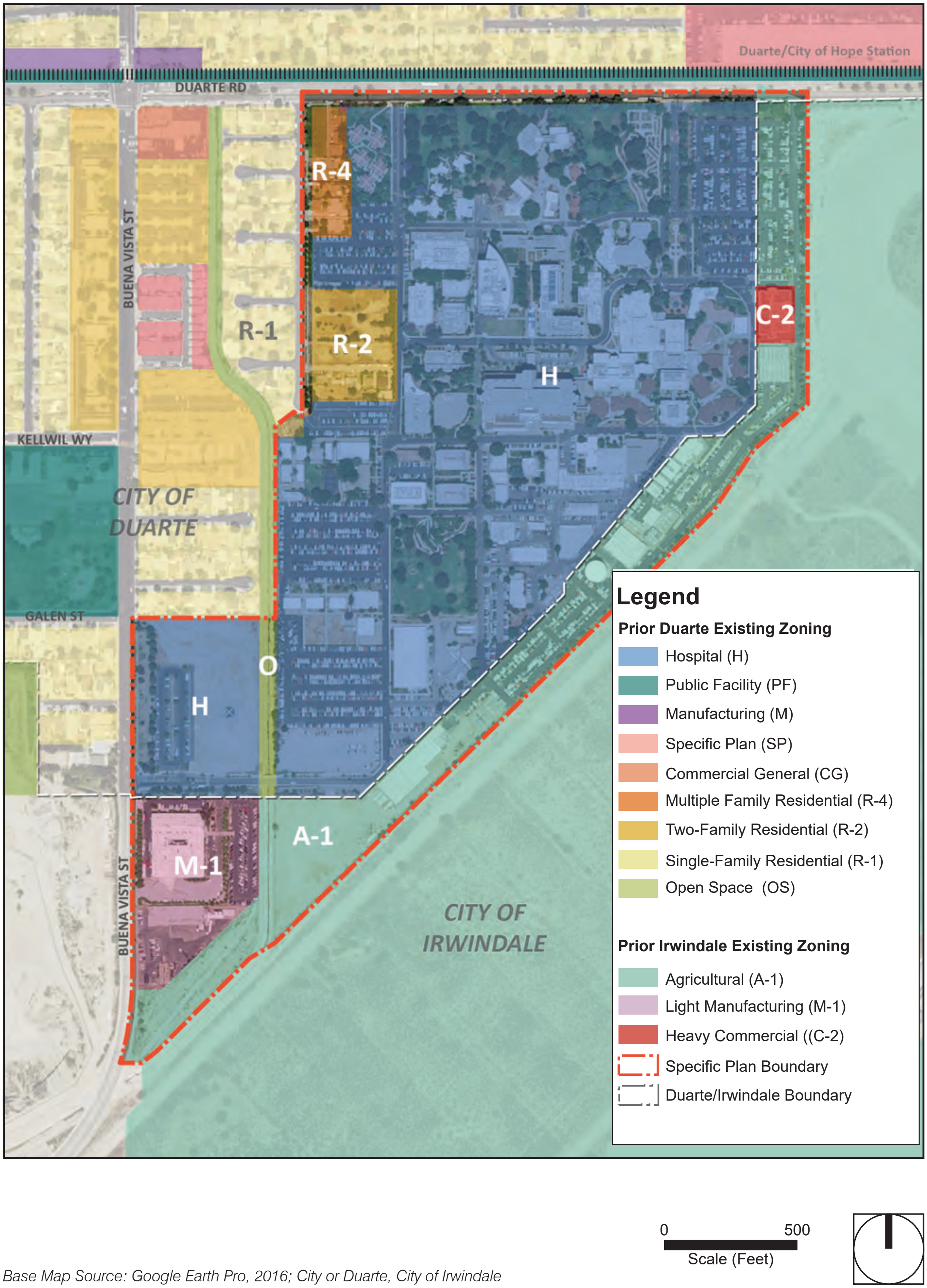
Figure 4-3 - Existing Zoning
4. Environmental Setting



Base Map Source: Google Earth Pro, 2016; City or Duarte, City of Irwindale

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4. Environmental Setting

- **Noise**. Cumulative traffic noise is assessed relative to applicable city general plan noise-level standards.

- **Population and Housing**. Cumulative impacts are assessed relative to citywide jobs-housing balances, applicable city general plan (including housing element), regional plans (RTP/SCS), and population/housing projections.

- **Public Services**. Cumulative impacts are based on potential related development within the applicable service provider boundaries (Los Angeles County Fire Department, Los Angeles County Sheriff's Department, Irwindale Police Department, Duarte Unified School District, Los Angeles County Public Library, and City of Irwindale Public Library) and assessed relative to applicable plans and projections.

- **Recreation**. Cumulative impacts are assessed relative to City of Duarte and City of Irwindale standards and are based on impacts within City of Duarte and City of Irwindale boundaries.

- **Transportation and Traffic**. Ambient growth for the study area was developed based on growth factors from the Congestion Management Program for Los Angeles County (F&P 2017). The State of California requires that a congestion management program be developed, adopted, and updated biennially for every county that includes an urbanized area and shall include every city and the county government within that county. Metro is designated as the Congestion Management Agency for Los Angeles County and is responsible for the implementation of the CMP. The CMP was approved in October 2010 and serves as a resource for future growth factors within the 21 regional statistical areas (RSA) of Los Angeles County. The growth rate factors for the RSA area of Duarte was used to determine yearly growth rates of the future traffic. A growth rates of 0.52 percent per year for the Duarte RSA was used for the development of the future year scenario.

  Future traffic forecasts also include the effects of related projects expected to be implemented in the vicinity of the proposed project site prior to the buildout date of the proposed project. A total of 13 cumulative projects were identified in the study area and are listed in Table 4-5 and shown on Figure 4-4, *Related Projects*, below.

- **Tribal Cultural Resources.** Considers Native American territory that includes the project site, as provided by the Native American Heritage Commission.

- **Utilities and Service Systems**. Water supply and distribution system impacts would be contiguous with the California American Water and Los Angeles County District service area. Wastewater conveyance and treatment would be contiguous with the Sanitation Districts of Los Angeles County service area. Storm drainage systems would be contiguous with the Buena Vista subwatershed of the Los Angeles River Watershed and the Los Angeles Regional Water Quality Control Board service area. Solid waste collection and disposal services would be contiguous with the Sanitation Districts of Los Angeles. And natural gas and electricity services would be contiguous with the Southern California Gas Company and Southern California Edison service areas.

4. Environmental Setting

4.4.1 Related Projects

The list of related projects was prepared based on data from the City of Duarte, City of Monrovia, City of Irwindale, City of Bradbury, City of Azusa, and County of Los Angeles. A total of 13 cumulative projects were identified in the study area for the traffic study, shown on Table 4-5 and Figure 4-4 below. These projects are expected to be implemented in the vicinity of the project site prior to the buildout date of the Campus Plan.

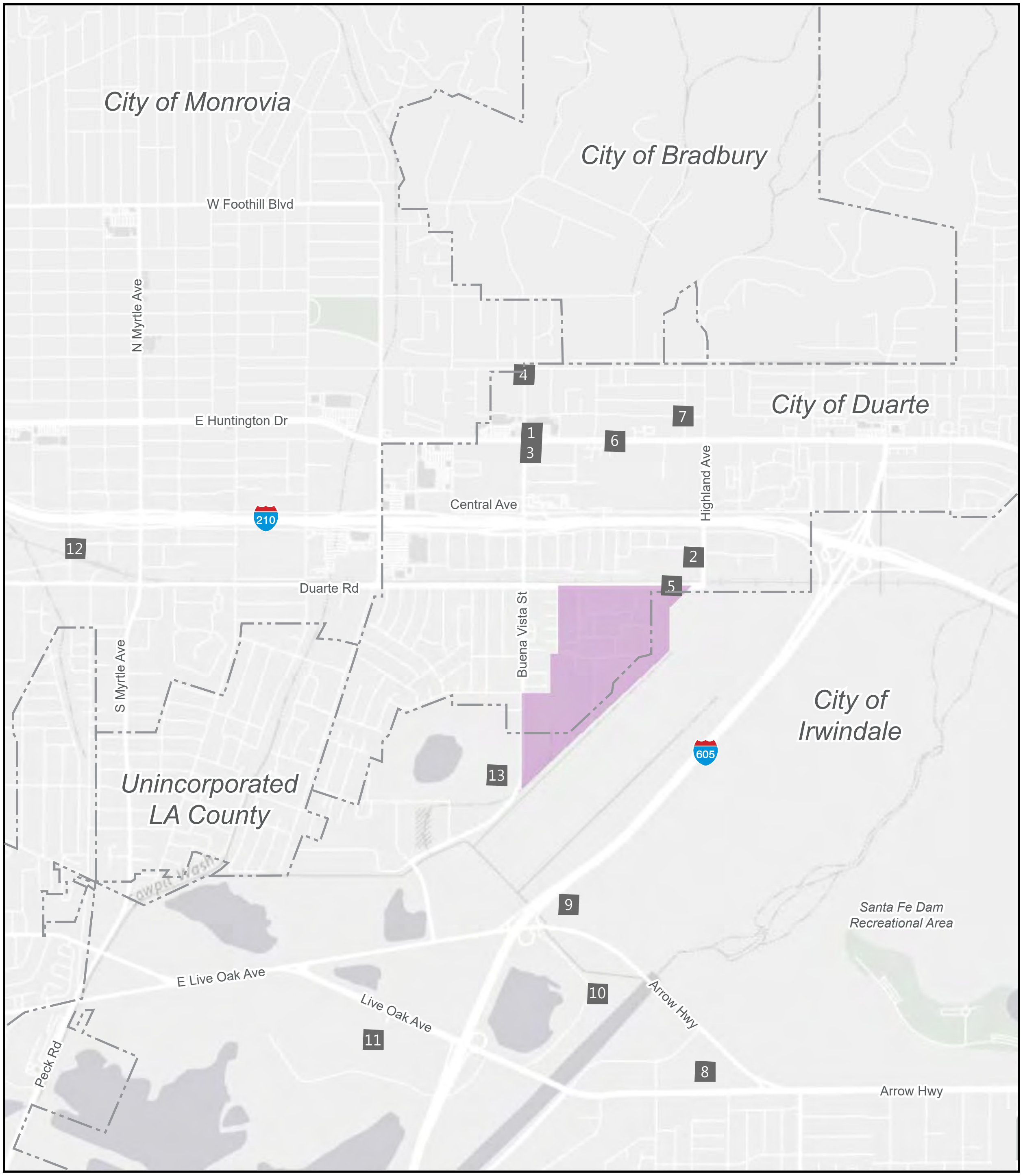
Table 4-5 Summary of Related Projects

No.	Project Location	Jurisdiction	Buildout Statistics	Daily Trips
1	Northeast Corner - Huntington Drive & Buena Vista Street	Duarte	• 1.80 KSF drive-thru coffee shop • 2.60 KSF retail	1,584
2	Metro Gold Line Duarte Station Parking Facility Project	Duarte	• Transit parking	893
3	Southeast Corner - Huntington Drive & Buena Vista Street	Duarte	• 19.93 KSF supermarket	2,038
4	800 Block of Buena Vista Street	Duarte	• 191-bed assisted living facility	411
5	Northwest Corner - Highland Avenue & Duarte Road	Duarte	• 475 DU apartment • 400 KSF office • 250-room hotel • 12 KSF retail	7,259
6	1200 Block Huntington Drive	Duarte	• 800 DU residential • 703 KSF commercial • 450-room lodging	3,150
7	1634 Third Street & 1101 Oak Avenue	Duarte	• 18 DU townhouse • Park	106
8	2200 Arrow Hwy	Irwindale	• General light industrial	8,333
9	Arrow Hwy & Live Oak Lane	Irwindale	• 17-acre athletic club	710
10	Live Oak Lane	Irwindale	• 29 KSF retail	1,202
11	500 Speedway Drive	Irwindale	• 700 KSF Factory Outlet Center	17,788
12	Station Square Transit Village	Monrovia	• 23 KSF retail • 450 KSF office • 700 DU residential	4,513
13	Miguel Miranda Avenue & Meridian Street	Azusa	n/a	1,610

Source: Fehr & Peers 2017; Table 6, Appendix J1 of this DEIR.
Notes: DU = dwelling unit; KSF = thousand square feet; n/a = not applicable

Please refer to Chapter 5, *Environmental Analysis*, of this DEIR for a discussion of the cumulative impacts associated with development and growth in the City and region for each environmental resource area.

Figure 4-4 - Related Projects
4. Environmental Setting



Related Projects (Refer to Table 4-4 for Corresponding Project)

Project Site

Base Map Source: Fehr & Peers, 2016

4. Environmental Setting

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4.5 REFERENCES

California Geological Survey (CGS). 2016, August 23. Fault Activity Map of California (2010). http://maps.conservation.ca.gov/cgs/fam/.

Duarte, City of. 2007, August 14. City of Duarte General Plan. http://www.accessduarte.com/dept/cd/planning/general_plan.htm.

Fehr & Peers. 2017, April. Transportation Impact Study for the City of Hope.

KPFF Consulting Engineers (KPFF). 2016, August 16 (revised). Hydrology Report: City of Hope Campus Plan.

Los Angeles County Metropolitan Transportation Authority (Metro). 2010, October 28. 2010 Congestion Management Program for Los Angeles County. http://media.metro.net/docs/cmp_final_2010.pdf.

Southern California Association of Governments (SCAG). 2016. 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy. http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS.pdf.

SWCA Environmental Consultants. 2016a, April. Paleontological Resources Impact Assessment Report for the City of Hope Specific Plan, City of Duarte, Los Angeles County, California.

———. 2016b, May. Draft Cultural Resources Technical Report for the City of Hope Specific Plan, City of Duarte, Los Angeles County, California.

Western Regional Climate Center (WRCC). 2016. Western U.S. Historical Summaries: Azusa City PK FC 143 Station Monitoring Station (Station ID No. 040410). http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0410.

4. Environmental Setting

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5. Environmental Analysis

Chapter 5 examines the environmental setting of the proposed project, analyzes its effects and the significance of its impacts, and recommends mitigation measures to reduce or avoid impacts. This chapter has a separate section for each environmental issue area that was determined to need further study in the EIR. This scope was determined in the Initial Study and Notice of Preparation (NOP), which were published October 15, 2015 (see Appendix A), as well as through public and agency comments received during the NOP comment period from October 15 through November 16, 2015 (see Appendix B). Environmental issues and their corresponding sections are:

- 5.1 Aesthetics
- 5.2 Air Quality
- 5.3 Biological Resources
- 5.4 Cultural Resources
- 5.5 Geology and Soils
- 5.6 Greenhouse Gas Emissions
- 5.7 Hazards and Hazardous Materials
- 5.8 Hydrology and Water Quality
- 5.9 Land Use and Planning
- 5.10 Noise
- 5.11 Population and Housing
- 5.12 Public Services
- 5.13 Recreation
- 5.14 Transportation and Traffic
- 5.15 Tribal Cultural Resources
- 5.16 Utilities and Service Systems
- 5.17 Energy

Sections 5.1 through 5.17 provide a detailed discussion of the environmental setting, impacts associated with the proposed project, and mitigation measures designed to reduce significant impacts where required and when feasible. The residual impacts following the implementation of any mitigation measure are also discussed.

The Initial Study also determined that certain issues under an environmental topic would not be significantly affected by implementation of the project; these issues are not discussed further in this EIR.

5. Environmental Analysis

Organization of Environmental Analysis

To assist the reader with comparing information between environmental issues, each section is organized under nine major headings:

- Environmental Setting
- Thresholds of Significance
- Environmental Impacts
- Cumulative Impacts
- Existing Regulations and Standard Conditions
- Level of Significance Before Mitigation
- Mitigation Measures
- Level of Significance After Mitigation
- References

In addition, at the end of Chapter 1, *Executive Summary,* is a table that summarizes all impacts by environmental issue.

Terminology Used in This DEIR

The level of significance is identified for each impact in this DEIR. Although the criteria for determining significance are unique for each topic area, the environmental analysis applies a uniform classification of the impacts based on definitions consistent with CEQA and the CEQA Guidelines.

- **No impact.** The project would not change the environment.
- **Less than significant.** The project would not cause any substantial, adverse change in the environment.
- **Less than significant with mitigation incorporated.** The EIR includes mitigation measures that avoid substantial adverse impacts on the environment.
- **Significant and unavoidable.** The project would cause a substantial adverse effect on the environment, and no feasible mitigation measures are available to reduce the impact to a less than significant level.

5.1 AESTHETICS

This section of the Draft Environmental Report (DEIR) discusses the potential impacts to the visual character of the project site and its surroundings associated with implementation of the City of Hope Campus Plan (proposed Campus Plan).

5.1.1 Environmental Setting

5.1.1.1 REGULATORY FRAMEWORK

State and local laws, regulations, plans, or guidelines that are applicable to the proposed Campus Plan are summarized below.

State

California Building Code: Building Energy Efficiency Standards

Energy conservation standards for new residential and non-residential buildings were adopted by the California Energy Resources Conservation and Development Commission (now the CEC) in June 1977 and most recently revised in 2013 (Title 24, Part 6, of the California Code of Regulations [CCR]). Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods. On May 31, 2012, the CEC adopted the 2013 Building Energy Efficiency Standards, which went into effect on July 1, 2014. Title 24 requires outdoor lighting controls to reduce energy usage; in effect, this reduces outdoor lighting.

Senate Bill 743

On September 27, 2013, SB 743 was signed into law. SB 743 started a process that could fundamentally change transportation impact analysis as part of CEQA compliance; these changes are discussed in Section 5.14, *Transportation and Traffic*, of this DEIR. Pursuant to this law, Section 21099(d)(1) was added to the Public Resources Code, which states that a project's aesthetic impacts is not considered a significant impact on the environment if the project is a residential, mixed-use residential, or employment center project, and the project is located on an infill site within a transit priority area. A portion of the project site is in a transit priority area as defined by Section 21099(a)(7), because it is within one-half mile of a major transit stop, the Gold Line station (Duarte/City of Hope).

Local

City of Duarte Development Code

The City of Duarte Development Code identifies land use categories, development standards, and other provisions that ensure consistency between the General Plan and proposed development and redevelopment projects. Adherence to the following chapters of the development code improves and maintains the visual quality of the community.

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- **Chapter 19.32, Site Planning and General Development Standards.** This chapter generally addresses the siting and massing of structures. Its purpose is to produce an environment of "stable and desirable character that is harmonious with existing and future development." Provisions include setback requirements, height restrictions, and street improvement requirements.

- **Chapter 19.36, Fences, Walls, and Hedges.** This chapter establishes standards and regulations for the construction and maintenance of fences and walls, and the planting and maintenance of hedges used for screening or buffering purposes. The standards are intended to ensure that all fences, walls, and hedges provide desired privacy and safety but do not create a public safety hazard or nuisance, and that fences, walls, and hedges meet the City's standards for quality design and regular maintenance.

- **Chapter 19.40, Landscaping.** This chapter establishes minimum landscape standards for all uses for the purpose of enhancing the appearance of developments, reducing heat and glare, controlling soil erosion, conserving water, establishing a buffer and/or screen between residential and nonresidential land uses, and ensuring the ongoing maintenance of landscape areas.

- **Chapter 19.42, Signs.** This chapter aims to maintain and enhance the City's appearance by regulating the design, character, location, number, type, materials, size, illumination, and maintenance of signs. Special attention is dedicated to pedestrian and vehicular safety and a balance between freedom of speech and aesthetic considerations.

- **Chapter 19.44, Architectural and Design Standards.** The standards established in this chapter are divided between those that apply to residential structures and those that apply to nonresidential uses. Standards relate to architectural character, scale and massing, site design, specific structural design elements, and the screening of equipment, loading docks, and other elements. Provisions specific to hospitals include requirements related to access, circulation, and architectural character (Section 19.44.020[F]).

- **Chapter 19.50, Performance Standards.** Section 19.50.070 establishes outdoor lighting standards that, among other goals, aim to avoid or minimize adverse impacts related to light trespass, light pollution, and glare. Standards in this section express the City's desire to balance security and safety benefits derived from nighttime lighting with energy efficiency and aesthetics.

City of Duarte General Plan

The Duarte General Plan does not have an element or section that comprehensively addresses aesthetics or urban design. However, the following policies address the visual environment.

- **Policy Con 3.1.3.** Minimize the aesthetic impacts of signs through the strict enforcement of the Municipal Sign Ordinance.

- **Policy Con 6.1.1.** Maintain very low densities in the northernmost portion of the city not included in the national forest. Further development must be sensitive to the terrain, natural environment and aesthetics.

- **Policy LU 2.1.1.** New infill residential development should be compatible in design, bulk, and height with existing nearby residential development as referenced in Duarte's Architectural Design Guidelines.
- **Policy LU 2.1.6.** Hillside development must be sensitive to the local views of the hills and to the natural environment.
- **Policy HP 3.1.1.** Encourage property owners to preserve the character defining features of historical resources.
- **Policy Econ. 2.1.1.** Continue to improve landscaping and the visual character of the I-210 freeway corridor.

City of Irwindale Municipal Code

The City of Irwindale Municipal Code contains provisions that address the quality of the community's visual appearance. Provisions related to aesthetic concerns are generally found in the following section.

- **Chapter 17.70, Site Plan and Design Review.** This chapter identifies procedures for site plan and design review. Design review criteria include provisions related to the color and quality of building materials, changes in building scale, landscaping buffers, and light and glare.

City of Irwindale Commercial and Industrial Design Guidelines

The City of Irwindale's design guidelines for commercial and industrial land uses do not explicitly state their applicability to public facilities such as City of Hope. However, they offer guidance on a number of design considerations that affect community character and visual appearance. As stated in the guidelines, the City's goal for the document is a "more aesthetically and functionally cohesive community." Provisions include guidelines related to:

- Site design and landscaping
- Parking and vehicular access
- Open space
- Screening and buffers
- Building materials and streetscape design
- Architectural character
- Signage

City of Irwindale General Plan

The City of Irwindale General Plan addresses aesthetics and community character in its community development element. The following policies relate to urban design.

- **Community Development Policy 12.** The City of Irwindale will continue to promote quality design in the review and approval of commercial and industrial development through the application of the commercial and industrial design guidelines.
- **Community Development Policy 13.** The City of Irwindale will continue to employ a design theme in the review of future commercial and industrial development and in the rehabilitation of existing commercial and industrial uses.
- **Community Development Policy 14.** The City of Irwindale will continue to promote property maintenance in all areas of the City.
- **Community Development Policy 15.** The City of Irwindale will continue to work towards improving the appearance of the City entryways.
- **Community Development Policy 16.** The City of Irwindale will continue to work towards the development of streetscape, sign standards, and a Public Art Program.
- **Community Development Element Policy 17.** The City of Irwindale will continue to encourage a balance of commercial uses to avoid an overconcentration of uses to best serve the residents, employee population, and business community.

5.1.1.2 VISUAL SETTING

The project site is an existing medical center and research facility featuring a wide variety of buildings, green spaces (including landscaped gardens), and numerous parking areas. The 116-acre campus site is organized on an internal network of two-lane roadways. Existing improvements include driveways and drive aisles, asphalt-paved parking areas, parking structures, walkways and sidewalks, and other hardscape improvements.

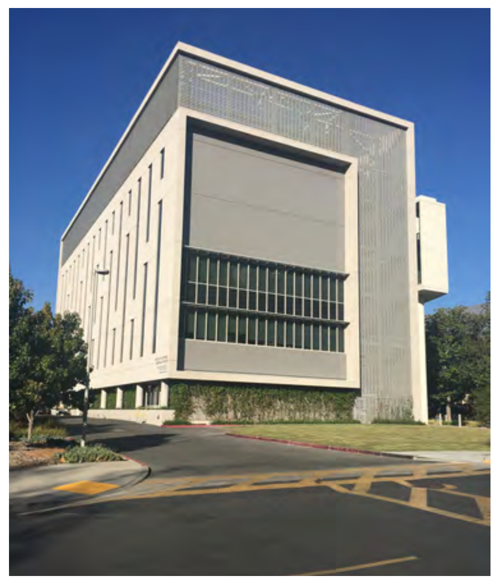
As shown in Figure 5.1-1, *Photographs of Existing Campus*, the visual character of the campus is dominated by large medical buildings that are between one and seven stories tall. The center of the project site has the most-urban character because it features a large cluster of adjoining buildings, including multistory hospital buildings. The southern and northern edges of the project site are more suburban in character due to single-story on-campus housing units (Hope Village and Parsons Village), green spaces (Heritage Park in the south; Pioneer Park, Japanese garden, rose garden, and sculpture garden in the north), and a prevalence of surface parking lots. In particular, the northern edge of the project site along Duarte Road has a parklike feel due to a large number of mature trees and expanses of landscaping and turf. The southeastern edge of the campus features an industrial character due to the presence of a water tower, warehouse buildings, electrical transformers, and heating/cooling facilities. The west edge of the campus consists largely of surface parking, with some residences along the northwest and west-central boundaries; some vacant land in the southwest part of the campus; and one large building near the southwest corner of the campus. Overall, the campus is marked by visual variety, and its structures do not feature a consistent architectural style or building scale.

Figure 5.1-1 - Photographs of Existing Campus
5. Environmental Analysis

Helford Clinical Research Hospital looking southwest from Ben Horowitz Drive.

House of Hope looking north.

Kaplan Pavilion looking northeast from Isadore Familian Way.



Arnold and Mabel Beckman Center looking northeast.

Water tank near the southeast edge of the campus.

Hope Village on-campus housing units in the northwest quadrant of the campus.

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Landform

The project site is approximately one mile south of the foothills of the San Gabriel Mountains. The San Gabriel Mountains are a visually prominent landform throughout the San Gabriel Valley, including Duarte and Irwindale. However, the project site itself is largely flat and lacking in topographical changes. There is a gradual slope to the site, with an approximately 47-foot elevation difference between the highest point and the lowest point of the project site.

Minor exceptions to the site's flat topography include the Duarte Flood Control Channel, which travels north–south on the western edge of the project site, passes through the southern portion of the campus, and is depressed below natural grade. Other exceptions include a low earthen berm along the campus's southeastern boundary and a high, steep, rock- and concrete-lined berm to the northeast that separates the site from San Gabriel River flood control facilities to the east (see Figure 3-3, *Aerial Photograph)*.

Unique Scenic Resources

Most buildings and improvements on the project site are utilitarian in nature and do not represent unique visual resources. However, the project site does contain a number of visual resources that provide character and visual interest, including:

- Heritage Park (trees, greenery, fountain, and public art)
- Pioneer Park (trees, greenery, and public art)
- Rose garden and sculpture garden (greenery and public art)
- Japanese garden (greenery, koi pond, and bridge)
- Kaplan Pavilion (new buildings with unique, undulating forms)
- Graff Plaza ("wishing trees" that feature colorful messages tied to branches)
- Visitor center and House of Hope (historic buildings eligible for listing in national and state registers)
- "Spirit of Life" fountain and sculpture (public art)

The Kaplan Pavilion and House of Hope are shown in Figure 5.1-1. The rose garden (including the "Golter Gate" sculpture), Japanese garden, Graff Plaza, visitor center, and the "Spirit of Life" fountain are shown in Figure 5.1-2, *Existing Visual Resources*.

Scenic Vistas and Corridors

Scenic vistas are panoramic views of features such as mountains, forests, the ocean, or urban skylines. The project site provides partially obstructed views of the San Gabriel Mountains, which are approximately 1.5 miles north of the project site.

The project is not adjacent to or near a state-designated scenic highway (Caltrans 2011). The nearest designated state scenic highway is State Route 2 (Angeles Crest Highway), approximately 10 miles north of the project site. The project site is not in a locally designated scenic corridor.

Light and Glare

Because the project site is developed with urban land uses and is surrounded on three sides by additional urbanized uses, light and glare are present in the area. In particular, substantial traffic along I-210, I-605, and Duarte Road contribute light and glare. Ambient lighting exists from surrounding uses. Lighting is also present within the campus for external building lighting and safety and security lighting associated with internal streets, pathways, and parking lots.

5.1.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

AE-1 Have a substantial adverse effect on a scenic vista.

AE-2 Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

AE-3 Substantially degrade the existing visual character or quality of the site and its surroundings.

AE-4 Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant:

- Threshold AE-1: Scenic vistas: Campus Plan buildout would not impact the partially obstructed views of the San Gabriel Mountains from Duarte Road because the project site is on the south side of Duarte Road, and views of the mountains are to the north. The spillway channel for the Santa Fe Flood Control Basin is closed to the public and does not afford views of the mountains to the public.

- Threshold AE-2: Scenic Resources: The nearest designated state scenic highway is State Route 2 (the Angeles Crest Highway), approximately 10 miles north of the project site. Campus Plan buildout would not impact scenic resources in a state scenic highway.

These impacts will not be addressed in the following analysis.

Figure 5.1-2 - Existing Visual Resources
5. Environmental Analysis

“Golter Gate” sculpture in the rose garden.

Historic visitor’s center looking east.

Public art adjacent to Hope Village.

Entrance to the Japanese garden, looking south.

Colorful “wishing trees” in Graff Plaza.

“Spirit of Life” fountain and sculpture at the Main Medical building.

Rose garden near the main entrance to City of Hope.

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5.1.3 Environmental Impacts

Methodology

This section includes a discussion of the qualitative aesthetic characteristics of the environment that could be potentially degraded by the project's implementation and the consistency of the project with established relevant visual resource policies. The information presented in this section is based on field reconnaissance, review of the project site and aerial photographs, and graphic representation of the project as presented in the proposed Specific Plan.

The assessment of aesthetic impacts is subjective by nature. Aesthetics generally refer to the identification of visual resources and the quality of what can be seen, as well as an overall visual perception of the environment. This analysis attempts to identify and objectively examine factors that contribute to the perception of aesthetic impacts. Potential aesthetic impacts can be evaluated by considering proposed grade separations, landform alteration, building setbacks, scale, massing, and landscaping features associated with the design of the proposed project. It should be noted, however, that there are no locally designated or defined standards or methodologies for the assessment of aesthetic impacts.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.1-1: Implementation of the Campus Plan would alter the visual appearance and character of the project site. [Threshold AE-3]

Impact Analysis: As described in Chapter 3, *Project Description*, of this DEIR, the Campus Plan would provide direction for the enhancement and development of the 116-acre City of Hope campus over a period of approximately 20 years. The proposed Specific Plan provides the vision, guidance, and implementation tools to govern the future of the campus.

Construction Impacts

Implementation of the Campus Plan would involve construction activities to development approximately 1.4 million square feet of building area, including approximately 387,500 square feet of demolition over a 20 year horizon. Construction activities have the potential to temporarily alter the visual character of the development sites. Visual impacts associated with construction include grading, open trenching, construction equipment and materials, truck traffic, and soil stockpiling. Temporary structures may also be provided during the construction phase, such as portable buildings, material storage, and fencing.

The vast majority of redevelopment would occur internal to the project site and not from public vantage points. However, demolition and construction are planned to occur along Duarte Road adjacent to the project entrance and at the northeast corner of the site. Additional new surface parking would be developed at the northeast corner of Buena Vista Street and Village Road and a parking structure would be constructed at the southern terminus of Cinco Robles Drive. These perimeter activities would be visible to drivers along

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Duarte Road and residences to the west. The length of time that construction activities would be at any one location would vary depending on the scale and nature of the proposed development.

Construction-related activities would be short-term and temporary in nature; therefore potential aesthetic impacts would be temporary. However, these temporary construction activities would result in potentially significant impacts to the visual appearance of the project site. Screening would be required between construction zones and residential receptors and soil hauling would be limited from residential areas (see Mitigation Measure N-1). Vehicles are required to be free of mud and dust before leaving the development site and street sweeping is required (see Mitigation Measure AQ-1 and SCAQMD Rules 403 and 1186).

Operational Impacts

As shown in Figure 3-5, *Illustrative Site Plan*, buildout of the proposed Campus Plan would add new buildings on the project site and replace existing buildings with larger, more visually prominent buildings. Parking areas are also planned to be expanded and reconfigured. Over time, these changes to the City of Hope campus would alter its visual character and appearance. However, most new buildings and structures are planned for the center of the campus, which is currently a cluster of dense, urban-scaled buildings. Maximum heights are established to strategically locate taller structures toward the interior of the campus and away from adjacent residential neighborhoods. Therefore, overall, the proposed Campus Plan is not anticipated to have a substantial impact on the character of the project site.

Notable exceptions are changes to the central campus and new buildings proposed for the periphery of the project site. These are the largest changes proposed for the project site, and their potential aesthetic impacts are discussed below.

- **Changes to Central Campus.** One of the largest changes proposed for the project site is the introduction of a large medical building on the east-central part of the project site currently occupied by sprawling one-story wings of the Main Medical Building and other structures. By replacing one-story buildings with a larger, multistory building, this area of the campus would look substantially different than under existing conditions. However, upon implementation of development standards and design guidelines in the proposed Specific Plan, the new building would visually tie together what is now a mismatched collection of buildings. This is considered a beneficial aesthetic impact. Furthermore, this area of the project site is generally not visible from surrounding neighborhoods. Therefore, changes to the central City of Hope campus are not anticipated to dramatically alter the project site's character and appearance as seen from the surrounding community.

- **Parking Structure #1.** A multistory parking structure with approximately 1,750 parking spaces is proposed to replace the surface parking lot in the northeast corner of the project site; this would alter the character of this part of the project site. The structure would be near the project site's edge and would be visually prominent from Duarte Road. To minimize any potential adverse effects of such a structure, the proposed Specific Plan identifies development standard and design guidelines aimed at minimizing the visual bulk and overall visual impact of the project's parking structures. As discussed in Chapter 4, Mobility & Streetscape, of the Specific Plan, these provisions would require 1) parking areas visible from the public right-of-way to be appropriately screened, 2) parking structures to “appear more similar to a campus building and not as a structure,” and 3) parking structure walls adjacent to residential areas to minimize vehicular entry points to minimize noise and lighting impacts. Subterranean or semi-subterranean parking structures are encouraged in order to reduce the height and mass of structures. The Specific Plan also requires that parking structures be designed to align with the architectural character and quality of campus buildings, including complementing the character, mass, and scale of campus buildings in the immediate area. In addition to these and other guidelines related specifically to parking structures, numerous development standards and design guidelines in the proposed Specific Plan address community compatibility. Upon implementation of these provisions, future parking structures, including the one conceptually planned for the northeast corner of the project site, would not generate significant adverse impacts to the project site’s character and appearance.

- **Parking Structure #2.** Another multistory parking structure with approximately 1,230 parking spaces is conceptually proposed for the west-central portion of the project site on its western edge. This site currently features small single-story buildings, portable buildings, an outdoor basketball court, a small grass yard/play field, and surface parking. Low-density residential uses are offsite to the west, across the Duarte Flood Control Channel. Because this parking structure would replace single-story structures, it would substantially change the visual appearance of this part of the campus. Furthermore, it would make the campus more visible from residential uses to the west. However, the adjacent drainage channel is approximately 50 feet wide and would serve as a buffer between the structure and residential uses. This parking structure would also be required to comply with the same design guidelines described above, including the reduction of visual bulk by landscaping and avoidance of spill light. Thus, the proposed parking structure would not adversely alter the project site’s character and appearance.

- **Replacement of Hope Village.** Proposed hospitality uses in the northwest corner of the project site would replace the existing “Village of Hope” housing units and a portion of Pioneer Park. A hotel or other similar uses would change the visual appearance of the campus as viewed from Duarte Road and would slightly diminish the corridor of green space visible from the public right-of-way. However, the specific design and orientation of new buildings in this location are unknown at this time. Future hospitality buildings would be required to comply with development standards and design guidelines in the proposed Specific Plan, including those related to community compatibility and urban design. As identified in Table 4 in Chapter 3, Land Use & Development Standards, of the Specific Plan, all new buildings would be required to be set back 50 feet from Duarte Road. This setback would accommodate a landscape buffer that would visually tie the site with the greenery of Pioneer Park directly to the east. Thus, the proposed hospitality uses would not adversely alter the project site’s character and appearance.

Avoidance of Existing Visual Resources

In addition to providing a robust set of development standards and design guidelines aimed at creating a unified and aesthetically appealing visual environment, the land use plan for the proposed Campus Plan is sensitive to existing visual resources on the project site, which contribute to its overall character. The following visual resources—described earlier in this section—would remain in their existing locations according to the illustrative site plan developed for the proposed Campus Plan (see Figure 3-5 in this DEIR):

- Pioneer Park (eastern two-thirds)
- Rose garden and sculpture garden
- Japanese garden
- Kaplan Pavilion
- Graff Plaza (alterations proposed, but same location)
- Visitor center and House of Hope
- "Spirit of Life" fountain and sculpture (alterations proposed but fountain/sculpture expected to remain)

The land use plan and illustrative site plan prepared for the proposed Campus Plan are conceptual in nature and do not represent the final design and orientation of buildings and public spaces on the project site. However, these exhibits demonstrate the project's effort to preserve existing visual resources. Furthermore, the proposed reorientation and reorganization of the campus's central cluster of buildings would create enhanced pedestrian linkages between the project site's green spaces (see Figure 3-5). This reorientation and enhanced linkage would represent a beneficial aesthetic impact of the proposed Campus Plan related to character and visual appearance.

Further, with the exception of Pioneer Park, the Visitor Center, House of Hope and the Rose Garden, none of the other visual resources discussed on the project site, including Heritage Park, are visible from outside the City of Hope campus. Therefore, any modifications or changes to those internal campus resources would not adversely affect the project site's character and appearance.

Development Standards and Design Guidelines

The proposed Specific Plan's development standards and design guidelines are designed to develop an "established identity and sense of place" (see Goal 2 in Chapter 2, Vision & Goals, of the proposed Specific Plan). They are intended to develop a "cohesive and contemporary design character for the campus" and create an enhanced campus entrance. Standards and guidelines in the Specific Plan address a number of aesthetic considerations, including:

- Building orientation, height, and setbacks
- Open space and landscaping
- Buffering and screening of utilities and service areas
- Architectural character and building form
- Building colors and materials
- Fences and walls
- Lighting
- Wayfinding
- Public art

Implementation of these provisions and adherence to land use regulations of the cities of Duarte and Irwindale (see Section 5.1.1.1, *Regulatory Setting*, above) would ensure that buildout of the proposed Campus Plan would create a unified character on the campus and buildings that are more architecturally compatible than under existing conditions. Design guidelines in the Specific Plan would supersede existing City of Duarte and City of Irwindale design guidelines in effect on the site. In particular, the proposed Specific Plan's focus on compatibility between buildings and on developing a system of meaningful, connected public spaces would result in beneficial aesthetic impacts on the project site.

Public Art

Section 5.8 of the Specific Plan Design Guidelines, Campus Public Art, requires that public art be installed on the campus concomitant with the certificate of occupancy for any new building of over 5,000 square feet outside of the IU District. Public art may be placed in exterior or interior spaces in areas of relatively high public activity. The value of the public art shall be at least 0.25 percent of the value of the new building per the City of Duarte's building permit fee schedule.

Setbacks

The proposed Specific Plan includes development standards to ensure visual compatibility between proposed uses and existing residential development. 50-foot-wide Duarte Flood Control Channel sets the campus back from residences nearest the western site boundary. The parking structure conceptually proposed for this area would be limited to a maximum height of 60 feet. Buildings in the Transitional Medical and Residential Medical Flex districts must be set back 30 feet from Cinco Robles Drive and include landscaping. These setbacks and height limitations would ensure visual compatibility with the existing adjacent uses; impacts would be less than significant.

Conclusion

Buildout of the proposed Campus Plan would add buildings, parking structures, and other improvements to the project site, which would alter its visual appearance. In particular, new buildings at the periphery of the project site, including two parking garages (near Duarte Road and Cinco Robles Drive) and hospitality uses along Duarte Road, would change the campus's appearance from surrounding land uses. However, the proposed Specific Plan's comprehensive set of development standards and design guidelines, when implemented, would ensure that new improvements would contribute to a unified sense of place that minimizes visual impacts on surrounding uses. Furthermore, the conceptual site plan accommodates preservation of existing visual resources on the project site that contribute to its visual character. Upon adherence to existing regulations enforced by the cities of Duarte and Irwindale and provisions of the proposed Specific Plan, operational impacts would be less than significant. Additionally, pursuant to SB 743 (Public Resources Code section 21099(d)(1)), aesthetic impacts of the project, including impacts related to aesthetic/visual character, are not considered significant within one-half mile of the Gold Line Station – which includes the northern portion of the project area.

However, while construction activities associated with the proposed buildings, parking structures and improvements, would be temporary, construction of the Campus Plan would have potentially significant impacts related to altering the temporary visual quality and character of the project site.

5. Environmental Analysis
AESTHETICS

Impact 5.1-2: Implementation of the Campus Plan could cause shade and shadow impacts on surrounding uses. [Threshold AE-3]

Impact Analysis: The issue of shade and shadow pertains to whether onsite buildings or structures block direct sunlight from adjacent properties. Shading is an important environmental issue because the users or occupants of certain land uses have expectations for direct sunlight and warmth from the sun for function, physical comfort, or conduct of commerce. Factors that influence the extent of shading include: season; time of day; weather (i.e., sunny vs. cloudy day); building height, bulk, and scale; topography; spacing between buildings; sensitivity of adjacent land uses; and tree cover. The longest shadows are cast during the winter months, when the sun is lowest on the horizon, and the shortest shadows are cast during the summer. Shadows are also longer in the early morning and late afternoon. Consequences of shadows on land uses may be positive, such as cooling effects during warm weather, or negative, such as the loss of natural light necessary for solar energy or the loss of warming influences during cool weather. The relative effects of shading from structures are site specific.

The proposed Campus Plan allows dense, multistory development throughout the project site. However, as shown in Table 5.1-1, the tallest buildings would be toward the center of the site, adjacent to existing midrise buildings. Tall buildings in this area would only cast shade and shadows on other medical buildings and public spaces on the project site. The nearby land uses most sensitive to shade and shadow—residential uses to the west of the project site—are adjacent to the proposed Transitional Medical District. As shown in Table 5.1-1, the parking structure conceptually proposed for this area would be limited to a maximum height of 60 feet. Residential uses to the west would generally not fall into the shadows cast by this structure because of the 50-foot-wide drainage channel that separates them from the project site and the additional setbacks required by the proposed Specific Plan. In the Transitional Medical and Residential Medical Flex districts, buildings must be setback 30 feet from Cinco Robles Drive.

Table 5.1-1 Maximum Allowed Building Heights

	Maximum Height (feet)			
Land Use District	**Primary Buildings**	**Portion of Buildings that Extends Above the Primary Building**	**Parking Structures**	**Modular Structures**
Core Medical	140	30	60	30
Transitional Medical	60	20	60	30
Cultural Amenity	50	10	—	—
Infrastructure and Utility	120	20	60	30
Residential Medical Flex	60	20	60	—

Because the proposed Campus Plan is a long-range planning effort and does not propose a specific development, it is unknown at this time how much of the allowable building height would be utilized. However, all new buildings would be required to adhere to the development standards and design guidelines in the proposed Specific Plan that address visual bulk and compatibility between buildings. Because most of the project site is surrounded by nonresidential uses (roadways, drainage basins, and flood control facilities) and because provisions of the proposed Campus Plan ensure that new development would be sensitive to surrounding land uses, shade and shadow impacts of the proposed Campus Plan would be less than significant. Additionally, pursuant to SB 743 (Public Resources Code section 21099(d)(1)), aesthetic impacts of the project, including impacts related to shade and shadow, are not considered significant within one-half mile of the Gold Line Station – which includes the northern portion of the project area.

Impact 5.1-3: Buildout of the proposed Campus Plan would generate additional light and glare at the project site. [Threshold AE-4]

Impact Analysis: Nighttime illumination and glare impacts are the effects of a project's exterior lighting on adjoining uses and areas. Light and glare impacts are determined by comparing existing light sources with the proposed lighting plan or policies.

The project site has many existing sources of nighttime illumination, including street and parking area lights, security lighting, and exterior lighting on buildings. Additional onsite light and glare is caused by surrounding land uses, I-210 to the north, and I-605 to the east.

The proposed Campus Plan would alter and intensify land uses and their related lighting. In addition to new building, security, and parking lighting throughout the site, the proposed Campus Plan's larger buildings would be expected to have additional exterior glazing (i.e., windows and doors) that could result in new sources of glare. However, despite new and expanded sources of nighttime illumination and glare, the proposed Campus Plan is not expected to generate substantial increases in light or glare due to the project site's existing built character. Section 4.5, Lighting, of the proposed Specific Plan addresses issues related to outdoor lighting, including lighting pollution and security. Project compliance with the following guidelines in the Specific Plan would ensure that new land uses on the project site do not generate excessive light.

- All lighting should eliminate light spill by utilizing full cut off luminaries and shielding to eliminate off-site glare onto adjacent residential areas.
- Lighting should promote Crime Prevention Through Environmental Design (CPTED) measures by creating well-lit entryways, pathways, open spaces and parking lots.
- All campus entry driveways and vehicle circulation routes within the campus should be lit so that they are visible from approaching vehicles
- Lighting design should include consideration of control systems to reduce light levels during low-usage times while not sacrificing uniformity or safety.
- Light fixtures should be made of materials that have long life spans and are able to withstand exposure to harsh weather elements and constant use.
- Similar or identical lighting fixtures should be used for building, signage, parking, internal road, and pathway lighting to maintain a consistent and cohesive theme across the City of Hope campus.

5. Environmental Analysis
AESTHETICS

- Special and subtle illumination is encouraged on and around new buildings to accent main building entrances, special architectural elements (such as distinctive building elements or rooftops), and landscaping.

- Parking lot lights should be of modest scale and height, utilizing more, smaller light poles rather than fewer, taller light poles. Exposed rooftop lights on parking structures are prohibited.

- Pedestrian pathways and zones and near campus directories should be lighted to properly guide wayfinding and provide safety with appropriately-scaled pole lighting and lighted bollards at the ground level, outside of pedestrian walkways.

- Warm white light is encouraged throughout the campus. Blinking, flashing, and oscillating lights are prohibited. Overly bright or glaring lights should be avoided.

- Areas along the perimeter of the Campus should be well-illuminated to enhance the perimeter landscape, support pedestrian activity, and provide accent lighting for campus identity markers, but should not interfere with drivers' visual perception.

In addition, the following guideline related to parking structures (see Section 4.7 of the Specific Plan) would minimize light and glare generated within parking structures:

- Headlight walls used to screen parking should be used in parking structures to minimize the impact of headlight glare. These walls should be low enough for safety and security purposes, but high enough to block headlight beams, approximately 42 inches high.

Design guidelines in the proposed Specific Plan also reduce light and glare spillover from the project site to surrounding land uses by buffering new development with landscaping and trees. Replacement of older buildings with newer buildings adhering to Specific Plan lighting guidelines, and surface parking with screened parking structures, would also reduce the amount of spill light potentially impacting surrounding land uses.

Last, future development on the project site would be required to comply with California's Building Energy Efficiency Standards for Residential and Nonresidential Buildings (24 CCR, Part 6), which outlines mandatory provisions for lighting control devices and luminaires.

Upon adherence with existing regulations and proposed Specific Plan provisions and because the project site and surrounding area are largely developed, the lighting and buildings associated with the proposed Specific Plan would not substantially increase nighttime light and glare within the project site or its surroundings. Therefore, project impacts relating to light and glare would be less than significant. Additionally, pursuant to SB 743 (Public Resources Code section 21099(d)(1)), aesthetic impacts of the project, including impacts related to light and glare, are not considered significant within one-half mile of the Gold Line Station – which includes the northern portion of the project area

5.1.4 Cumulative Impacts

Aesthetic/Visual Character

Cumulative aesthetic impacts are generally localized to the project site and its immediate surroundings. A cumulative impact would be considered significant if cumulative development would have a substantial adverse effect on a scenic vista or degrade the existing visual character or quality of the area and its surroundings. Related projects adjacent to the project site include the Duarte Station Specific Plan. The project and the related projects would be designed to be compatible with the urban, highly developed character of the surrounding area. The Campus Plan project would comply with the proposed Specific Plan's development standards and design guidelines, which are aimed at creating a unified and aesthetically appealing visual environment. Similar regulations targeted at creating a cohesive and visually appealing visual environment are imposed on the adjacent Duarte Station Specific Plan area under that planning document. The goals and standards of both of these specific plan documents are intended to enhance the visual environment of their respective plan areas and are not in conflict. Specifically, the proposed Campus Plan was determined not to result in aesthetic impacts and is designed to maximize visual connections between City of Hope and the Gold Line Station. The Duarte Station Specific Plan area, which is on the other side of the Gold Line Station from City of Hope, is similarly designed to embrace the station and promote transit-oriented development. Improvements on either side of the station would visually unify the area as a walkable, connected neighborhood. Therefore, implementation of both specific plans would not degrade or otherwise adversely affect the visual character or quality of the area. Additionally, pursuant to SB 743 (Public Resources Code section 21099(d)(1)), aesthetic impacts of the project, including impacts related to aesthetic/visual character, are not considered significant within one-half mile of the Gold Line Station – which is the area where any potential visual effects of the project could combine with the visual effects of the Duarte Station Specific Plan area. In consideration of these factors, cumulative aesthetic impacts would be less than significant.

Shade and Shadow

The relative effects of shading from structures are site specific. As concluded above, shade/shadow impacts of the proposed Campus Plan would not be significant. There are no planned projects near the project site that would, with the proposed Campus Plan, result in a cumulatively significant impact related to shade and shadow. New buildings in the Duarte Station Specific Plan area could create new sources of shade and shadow, but new buildings on the project site would be sufficiently far away to not exacerbate or contribute to any adverse effects caused by this shade and shadow. Additionally, pursuant to SB 743 (Public Resources Code 21099(d)(1)), aesthetic impacts of the project, including shade and shadow impacts, are not considered significant within one-half mile of the Gold Line Station – which is the area where any potential shadows from the project could combine with shadows from the Duarte Station Specific Plan area. Therefore, cumulative shade and shadow impacts would be less than significant.

Light and Glare

Due to the highly developed nature of the project area and the existence of light and glare from existing onsite land uses and from surrounding properties, the proposed Campus Plan is not anticipated to add significantly to the creation of nighttime light and glare in the project vicinity. Nighttime lighting from new buildings along Duarte Road within the project site could combine with that generated by proposed land uses to the north in the Duarte Station Specific Plan area. However, these combined effects would affect a segment of Duarte Road (between Hope Drive and Highland Avenue) that does not contain single-family homes or other sensitive receptors to light overspill. Furthermore, new land uses in the Duarte Station Specific Plan area, like those in the applicable portion of the project area, would be required to comply with lighting regulations identified in Chapter 19.50 of the Duarte Development Code and Title 24 of the California Code of Regulations. Additionally pursuant to SB 743 (Public Resources Code section 21099(d)(1)), aesthetic impacts of the project, including light and glare impacts, are not considered significant within one-half mile of the Gold Line Station – which is the area where any potential light and glare from the project could combine with light and glare from the Duarte Station Specific Plan area. Therefore, the cumulative light and glare impacts would be less than significant.

5.1.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to aesthetics and were described in detail in Sections 5.1.1.1 of this DEIR and are listed below.

State of California

- California Code of Regulations, Title 24, Part 6: Building Energy Efficiency Standards for Residential and Nonresidential Buildings

City of Duarte

- City of Duarte Municipal Code
- City of Duarte General Plan

City of Irwindale

- City of Irwindale Municipal Code
- City of Irwindale General Plan
- Commercial and Industrial Design Guidelines

5.1.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements and Specific Plan development standards and design guidelines, Impacts 5.1-2 and 5.1-3 would be less than significant.

Without mitigation, these impacts would be **potentially significant**:

- **Impact 5.1-1** Construction-related activities of the proposed project has the potential to result in temporary aesthetic impacts related to the visual quality of the site.

5.1.7 Mitigation Measures

Impact 5.1-1

Mitigation Measures AQ-1 and N-1 would also apply this impact.

5.1.8 Level of Significance After Mitigation

No significant adverse impacts relating to aesthetics were identified.

5.1.9 References

California Department of Transportation (Caltrans). 2011. California Scenic Highway Mapping System. http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm.

Duarte, City of. 2007, August 14. City of Duarte General Plan. http://www.accessduarte.com/dept/cd/planning/general_plan.htm.

———. 2015. Duarte Municipal Code and Code of Ordinances. https://www.municode.com/library/CA/duarte/codes/code_of_ordinances.

Irwindale, City of. 2008, June. City of Irwindale 2020 General Plan. http://ci.irwindale.ca.us/DocumentCenter/View/38.

———. 2009. City of Irwindale Commercial and Industrial Design Guidelines. http://www.ci.irwindale.ca.us/DocumentCenter/View/39.

———. 2015. Irwindale Municipal Code. https://www.municode.com/library/ca/irwindale/codes/code_of_ordinances.

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5.2 AIR QUALITY

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for the City of Hope Campus Plan to impact air quality in a local and regional context. This evaluation is based on the methodology recommended by the South Coast Air Quality Management District (SCAQMD). The analysis focuses on air pollution from regional emissions and localized pollutant concentrations. Criteria air pollutant emissions modeling for the proposed project, as modeled using the California Emissions Estimator Model (CalEEMod), Version 2016.3.1, is included in Appendix C1 of this DEIR. Transportation-sector impacts are based on trip generation and vehicle miles traveled provided by Fehr & Peers (see Appendix J1). Cumulative impacts related to air quality are based on the regional boundaries of the South Coast Air Basin (SoCAB).

5.2.1 Environmental Setting

5.2.1.1 REGULATORY SETTING

Ambient air quality standards (AAQS) have been adopted at the state and federal levels for criteria air pollutants. In addition, both the state and federal government regulate the release of toxic air contaminants (TACs). The project site is in the SoCAB and subject to the rules and regulations imposed by SCAQMD, the California AAQS adopted by California Air Resources Board (CARB), and National AAQS adopted by the United States Environmental Protection Agency (EPA). Federal, state, regional, and local laws, regulations, plans, or guidelines that are potentially applicable to the project are summarized in this section.

Federal and State

Ambient Air Quality Standards

The Clean Air Act was passed in 1963 by the US Congress and has been amended several times. The 1970 Clean Air Act amendments strengthened previous legislation and laid the foundation for the regulatory scheme of the 1970s and 1980s. In 1977, Congress again added several provisions, including nonattainment requirements for areas not meeting National AAQS and the Prevention of Significant Deterioration program. The 1990 amendments represent the latest in a series of federal efforts to regulate the protection of air quality in the United States. The Clean Air Act allows states to adopt more stringent standards or to include other pollution species. The California Clean Air Act, signed into law in 1988, requires all areas of the state to achieve and maintain the California AAQS by the earliest practical date. The California AAQS tend to be more restrictive than the National AAQS.

The National and California AAQS are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect "sensitive receptors" most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

5. Environmental Analysis
AIR QUALITY

Both California and the federal government have established health-based AAQS for seven air pollutants, which are shown in Table 5.2-1, *Ambient Air Quality Standards for Criteria Pollutants*. These pollutants are ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb). In addition, the state has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles.

Table 5.2-1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard[1]	Federal Primary Standard[2]	Major Pollutant Sources
Ozone (O_3)[3]	1 hour	0.09 ppm	*	Motor vehicles, paints, coatings, and solvents.
	8 hours	0.070 ppm	0.070 ppm	
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm	0.053 ppm	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.18 ppm	0.100 ppm	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	*	0.030 ppm	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	0.075 ppm	
	24 hours	0.04 ppm	0.14 ppm	
Respirable Coarse Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	*	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	50 µg/m^3	150 µg/m^3	
Respirable Fine Particulate Matter ($PM_{2.5}$)[4]	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	*	35 µg/m^3	
Lead (Pb)	30-Day Average	1.5 µg/m^3	*	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Calendar Quarter	*	1.5 µg/m^3	
	Rolling 3-Month Average	*	0.15 µg/m^3	
Sulfates (SO_4)[5]	24 hours	25 µg/m^3	*	Industrial processes.

Table 5.2-1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard[1]	Federal Primary Standard[2]	Major Pollutant Sources
Visibility Reducing Particles	8 hours	ExCo =0.23/km visibility of 10≥ miles	No Federal Standard	Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt.
Hydrogen Sulfide	1 hour	0.03 ppm	No Federal Standard	Hydrogen sulfide (H_2S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation.
Vinyl Chloride	24 hour	0.01 ppm	No Federal Standard	Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.

Source: CARB 2016a.
Notes: ppm: parts per million; μg/m³: micrograms per cubic meter
* Standard has not been established for this pollutant/duration by this entity.
1 California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2 National standards (other than O_3, PM, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m³ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
3 On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
4 On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m³ to 12.0 μg/m³. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m³, as was the annual secondary standard of 15 μg/m³. The existing 24-hour PM_{10} standards (primary and secondary) of 150 μg/m³ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
5 On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. The 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

California has also adopted a host of other regulations that reduce criteria pollutant emissions, including:

- AB 1493: Pavley Fuel Efficiency Standards
- California Code of Regulations (CCR), Title 20: Appliance Energy Efficiency Standards
- 24 CCR, Part 6: Building and Energy Efficiency Standards
- 24 CCR, Part 11: Green Building Standards Code

Tanner Air Toxics Act and Air Toxics Hots Information and Assessment Act

Public exposure to TACs is a significant environmental health issue in California. In 1983, the California legislature enacted a program to identify the health effects of TACs and reduce exposure to them. The California Health and Safety Code defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health" (HSC § 39655). A substance that is listed as a hazardous air pollutant pursuant to Section 112(b) of the federal Clean Air Act (see 42 US Code § 7412[b]) is a toxic air contaminant. Under state law, the California Environmental Protection Agency, acting through CARB, is authorized to identify a substance as a TAC if it is an air pollutant that may cause or contribute to an increase in mortality or serious illness, or may pose a present or potential hazard to human health.

California regulates TACs primarily through AB 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics "Hot Spot" Information and Assessment Act of 1987). The Tanner Air Toxics Act set up a formal procedure for CARB to designate substances as TACs. Once a TAC is identified, CARB adopts an "airborne toxics control measure" for sources that emit that TAC. If there is a safe threshold for a substance (i.e., a point below which there is no toxic effect), the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate "toxics best available control technology" to minimize emissions. To date, CARB has established formal control measures for 11 TACs that are identified as having no safe threshold.

Under AB 2588, TAC emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High-priority facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, are required to communicate the results to the public through notices and public meetings.

CARB has promulgated the following specific rules to limit TAC emissions:

- **CARB Rule 2485** (13 CCR, Chapter 10 § 2485), Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling
- **CARB Rule 2480** (13 CCR Chapter 10 § 2480), Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools
- **CARB Rule 2477** (13 CCR § 2477 and Article 8), Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets and Facilities Where TRUs Operate

Air Pollutants of Concern

Criteria Air Pollutants

The pollutants emitted into the ambient air by stationary and mobile sources are categorized as primary and/or secondary pollutants. Primary air pollutants are emitted directly from sources. Carbon monoxide

(CO), volatile organic compounds (VOC), nitrogen oxides (NO_x), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb) are primary air pollutants. Of these, CO, SO_2, NO_2, PM_{10}, and $PM_{2.5}$ are "criteria air pollutants," which means that AAQS have been established for them. VOC and NO_x are criteria pollutant precursors that form secondary criteria air pollutants through chemical and photochemical reactions in the atmosphere. Ozone (O_3) and nitrogen dioxide (NO_2) are the principal secondary pollutants.

A description of each of the primary and secondary criteria air pollutants and its known health effects is presented below.

- **Carbon Monoxide** is a colorless, odorless gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. CO is a primary criteria air pollutant. CO concentrations tend to be the highest during winter mornings with little to no wind, when surface-based inversions trap the pollutant at ground levels. The highest ambient CO concentrations are generally found near traffic-congested corridors and intersections. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation (SCAQMD 2005; USEPA 2016). The SoCAB is designated under the California and National AAQS as being in attainment of CO criteria levels (CARB 2015).

- **Volatile Organic Compounds** are composed primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of VOCs. Other sources include evaporative emissions from paints and solvents, asphalt paving, and household consumer products such as aerosols (SCAQMD 2005). There are no AAQS for VOCs. However, because they contribute to the formation of O_3, SCAQMD has established a significance threshold.

- **Nitrogen Oxides** are a by-product of fuel combustion and contribute to the formation of ground-level O_3, PM_{10}, and $PM_{2.5}$. The two major forms of NO_X are nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. The principal form of NO_X produced by combustion is NO, but NO reacts quickly with oxygen to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. NO_2 is an acute irritant and more injurious than NO in equal concentrations. At atmospheric concentrations, however, NO_2 is only potentially irritating. NO_2 absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO_2 exposure concentrations near roadways are of particular concern for susceptible individuals, including asthmatics, children, and the elderly. Current scientific evidence links short-term NO_2 exposures, ranging from 30 minutes to 24 hours, with adverse respiratory effects, including airway inflammation in healthy people and increased respiratory symptoms in people with asthma. Also, studies show a connection between elevated short-term NO_2 concentrations and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma (SCAQMD 2005; USEPA 2016). The SoCAB is designated an attainment area for NO_2 under the National and California AAQS (CARB 2015).

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- **Sulfur Dioxide** is a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. It enters the atmosphere as a result of burning high-sulfur-content fuel oils and coal and chemical processes at plants and refineries. Gasoline and natural gas have very low sulfur content and do not release significant quantities of SO_2. When sulfur dioxide forms sulfates (SO_4) in the atmosphere, together these pollutants are referred to as sulfur oxides (SO_X). Thus, SO_2 is both a primary and secondary criteria air pollutant. At sufficiently high concentrations, SO_2 may irritate the upper respiratory tract. Current scientific evidence links short-term exposures to SO_2, ranging from 5 minutes to 24 hours, with an array of adverse respiratory effects, including bronchoconstriction and increased asthma symptoms. These effects are particularly adverse for asthmatics at elevated ventilation rates (e.g., while exercising or playing) at lower concentrations and when combined with particulates, SO_2 may do greater harm by injuring lung tissue. Studies also show a connection between short-term exposure and increased visits to emergency facilities and hospital admissions for respiratory illnesses, particularly in at-risk populations such as children, the elderly, and asthmatics (SCAQMD 2005; USEPA 2016). The SoCAB is designated attainment under the California and National AAQS (CARB 2015).

- **Suspended Particulate Matter** consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates are now recognized and regulated. Inhalable coarse particles, or PM_{10}, include particulate matter with an aerodynamic diameter of 10 microns or less (i.e., ≤10 millionths of a meter or 0.0004 inch). Inhalable fine particles, or $PM_{2.5}$, have an aerodynamic diameter of 2.5 microns or less (i.e., ≤2.5 millionths of a meter or 0.0001 inch). Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in people who are naturally sensitive or susceptible to breathing problems. The EPA's scientific review concluded that $PM_{2.5}$, which penetrates deeply into the lungs, is more likely than PM_{10} to contribute to health effects and at far lower concentrations. These health effects include premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms (e.g., irritation of the airways, coughing, or difficulty breathing) (SCAQMD 2005). There has been emerging evidence that ultrafine particulates (UFPs), which are even smaller particulates with an aerodynamic diameter of <0.1 microns or less (i.e., ≤0.1 millionths of a meter or <0.000004 inch), have human health implications, because UFPs toxic components may initiate or facilitate biological processes that may lead to adverse effects to the heart, lungs, and other organs (SCAQMD 2013). However, the EPA or CARB has yet to adopt AAQS to regulate these particulates. Diesel particulate matter is classified by CARB as a carcinogen (CARB 1998). Particulate matter can also cause environmental effects such as visibility impairment,[1] environmental damage,[2] and aesthetic damage[3] (SCAQMD 2005; USEPA 2016). The SoCAB is a nonattainment area for $PM_{2.5}$ under California and National AAQS and a nonattainment area for PM_{10} under the California AAQS (CARB 2015).

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1 $PM_{2.5}$ is the main cause of reduced visibility (haze) in parts of the United States.

2 Particulate matter can be carried over long distances by wind and then settle on ground or water, making lakes and streams acidic; changing the nutrient balance in coastal waters and large river basins; depleting the nutrients in soil; damaging sensitive forests and farm crops; and affecting the diversity of ecosystems.

3 Particulate matter can stain and damage stone and other materials, including culturally important objects such as statues and monuments.

- **Ozone** is commonly referred to as "smog" and is a gas that is formed when VOCs and NO_X, both by-products of internal combustion engine exhaust, undergo photochemical reactions in sunlight. O_3 is a secondary criteria air pollutant. O_3 concentrations are generally highest during the summer months when direct sunlight, light winds, and warm temperatures create favorable conditions for its formation. O_3 poses a health threat to those who already suffer from respiratory diseases as well as to healthy people. Breathing O_3 can trigger a variety of health problems, including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground-level O_3 also can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue. O_3 also affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas. In particular, O_3 harms sensitive vegetation during the growing season (SCAQMD 2005; USEPA 2016). The SoCAB is designated extreme nonattainment under the California AAQS (1-hour and 8-hour) and National AAQS (8-hour) (CARB 2015).

- **Lead** is a metal found naturally in the environment as well as in manufactured products. Once taken into the body, lead distributes throughout the body in the blood and accumulates in the bones. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the oxygen-carrying capacity of the blood. The effects of lead most commonly encountered in current populations are neurological effects in children and cardiovascular effects in adults (e.g., high blood pressure and heart disease). Infants and young children are especially sensitive to even low levels of lead, which may contribute to behavioral problems, learning deficits, and lowered IQ (SCAQMD 2005; USEPA 2016). The major sources of lead emissions have historically been mobile and industrial sources. As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector dramatically declined by 95 percent between 1980 and 1999, and levels of lead in the air decreased by 94 percent between 1980 and 1999. Today, the highest levels of lead in air are usually found near lead smelters. The major sources of lead emissions today are ore and metals processing and piston-engine aircraft operating on leaded aviation gasoline. However, in 2008 the EPA and CARB adopted more strict lead standards, and special monitoring sites immediately downwind of lead sources recorded very localized violations of the new state and federal standards.[4] As a result of these violations, the Los Angeles County portion of the SoCAB is designated as nonattainment under the National AAQS for lead (SCAQMD 2012; CARB 2015). Because emissions of lead are found only in projects that are permitted by SCAQMD, lead is not a pollutant of concern for the proposed project.

Toxic Air Contaminants

By the last update to the TAC list in December 1999, CARB had designated 244 compounds as TACs (CARB 1999). Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be

[4] Source-oriented monitors record concentrations of lead at lead-related industrial facilities in the SoCAB, which include Exide Technologies in the City of Commerce; Quemetco, Inc., in the City of Industry; Trojan Battery Company in Santa Fe Springs; and Exide Technologies in Vernon. Monitoring conducted between 2004 through 2007 showed that the Trojan Battery Company and Exide Technologies exceed the federal standards (SCAQMD 2012).

attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines.

Diesel Particulate Matter

In 1998, CARB identified diesel particulate matter as a TAC. Previously, the individual chemical compounds in diesel exhaust were considered TACs. Almost all diesel exhaust particles are 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs.

Air Quality Management Planning

SCAQMD is the agency responsible for improving air quality in the SoCAB and assuring that the National and California AAQS are attained and maintained. SCAQMD is responsible for preparing the air quality management plan (AQMP) for the SoCAB in coordination with the Southern California Association of Governments (SCAG). Since 1979, a number of AQMPs have been prepared.

2016 AQMP

On March 3, 2017, SCAQMD adopted the 2016 AQMP, which serves as an update to the 2012 AQMP. The 2016 AQMP addresses strategies and measures to attain the following National AAQS:

- 2008 National 8-hour ozone standard by 2031,
- 2012 National annual $PM_{2.5}$ standard by 2025[5],
- 2006 National 24-hour $PM_{2.5}$ standard by 2019,
- 1997 National 8-hour ozone standard by 2023, and the
- 1979 National 1-hour ozone standard by year 2022.

It is projected that total NO_X emissions in the SoCAB would need to be reduced to 150 tons per day (tpd) by year 2023 and to 100 tpd in year 2031 to meet the 1997 and 2008 federal 8-hour ozone standards. The strategy to meet the 1997 federal 8-hour ozone standard would also lead to attaining the 1979 federal 1-hour ozone standard by year 2022 (SCAQMD 2016a), which requires reducing NO_X emissions in the SoCAB to 250 tpd. This is approximately 45 percent additional reductions above existing regulations for the 2023 ozone standard and 55 percent additional reductions above existing regulations to meet the 2031 ozone standard.

Reducing NO_X emissions would also reduce $PM_{2.5}$ concentrations within the SoCAB. However, as the goal is to meet the 2012 federal annual $PM_{2.5}$ standard no later than year 2025, SCAQMD is seeking to reclassify the SoCAB from "moderate" to "serious" nonattainment under this federal standard. A "moderate" non-attainment would require meeting the 2012 federal standard by no later than 2021.

Overall, the 2016 AQMP is composed of stationary and mobile-source emission reductions from regulatory control measures, incentive-based programs, co-benefits from climate programs, mobile-source strategies, and

5 The 2016 AQMP requests a reclassification from moderate to serious non-attainment for the 2012 National $PM_{2.5}$ standard.

reductions from federal sources such as aircrafts, locomotives, and ocean-going vessels. Strategies outlined in the 2016 AQMP would be implemented in collaboration between CARB and the EPA (SCAQMD 2017).

Lead Implementation Plan

In 2008, the EPA designated the Los Angeles County portion of the SoCAB as a nonattainment area under the federal lead classification due to the addition of source-specific monitoring under the new federal regulation. This designation was based on two source-specific monitors in the City of Vernon and the City of Industry that exceeded the new standard in the 2007-to-2009 period. The remainder of the SoCAB, outside the Los Angeles County nonattainment area, remains in attainment of the new 2008 lead standard. On May 24, 2012, CARB approved the State Implementation Plan (SIP) revision for the federal lead standard, which the EPA revised in 2008. Lead concentrations in this nonattainment area have been below the level of the federal standard since December 2011. The SIP revision was submitted to the EPA for approval.

SCAQMD Rules and Regulations

All projects are subject to SCAQMD rules and regulations in effect at the time of activity, including the following:

- **Rule 401, Visible Emissions.** This rule is intended to prevent the discharge of pollutant emissions from an emissions source that results in visible emissions. Specifically, the rule prohibits the discharge of any air contaminant into the atmosphere by a person from any single source of emission for a period or periods aggregating more than three minutes in any one hour that is as dark as or darker than designated No. 1 on the Ringelmann Chart, as published by the U.S. Bureau of Mines.

- **Rule 402, Nuisance.** This rule is intended to prevent the discharge of pollutant emissions from an emissions source that results in a public nuisance. Specifically, this rule prohibits any person from discharging quantities of air contaminants or other material from any source such that it would result in an injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public. Additionally, the discharge of air contaminants would also be prohibited where it would endanger the comfort, repose, health, or safety of any number of persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. This rule does not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

- **Rule 403, Fugitive Dust.** This rule is intended to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (human-made) fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. Rule 403 applies to any activity or human-made condition capable of generating fugitive dust, and requires best available control measures to be applied to earth moving and grading activities.

- **Rule 1113, Architectural Coatings.** This rule serves to limit the VOC content of architectural coatings used on projects in the SCAQMD. Any person who supplies, sells, offers for sale, or manufactures any architectural coating for use on projects in the SCAQMD must comply with the current VOC standards set in this rule.

Local

City of Duarte

The City of Duarte's sustainable development practices in the City's development code are summarized below. Per the Alfred E. Alquist Hospital Facilities Seismic Safety Act of 1983, the Office of Statewide Health Planning and Development (OSHPD) is the enforcement agency for hospital buildings, acute psychiatric hospitals, skilled nursing facilities, and intermediate care facilities—as defined in Section 129725 of the Health and Safety Code—with regard to the applicable Title 24 building standards, preempting the local jurisdiction. However, the City of Duarte would have jurisdiction over parts of the proposed Campus Plan that are not under OSHPD's jurisdiction—such as surface parking, landscaping, parking structure, and other buildings not subject to OSHPD.

City of Duarte Sustainable Development Practices

The City of Duarte Sustainable Development Practices is codified in Chapter 19.52, Article 3, of the City's development code. This chapter includes guidelines and standards for conservation of natural resources, increased energy efficiency, and transit (e.g., transportation demand management, active transit design). Specific sustainable design requirements for energy efficiency, water conservation, transit and pedestrian access, and construction debris recycling depend on the level of development based on size (e.g., number of dwelling units, amount of nonresidential square footage), per Section 19.52.020(B). There are four levels of development, Level 1 to Level 4. Level 1 has the fewest requirements and Level 4 the most. In addition to these requirements, Chapter 19.52 includes optional measures that may be incorporated into an individual project.

City of Irwindale

The City of Irwindale has adopted the Los Angeles County Green Building Standards Code, which incorporates the California Green Building Standards Code. As with the City of Duarte, OSHPD is the enforcement agency for Title 24 building standards compliance. However, the City of Irwindale would have jurisdiction over components and facilities of the proposed Campus Plan that are not subject to OSHPD's jurisdiction.

5.2.1.2 EXISTING CONDITIONS

South Coast Air Basin

The project site is in the SoCAB, which includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The SoCAB is in a coastal plain with connecting broad valleys and low hills and is bounded by the Pacific Ocean in the southwest quadrant, with high mountains forming the remainder of the perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. This usually mild weather pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds (SCAQMD 2005).

Temperature and Precipitation

The annual average temperature varies little throughout the SoCAB, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station nearest to the project plan area is the Azusa City PK FC 143 Station Monitoring Station (ID No. 040410). The average low is reported at 39.6°F in December, and the average high is 91.9°F in August (WRCC 2016).

In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all rain falls from November through April. Summer rainfall is normally restricted to widely scattered thundershowers near the coast, with slightly heavier shower activity in the east and over the mountains. Rainfall averages 18.96 inches per year in the project area (WRCC 2016).

Humidity

Although the SoCAB has a semiarid climate, the air near the earth's surface is typically moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the SoCAB by offshore winds, the "ocean effect" is dominant. Periods of heavy fog, especially along the coast, are frequent. Low clouds, often referred to as high fog, are a characteristic climatic feature. Annual average humidity is 70 percent at the coast and 57 percent in the eastern portions of the SoCAB (SCAQMD 2005).

Wind

Wind patterns across the south coastal region are characterized by westerly or southwesterly onshore winds during the day and by easterly or northeasterly breezes at night. Wind speed is somewhat greater during the dry summer months than during the rainy winter season.

Between periods of wind, periods of air stagnation may occur, both in the morning and evening hours. Air stagnation is one of the critical determinants of air quality conditions on any given day. During the winter and fall months, surface high-pressure systems over the SoCAB, combined with other meteorological conditions, can result in very strong, downslope Santa Ana winds. These winds normally continue a few days before predominant meteorological conditions are reestablished.

The mountain ranges to the east affect the transport and diffusion of pollutants by inhibiting their eastward transport. Air quality in the SoCAB generally ranges from fair to poor and is similar to air quality in most of coastal southern California. The entire region experiences heavy concentrations of air pollutants during prolonged periods of stable atmospheric conditions (SCAQMD 2005).

Inversions

In conjunction with the two characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed. These are the marine/subsidence inversion and the radiation inversion. The combination of winds and inversions are critical determinants in leading to the highly degraded air quality in summer and the generally good air quality in the winter in the project area (SCAQMD 2005).

SoCAB Nonattainment Areas

The AQMP provides the framework for air quality basins to achieve attainment of the state and federal ambient air quality standards through the SIP. Areas are classified as attainment or nonattainment areas for particular pollutants depending on whether they meet the ambient air quality standards. Severity classifications for ozone nonattainment range in magnitude from marginal, moderate, and serious to severe and extreme.

- **Unclassified.** A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
- **Attainment.** A pollutant is in attainment if the AAQS for that pollutant was not violated at any site in the area during a three-year period.
- **Nonattainment.** A pollutant is in nonattainment if there was at least one violation of an AAQS for that pollutant in the area.
  - Nonattainment/Transitional. A subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the AAQS for that pollutant.

The attainment status for the SoCAB is shown in Table 5.2-2, *Attainment Status of Criteria Pollutants in the South Coast Air Basin.*

Table 5.2-2 Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
Ozone – 1-hour	Extreme Nonattainment	No Federal Standard
Ozone – 8-hour	Extreme Nonattainment	Extreme Nonattainment
PM_{10}	Serious Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment/Maintenance
SO_2	Attainment	Attainment
Lead	Attainment	Nonattainment (Los Angeles County only)[1]
All others	Attainment/Unclassified	Attainment/Unclassified

Source: CARB 2015.
[1] In 2010, the Los Angeles portion of the SoCAB was designated nonattainment for lead under the new 2008 federal AAQS as a result of large industrial emitters. Remaining areas in the SoCAB are unclassified.

Regional Air Quality Historic Trends

As stated, the SCAQMD is the agency responsible for improving air quality in the SoCAB and achieving the National and California AAQS. The SCAQMD prepares AQMPs that details regional programs to attain the AAQS. While the SoCAB may still be in nonattainment for ozone, particulate matter, and lead (Los Angeles County), air quality for the region has generally improved since the 1970s (see Appendix C1 for further details). In general, concentrations of ozone, NO_X, VOC, CO, PM_{10}, and $PM_{2.5}$ have been decreasing in the SoCAB although population and employment within the SoCAB have increased. The reduction in ozone, NO_X, VOC, and CO concentrations have been primarily a result of motor vehicle controls and reductions in evaporative emissions. Ozone concentrations within the SoCAB are approximately one-third of the concentrations in the late 1970s. The 24-hour national average for PM_{10} decreased by approximately 45 percent between years 1989 to 2014 while the national 24-hour $PM_{2.5}$ average decreased by approximately 52 percent from 1999 to 2014. Concentrations of CO within the SoCAB decreased by more than 80 percent since 1986. The overall improvements in regional air quality have coincided with the creation of SCAQMD and preparation of the AQMPs in addition to the regulations at the state and federal levels.

Multiple Air Toxics Exposure Study IV

The Multiple Air Toxics Exposure Study (MATES) is a monitoring and evaluation study on ambient concentrations of TACs and estimated the potential health risks from air toxics in the SoCAB. In 2008, SCAQMD conducted its third update to the MATES study (MATES III). The results showed that the overall basinwide risk for excess cancer from a lifetime exposure to ambient levels of air toxics was about 1,200 in a million. The largest contributor to this risk was diesel exhaust, accounting for 84 percent of the cancer risk (SCAQMD 2008a).

SCAQMD recently released the fourth update (MATES IV). The results showed that the overall monitored basinwide risk for excess cancer from a lifetime exposure to ambient levels of air toxics was approximately 418 in one million, a decrease of approximately 57 percent. Compared to the 2008 MATES III, monitored excess cancer risks decreased by approximately 65 percent. Approximately 90 percent of the risk is attributed to mobile sources, and 10 percent is attributed to stationary sources, such as refineries, metal processing facilities, gas stations, and chrome-plating facilities. The largest contributor to this risk was diesel exhaust, accounting for approximately 68 percent of the air toxics risk. Compared to MATES III, MATES IV found substantial improvement in air quality and associated decrease in air toxics exposure. (SCAQMD 2015a).

The Office of Environmental Health Hazard Assessment updated the guidelines for estimating cancer risks on March 6, 2015. The new method uses higher estimates of cancer potency during early life exposures, which result in a higher calculation of risk. There are also differences in the assumptions on breathing rates and length of residential exposures. SCAQMD estimates that risks for a given inhalation exposure level will be about 2.7 times higher using the proposed updated methods from MATES IV (e.g., 2.7 times higher than 418 in one million overall excess cancer risk) (SCAQMD 2015a).

Existing Ambient Air Quality

Existing levels of ambient air quality and historical trends and projections in the vicinity of the project site and project area are best documented by measurements made by SCAQMD. The project site is in Source

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Receptor Area (SRA) 9, the East San Gabriel Valley. The air quality monitoring station in SRA 9 closest to the project is the Azusa Monitoring Station. Because this station does not monitor SO_2, the analysis uses data from the Los Angeles-North Main Street Monitoring Station. Data from these stations are summarized in Table 5.2-3, *Ambient Air Quality Monitoring Summary*. The data show that the area regularly exceeds the state and federal eight-hour O_3 standards and occasionally exceeds the state one-hour standard. The state PM_{10} and federal $PM_{2.5}$ standards are also regularly exceeded. The CO, SO_2, and NO_2 standards have not been exceeded in the last five years in the project vicinity.

Table 5.2-3 Ambient Air Quality Monitoring Summary

Pollutant/Standard	Number of Days Threshold Were Exceeded and Maximum Levels during Such Violations				
	2011	2012	2013	2014	2015
Ozone (O3)[1]					
State 1-Hour ≥ 0.09 ppm	13	18	7	11	21
State 8-hour ≥ 0.07 ppm	19	20	15	20	28
Federal 8-Hour > 0.075 ppm	12	10	6	11	17
Max. 1-Hour Conc. (ppm)	0.111	0.0134	0.115	0.123	0.122
Max. 8-Hour Conc. (ppm)	0.092	0.095	0.085	0.092	0.096
Carbon Monoxide (CO)[1]					
State 8-Hour > 9.0 ppm	0	0	*	*	*
Federal 8-Hour ≥ 9.0 ppm	0	0	*	*	*
Max. 8-Hour Conc. (ppm)	1.36	1.13	*	*	*
Nitrogen Dioxide (NO_2)[1]					
State 1-Hour ≥ 0.18 ppm	0	0	0	0	0
Max. 1-Hour Conc. (ppb)	0.0795	0.0718	0.0768	0.0702	0.0710
Sulfur Dioxide (SO_2)[2]					
State 24-Hour ≥ 0.04 ppm	0	0	0	*	*
Max. 24-Hour Conc. (ppm)	0.002	0.002	0.002	*	*
Coarse Particulates (PM_{10})[1]					
State 24-Hour > 50 μg/m³	8	6	6	21	12
Federal 24-Hour > 150 μg/m³	0	0	0	0	0
Max. 24-Hour Conc. (μg/m³)	65	78	76	96	101
Fine Particulates ($PM_{2.5}$) [1]					
Federal 24-Hour > 35 μg/m³	2	0	0	0	2
Max. 24-Hour Conc. (μg/m³)	94.6	39.6	29.6	32.4	70.3

Source: CARB 2016b.
Notes: ppm = parts per million; ppb = parts per billion; μg/m³ = micrograms per cubic meter
* Data not available.
[1] Data from the Azusa Monitoring Station in Azusa.
[2] Data from the Los Angeles-North Main Street Monitoring Station in Los Angeles.

Existing Emissions

The City of Hope campus consists of hospital, office, hospitality, limited residential, commercial, and industrial land uses. These uses currently generate criteria air pollutant emissions from natural gas use for energy, heating and cooking; vehicle trips associated with each land use; and area sources such as landscaping equipment and consumer cleaning products. Table 5.2-4, *Existing City of Hope Daily Emissions Inventory*, shows the average daily emissions inventory currently generated by City of Hope.

Table 5.2-4 Existing City of Hope Daily Emissions Inventory

	Operation-Related Regional Emissions (pounds/day)					
Phase	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Area	37	<1	2	<1	<1	<1
Energy	2	18	15	<	1	1
Transportation[1]	45	219	698	2	133	37
Total	**83**	**237**	**715**	**2**	**135**	**39**
Stationary Equipment						
Central Utilities Plant[2]	*3*	*46*	*34*	*<1*	*3*[3]	*3*[3]

Source: CalEEMod 2016.3.1.

Notes: Based on highest winter or summer emissions using 2016 transportation emission rates. Totals may not equal 100 percent due to rounding. Excludes permitted sources of emissions that are covered under SCAQMD regulations.

1 Assumed vehicle fleet mix based on CalEEMod defaults and the annual average daily trips identified by Caltrans for the segment of Interstate 210 west of interstate 605 (Caltrans 2016).

2 Emissions are shown for information purposes and are from SCAQMD reporting system, City of Hope Medical Center (Facility ID 23194). Per CalEEMod methodology, emissions associated with boilers in the Energy sector are based on building energy demand and are encompassed within the total Energy sector emissions shown. In addition, emissions from permitted stationary equipment such as installed in the central utilities plant (e.g., boilers) are controlled through the SCAQMD permitting process.

3 PM emissions are shown as PM_{10}. $PM_{2.5}$ fraction of PM_{10} is assumed at 99 percent (SCAQMD 2006).

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiorespiratory diseases.

Residential areas are also considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Other sensitive receptors include retirement facilities, hospitals, and schools. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial, commercial, retail, and office areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, because the majority of the workers tend to stay indoors most of the time. In addition, the workforce is generally the healthiest segment of the population.

The nearest off-site sensitive receptors are the residences to the north across Duarte Road and the adjacent residences to the west as well as Beardslee Elementary School to the west across Buena Vista Street. In addition to the off-site sensitive receptors, existing sensitive receptors on-site consist of City of Hope patients.

5.2.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

AQ-1 Conflict with or obstruct implementation of the applicable air quality plan.

AQ-2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

AQ-3 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

AQ-4 Expose sensitive receptors to substantial pollutant concentrations.

AQ-5 Create objectionable odors affecting a substantial number of people.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant:

- Threshold AQ-5: Future development, revitalization, and/or redevelopment activities that would be accommodated by the Campus Plan would not emit objectionable odors that would affect a substantial number of people.

This impact will not be addressed in the following analysis.

5.2.2.1 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT THRESHOLDS

The analysis of the proposed project's air quality impacts follows the guidance and methodologies recommended in SCAQMD's *CEQA Air Quality Handbook* and the significance thresholds on SCAQMD's website.[6] CEQA allows the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. SCAQMD has established thresholds of significance for regional air quality emissions for construction activities and project operation. In addition to the daily thresholds listed above, projects are also subject to the AAQS. These are addressed through an analysis of localized CO impacts and localized significance thresholds (LSTs).

Regional Significance Thresholds

SCAQMD has adopted regional construction and operational emissions thresholds to determine a project's cumulative impact on air quality in the SoCAB, shown in Table 5.2-5, *SCAQMD Regional Significance Thresholds*. The table lists thresholds that are applicable for all projects uniformly, regardless of size or scope. There is growing evidence that although UFPs contribute a very small portion of the overall atmospheric mass

[6] SCAQMD's Air Quality Significance Thresholds are current as of March 2011 and can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook.

concentration, they represent a greater proportion of the health risk from PM. However, the EPA and CARB have not adopted AAQS to regulate UFPs; therefore, SCAQMD has not developed thresholds for them.

Table 5.2-5 SCAQMD Significance Thresholds

Air Pollutant	Construction Phase	Operational Phase
Reactive Organic Gases (ROGs)/Volatile Organic Compounds (VOCs)	75 lbs/day	55 lbs/day
Nitrogen Oxides (NO_X)	100 lbs/day	55 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Sulfur Oxides (SO_X)	150 lbs/day	150 lbs/day
Particulates (PM_{10})	150 lbs/day	150 lbs/day
Particulates ($PM_{2.5}$)	55 lbs/day	55 lbs/day

Source: SCAQMD 2015b.

Projects that exceed the regional significance threshold contribute to the nonattainment designation of the SoCAB. The attainment designations are based on the AAQS, which are set at levels of exposure that are determined to not result in adverse health effects. Exposure to fine particulate pollution and ozone causes myriad health impacts, particularly to the respiratory and cardiovascular systems:

- Increases cancer risk ($PM_{2.5}$, TACs)
- Aggravates respiratory disease (O_3, $PM_{2.5}$)
- Increases bronchitis (O_3, $PM_{2.5}$)
- Causes chest discomfort, throat irritation, and increased effort to take a deep breath (O_3)
- Reduces resistance to infections and increases fatigue (O_3)
- Reduces lung growth in children ($PM_{2.5}$)
- Contributes to heart disease and heart attacks ($PM_{2.5}$)
- Contributes to premature death (O_3, $PM_{2.5}$)
- Contributes to lower birth weight in newborns ($PM_{2.5}$) (SCAQMD 2015c)

Exposure to fine particulates and ozone aggravates asthma attacks and can amplify other lung ailments such as emphysema and chronic obstructive pulmonary disease. Exposure to current levels of $PM_{2.5}$ is responsible for an estimated 4,300 cardiopulmonary-related deaths per year in the SoCAB. In addition, University of Southern California scientists, in a landmark children's health study, found that lung growth improved as air pollution declined for children aged 11 to 15 in five communities in the SoCAB (SCAQMD 2015d).

Mass emissions in Table 5.2-5 are not correlated with concentrations of air pollutants but contribute to the cumulative air quality impacts in the SoCAB. Therefore, regional emissions from a single project do not single-handedly trigger a regional health impact, and it is speculative to identify how many more individuals in the air basin would be affected by the health effects listed above. In addition, the analysis to determine how exceeding the regional thresholds would affect the number of days the region is in nonattainment is within the scope of the AQMP. SCAQMD is the primary agency responsible for ensuring the health and welfare of

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sensitive individuals exposed to elevated concentrations of air pollutants in the SoCAB. To achieve the health-based standards established by the EPA, SCAQMD prepares an AQMP that details regional programs to attain the AAQS.

Localized Significance Thresholds

SCAQMD identifies localized significance thresholds, shown in Table 5.2-6, *SCAQMD Localized Significance Thresholds*. Emissions of NO_2, CO, PM_{10}, and $PM_{2.5}$ generated at a project site (offsite mobile-source emissions are not included in the LST analysis) could expose sensitive receptors to substantial concentrations of criteria air pollutants. A project that generates emissions that trigger a violation of the AAQS when added to the local background concentrations would generate a significant impact.

Table 5.2-6 SCAQMD Localized Significance Thresholds

Air Pollutant (Relevant AAQS)	Concentration
1-Hour CO Standard (CAAQS)	20 ppm
8-Hour CO Standard (CAAQS)	9.0 ppm
1-Hour NO_2 Standard (CAAQS)	0.18 ppm
Annual NO_2 Standard (CAAQS)	0.03 ppm
24-Hour PM_{10} Standard – Construction (SCAQMD)[1]	10.4 $\mu g/m^3$
24-Hour $PM_{2.5}$ Standard – Construction (SCAQMD)[1]	10.4 $\mu g/m^3$
24-Hour PM_{10} Standard – Operation (SCAQMD)[1]	2.5 $\mu g/m^3$
24-Hour $PM_{2.5}$ Standard – Operation (SCAQMD)[1]	2.5 $\mu g/m^3$
Annual Average PM_{10} Standard (SCAQMD)[1]	1.0 $\mu g/m^3$

Source: SCAQMD 2015b.
ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter
1 Threshold is based on SCAQMD Rule 403. Since the SoCAB is in nonattainment for PM_{10} and $PM_{2.5}$, the threshold is established as an allowable change in concentration. Therefore, background concentration is irrelevant.

To assist lead agencies, SCAQMD developed screening-level LSTs to back-calculate the mass amount (lbs. per day) of emissions generated onsite that would trigger the levels shown in Table 5.2-6 for projects under five acres. Screening-level LSTs are based on the ambient concentrations of that pollutant within the project SRA and the distance to the nearest sensitive receptor. Screening-level LST analyses are the localized significance thresholds for all projects of five acres and less; however, they can be used as screening criteria for larger projects to determine whether or not dispersion modeling may be required to compare concentrations of air pollutants generated by the project to the localized concentrations shown in Table 5.2-6.

The construction screening-level LSTs in SRA 9 are shown in Table 5.2-7, *SCAQMD Screening-Level Localized Significance Thresholds*. For construction activities, LSTs are based on the acreage disturbed per day based on equipment use (SCAQMD 2011). The different types of construction activities would require different equipment mixes, resulting in multiple LSTs. Because the proposed project is not an industrial project that has the potential to emit substantial sources of stationary emissions, operational LSTs are not an air quality impact of concern, but they are shown in Table 5.2-7 for reference.

Table 5.2-7 SCAQMD Screening-Level Localized Significance Thresholds

Acreage Disturbed	Threshold (lbs/day)			
	Nitrogen Oxides (NO_X)	Carbon Monoxide (CO)	Coarse Particulates (PM_{10})	Fine Particulates ($PM_{2.5}$)
Construction[1]				
Phases I and II[1]				
=>1-Acre LSTs	89	623	5	3
1.31-Acre LSTs	101	726	6	4
3.50-Acre LSTs	165	1,343	10.49	6.50
4.00-Acre LSTs	178	1,473	12	7
Phase 3[2]				
=>1-Acre LSTs	89	623	5	3
1.31-Acre LSTs	101	726	6	4
3.50-Acre LSTs	165	1,343	10	6
4.00-Acre LSTs	178	1,473	12	7
Phase 4[2]				
=>1-Acre LSTs	89	623	5	3
1.31-Acre LSTs	101	726	6	4
3.50-Acre LSTs	165	1,343	10	6
4.00-Acre LSTs	178	1,473	12	7
Operation[2]				
=>5-Acre Area	371	1,965	4	2

Source: SCAQMD 2008b and SCAQMD 2011; Based on receptors in SRA 9.
1 LSTs are based on receptors within 82 feet (25 meters).
2 LSTs are based on receptors within 82 feet (25 meters) and a 5-acre project site.

CO Hotspots

Areas of vehicle congestion have the potential to create pockets of CO called hotspots. These pockets have the potential to exceed the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Hotspots are typically produced at intersections, where traffic congestion is highest because vehicles queue for longer periods and are subject to reduced speeds. With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the SoCAB and the state have steadily declined.

Health Risk Analysis

Whenever a project would use chemical compounds identified in SCAQMD Rule 1401, on CARB's air toxics list pursuant to AB 1807, or on the EPA's National Emissions Standards for Hazardous Air Pollutants, a health risk assessment is required by the SCAQMD. Table 5.2-8, *SCAQMD Toxic Air Contaminants Incremental Risk Thresholds*, lists the SCAQMD's TAC incremental risk thresholds for operation of a project. Projects that do not generate emissions that exceed the values in Table 5.2-8 would not substantially contribute to cumulative air quality hazards or exacerbate an existing environmental hazard. Residential, commercial, office,

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and institutional uses (such as the hospital land uses) do not use substantial quantities of TACs and typically do not exacerbate existing hazards. Therefore, these thresholds are typically applied to new industrial projects and are not required to be applied to the proposed project.

Table 5.2-8 SCAQMD Toxic Air Contaminants Incremental Risk Thresholds

Maximum Incremental Cancer Risk	≥ 10 in 1 million
Cancer Burden (in areas ≥ 1 in 1 million)	> 0.5 excess cancer cases
Hazard Index (project increment)	≥ 1.0

Source: SCAQMD 2015b.

Per the Office of Environmental Health Hazard Assessment (OEHHA) guidelines, projects lasting for longer than two months may be evaluated for potential health risks to surrounding receptors. The determination of health risks in a Health Risk Assessment (HRA) required the calculation of 70-year average to determine individual lifetime cancer risks. OEHHA guidelines also stated that HRAs should be based on an age factor exposure period; however, such assessments should be limited to the period and duration of activities associated with the subject project. For the proposed project, construction activities are anticipated to occur over an approximately 18-year period. For purposes of this analysis, the SCAQMD significance thresholds for operational related health risk impacts, as shown in Table 5.2-8, are utilized for analyzing construction impacts.

5.2.3 Environmental Impacts

Methodology

This air quality evaluation was prepared in accordance with the requirements of CEQA to determine if significant air quality impacts are likely to occur in conjunction with implementation of the proposed project. SCAQMD has published the *CEQA Air Quality Handbook* (Handbook) and updates on its website to provide local governments with guidance for analyzing and mitigating project-specific air quality impacts. The Handbook provides standards, methodologies, and procedures for conducting air quality analyses in environmental impact reports and was used extensively in the preparation of this analysis. The SCAQMD has published additional guidance—*Localized Significance Threshold Methodology for CEQA Evaluations* (SCAQMD 2008c)—for evaluating localized effects from emissions generated by a project. This document was also used in the preparation of this analysis.

The analysis also makes use of the CalEEMod, Version 2016.3.1, for determination of daily construction and operational emissions, which are based on the following:

- **Transportation:** Based on the annual average trip generation and vehicle miles traveled data provided by Fehr & Peers (see Appendix J1 of this DEIR). For purposes of this analysis, an average trip distance of 14.3 miles per trip is used for both the existing and project buildout scenarios. Based on the estimated 11,903 average daily trips generated under existing conditions and the 16,645 average daily trips generated under full buildout conditions, approximately 170,213 vehicle miles per day are generated currently, and 238,024 vehicle miles per day would be generated under full buildout conditions (Fehr & Peers 2016).

- **Area Sources:** Area and stationary sources are based on the CalEEMod defaults for emissions generated from use of consumer products and cleaning supplies (based on building square footage) and for the VOC-content in paints used for architectural coatings.

- **Energy:** Criteria air pollutant emissions from energy use (natural gas used for cooking, heating, etc.) are based on the CalEEMod defaults for natural gas usage by nonresidential land uses. For purposes of this analysis, new buildings are assumed to comply with the 2016 Building Energy Efficiency Standards, which are 5 percent more energy efficient for nonresidential buildings than the 2013 Building Energy Efficiency Standards. Existing buildings are assumed to comply with the 2005 Building Energy Efficiency Standards.

- **Stationary Sources:** Per CalEEMod methodology, emissions associated with operation of boilers are encompassed within the energy sector emissions associated with the buildings. Moreover, specific planned future improvements to the City of Hope central utilities plant are currently unknown and speculative. However, for purposes of this analysis, emissions from the potential installation of two new boilers are included for informational purposes only and are not additive to the overall total operational-phase emissions. While two new emergency generators could also be installed, operation of an emergency generator would only occur during emergencies and periodic testing and its operation would be minimal overall. Additionally, stationary sources of emissions such as boilers and generators would be subject to CEQA and future discretionary action by SCAQMD per SCAQMD Regulation XIII, New Source Review. The daily and heat annual inputs are based on data provided for the three existing boilers in operation at the City of Hope central utilities plant. Boiler emissions are based on the following:
  - Boilers:
    - Fuel Type: Compressed natural gas
    - Boiler Rating: 4 MMBtu per hour
    - Daily Heat Input Per Boiler: 131.79 MMBtu per day
    - Annual Heat Input Per Boiler: 49,003 MMBtu per year

- **Construction:** Construction emissions are based on the construction information provided by the applicant. Where specific information was not available, construction assumptions were based on CalEEMod defaults such as construction equipment mix and worker, vendor, and haul trips. For purposes of this analysis, it is assumed that the proposed project would be developed in four phases, beginning January 2018, with buildout in 2035. Construction details for each development phase are as follows:
  - **Phase 1:** For purposes of this analysis, Phase 1 is anticipated to begin construction at the start of 2018 and be completed by the end of 2021. Under this development phase, approximately 98,000 square feet of existing hospital, medical office, and research and development buildings would be demolished, and up to 520,000 building square feet of hospital, medical office, and research buildings

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would be built. A parking structure with up to 1,750 parking spaces would also be constructed as well as a new surface parking lot. The general construction activities, schedule, and anticipated equipment are shown in Table 5.2-9, *Phase 1 Construction Activities, Phasing, and Equipment*.

Table 5.2-9 Phase 1: Construction Activities, Phasing, and Equipment

Activities[1]	Start/End Dates[1]	Equipment[2]
Demolition	1/1/2018-3/23/2018	1 concrete/industrial saw; 3 excavators; 2 rubber tired dozers; 1 water truck
Site Preparation	3/24/2018-5/4/2018	3 rubber tired dozers; 4 tractors/loaders/backhoes; 1 water truck
Grading	5/7/2018-7/27/2018	2 excavators; 1 grader; 1 rubber tired dozer; 2 scrapers; 2 tractors/loaders/backhoes; 1 water truck
Building Construction	7/28/2018-1/22/2021	1 crane; 3 forklifts; 1 generator set; 3 tractors/loaders/backhoes; 1 welder
Architectural Coating	7/28/2019-12/24/2021	1 air compressor
Asphalt Paving	1/23/2021-3/19/2021	2 pavers; 2 paving equipment; 2 rollers

Notes: n/a = not applicable
[1] Based on information provided by applicant.

- **Phase 2:** This phase is anticipated to commence in 2021 and be completed in the first quarter of 2025. Approximately 107,000 building square feet of existing medical office, research and development, hospitality, industrial, and warehouse space would be demolished, and approximately 210,000 building square feet of new hospital, 61,000 building square feet of research and development, and 20,000 building square feet of industrial space would be built. A new proposed parking structure with up to 1,250 parking spaces as well as new surface parking lots would also be constructed. Additionally, for purposes of this analysis, it is assumed a new boiler and emergency generator could potentially be installed at the existing City of Hope central utilities plant during this development phase, subject to SCAQMD Regulation XIII, New Source Review. The general construction activities, schedule, and anticipated equipment are shown in Table 5.2-10, *Phase 2 Construction Activities, Phasing, and Equipment*.

Table 5.2-10 Phase 2: Construction Activities, Phasing, and Equipment

Activities[1]	Start/End Dates[1]	Equipment[2]
Demolition	1/1/2021-3/25/2021	1 concrete/industrial saw; 3 excavators; 2 rubber tired dozers; 1 water truck
Site Preparation	3/26/2021-5/20/2021	3 rubber tired dozers; 4 tractors/loaders/backhoes; 1 water truck
Grading	5/21/2021-8/12/2021	2 excavators; 1 grader; 1 rubber tired dozer; 2 scrapers; 2 tractors/loaders/backhoes; 1 water truck
Building Construction	8/13/2021-1/23/2025	1 crane; 3 forklifts; 1 generator set; 3 tractors/loaders/backhoes; 1 welder
Architectural Coating	8/13/2022-12/26/2025	1 air compressor
Asphalt Paving	1/24/2025-4/17/2025	2 pavers; 2 paving equipment; 2 rollers

Notes: n/a = not applicable
[1] Based on information provided by applicant.

- **Phase 3:** Phase 3 is anticipated to begin in 2026 and be completed in 2030. Under this phase, approximately 153,500 building square feet of hospital, medical office, hospitality, warehouse, housing, and assembly buildings would be demolished, and approximately 180,000 building square feet of hospital, 70,000 building square feet of medical office, 75,000 building square feet of hospitality, 10,000 building square feet of industrial, and a 30,000-square-foot data center would be constructed as well as a surface parking lot. The general construction activities, schedule, and anticipated equipment are shown in Table 5.2-11, *Phase 3 Construction Activities, Phasing, and Equipment*.

Table 5.2-11 Phase 3: Construction Activities, Phasing, and Equipment

Activities[1]	Start/End Dates[1]	Equipment[2]
Demolition	1/1/2026-3/25/2026	1 concrete/industrial saw; 3 excavators; 2 rubber tired dozers; 1 water truck
Site Preparation	3/26/2026-5/20/2026	3 rubber tired dozers; 4 tractors/loaders/backhoes; 1 water truck
Grading	5/21/2026-8/12/2026	2 excavators; 1 grader; 1 rubber tired dozer; 2 scrapers; 2 tractors/loaders/backhoes; 1 water truck
Building Construction	8/13/2026-1/23/2030	1 crane; 3 forklifts; 1 generator set; 3 tractors/loaders/backhoes; 1 welder
Architectural Coating	8/13/2027-12/26/2030	1 air compressor
Asphalt Paving	1/24/2030-4/17/2030	2 pavers; 2 paving equipment; 2 rollers

Notes: n/a = not applicable
[1] Based on information provided by applicant.

- **Phase 4:** Development of Phase 4 is anticipated to begin in 2031 and be built out by 2035. Approximately 29,000 building square feet of research and development building space would be demolished, and 120,000 building square feet of medical office and 130,000 building square feet of research and development space would be built as well as a new surface parking lot. In addition, for purposes of this analysis, another new boiler and emergency generator in addition to the new boiler and emergency generator assumed for Phase 2 could potentially be installed at the existing City of Hope central utilities plant during this development phase, subject to SCAQMD Regulation XIII, New Source Review. The general construction activities, schedule, and anticipated equipment are shown in Table 5.2-12, *Phase 4 Construction Activities, Phasing, and Equipment*.

Table 5.2-12 Phase 4: Construction Activities, Phasing, and Equipment

Activities[1]	Start/End Dates[1]	Equipment[2]
Demolition	1/1/2031-3/25/2031	1 concrete/industrial saw; 3 excavators; 2 rubber tired dozers; 1 water truck
Site Preparation	3/26/2031-5/20/2031	3 rubber tired dozers; 4 tractors/loaders/backhoes; 1 water truck
Grading	5/21/2031-8/12/2031	2 excavators; 1 grader; 1 rubber tired dozer; 2 scrapers; 2 tractors/loaders/backhoes; 1 water truck
Building Construction	8/13/2031-1/23/2035	1 crane; 3 forklifts; 1 generator set; 3 tractors/loaders/backhoes; 1 welder
Architectural Coating	8/13/2032-12/27/2035	1 air compressor
Asphalt Paving	1/24/2035-4/14/2035	2 pavers; 2 paving equipment; 2 rollers

Notes: n/a = not applicable
[1] Based on information provided by applicant.

The construction HRA prepared for the proposed project (Appendix C2 of this DEIR) was based on conservative (i.e., health protective) assumptions to ensure that estimated risks do not underestimate actual risks. The HRA is based on OEHHA guidelines to produce conservative estimates of cancer risk posed by exposure to construction diesel particulate matter (DPM).

For this residential-based risk assessment, the following conservative assumptions were used:

- It was assumed that maximum-exposed residential receptors (both children and adults) stood outdoors and are subject to DPM at their residence for 8 hours per day, and approximately 260 construction days per year. As a conservative measure, the SCAQMD does not recognize indoor adjustments for receptors. However, California residents typically spend on average 2 hours per day outdoors at their residences and their remaining time indoors (USEPA 2011). This would result in lower exposures to construction related DPM emissions and lower estimated risk values.

- The calculated risk for infants from third trimester to age 2, children aged 2 to 16 years, and those aged 16 to 30 are multiplied by age sensitivity factors of 10, 3, and 1, respectively, to account for early life exposure and uncertainty in child versus adult exposure impacts (OEHHA 2015).

For this elementary school-based risk assessment, the following conservative assumptions were used:

- It was assumed that maximum-exposed students stood outdoors and are subject to DPM at the school for 8 hours per day, 250 days per year (work days; OEHHA 2004). In reality, children are exposed to outdoor pollutant concentration levels for a portion of the day and are exposed to reduced indoor pollutant concentrations for the remaining school hours. This would result in lower estimated risk values.

- The calculated risk for children from 2 to 16 years is multiplied by an age sensitivity factor of 3 to account for early life exposure and uncertainty in child versus adult exposure impacts (OEHHA 2015).

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.2-1: The proposed project would be consistent with the South Coast Air Quality Management District's Air Quality Management Plan. [Threshold AQ-1]

Impact Analysis: SCAQMD is directly responsible for reducing emissions from area, stationary, and mobile sources in the SoCAB to achieve the National and California AAQS. SCAQMD has responded to this requirement by preparing an AQMP. On March 3, 2017 the SCAQMD Governing Board adopted the 2016 AQMP, which is a regional and multiagency effort (SCAQMD, CARB, SCAG, and EPA). A consistency determination with the AQMP plays an important role in local agency project review by linking local planning and individual projects to the AQMP. It fulfills the CEQA goal of informing decision makers of the environmental efforts of the project under consideration early enough to ensure that air quality concerns are fully addressed. It also provides the local agency with ongoing information as to whether they are contributing to the clean air goals in the AQMP.

The two principal criteria for conformance with an AQMP are:

1. Whether the project would exceed the assumptions in the AQMP.
2. Whether the project would result in an increase in the frequency or severity of existing air quality violations, cause or contribute to new violations, or delay timeline attainment of air quality standards.

SCAG is SCAQMD's partner in the preparation of the AQMP, providing the latest economic and demographic forecasts and developing transportation measures. Regional population, housing, and employment projects developed by SCAG are based in part on a city's general plan land use designations. These projections form the foundation for the emissions inventory of the AQMP and are incorporated into the regional transportation plan/sustainable communities strategy prepared by SCAG to determine priority transportation projects and vehicle miles traveled in the SCAG region. Because the AQMP strategy is based on projections from local general plans, projects that are consistent with the local general plan are considered consistent with the air quality-related regional plan. Additionally, only large projects have the potential to substantially affect the demographic forecasts in the AQMP.

CEQA Guidelines Section 15206(b) states that a proposed project is of statewide, regional, or area-wide significance if the project is a residential development of more than 500 dwelling units or a commercial office building of 250,000 square feet or more or that employs 1,000 or more employees. The proposed project would introduce a net of approximately 1,038,500 square feet of new medical campus buildings (excludes the two planned parking structures) in addition to 2,841 new jobs. These numbers would exceed the standards determining whether a project is of statewide, regional, or area-wide significance, but any growth associated with the proposed project in regard to households would be within the assumed SCAG growth projections for the cities of Duarte and Irwindale (see Impact 5.11-1, Section 5.11, *Population and Housing*, of this DEIR). Thus, implementation of the proposed project would not have the potential to substantially affect SCAG's demographic projections beyond what is already anticipated for the area.

With respect to the second criterion, the analyses for Impact 5.2-3 demonstrate that the proposed project would not generate long-term emissions of criteria air pollutants that would exceed SCAQMD's regional operation-phase significance thresholds, which were established to determine whether a project has the potential to cumulatively contribute to the SoCAB's nonattainment designations. Thus, the proposed project would not result in an increase in the frequency or severity of existing air quality violations; cause or contribute to new violations; or delay timely attainment of the AAQS. Therefore, overall, the proposed project would be considered consistent with the AQMP, and impacts would be less than significant.

Impact 5.2-2: Construction activities associated with the proposed project would not generate short-term emissions in exceedance of SCAQMD'S regional threshold criteria. [Thresholds AQ-2 and AQ-3]

Impact Analysis: At full buildout, the proposed project would develop approximately 670,000 building square feet of hospital, 250,000 building square feet of medical office, 371,000 building square feet of research and development, 75,000 building square feet of hospitality, and 30,000 building square feet of industrial space in addition to a 30,000-square-foot data center, two parking structures, and surface lots.

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Construction activities associated with the proposed project would produce combustion emissions from various sources, such as onsite heavy-duty construction vehicles, vehicles hauling materials to and from the site, and motor vehicles transporting the construction crew. Site preparation activities produce fugitive dust emissions (PM_{10} and $PM_{2.5}$) from soil-disturbing activities, such as grading and excavation. Air pollutant emissions from construction activities onsite would vary daily as construction activity levels change. Table 5.2-13, *Maximum Daily Regional Construction Emissions by Development Phase*, shows the construction emissions for the proposed project. As shown in the table, project-related construction emissions would not exceed the SCAQMD regional construction significance thresholds. Therefore, construction-related regional air quality impacts would be less than significant.

Table 5.2-13 Maximum Daily Regional Construction Emissions by Development Phase

Construction Phase(s)	Criteria Air Pollutants (pounds per day)[1, 2]					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Phase 1 and Phase 2						
Year 2018						
Phase 1 Demolition	4	43	24	<1	4	2
Phase 1 Site Preparation	5	49	24	<1	11	7
Phase 1 Grading	6	77	40	<1	7	4
Phase 1 Building Construction	7	56	57	<1	9	4
Year 2019						
Phase 1 Building Construction	7	52	53	<1	9	3
Phase 1 Building Construction and Architectural Coating Overlap	16	54	60	<1	10	4
Year 2020						
Phase 1 Building Construction and Architectural Coating Overlap	15	50	56	<1	10	4
Year 2021						
Phase 1 Building Construction and Architectural Coating Overlap	14	45	53	<1	10	3
Phase 1 Building Construction, Architectural Coating, and Phase 2 Demolition Overlap	18	81	76	<1	13	5
Phase 1 Architectural Coating, Paving, and Phase 2 Demolition Overlap	14	51	45	<1	6	3
Phase 1 Architectural Coating and Phase 2 Site Preparation Overlap	13	43	28	<1	11	7
Phase 1 Architectural Coating and Phase 2 Grading Overlap	13	55	40	<0	8	4
Phase 1 Architectural Coating and Phase 2 Building Construction Overlap	13	36	42	<1	7	3
Year 2022						
Phase 2 Building Construction	4	31	34	<1	6	2
Phase 2 Building Construction and Architectural Coating Overlap	8	33	39	<1	7	2

Table 5.2-13 Maximum Daily Regional Construction Emissions by Development Phase

Construction Phase(s)	Criteria Air Pollutants (pounds per day)[1, 2]					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Year 2023						
Phase 2 Building Construction and Architectural Coating Overlap	7	28	37	<1	6	2
Year 2024						
Phase 2 Building Construction and Architectural Coating Overlap	7	27	36	<1	6	2
Year 2025						
Phase 2 Building Construction and Architectural Coating Overlap	7	26	35	<1	6	2
Phase 2 Architectural Coating and Paving Overlap	5	10	19	<1	1	1
Maximum Daily Emissions	18	81	76	<1	13	7
SCAQMD Regional Construction Threshold	75	100	550	150	150	55
Significant?	No	No	No	No	No	No
Phase 3						
Year 2026						
Phase 3 Demolition	2	21	21	<1	2	1
Phase 3 Site Preparation	3	25	18	<1	9	5
Phase 3 Grading	3	28	27	<1	5	3
Phase 3 Building Construction	2	17	22	<1	3	1
Year 2027						
Phase 3 Building Construction	2	17	21	<1	3	1
Phase 3 Building Construction and Architectural Coating Overlap	6	19	24	<1	3	1
Year 2028						
Phase 3 Building Construction and Architectural Coating Overlap	6	19	24	<1	3	1
Year 2029						
Phase 3 Building Construction and Architectural Coating Overlap	6	19	23	<1	3	1
Year 2030						
Phase 3 Building Construction and Architectural Coating Overlap	6	14	23	<1	2	1
Phase 3 Architectural Coating and Paving Overlap	6	8	19	<1	1	<1
Maximum Daily Emissions	6	29	27	<1	9	5
SCAQMD Regional Construction Threshold	75	100	550	150	150	55
Significant?	No	No	No	No	No	No
Phase 4						
Year 2031						
Phase 4 Demolition	2	11	20	<1	2	1
Phase 4 Site Preparation	2	14	17	<1	8	5
Phase 4 Grading	3	14	24	<1	4	2
Phase 4 Building Construction	2	11	19	<1	2	1

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Table 5.2-13 Maximum Daily Regional Construction Emissions by Development Phase

Construction Phase(s)	Criteria Air Pollutants (pounds per day)[1, 2]					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Year 2032						
Phase 4 Building Construction	2	11	19	<1	2	1
Phase 4 Building Construction and Architectural Coating Overlap	5	12	21	<1	2	1
Year 2033						
Phase 4 Building Construction and Architectural Coating Overlap	4	12	21	<1	2	1
Year 2034						
Phase 4 Building Construction and Architectural Coating Overlap	4	12	21	<1	2	1
Year 2035						
Phase 4 Building Construction and Architectural Coating Overlap	4	11	21	<1	2	1
Phase 4 Architectural Coating and Paving Overlap	4	6	18	<1	1	<1
Maximum Daily Emissions	5	14	24	<1	8	5
SCAQMD Regional Construction Threshold	75	100	550	150	150	55
Significant?	No	No	No	No	No	No

Source: CalEEMod Version 2016.3.1. Highest winter or summer emissions are reported.
[1] Based on information provided by the applicant. Where specific information regarding project-related construction activities was not available, construction assumptions were based on CalEEMod defaults.
[2] Includes implementation of fugitive dust control measures required by SCAQMD under Rule 403, including watering disturbed areas a minimum of two times per day, reducing speed limit to 15 miles per hour on unpaved surfaces, replacing ground cover quickly, and street sweeping with Rule 1186–compliant sweepers.

Impact 5.2-3: Long-term operation of the project would not generate additional emissions in exceedance of SCAQMD's regional significance thresholds. [Thresholds AQ-2 and AQ-3]

Impact Analysis: The following evaluates operation-related impacts associated with each phase of development—Phases I through IV. Development of each phase of the City of Hope Campus Plan would result in direct and indirect criteria air pollutant emissions from transportation, energy (e.g., natural gas use), and area sources (e.g., aerosols and landscaping equipment). Mobile-source criteria air pollutant emissions are based on the traffic analysis conducted by Fehr & Peers (see Appendix J1 of this DEIR).

Phase 1

Phase 1 of the project would result in an overall net decrease of 920 average daily trips and 13,156 vehicle miles per day (see Appendix J1) compared to existing conditions. The results of the CalEEMod modeling are shown in Table 5.2-14, *Phase 1: Net Maximum Daily Operation-Phase Emissions*. The net change in emissions is based on the new emissions generated by the new facility buildings subtracted by the emissions associated with the existing buildings proposed to be demolished. Furthermore, the net change in emissions is also attributed to the net change in vehicle trips. As shown in the table, the net emissions generated from implementation of the proposed project would not exceed the SCAQMD regional operation-phase significance thresholds.

Table 5.2-14 Phase 1: Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Existing (Year 2021)						
Area	37	<1	2	<1	<1	<1
Energy	2	18	15	<1	1	1
Transportation	27	145	428	2	132	36
Total	**66**	**163**	**445**	**2**	**133**	**37**
Project[1]						
Area	46	<1	1	<1	<1	<1
Energy	2	23	19	<1	2	2
Transportation[2]	25	134	396	1	122	33
Total	**74**	**157**	**416**	**2**	**124**	**35**
Net Change (Project – Existing)						
Net Change	**8**	**(-6)**	**(-29)**	(-<1)	**(-10)**	**(-3)**
SCAQMD Regional Thresholds	55	55	550	150	150	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod Version 2016.3.1. Based on highest winter or summer emissions using 2035 transportation emission rates. Totals may not equal 100 percent due to rounding. Excludes permitted sources of emissions that are covered under SCAQMD regulations.
1 It is assumed that approximately 98,000 building square feet of the existing City of Hope structures would be demolished.
2 Assumed vehicle fleet mix based on CalEEMod defaults and the annual average daily trips identified by Caltrans for the segment of I-210 west of I-605 (Caltrans 2016).

Phase 2

Phase 2 of the project would generate a net increase of 641 average daily trips and 9,166 vehicle miles per day (see Appendix J1). The results of the CalEEMod modeling are shown in Table 5.2-15, *Phase 2: Net Maximum Daily Operation-Phase Emissions*. The net change in emissions is based on the new emissions generated by the new facility buildings and the additional vehicle trips associated with the additional visitors, patients, and employees subtracted by the emissions associated with the existing buildings proposed to be demolished. As shown in the table, the net emissions generated from implementation of the proposed project would not exceed the SCAQMD regional operation-phase significance thresholds.

Table 5.2-15 Phase 2: Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Existing (Year 2025)						
Area	37	<1	2	<1	<1	<1
Energy	2	18	15	<1	1	1
Transportation	21	93	334	1	131	36
Total	**60**	**111**	**352**	**1**	**133**	**37**
Project[1]						
Area	50	<1	1	<1	<1	<1
Energy[2]	3	26	22	<1	2	2

Table 5.2-15 Phase 2: Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Transportation[3]	22	99	353	1	139	38
Total	**76**	**125**	**376**	**2**	**141**	**40**
Net Change (Project – Existing)						
Net Change	**16**	**14**	**25**	<1	**8**	**2**
SCAQMD Regional Thresholds	55	55	550	150	150	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
New Potential Stationary Sources						
Central Utilities Plant – Boilers[4]	*1*	*1*	*13*	*<1*	*1*	*1*

Source: CalEEMod Version 2016.3.1. Based on highest winter or summer emissions using 2035 transportation emission rates. Totals may not equal 100 percent due to rounding. Excludes permitted sources of emissions that are covered under SCAQMD regulations.
1 It is assumed that approximately 107,000 building square feet of the existing City of Hope structures would be demolished.
2 Per CalEEMod methodology, emissions associated with any additional boilers needed for additional heating for the new facilities are accounted in the Energy sector. Emissions in this sector represent emissions associated with building energy use.
3 Assumed vehicle fleet mix based on CalEEMod defaults and the annual average daily trips identified by Caltrans for the segment of I-210 west of I-605 (Caltrans 2016).
4 Shown for informational purposes. For purposes of this analysis, it is assumed a new boiler would be installed at the City of Hope central utilities plant in Phase 2 and Phase 4 for a total of two new boiler units. Per CalEEMod methodology, the Energy sector emissions calculated for land uses encompasses emissions associated with boilers. In addition, installation of new or additional boilers and other stationary equipment such as an emergency generator would require a permit to operate from SCAQMD and would be subject to SCAQMD Regulation XIII, *New Source Review*.

Phase 3

Phase 3 of the project would generate a net increase of 2,572 average daily trips and 36,779 vehicle miles per day (see Appendix J1). The results of the CalEEMod modeling are shown in Table 5.2-16, *Phase 3: Net Maximum Daily Operation-Phase Emissions*. The net change in emissions is based on the new emissions generated by the new facility buildings and the additional vehicle trips associated with the additional visitors, patients, and employees subtracted by the emissions associated with the existing buildings proposed to be demolished. As shown in the table, the net emissions generated from implementation of the proposed project would not exceed the SCAQMD regional operation-phase significance thresholds.

Table 5.2-16 Phase 3: Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Existing (Year 2030)						
Area	37	<1	2	<1	<1	<1
Energy	2	18	15	<1	1	1
Transportation	18	82	269	1	131	35
Total	**56**	**100**	**286**	**1**	**133**	**37**
Project[1]						
Area	55	<1	1	<1	<1	<1
Energy[2]	3	28	24	<1	2	2
Transportation[3]	21	100	328	1	160	43

Table 5.2-16 Phase 3: Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Total	**80**	**129**	**353**	**2**	**162**	**45**
Net Change (Project – Existing)						
Net Change	**24**	**29**	**67**	<1	**29**	**8**
SCAQMD Regional Thresholds	55	55	550	150	150	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
New Potential Stationary Sources						
Central Utilities Plant – Boilers[4]	*1*	*1*	*13*	*<1*	*1*	*1*

Source: CalEEMod Version 2016.3.1. Based on highest winter or summer emissions using 2035 transportation emission rates. Totals may not equal 100 percent due to rounding. Excludes permitted sources of emissions that are covered under SCAQMD regulations.

1 It is assumed that approximately 153,500 building square feet of the existing City of Hope structures would be demolished.

2 Per CalEEMod methodology, emissions associated with any additional boilers needed for additional heating for the new facilities are accounted in the Energy sector. Emissions in this sector represent emissions associated with building energy use.

3 Assumed vehicle fleet mix based on CalEEMod defaults and the annual average daily trips identified by Caltrans for the segment of I-210 west of I-605 (Caltrans 2016).

4 Shown for informational purposes. For purposes of this analysis, it is assumed a new boiler would be installed at the City of Hope central utilities plant in Phase 2 and Phase 4 for a total of two new boiler units. Per CalEEMod methodology, the Energy sector emissions calculated for land uses encompasses emissions associated with boilers. In addition, installation of new or additional boilers and other stationary equipment such as an emergency generator would require a permit to operate from SCAQMD and would be subject to SCAQMD Regulation XIII, *New Source Review*.

Phase 4 (Full Buildout)

Full buildout of the project would generate a net increase of 4,753 average daily trips and 67,968 vehicle miles per day (see Appendix J1). The results of the CalEEMod modeling are shown in Table 5.2-17, *Phase 4 (Full Buildout): Net Maximum Daily Operation-Phase Emissions*. The net change in emissions is based on the new emissions generated by the new facility buildings and the additional vehicle trips associated with the additional visitors, patients, and employees subtracted by the emissions associated with the existing buildings proposed to be demolished. As shown in the table, the net emissions generated from implementation of the proposed project would not exceed the SCAQMD regional operation-phase significance thresholds. Therefore, long-term impacts would be less than significant.

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Table 5.2-17 Phase 4 (Full Buildout): Net Maximum Daily Operation-Phase Emissions

Phase	Operation-Related Regional Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Land Uses						
Existing (Year 2035)						
Area	37	<1	2	<1	<1	<1
Energy	2	18	15	<1	1	1
Transportation	15	75	227	1	131	35
Total	**54**	**93**	**245**	**1**	**133**	**37**
Project[1]						
Area	60	<1	1	<1	<1	<1
Energy[2]	3	29	25	<1	2	2
Transportation[3]	21	106	319	2	184	49
Total	**84**	**135**	**344**	**2**	**186**	**52**
Net Change (Project – Existing)						
Net Change	**31**	**42**	**100**	1	**53**	**15**
SCAQMD Regional Thresholds	55	55	550	150	150	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**
New Potential Stationary Sources						
Central Utilities Plant – Boilers[4]	*1*	*3*	*25*	*<1*	*2*	*2*

Source: CalEEMod Version 2016.3.1. Based on highest winter or summer emissions using 2035 transportation emission rates. Totals may not equal 100 percent due to rounding. Excludes permitted sources of emissions that are covered under SCAQMD regulations.
1 It is assumed that approximately 387,500 building square feet of the existing City of Hope structures would be demolished.
2 Per CalEEMod methodology, emissions associated with any additional boilers needed for additional heating for the new facilities are accounted in the Energy sector. Emissions in this sector represent emissions associated with building energy use.
3 Assumed vehicle fleet mix based on CalEEMod defaults and the annual average daily trips identified by Caltrans for the segment of I-210 west of I-605 (Caltrans 2016).
4 Shown for informational purposes. For purposes of this analysis, it is assumed a new boiler would be installed at the City of Hope central utilities plant in Phase 2 and Phase 4 for a total of two new boiler units. Per CalEEMod methodology, the Energy sector emissions calculated for land uses encompasses emissions associated with boilers. In addition, installation of new or additional boilers and other stationary equipment such as an emergency generator would require a permit to operate from SCAQMD and would be subject to SCAQMD Regulation XIII, *New Source Review*.

Impact 5.2-4: Construction of the proposed project during Phase 1 would exceed the SCAQMD screening-level LST for $PM_{2.5}$ and potentially expose sensitive receptors to substantial pollutant concentrations. [Threshold AQ-4]

Impact Analysis: The proposed project could expose sensitive receptors to elevated pollutant concentrations during construction activities if it would cause or contribute significantly to elevated levels. Unlike the mass of construction and operations emissions shown in the regional emissions analysis in Tables 5.2-13 and 5.2-14, which are described in pounds per day, localized concentrations refer to an amount of pollutant in a volume of air (ppm or $\mu g/m^3$) and can be correlated to potential health effects.

LSTs

The screening-level LSTs are the amount of project-related emissions at which localized concentrations could exceed the ambient air quality standards for criteria air pollutants for which the SoCAB is designated nonattainment. Screening-level LSTs are based on the proposed project site size and distance to the nearest sensitive receptor. Thresholds are based on the California AAQS, which are the most stringent AAQS, established to provide a margin of safety in the protection of the public health and welfare. They are designed to protect sensitive receptors most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise.

Table 5.2-18, *Maximum Daily Onsite Localized Construction Emissions*, shows the maximum daily construction emissions (pounds per day) generated during onsite construction activities. As shown in the table, maximum daily construction emissions would not exceed the SCAQMD screening-level LSTs for NO_X, CO, or PM_{10}. However, site preparation activities during Phase 1 would result in an exceedance of the LST for $PM_{2.5}$. Therefore, without mitigation, development of the proposed project would result in a potentially significant localized air quality impact and cause an exceedance of the California AAQS.

Table 5.2-18 Maximum Daily Onsite Localized Construction Emissions

Source	Pollutants (pounds per day)[1, 2]			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Phase 1 and Phase 2				
Phase 1 Demolition – 2018	38	22	3	2
Phase 1 Architectural Coating and Paving and Phase 2 Demolition Overlap – 2021	50	40	4	3
Phase 2 Paving	10	16	<1	<1
=>1-Acre LSTs[3]	89	623	5	3
Exceeds LSTs?	No	No	No	No
Phase 1 Building Construction – 2018	23	18	1	1
Phase 1 Building Construction – 2019	21	17	1	1
Phase 1 Building Construction and Architectural Coating – 2019	54	41	3	3
Phase 1 Building Construction and Architectural Coating – 2020	52	40	3	3
Phase 1 Building Construction and Architectural Coating – 2021	32	33	2	2
Phase 1 Architectural Coating and Phase 2 Building Construction – 2021	19	18	1	1
Phase 2 Building Construction – 2022	16	15	1	1
Phase 2 Building Construction and Architectural Coating – 2022	17	18	1	1
Phase 2 Building Construction and Architectural Coating – 2023	16	18	1	1
Phase 2 Building Construction and Architectural Coating – 2024	15	18	1	1
Phase 2 Building Construction and Architectural Coating – 2025	14	18	1	1
1.31-Acre LSTs[3]	101	726	6	4
Exceeds LSTs?	No	No	No	No
Phase 1 Site Preparation – 2018	48	22	10.30	**6.62**
3.50-Acre LSTs[3]	165	1,343	10.49	6.50
Exceeds LSTs?	No	No	No	**Yes**
Phase 1 Grading – 2018	60	35	6	4
4.00-Acre LSTs[3]	178	1,473	12	7
Exceeds LSTs?	No	No	No	No

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Table 5.2-18 Maximum Daily Onsite Localized Construction Emissions

Source	Pollutants (pounds per day)[1, 2]			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Phase 3				
Phase 3 Demolition – 2026	19	19	2	1
Phase 3 Paving – 2030	7	16	<1	<1
=>1-Acre LSTs[3]	89	623	5	3
Exceeds LST?	No	No	No	No
Phase 3 Building Construction – 2026	12	16	1	<1
Phase 3 Building Construction – 2027	12	16	1	<1
Phase 3 Building Construction and Architectural Coating – 2027	14	18	1	1
Phase 3 Building Construction and Architectural Coating – 2028	14	18	1	1
Phase 3 Building Construction and Architectural Coating – 2029	14	18	1	1
Phase 3 Building Construction and Architectural Coating – 2030	9	18	<1	<1
1.31-Acre LSTs[3]	101	726	6	4
Exceeds LST?	No	No	No	No
Phase 3 Site Preparation – 2026	25	18	9	5
3.50-Acre LSTs[3]	165	1,343	10	6
Exceeds LSTs?	No	No	No	No
Phase 3 Grading – 2026	28	26	5	3
4.00-Acre LSTs[3]	178	1,473	12	7
Exceeds LSTs?	No	No	No	No
Phase 4				
Phase 4 Demolition – 2031	10	19	1	<1
Phase 4 Paving – 2035	6	18	<1	<1
=>1-Acre LSTs[3]	89	623	5	3
Exceeds LST?	No	No	No	No
Phase 4 Building Construction – 2031	8	16	<1	<1
Phase 4 Building Construction – 2032	8	16	<1	<1
Phase 4 Building Construction and Architectural Coating – 2032	9	18	<1	<1
Phase 4 Building Construction and Architectural Coating – 2033	9	18	<1	<1
Phase 4 Building Construction and Architectural Coating – 2034	9	18	<1	<1
Phase 4 Building Construction and Architectural Coating – 2035	8	18	<1	<1
1.31-Acre LSTs[3]	101	726	6	4
Exceeds LST?	No	No	No	No
Phase 4 Site Preparation – 2031	14	16	8	5
3.50-Acre LSTs[3]	165	1,343	10	6
Exceeds LSTs?	No	No	No	No

Table 5.2-18 Maximum Daily Onsite Localized Construction Emissions

Source	Pollutants (pounds per day)[1, 2]			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Phase 4 Grading – 2031	14	23	4	2
4.00-Acre LSTs[3]	178	1,473	12	7
Exceeds LSTs?	No	No	No	No

Source: CalEEMod 2016.3.1; SCAQMD 2008b; SCAQMD 2011. Highest winter or summer emissions are reported.
1 Based on the preliminary information provided by the applicant. Where specific information regarding project-related construction activities was not available, construction assumptions were based on CalEEMod defaults.
2 Includes implementation of fugitive dust control measures required by SCAQMD under Rule 403, including watering disturbed areas a minimum of two times per day, reducing speed limit to 15 miles per hour on unpaved surfaces, replacing ground cover quickly, and street sweeping with Rule 1186–compliant sweepers.
3 LSTs are based on receptors within 82 feet (25 meters).

Impact 5.2-5: Project-related construction activities could result in potentially significant cancer risk impacts to nearby off-site residences. [Threshold AQ-4]

Impact Analysis: The proposed project would temporarily elevate concentrations TACs and DPM in the vicinity of sensitive land uses during construction activities. As stated, SCAQMD currently does not require health risk assessments for short-term emissions from construction equipment, which primarily consist of DPM. However, this analysis has been included to conservatively gauge the potential health risk-related impacts of short-term construction activities on off-site sensitive receptors.

OEHHA recently adopted new guidance for the preparation of health risk assessments issued in March 2015 (OEHHA 2015). It developed a cancer risk factor and noncancer chronic reference exposure level for DPM based on continuous exposure over a 30-year time frame. No short-term acute exposure levels that correlate with typical construction activity time frames have been developed for DPM.

The proposed project would be developed over four phases. It is anticipated that the construction duration of each phase would last an average of 48 to 52 months. In addition, construction would not be continuous, but spread out incrementally over a 18-year period, which would limit the exposure to on- and offsite receptors. The United States Environmental Protection Agency (US EPA) AERMOD, Version 9.3, dispersion modeling program was used to estimate excess lifetime cancer risk and chronic non-cancer hazard index for non-carcinogenic risk at the nearest sensitive receptors. Results of the analysis are shown in Table 5.2-19, *Construction Risk Summary*.

Table 5.2-19 Construction Risk Summary

Receptor	Cancer Risk (per million)	Chronic Hazards
Maximum Exposed Receptor – Resident	26.0	0.10
Maximum Exposed Receptor – Beardslee Elementary School	1.4	0.02
Significance Thresholds	10	1.0
Exceeds Threshold?	**Yes**	No

Source: PlaceWorks 2017 (see AppendixC2).
Note: Cancer risk calculated using 2015 OEHHA HRA guidance.

The results of the HRA are based on the maximum modeled receptor concentration over the construction exposure period, conservatively assuming a 24-hour per day outdoor exposure and averaged over a 70-year lifetime. According to the modeling results, the residential maximum exposed receptor (MER) is the single-family residence at 1342 Galen Street along the western boundary of the planning area near Galen Street and the Duarte Flood Control Channel. The school MER location lies within the southeast portion of the Beardslee Elementary School campus near the intersection of Galen Street and Buena Vista Street.

Results of the health risk assessment shown in Table 5.2-9 indicate that the maximum incremental cancer risk during the construction phase of the project at the residential MER is 26.0 per million, which exceeds the significance threshold of 10 per million. Cancer risk for students at Beardslee Elementary School is 1.4 per million and would not exceed 10 per million. For non-carcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for both the residential and school MER. Therefore, chronic non-carcinogenic hazards are within acceptable limits. As the cancer risk for the residential MER would exceed the 10 per million threshold, project-related construction activities could result in potentially significant health risk impacts to off-site residences.

Impact 5.2-6: Implementation of the proposed City of Hope Campus Plan would not expose sensitive receptors to substantial pollutant concentrations. [Threshold AQ-4]

Impact Analysis: Operation of new land uses consistent with the Campus Plan would result in new area/stationary and mobile sources of criteria air pollutants and TACs in the plan area.

Operational LSTs

The types of land uses that typically generate substantial amounts of stationary source emissions include industrial land uses. The City of Hope Campus Plan would guide expansion of the City of Hope medical office facilities to meet the medical needs of the region. The City of Hope operates a Central Plant to offset campus-wide energy needs associated with building and cooling. These facilities are constructed at institutional facilities, such as hospitals, universities, and county facilities, because they offer co-benefits that reduce the overall energy needs and the amount of electricity and natural gas the agency needs to purchase from the grid/energy purveyor. The existing Central Plant at the City of Hope Campus includes three boilers and chillers. Additionally, the City of Hope campus maintains emergency generators for back-up power to support critical services. These types of equipment require a permit to operate by the SCAQMD.

The proposed project would result in an increase in electricity and natural gas use on the campus (see Table 5.2-17). To accommodate the increase in electricity and natural gas use, the City of Hope may purchase additional energy from electricity purveyors or expand the Central Plant so that it can offset the increase in energy use. At this time, information on the specific equipment that the City of Hope may consider and SCAQMD would permit at the Central Plant is not known; and is therefore considered speculative for this programmatic analysis. Additionally, installation of additional boilers, chillers, emergency generators, and other stationary equipment (e.g., cogeneration unit) necessary to provide heating and cooling and power needs to the City of Hope would require a permit to operate from SCAQMD as required under SCAQMD Regulation XIII, *New Source Review*. This permitting process would be separate from the general occupancy permits issued either by the City of Duarte or City of Irwindale and would provide a control for emissions associated with any new or modified future stationary equipment and ensure that applicable emissions standards are met and potential impacts are less than significant.

Although operation of the proposed project would result in the use of standard on-site mechanical equipment (such as heating, ventilation, and air conditioning units) and occasional use of landscaping equipment for project site maintenance, air pollutant emissions generated from these activities would be below the SCAQMD screening-level LSTs thresholds, as shown in Table 5.2-20, *Maximum Daily On-Site Localized Operation Emissions at Full Buildout*. Therefore, localized air quality impacts related to stationary-source emissions would be less than significant.

Table 5.2-20 Maximum Daily On-Site Localized Operational Phase Emissions at Full Buildout

Operational Phase	Net Increase in Criteria Air Pollutants (lbs/day)			
	NOx	CO	PM_{10}	$PM_{2.5}$
Area	<1	<1	<1	<1
Energy	11	10	1	1
Total	**11**	**10**	**1**	**1**
SCAQMD LST	203	1,733	4	2
Exceeds LST?	No	No	No	No
New Potential Stationary Sources				
Central Utilities Plant Boilers[1]	3	25	2	2

Source: CalEEMod 2016.3.1; SCAQMD 2008b.

Notes: In accordance with SCAQMD methodology, only on-site stationary sources and mobile equipment occurring within the proposed project site are included in the analysis. LSTs are based on sensitive receptors within 82 feet (25 meters) of the proposed project site within SRA 9. Excludes permitted sources of emissions that are covered under SCAQMD regulations.

1 Shown for informational purposes. For purposes of this analysis, it is assumed a new boiler would be installed at the City of Hope central utilities plant in Phase 2 and Phase 4 for a total of two new boiler units. Per CalEEMod methodology, the Energy sector emissions calculated for land uses encompasses emissions associated with boilers. In addition, installation of new or additional boilers and other stationary equipment such as an emergency generator would require a permit to operate from SCAQMD and would be subject to SCAQMD Regulation XIII, *New Source Review*.

Toxic Air Contaminants

The proposed project would result in development of approximately 60,000 square feet of industrial-type land uses within the City of Hope campus. However, it is not anticipated that these industrial-type land uses, which would include a 30,000 square-foot data center, would be large emitters of TACs. In addition, and as stated, land uses that have the potential to be substantial stationary sources that would require a permit from SCAQMD for emissions of TACs include industrial land uses, such as chemical processing facilities, chrome-plating facilities, dry cleaners, and gasoline-dispensing facilities. Emissions of TACs would be controlled by SCAQMD through permitting and would be subject to further study and health risk assessment prior to the issuance of any necessary air quality permits under SCAQMD Rule 1401. The permitting process ensures that stationary source emissions would be below the SCAQMD significance thresholds of 10 in a million cancer risk and 1 for acute risk at the maximally exposed individual. There may be a possibility that new medical buildings accommodated under the proposed Campus Plan would include stationary sources of emissions such as from an emergency generator or cogeneration unit. For example, the proposed central plant would be located on the southeastern edge of the campus adjacent to undeveloped land. The structure would be located more than 1,000 feet from existing off-site sensitive receptors. Emissions disperse rapidly from the source and would not be expected to result in a substantial impact to off-site receptors. Therefore, equipment installed through the SCAQMD permitting process would not be expected to result in toxic air contaminant impacts to off-site receptors.

Further, as the proposed project is a program-level document, it is currently unknown which additional types of stationary sources may be installed, if any. However, as stated, any new stationary sources of emissions introduced under the proposed project would require an SCAQMD permit to operate, which would provide a control for emissions. Therefore, overall, impacts related to TACs are considered less than significant. CO Hot Spot Analysis

Areas of vehicle congestion have the potential to create pockets of CO called hotspots. These pockets have the potential to exceed the state one-hour standard of 20 ppm or the eight-hour standard of 9.0 ppm. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Hotspots are typically produced at intersections, where traffic congestion is highest because vehicles queue for longer periods and are subject to reduce speeds.

The SoCAB has been designated in attainment under both the national and California AAQS for CO. Under existing and future vehicle emission rates, a project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal air does not mix (i.e., bridges and tunnels)—in order to generate a substantial CO impact (BAAQMD 2011). The proposed project would generate up to approximately 519 net peak hour trips and would be significantly less than the volumes cited above (Fehr & Peers 2016). Furthermore, the SoCAB has since been designated attainment under both the national and California AAQS for CO. Thus, the proposed project would not have the potential to substantially increase CO hotspots at intersections in the vicinity of the project site, and impacts would be less than significant.

5.2.4 Cumulative Impacts

In accordance with SCAQMD's methodology, any project that produces a significant project-level regional air quality impact in an area that is in nonattainment contributes to the cumulative impact. Cumulative projects within the local area include new development and general growth within the SoCAB. The greatest source of emissions within the SoCAB is mobile sources. Due to the extent of the area potentially impacted from cumulative project emissions (i.e., the SoCAB), SCAQMD considers a project cumulatively significant when project-related emissions exceed the SCAQMD regional emissions thresholds shown in Table 5.2-5.

Construction

The SoCAB is designated nonattainment for O_3 and $PM_{2.5}$ under the California and National AAQS and nonattainment for PM_{10} and lead (Los Angeles County only) under the National AAQS. Construction of cumulative projects will further degrade the regional and local air quality. However, development of the proposed project would not generate construction-related criteria air pollutant emissions that would exceed the SCAQMD regional construction significance threshold. Therefore, the project's contribution to cumulative air quality impacts would be less than significant.

Operation

For operational air quality emissions, any project that does not exceed or can be mitigated to less than the daily regional threshold values is not considered by SCAQMD to be a substantial source of air pollution and does not add significantly to a cumulative air quality impact. Operation of the project would not result in emissions in excess of the SCAQMD regional emissions thresholds. Furthermore, the proposed project would be consistent with regional plans to reduce air pollution. Therefore, the project's contribution to cumulative air quality impacts during project operation would be less than significant.

5.2.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to air quality and were described in detail in Sections 5.2.1.1 of this DEIR and are listed below.

State

- Clean Car Standards – Pavley (AB 1493)
- California Advanced Clean Cars CARB (Title 13 CCR)
- Low-Emission Vehicle Program – LEV III (Title 13 CCR)
- Statewide Retail Provider Emissions Performance Standards (SB 1368).
- Airborne Toxics Control Measure to Limit School Bus Idling and Idling at Schools (13 CCR 2480)
- Airborne Toxic Control Measure to Limit Diesel-Fuel Commercial Vehicle Idling (13 CCR 2485)
- In-Use Off-Road Diesel Idling Restriction (13 CCR 2449)
- Building Energy Efficiency Standards (Title 24, Part 6)
- California Green Building Code (Title 24, Part 11)
- Appliance Energy Efficiency Standards (Title 20)

SCAQMD

- SCAQMD Rule 201: Permit to Construct
- SCAQMD Rule 402: Nuisance Odors
- SCAQMD Rule 403: Fugitive Dust
- SCAQMD Rule 1113: Architectural Coatings
- SCAQMD Rule 1186: Street Sweeping
- SCAQMD Rule 1403: Asbestos Emissions from Demolition/Renovation Activities

5.2.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.2-1, 5.2-2, 5.2-3, and 5.2-6.

Without mitigation, these impacts would be **potentially significant**:

- **Impact 5.2-4** Construction of the proposed project during Phase 1 would exceed the SCAQMD LST for $PM_{2.5}$ and potentially expose sensitive receptors to substantial pollutant concentrations.
- **Impact 5.2-5** Project-related construction activities would could result in potentially significant cancer risk impacts to nearby off-site residences.

5.2.7 Mitigation Measures

Project Design Features

The following project design features would contribute to reducing criteria air pollutant emissions associated with the proposed project:

Energy Efficiency and Conservation

- Exceeding local and state energy-efficiency building requirements is encouraged.

Healthy Design

- Recreational amenities should be incorporated on campus, including community gardens, gathering spaces, campus walking paths/routes, and areas for physical activity.
- Buildings should provide visibility and access to active/recreational areas.
- Bicycle storage and infrastructure should be secure, easily accessible and identifiable, and near building entrances.
- To facilitate pedestrian movement, a continuous, unobstructed path of travel must be maintained in any pathway.
- Pedestrian pathways can be used to connect less active outdoor spaces with more active uses.

Mitigation Measures

Impact 5.2-4

AQ-1 During construction, the construction contractor shall water open exposed surfaces a minimum of three times per day or apply other soil stabilizers on inactive construction areas consistent with the Best Available Control Measures identified in South Coast Air Quality Management District (SCAQMD) Rule 403 to minimize fugitive dust emissions generated from ground disturbing activities. Prior to issuance to construction permits, the construction contractor shall note the watering and/or soil stabilization requirement on all construction plans submitted to the entity with jurisdiction over the project, i.e., either the City of Duarte, City of Irwindale, and/or Office of Statewide Health Planning and Development.

Impact 5.2-5

AQ-2 The project construction contractor(s) shall use construction equipment fitted with Level 3 Diesel Particulate Filters (DPF) for all construction equipment of 50 horsepower or more. Prior to any construction, the construction contractor(s) shall ensure that all construction plans submitted to the entity with jurisdiction over the project, i.e., either the City of Duarte, City of Irwindale, and/or Office of Statewide Health Planning and Development, clearly show the requirement for Level 3 DPF for construction equipment over 50 horsepower. During construction, the construction contractor(s) shall maintain a list of all operating equipment in use on the project site for verification by the entity with jurisdiction over the project, i.e., either the City of Duarte, City of Irwindale, and/or Office of Statewide Health Planning and Development. The construction equipment list shall state the makes, models, and number of construction equipment on site. Equipment shall be properly serviced and maintained in accordance with manufacturer recommendations. The construction contractor(s) shall ensure that all non-essential idling of construction equipment is restricted to five minutes or less in compliance with California Code of Regulations Title 13, Article 4.8, Chapter 9, Section 2449.

5.2.8 Level of Significance After Mitigation

Impact 5.2-4

As shown in Table 5.2-21, *Maximum Daily Onsite Localized Construction Emissions, Mitigated*, incorporation of Mitigation Measure AQ-1 would reduce the maximum daily onsite $PM_{2.5}$ emissions generated during Phase 1 site preparation activities to below the SCAQMD screening-level LST. Therefore, Impact 5.2-4 would be reduced to a less than significant level.

Table 5.2-21 Maximum Daily Onsite Localized Construction Emissions, Mitigated

Source	Pollutants (pounds per day)[1, 2]			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Phase 1 and Phase 2				
Phase 1 Site Preparation – 2018	48	22	9.27	6.05
3.50-Acre LSTs[3]	165	1,343	10.49	6.50
Exceeds LSTs?	No	No	No	No

Source: CalEEMod Version 2016.3.1., SCAQMD 2008b, and SCAQMD 2011. Highest winter or summer emissions are reported.
1 Based on the preliminary information provided by the applicant. Where specific information regarding project-related construction activities was not available, construction assumptions were based on CalEEMod defaults.
2 Includes implementation of fugitive dust control measures required by SCAQMD under Rule 403, including watering disturbed areas a minimum of two times per day, reducing speed limit to 15 miles per hour on unpaved surfaces, replacing ground cover quickly, and street sweeping with Rule 1186–compliant sweepers. Mitigation Measure AQ-1 requiring water exposed surfaces a minimum of three times a day is also incorporated.
3 LSTs are based on receptors within 82 feet (25 meters).

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Impact 5.2-5

As shown in Table 5.2-22, *Construction Risk Summary, Mitigated*, incorporation of Mitigation Measure AQ-2 would require use of Level 3 diesel particulate filters (DPF), which would reduce cancer risk to 5.1 per million for off-site residential receptors. With implementation of Mitigation Measure AQ-2, potential construction-related health risk would be reduced to below the 10 per million significance threshold and, Impact 5.2-5 would be reduced to a less than significant level.

Table 5.2-22 Construction Risk Summary, Mitigated

Receptor	Cancer Risk (per million)[1]	Chronic Hazards[1]
Maximum Exposed Receptor – Resident	5.1	0.02
Significance Thresholds	10	1.0
Exceeds Threshold?	No	No

Source: PlaceWorks 2017 (see Appendix C2).
Note: Cancer risk calculated using 2015 OEHHA HRA guidance.
1 Risks incorporate Mitigation Measure AQ-2, which includes using construction equipment with Level 3 DPF for equipment over 50 horsepower.

5.2.9 References

Bay Area Air Quality Management District (BAAQMD). 2011 (revised). California Environmental Quality Act Air Quality Guidelines.

California Air Pollution Control Officers Association (CAPCOA). 2016. California Emissions Estimator Model (CalEEMod). Version 2016.3.1. Prepared by: Trinity Consultants and the California Air Districts.

California Air Resources Board (CARB). 1998, April 22. The Report on Diesel Exhaust. http://www.arb.ca.gov/toxics/dieseltac/de-fnds.htm.

———. 1999. Final Staff Report: Update to the Toxic Air Contaminant List.

———. 2015, December. Area Designations Maps: State and National. http://www.arb.ca.gov/desig/adm/adm.htm.

———. 2016a, May 4. Ambient Air Quality Standards. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

———. 2016b. Air Pollution Data Monitoring Cards (2011, 2012, 2013, 2014, and 2015). Accessed July 22, 2016. http://www.arb.ca.gov/adam/topfour/topfour1.php.

California Department of Transportation (Caltrans). 2016. Traffic Census Program: Traffic Counts, Year 2014. Annual Average Daily Traffic. Accessed October 18, 2016. http://traffic-counts.dot.ca.gov/.

Fehr & Peers, 2017, April. Transportation Impact Study for the City of Hope.

Office of Environmental Health Hazard Assessment (OEHHA). 2015, February. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf.

PlaceWorks. 2017, April. *Draft Construction Health Risk Assessment: City of Hope Campus Plan*.

South Coast Air Quality Management District (SCAQMD). 1993. *California Environmental Quality Act Air Quality Handbook*.

———. 2005, May. Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. http://www.aqmd.gov/home/library/documents-support-material/planning-guidance/guidance-document.

———. 2006, October. Final – Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds.

———. 2008a, September. Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES III). http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iii.

———. 2008b, June. Final Localized Significance Threshold Methodology. http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds.

———. 2011. Fact Sheet for Applying CalEEMod to Localized Significance Thresholds. http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/caleemod-guidance.pdf.

———. 2012, May 4. Final 2012 Lead State Implementation Plan: Los Angeles County. http://www.aqmd.gov/home/library/clean-air-plans/lead-state-implementation-plan.

———. 2013, February. 2012 Final Air Quality Management Plan. http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan.

———. 2015a, October 3. Final Report Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES IV). http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv.

———. 2015b, March (revised). SCAQMD Air Quality Significance Thresholds. http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2.

———. 2015c. Health Effects of Air Pollution. http://www.aqmd.gov/home/library/public-information/publications.

———. 2015d, October. "Blueprint for Clean Air: 2016 AQMP White Paper." 2016 AQMP White Papers Web Page. http://www.aqmd.gov/home/about/groups-committees/aqmp-advisory-group/2016-aqmp-white-papers.

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———. 2016. Updates to CEQA Air Quality Handbook. Accessed July 2016. http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook.

———. 2017, March. Final 2016 Air Quality Management Plan. http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

US Environmental Protection Agency (EPA). 2016, May 5. Criteria Air Pollutants. https://www.epa.gov/criteria-air-pollutants.

Western Regional Climate Center (WRCC). 2016. Western U.S. Historical Summaries: Azusa City PK FC 143 Station Monitoring Station (Station ID No. 040410). http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0410.

5.3 BIOLOGICAL RESOURCES

The analysis in this section is based in part on the following technical report(s):

- *Biological Resources Technical Report, City of Hope Campus Plan, City of Duarte*, Cadre Environmental, June 2016.

A complete copy of this study is included in Appendix D of this DEIR.

5.3.1 Environmental Setting

5.3.1.1 APPLICABLE PLANS AND REGULATIONS

Federal and State Regulations

Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973, as amended, protects and conserves any species of plant or animal that is endangered or threatened with extinction, as well as the habitats where these species are found. "Take" of endangered species is prohibited under Section 9 of the FESA. "Take" means to "harass, harm, pursue, hunt, wound, kill, trap, capture, collect, or attempt to engage in any such conduct." Section 7 of the FESA requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) on proposed federal actions that may affect any endangered, threatened, or proposed (for listing) species or critical habitat that may support the species. Section 4(a) of the FESA requires that critical habitat be designated by the USFWS "to the maximum extent prudent and determinable, at the time a species is determined to be endangered or threatened." This provides guidance for planners/managers and biologists by indicating locations of suitable habitat and where preservation of a particular species has high priority. Section 10 of the FESA provides the regulatory mechanism for incidental take of a listed species by private interests and nonfederal government agencies during lawful activities. Habitat conservation plans for the impacted species must be developed in support of incidental take permits to minimize impacts to the species and formulate viable mitigation measures.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (MBTA) affirms and implements the United States' commitment to four international conventions—with Canada, Japan, Mexico, and Russia—to protect shared migratory bird resources. The MBTA governs the take, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. It prohibits the take, possession, import, export, transport, sale, purchase, barter, or offering of these items, except under a valid permit or as permitted in the implementing regulations. USFWS administers permits to take migratory birds in accordance with the MBTA.

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Clean Water Act, Section 404

The United States Army Corps of Engineers (Corps) regulates discharge of dredged or fill material into "waters of the United States."[1] Any filling or dredging within waters of the United States requires a permit, which entails assessment of potential adverse impacts to Corps wetlands and jurisdictional waters and any mitigation measures that the Corps requires. Section 7 consultation with USFWS may be required for impacts to a federally listed species. If cultural resources may be present, Section 106 review may also be required. When a Section 404 permit is required, a Section 401 Water Quality Certification is also required from the Regional Water Quality Control Board (RWQCB).

Clean Water Act, Section 401and 402

Section 401(a)(1) of the CWA specifies that any applicant for a federal license or permit to conduct any activity that may result in any discharge into navigable waters shall provide the federal permitting agency with a certification, issued by the state in which the discharge originates, that any such discharge will comply with the applicable provisions of the CWA. In California, the applicable RWQCB must certify that the project will comply with water quality standards. Permits requiring Section 401 certification include Corps Section 404 permits and National Pollutant Discharge Elimination System (NPDES) permits issued by the US Environmental Protection Agency (EPA) under Section 402 of the CWA. NPDES permits are issued by the applicable RWQCB.

California Fish and Game Code, Section 1600

Section 1600 of the California Fish and Game Code requires a project proponent to notify the California Department of Fish and Wildlife (CDFW) of any proposed alteration of streambeds, rivers, and lakes. The intent is to protect habitats that are important to fish and wildlife. CDFW may review and place conditions on the project, as part of a Streambed Alteration Agreement, that address potentially significant adverse impacts within CDFW's jurisdictional limits.

California Endangered Species Act

The California Endangered Species Act (CESA) generally parallels the main provisions of the FESA and is administered by the CDFW. Its intent is to prohibit take and protect state-listed endangered and threatened species of fish, wildlife, and plants. Unlike its federal counterpart, CESA also applies the take prohibitions to species petitioned for listing (state candidates). Candidate species may be afforded temporary protection as though they were already listed as threatened or endangered at the discretion of the Fish and Game Commission. Unlike the FESA, CESA does not include listing provisions for invertebrate species. Under certain conditions, CESA has provisions for take through a 2081 permit or memorandum of understanding. In

[1] "Waters of the United States," as applied to the jurisdictional limits of the Corps under the Clean Water Act, includes all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the tide; all interstate waters, including interstate wetlands; and all other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds whose use, degradation, or destruction could affect interstate or foreign commerce; water impoundments; tributaries of waters; territorial seas; and wetlands adjacent to waters. The terminology used by Section 404 of the Clean Water Act includes "navigable waters," which is defined at Section 502(7) of the act as "waters of the United States, including the territorial seas."

addition, some sensitive mammals and birds are protected by the state as "fully protected species." California "species of special concern" are species designated as vulnerable to extinction due to declining population levels, limited ranges, and/or continuing threats. This list is primarily a working document for the CDFW's California Natural Diversity Database, which maintains a record of known and recorded occurrences of sensitive species. Informally listed taxa are not protected per se, but warrant consideration in the preparation of biological resources assessments.

Existing Conservation Plans and Areas

Part of the Santa Fe Dam Recreational Area east of the project site is critical habitat for the southwestern willow flycatcher. The Santa Fe Dam Recreational Area is a 836-acre facility with a 70-acre lake that allows year-round fishing and nonmotorized watercraft. The recreation area contains a nature center, picnic areas, boat launch, trails, boat rentals, snack bar, camping facilities, a water play area, and swim beach. The project site and the portion of the Santa Fe Flood Control Basin adjacent to the southeast site boundary are outside of critical habitat.

5.3.1.2 PLANT COMMUNITIES/HABITAT

No suitable habitat for sensitive plant species including those listed as federal or state threatened/endangered was documented within the project site. The project site is characterized as developed, ornamental, disturbed, and ruderal

Habitat and Plant Species

Developed

The majority of the 116-acre project site is developed areas (82.1 acres, or 71 percent of the site) consisting of existing roads, concrete-lined Duarte Flood Control Channel, and hospital-related uses, including office, industrial, warehouse, assembly, and hospitality housing facilities—as outlined in Table 1, Project Site Vegetation Community Acreages in the biological report (Appendix D), and shown on Figure 5.3-1, *Vegetation Communities Map*.

Ornamental

The landscaped areas of the project site—21.1 acres, or approximately 18 percent of the site, including areas in Pioneer and Heritage parks—are vegetated with an extensive assortment of ornamental plantings, including but are not limited to, turf, pine (*Pinus* sp.), shrub verbenas (*Lantana* sp.), rose (*Rosa* sp.), creeping myoporum (*Myoporum parvifolium*), fountain grass (*Pennisetum setaceum*), rosemary (*Rosmarinus officinalis*), eucalyptus (*Eucalyptus* sp.), Chinese elm (*Ulmus parvifolia*), Brazilian pepper (*Schinus terebinthifolius*), magnolia (*Magnolia* sp.), and various species of exotic succulents.

Disturbed

Disturbed areas constitute 10.9 acres or 9 percent of the site; and mostly in the southwest part of the site. This area is generally devoid of vegetation. These areas are periodically cleared and dominated by filaree

(*Erodium* sp.), black mustard (*Brassica nigra*), telegraph weed (*Heterotheca grandiflora*), Mediterranean schismus (*Schismus barbatus*), castor bean (*Ricinus communis*), Russian thistle (*Kali tragus*), tobacco tree (*Nicotiana glauca*), and horehound (*Marrubium vulgare*). A few isolated native plants, shrubs, and trees occur within this habitat type, including a single coast live oak (*Quercus agrifolia*), laurel sumac (*Malosma laurina*), California croton (*Croton californicus*), and California sagebrush (*Artemisia californica*). These native species are common offsite along the southeastern project site boundary within the Santa Fe Flood Control Basin.

Ruderal

A 1.9-acre (1.6 percent of the site) patch of ruderal vegetation is at the extreme southwestern tip of the project site. This area is bisected by a disturbed road and dominated by Russian thistle and deerweed (*Acmispon glaber*).

Wildlife Species

General wildlife species documented onsite or within the vicinity during the site assessment include but are not limited to American kestrel (*Falco sparverius*), killdeer (*Charadrius vociferous*), rock dove (*Columba livia*), Eurasian collared dove (*Streptopelia decaocto*), mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), black phoebe (*Sayornis nigricans*), Say's phoebe (*Sayornis saya*), western kingbird[2] (*Tyrannus verticalis*), American crow (*Corvus brachyrhynchos*), northern mockingbird (*Mimus polyclottos*), European starling (*Sturnus vulgaris*), yellow-rumped warbler (*Dendroica coronata*), white-crowned sparrow (*Zonotrichia leucophrys*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), desert cottontail (*Sylvilagus audubonii*), and California ground squirrel (*Otospermophilus beecheyi*).

5.3.1.3 SENSITIVE RESOURCES

Sensitive Habitats

The project site is characterized as developed, ornamental, disturbed, and ruderal, and no sensitive or native habitats were documented within the project site.

A single sensitive vegetation community (alluvial fan sage scrub) was documented immediately adjacent and offsite along the southeastern project site boundary. Also referred to as Riversidean alluvial fan sage scrub, this vegetation community extends southeast of the project site within the Santa Fe Flood Control Basin. The narrow strip which occurs between the project site and existing access road/dike is dominated by scale-broom (*Lepidospartum squamatum*), California sagebrush, laurel sumac, California buckwheat (*Eriogonum fasciculatum*), California bush sunflower (*Encelia californica*), brittlebush (*Encelia farinosa*), and ladies' tobacco (*Pseudognaphalium californicum*).

[2] Every effort was made to distinguish the observation from the more common and resident Cassin's Kingbird. Based on coloration (tail features were not visible), the observation was listed as a Western kingbird. Neither species of Kingbird is listed as a state or federally sensitive species. These are common migratory and resident species in the southwest.

Figure 5.3-1 - Vegetation Communities Map

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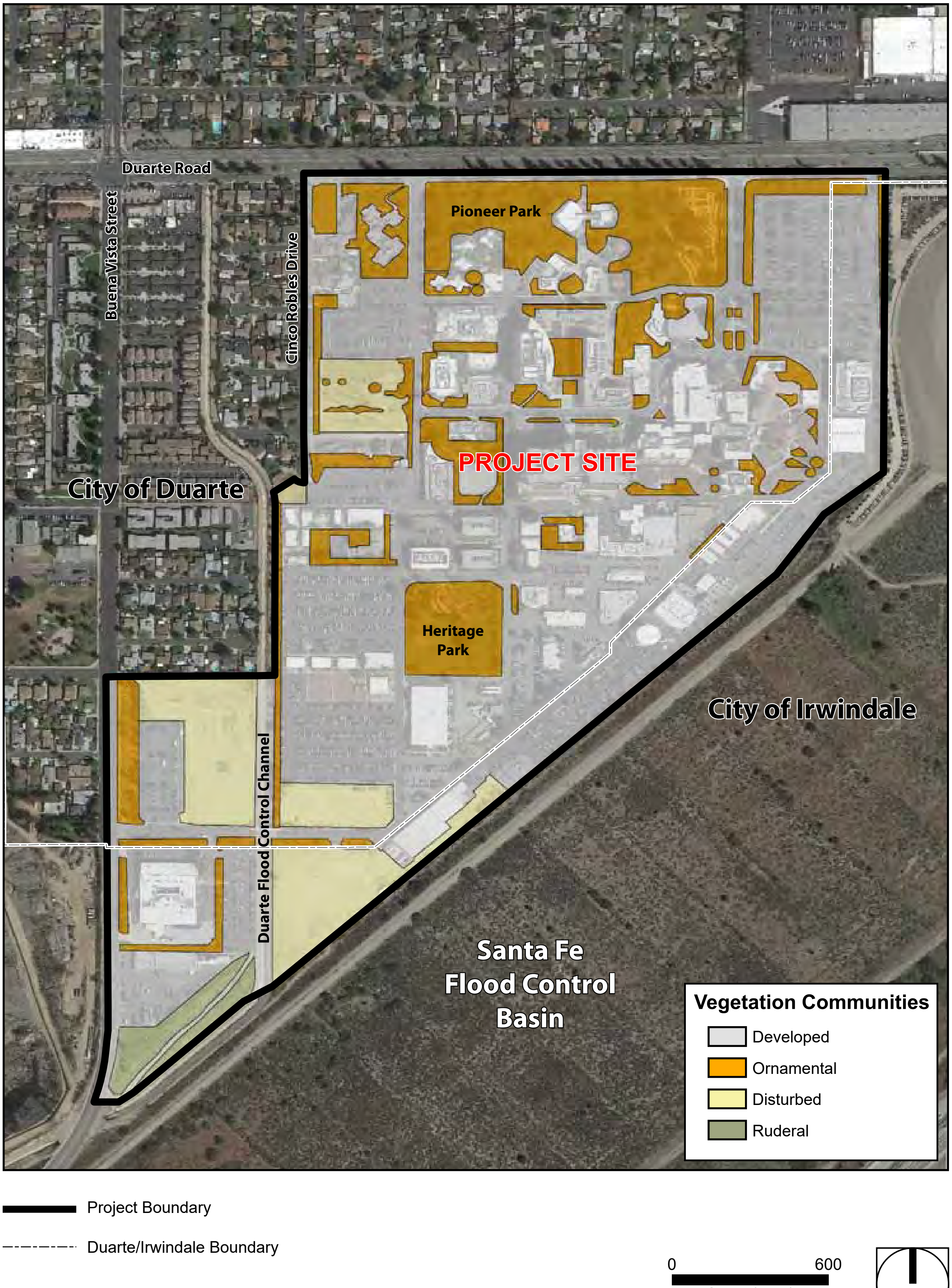

Base Map Source: Cadre Environmental, 2016

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Sensitive Plants

The project site was assessed to determine the potential for 10 sensitive plant species known to occur within the region. These 10 species are listed below and were identified using federal register listings, protocols, and species data provided by the USFWS; the California Natural Diversity Database (CDFW 2016), a CDFW species account database; and regional field guides. Habitat descriptions for the 10 species are provided in Table 2 of the Biological Resources Technical Report (see Appendix D of this DEIR). No sensitive or native habitats were documented within the project site, and no suitable habitat for sensitive plant species was documented within the project site.

- Braunton's milk-vetch (*Astragalus brauntonii*)
- Plummer's mariposa-lily (*Calochortus plummerae*)
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*)
- California saw-grass (*Cladium californicum*)
- Slender-horned spineflower *(Dodecahema leptoceras)*
- San Gabriel bedstraw (*Galium grande*)
- Mesa horkelia *(Horkelia cuneata* ssp. *puberula)*
- Robinson's pepper-grass *(Lepidium virginicum* var. *robinsonii)*
- Brand's star phacelia *(Phacelia stellaris)*
- Greata's aster (*Symphyotrichum greatae*)

Sensitive Wildlife

The project site was assessed to determine the potential for sensitive wildlife. These 10 species are listed below and were identified using federal register listings, protocols, and species data provided by the USFWS; the California Natural Diversity Database (CDFW 2016), a CDFW species account database; and regional field guides.

- Coast horned lizard (*Phrynosoma blainvillii*)
- Coastal California gnatcatcher *(Polioptila californica californica)*
- Least Bell's vireo *(Vireo bellii pusillus)*
- Southwestern willow flycatcher *(Empidonax traillii extimus)*
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)
- Yellow Warbler *(Setophaga petechia)*
- Yellow-breasted Chat *(Icteria virens)*
- San Diego black-tailed jackrabbit *(Lepus californicus bennettii)*

Habitat descriptions for 10 sensitive species known to occur in the region and the potential for each to occur onsite are provided in Table 3 of the *Biological Resources Technical Report* (see Appendix D of this DEIR). None of the sensitive wildlife species identified are expected to occur onsite due to lack of suitable habitat.

However, two sensitive bird species—Cooper's hawk (*Accipiter cooperii*), a California Watch List species, and white-tailed kite (*Elanus leucurus*), a State Fully Protected species—may occasionally roost and forage onsite. The project site does not occur within or adjacent to a USFWS-designated critical habitat for any federally listed threatened or endangered species.

5.3.1.4 JURISDICTIONAL WATERS AND WETLANDS

No wetlands regulated by the Corps, CDFW, or Los Angeles RWQCB were documented within or adjacent to the project site (see Appendix D of this DEIR). However, the unvegetated concrete-lined Duarte Flood Control Channel is a jurisdictional feature, and any impacts to the existing outfall structures would be regulated by the Corps, CDFW, and RWQCB. The Duarte Flood Control Channel bisects the southwest part of the project site and drains south to an existing sediment basin about 0.3 mile southwest of the project site. High flow rates extend south through a series of sediment basins and concrete-lined channels, which drain to Long Beach Harbor.

5.3.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

B-1 Have a substantial effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

B-2 Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

B-3 Have a substantial adverse effect on federally protected 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.

B-4 Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

B-5 Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

B-6 Conflict with the provisions of an adopted habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant:

- Threshold B-5: The cities of Duarte and Irwindale do not have ordinances protecting biological resources applicable to resources within the project site.
- Threshold B-6: The project site is not within a habitat conservation plan or natural community conservation plan.

These impacts will not be addressed in the following analysis.

Threshold B-4 (wildlife movement) was identified as less than significant in the Initial Study. However, impacts were identified in the Biological Technical Report prepared for the proposed project; therefore this topic is analyzed in further detail below.

5.3.3 Environmental Impacts

Methodology

The biological resources assessment was based on a literature review and field surveys, as described in Appendix D. Existing biological resource conditions within and adjacent to the project site were initially investigated through review of pertinent scientific literature. The following sources were reviewed:

- Federal register listings, protocols, and species data provided by the United States Fish and Wildlife Service (USFWS);
- Federally listed species potentially occurring within the region;
- California Natural Diversity Database (CNDDB) (CDFW 2016a);
- California Department of Fish and Wildlife (CDFW) Natural Heritage Division ;
- Numerous regional floral and faunal field guides;
- Special Animals (CDFW 2016b);
- Special Vascular Plants and Bryophytes List (CDFW 2016c);
- Endangered, Threatened, and Rare Plants of California (CDFW 2016d); and
- State and Federally Listed Endangered and Threatened Animals of California (CDFW 2016e).

A reconnaissance survey of the project site was conducted by Ruben Ramirez of Cadre Environmental on January 21st, 2016 in order to characterize and identify potential sensitive plant and wildlife habitats, and to establish the accuracy of the data identified in the literature search. Geologic and soil maps were examined to identify local soil types that may support sensitive taxa. Aerial photograph, topographic maps, vegetation and rare plant maps prepared for previous studies in the region were used to determine community types and

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other physical features that may support sensitive plants/wildlife, uncommon taxa, or rare communities that occur within or adjacent to the Project Site. Habitat assessments were conducted for, but not limited to, the following target species/groups.

- Coastal California gnatcatcher – FT/SSC
- Least Bell's vireo – FE/SE
- Southwestern willow flycatcher – FE/SE
- Sensitive plants
- Protected street trees (City of Duarte Municipal Code, Chapter 13.08)

Natural vegetation communities and habitat types observed on the project site were mapped. The biological assessment included a floristic plant and wildlife resources inventory. Additionally, the project site was assessed for jurisdiction by the Corps, CDFW, and Regional Water Quality Control Board (RWQCB). Non-wetland waters of the United States were assessed based on the limits of the "ordinary high water mark" as determined by erosion, the deposition of vegetation or debris, and changes in vegetation and soil characteristics. The assessment utilized the methodology for routine wetland determination according to the methods outlined in the Corps Wetland Delineation Manual (Environmental Laboratory 1987) and the Arid West Wetland Delineation Supplement (USACE 2008), and updated regulatory guidance letters.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.3-1: Implementation of the Campus Plan would not impact habitat for sensitive wildlife or plant species; however, construction noise could impact adjacent sensitive wildlife. [Threshold B-1]

Impact Analysis:

On-Site

Development has the potential to impact sensitive plants and wildlife species when it results in the removal of suitable habitat for these species. The majority of the project site is developed with a few remaining vacant parcels. As discussed above, a biological survey was conducted and determined that the project site is characterized as developed, ornamental, disturbed, and ruderal habitat, and there is no native undisturbed suitable habitat for sensitive plant species. As a result, development within the project area would not impact sensitive plant species.

The proposed project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS. There is no native undisturbed suitable habitat for federal or state threatened or endangered wildlife species on the project site. As indicated, two sensitive bird species—Cooper's hawk, a California Watch List species, and white-tailed kite, a State Fully Protected species—may occasionally roost and forage onsite. These species are not expected to breed onsite due to a lack of suitable nesting habitat. Based on the extensive amount of suitable roosting, foraging and breeding habitat located offsite within the Santa Fe Flood Control Basin/Recreation Area, onsite loss of ornamental vegetation potentially utilized for roosting and/or foraging would not represent a significant impact. Implementation of the Campus Plan would not impact sensitive bird species or other wildlife because there is no suitable habitat for these species on site. Impacts are considered less than significant.

Off-Site

The Santa Fe Flood Control Basin (immediately southeast of project site) and Santa Fe Dam Recreational Area (approximately 3,000 feet southeast of project site and I-605) are both potential and occupied habitat for species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS. Specifically, the federal/state endangered least Bell's vireo and federal threatened coastal California gnatcatcher have been documented within the Santa Fe Dam Recreational Area, as illustrated in Figure 6, USFWS Sensitive Species Occurrences of Appendix D.

Development in accordance with the Campus Plan would not result in any direct impact to these areas, because it consists of infill development that would be confined to the project site and surrounding roadways.

Potential indirect impacts to habitat areas adjacent to the project site could occur if development resulted in hydrological modification, increased stormwater discharge, increased lighting, or construction noise.

Hydrology and Water Quality

Off-site and indirect impacts to biological resources could occur if development would result in a substantial increase in stormwater runoff or substantially degrade water quality of sensitive habitat. Hydrology and water quality impacts are analyzed in Section 5.7, *Hydrology and Water Quality*, of this DEIR, and impacts were determined to be less than significant.

As discussed in Section 5.7, the Campus Plan is required to comply with the stormwater and urban runoff pollution control provisions of the Los Angeles RWQCB's NPDES permit for municipal separate storm sewer system (MS4) discharges during construction. In addition, development must comply with the Duarte and Irwindale municipal codes (Chapter 6.15 of the Duarte Municipal Code, and Chapter 8.28 of the City of Irwindale Municipal Code.) The MS4 NPDES and Duarte and Irwindale code provisions regulate non-stormwater discharge to the storm drain system and reduction of pollutants in stormwater and urban runoff to the maximum extent practicable.

Operationally, urban runoff could include a variety of contaminants that could impact water quality. Runoff from buildings and parking lots typically contains oils, grease, fuel, antifreeze, byproducts of combustion (such as lead, cadmium, nickel, and other metals), fertilizers, herbicides, pesticides, and other pollutants. Precipitation at the beginning of the rainy season may result in an initial stormwater runoff (first flush) with high pollutant concentrations. The Campus Plan includes stormwater treatment features to treat the first flush stormwater in accordance with Los Angeles County MS4 Permit requirements and the guidance provided in the Los Angeles County Department of Public Works' Low-Impact Development Standards Manual.

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Implementation of the Campus Plan would not substantially alter the existing drainage pattern. The stormwater measures incorporated into the project would result in an overall decrease in runoff of 11 cubic feet per second, resulting in lower flow rates than under existing conditions. Therefore, there would be not exceedance of the capacity of existing or planned storm drain system.

Impacts to hydrology and water quality would be less than significant during both construction and operation (i.e., compliance with NPDES permit and MS4 code provisions would ensure no impacts to species, and compliance with County MS4 permit requirements and LID manual would also ensure no impacts to species).

Lighting

The project site has many existing sources of nighttime illumination, including street and parking area lights, security lighting, and exterior lighting on buildings. Additional onsite light and glare is caused by surrounding land uses, I-210 to the north, and I-605 to the east. As discussed in Section 5.1, *Aesthetics*, of this DEIR, implementation of the Campus Plan would increase land uses and related lighting for building security, parking lot lighting, pedestrian lighting, and other sources. The Specific Plan includes a number of guidelines to ensure that new land uses do not generate excessive light or spill light onto adjacent properties, including the Santa Fe Flood Control Basin. Since the project site is developed and implementation of the Specific Plan contains a number of requirements to reduce excessive lighting and eliminate spill light, indirect impacts to sensitive wildlife species are not expected to occur. Impacts related to lighting would be less than significant during both construction and operation. Night lighting associated with the proposed project would not be directed toward the Santa Fe Flood Control Basin located immediately southeast of the project site and no indirect impacts to wildlife species will occur. No significant impacts are anticipated.

Noise

Indirect temporal noise impacts may occur to nesting bird species located adjacent to the project site (Santa Fe Flood Control Basin) during project construction. Noise and vibration associated with the use of heavy equipment during project construction has the potential to disrupt bird nesting, foraging and breeding behavior within the adjacent sensitive receptor site. Significant construction noise impacts were identified in Section 5.10, *Noise*, of this DEIR.

Construction activities would increase noise levels on and near the project site above existing levels. In general, the site preparation and grading portions of construction would typically be the noisiest periods of activity, since the largest and most powerful equipment is typically used during these phases of construction. Thereafter, building construction, paving, and application of architectural coatings typically generate markedly less noise than do demolition and grading activities. Noise produced from construction equipment items is commonly held to decrease at a rate of at least 6 decibels (dB) per doubling of distance; conservatively ignoring other attenuation effects from air absorption, ground effects, and/or shielding/scattering effects.[3] For example, a dozer that generates 85 dBA at 50 feet would measure 79 dBA at

[3] As sound energy travels outward from the source, spreading loss accounts for a 6 dB decrease in noise level. Soft ground and atmospheric absorption effects can provide an additional 1.5 dB of propagation reduction; for a total of minus 7.5 dB per distance doubling.

100 feet, 73 dBA at 200 feet, 67 dBA at 400 feet, and 61 dBA at 800 feet (at minus 6 dB per distance-doubling).

In order to aggregate individual equipment items into sets of common processes/activities, composite construction noise by phase has been characterized by Bolt, Beranek & Newman (1987). In their study, construction noise for ground clearing, excavation, foundations, erection, and finishing are aggregated by class of activity. For the majority of residential, commercial, industrial, and public works projects, the loudest phases are typically the site preparation and grading phases; each of which as an aggregate of 88 – 89 dBA L_{eq} when measured at a distance of 50 feet from the summed construction effort (see Impact 5.10-1). This summed value takes into account both the number of pieces and the spacing of the heavy equipment used in the construction effort. Further, noise levels are typically reduced from this value due to usage factors,[4] as well as the barrier effects provided by the physical structures themselves (once erected). Therefore, the 88 dBA L_{eq} value is a reasonable and prudent value for representing most construction activities. This is a potentially significant impact.

Impact 5.3-2: Implementation of the Campus Plan would not cause the loss of riparian habitats or sensitive natural communities. [Threshold B-2]

Impact Analysis: The majority of the project site is developed, with a few remaining vacant parcels. As described, the project site is characterized as developed, ornamental, disturbed, and ruderal and does not contain any riparian, sensitive, or native habitats. The biological report identified a single sensitive vegetation community (alluvial fan sage scrub) abutting the southeast project site boundary. However, this vegetation would not be impacted by buildout of the proposed Campus Plan, since no development or other off-site improvements would occur in this area. Impacts are considered less than significant.

Impact 5.3-3: Implementation of the Campus Plan would not impact jurisdictional waters or wetlands jurisdictional to the Corps, CDFW, or Los Angeles RWQCB. [Threshold B-3]

Impact Analysis: No wetlands regulated by the Corps, CDFW, or RWQCB were documented within or adjacent to the project site. Therefore, implementation of the Campus Plan would not impact any wetlands.

The unvegetated, concrete-lined Duarte Flood Control Channel is a jurisdictional feature, and any impacts to the existing outfall structures would be regulated by the Corps, CDFW, and Los Angeles RWQCB. The Duarte Flood Control Channel bisects the southwest region of the project site and drains south to an existing currently unvegetated sediment basin. High flow rates extend south through a series of sediment basins and concrete-lined channels that ultimately drain to Long Beach Harbor. In the event that any phase of the proposed project would require the construction, improvement, or relocation of existing outfall structures leading to the Duarte Flood Control Channel or Santa Fe Flood Control Basin, the project applicant would be required to conduct a formal jurisdictional delineation and obtain all applicable permits, including a 404/408 Permit from the Corps, 1602 Streambed Alteration Agreement from CDFW, and a 401 Certification issued by the RWQCB pursuant to the California Water Code Section 13260, as warranted. Compliance with

[4] Usage factor is the percentage of time during the workday that the equipment is operating at full power (on which the reference noise ratings for typical average and typical maximum noise emissions are based).

the federal and state regulatory requirements would reduce any potential impacts to jurisdictional resources to less than significant during both construction and operation of developments under the Campus Plan.

Impact 5.3-4: Tree removal during the course of Campus Plan buildout could cause loss of active bird nests. [Threshold B-4].

Impact Analysis: The project site is largely developed, surrounded by urbanized uses, and isolated from areas supporting suitable habitat for wildlife species. Therefore, the project site is not available for overland wildlife movement or migration. However, the project site contains numerous mature trees that could be used for nesting by migratory birds. Construction activities of future development, revitalization, and/or redevelopment activities that would be accommodated by the Campus Plan could result in the removal and/or replacement of trees onsite. However, the Campus Plan intends to preserve and enhance the existing trees in its parks and open space areas. Furthermore, future development would also be required to comply with the Migratory Bird Treaty Act (MBTA) (US Code, Title 16, §§ 703–712) and state law (California Fish and Game Code, §§ 3503 et seq.). The MBTA implements the United States' commitment to four treaties with Canada, Japan, Mexico, and Russia for the protection of shared migratory bird resources. It governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. The USFWS administers permits to take migratory birds in accordance with the MBTA. Loss of an active nest would be considered a potentially significant impact.

5.3.4 Cumulative Impacts

The area considered for cumulative impacts is the San Gabriel Valley, which is largely built out with urban land uses. Most of the streams in the San Gabriel Valley are engineered channels rather than natural streams supporting riparian habitats. The San Gabriel Valley is part of the Los Angeles Plain ecoregion designated by the US Geological Survey. Typical vegetation historically included California sagebrush, California buckwheat, coast live oak, chamise chaparral, and annual grasslands, although most of the region has been converted to urban and residential land cover. Hydrology has been greatly modified and channelized (Griffith 2016).

Substantial habitat areas in the San Gabriel Valley include the Santa Fe Dam Recreation Area, just east of the Campus Plan area; the Frank Bonelli Regional Park (which includes Puddingstone Reservoir) in the City of San Dimas, about nine miles east of the site; portions of the San Jose Hills southwest of Frank Bonelli Regional Park; and the Whittier Narrows Wildlife Sanctuary in the Whittier Narrows Recreation Area, about 7.3 miles southwest of the project site. The Santa Fe Dam Recreation Area contains a 350-acre wildlife management area plus 50 acres of natural open space (Irwindale 2008). Frank Bonelli Regional Park spans 1,800 acres, much of which is habitat. The 400-acre Whittier Narrows Wildlife Sanctuary is in the southeastern part of the Whittier Narrows Recreation Area in unincorporated Los Angeles County and next to the west bank of the San Gabriel River.

The total population of the 31incorporated cities in the San Gabriel Valley is forecast to increase from about 1.51 million in 2013 to 1.71 million in 2035. Total employment in the valley is forecast to increase from about 645,000 in 2013 to 728,700 in 2035 (Kyser 2015; PlaceWorks 2015). Most other projects in the San Gabriel Valley would redevelop existing developed sites. Therefore, it is not anticipated that cumulative projects in the study area would remove substantial areas of native habitat or interfere with wildlife movement on major wildlife corridors. As described above, the project site does not provide potential habitat for sensitive plant or wildlife communities. As a result, development of the Campus Plan would not impact sensitive plant or wildlife species. Additionally, the project would not impact riparian or sensitive natural communities. Therefore, the project would not contribute to the loss of special-status plant and wildlife species, riparian habitat, or sensitive habitats and cumulative impacts would be less than significant.

Construction activities associated with implementation of the Campus Plan could result in the removal and/or replacement of trees onsite. In addition, many other projects would remove or disturb trees that could be used for nesting by migratory birds protected under federal and state laws. However, construction of the Campus Plan and other cumulative projects would adhere to regulations implementing the federal Migratory Bird Treaty Act, which would mitigate impacts to less than significant. Compliance with the MBTA (see Mitigation Measure BIO-1) would ensure that the project's contribution to disturbance of migratory birds would be less than significant.

5.3.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to biological resources and were described in detail in Sections 5.3.1.1 of this DEIR and are listed below.

Federal

- United States Code, Title 16, Sections 1531 et seq.: Endangered Species Act
- United States Code, Title 16, Sections 703-712: Migratory Bird Treaty Act
- United States Code, Title 33, Sections 1251 et seq.: Clean Water Act

State

- California Fish and Game Code, Section 2080: Endangered Species Act
- California Fish and Game Code, Section 1600: Lakes and Streambeds

5.3.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, some impacts would be less than significant: 5.3-2 and 5.3-3.

Without mitigation, these impacts would be **potentially significant**:

- **Impact 5.3-1** Construction activities have the potential to result in indirect construction noise impacts to sensitive wildlife in the adjacent Santa Fe Dam Recreational Area.

- **Impact 5.3-4** Tree removal during the course of Campus Plan buildout could cause loss of active bird nests.

5.3.7 Mitigation Measures

Impact 5.3-1

Mitigation Measure N-1 in Section 5.10, *Noise*, applies. The Biological Technical Report includes a Mitigation Measure BIO-MM2 on page 29 for reducing construction noise impacts. Mitigation Measure BIO-MM2 duplicates the requirements set forth in Mitigation Measure N-1, and thus incorporation of Measure BIO-MM2 in this DEIR is not required.

Impact 5.3-4

BIO-1 Prior to issuance of permits for any construction activity, the project applicant shall demonstrate compliance with the federal MBTA and submit required nesting bird surveys to the City of Duarte. Construction outside the nesting season (between September 1st and February 15th) does not require pre-removal nesting bird surveys. If construction is proposed between February 16th and August 31st, a qualified biologist must conduct a nesting bird survey(s) no more than three (3) days prior to initiation of grading to document the presence or absence of nesting birds within or directly adjacent (100 feet) to the project site.

The preconstruction survey(s) shall focus on identifying any raptors and/or passerines nests that may be directly or indirectly affected by construction activities. If active nests are documented, species-specific measures shall be prepared by a qualified biologist and implemented to prevent abandonment of the active nest. At a minimum, grading in the vicinity of a nest shall be postponed until the young birds have fledged. A minimum exclusion buffer shall be maintained during construction, depending on the species and location per the discretion of the qualified biologist. The perimeter of the nest setback zone shall be fenced or adequately demarcated with stakes and flagging at 20-foot intervals, and construction personnel and activities restricted from the area. A survey report by a qualified biologist verifying that no active nests are present or that the young have fledged, shall be submitted to the City of Duarte prior to initiation of grading in the nest-setback zone. The qualified biologist shall serve as a biological monitor during those periods when construction activities occur near active nest areas to ensure that no inadvertent impacts on these nests occur. A final report of the findings, prepared by a qualified biologist, shall be submitted to the City of Duarte prior to construction-related activities that have the potential to disturb any active nests during the nesting season. Any nest permanently vacated for the season would not warrant protection pursuant to the MBTA.

5.3.8 Level of Significance After Mitigation

Impact 5.3-1

Mitigation Measure N-1 would reduce potential construction noise impacts to sensitive biological resources in the Sana Fe Flood Control Basin by requiring stationary noise-generating construction equipment to be placed away from the Basin and to require a temporary noise barrier with a Sound Transmission Class rating of 35 or greater between construction zones and the Basin. The noise barrier would block line of sight noise levels to adjacent properties and substantially reduce noise levels at the Santa Fe Flood Control Basin due to its elevation which is lower than the project site. Therefore, Impact 5.3-1 would be less than significant following implementation of Mitigation Measure N-1.

Impact 5.3-4

Implementation of Mitigation Measure BIO-1 would ensure compliance with the MBTA and reduce potential impacts to nesting birds to less than significant.

5.3.9 References

Cadre Environmental. 2016, June. Biological Resources Technical Report, City of Hope Campus Plan, City of Duarte.

California Department of Fish and Wildlife (CDFW). 2016. Sensitive Element Record Search for the Baldwin Park and Azusa Quadrangles. Natural Diversity Data Base (CNDDB). Sacramento, California. Accessed February 2016.

Griffith, Glenn et al. 2016, February 24. Ecoregions of California (poster). Open-File Report 2016–1021. U.S. Geological Survey. http://pubs.usgs.gov/of/2016/1021/ofr20161021_sheet2.pdf.

Irwindale, City of. 2008, June. City of Irwindale 2020 General Plan. http://ci.irwindale.ca.us/DocumentCenter/View/38.

Kyser Center for Economic Research. 2015, February 20. 2014 San Gabriel Valley Economic Forecast and Regional Overview. Los Angeles County Economic Development Corporation. http://laedc.org/wp-content/uploads/2012/04/SGV-Report-2014_Final.pdf.

PlaceWorks. 2015, January. Population and Housing. Section 5.10 of Draft Environmental Impact Report for the Pasadena General Plan. http://www.cityofpasadena.net/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=8589939184&libID=8589939188.

Science & Collaboration for Connected Wildlands (SC Wildlands). 2008, December 2. South Coast Missing Linkages. Data Layer ds419 on Biogeographic Information and Observation System (BIOS). California Department of Fish and Wildlife. https://map.dfg.ca.gov/bios/.

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5.4 CULTURAL RESOURCES

Cultural resources comprise paleontological, archaeological, and historical resources. Paleontological resources are the fossilized remains, impressions, and traces of plants and animals. Archaeology studies human artifacts, such as places, objects, and settlements that reflect group or individual religious, cultural, or everyday activities. Historical resources include sites, structures, objects, or places that are at least 50 years old and are significant for their engineering, architecture, cultural use or association, etc. In California, historic resources cover human activities over the past 12,000 years. Cultural resources provide information on scientific progress, environmental adaptations, group ideology, or other human advancements. Refer to Section 5.4.2 for legal definitions and significance thresholds associated with paleontological, archaeological, and historical resources. Tribal cultural resources are analyzed in Section 5.15, *Tribal Cultural Resources*, of this DEIR.

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for implementation of the Campus Plan to impact cultural resources in the City of Duarte and the City of Irwindale. The analysis in this section is based, in part, upon the following information:

- *Cultural Resources Technical Report for the City of Hope Specific Plan, City of Duarte, Los Angeles County, California*, SWCA Environmental Consultants, July 2017.
- *City of Hope Specific Plan, Duarte, California, Historical Resource Report,* Galvin Preservation Associates, March 2016.
- *Paleontological Resources Impact Assessment Report for the City of Hope Specific Plan, City of Duarte, Los Angeles County, California*, SWCA Environmental Consultants, April 2016.

Complete copies of these studies are included in Appendices E1 and E2 to this DEIR.

5.4.1 Environmental Setting

5.4.1.1 REGULATORY BACKGROUND

Regulations that apply to cultural resources impacts are the federal and state regulations described here.

Federal

National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966 is the primary federal law governing the preservation of cultural and historic resources in the United States. The law establishes a national preservation program and a system of procedural protections that encourage the identification and protection of cultural and historic resources of national, state, tribal, and local significance. Primary components of the NHPA include:

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- Articulation of a national policy governing the protection of historic and cultural resources.
- Establishment of a comprehensive program for identifying historic and cultural resources for listing in the National Register of Historic Places.
- Creation of a federal-state/tribal-local partnership for implementing programs established by the act.
- Requirement that under Section 106 (Protection of Historic Properties) of the NHPA, federal agencies take into consideration actions that could adversely affect historic properties listed or eligible for listing on the National Register of Historic Places, known as the Section 106 Review Process.[1]
- Establishment of the Advisory Council on Historic Preservation, which oversees federal agency responsibilities governing the Section 106 Review Process.
- Placement of specific stewardship responsibilities on federal agencies for historic properties owned or within their control (Section 110 of the NHPA).

National Register of Historic Places

The National Register of Historic Places (National Register) is the nation's official list of buildings, structures, objects, sites, and districts worthy of preservation because of their significance in American history, architecture, archeology, engineering, and culture. The National Register recognizes resources of local, state, and national significance that have been documented and evaluated according to uniform standards and criteria. Authorized under the NHPA, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. The National Register is administered by the National Park Service, which is part of the US Department of the Interior.

To be eligible for listing in the National Register, a resource must meet at least one of the following criteria:

A. Is associated with events that have made a significant contribution to the broad patterns of our history.

B. Is associated with the lives of persons significant in our past.

C. Embodies the distinctive characteristics of a type, period or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction.

D. Has yielded, or may be likely to yield, information important in history or prehistory.

[1] Section 106 Review is designed to ensure that historic properties are considered during federal project planning and implementation. The Advisory Council on Historic Preservation, an independent federal agency, administers the review process with assistance from state historic preservation offices.

Archaeological Resources Protection Act

The Archaeological Resources Protection Act of 1979 regulates the protection of archaeological resources and sites on federal and Indian lands.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act is a federal law passed in 1990 that mandates museums and federal agencies to return certain Native American cultural items—such as human remains, funerary objects, sacred objects, or objects of cultural patrimony—to lineal descendants or culturally affiliated Indian tribes.

State

California Register of Historical Resources

In 1992, Governor Wilson signed Assembly Bill 2881 into law establishing the California Register of Historical Resources (CRHR). The CRHR is an authoritative guide used by state and local agencies, private groups, and citizens to identify historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse impacts.

The CRHR consists of properties that are listed automatically as well as those that must be nominated through an application and public hearing process. The CRHR automatically includes the following:

- California properties listed in the National Register and those formally Determined Eligible for the National Register.
- California Registered Historical Landmarks from No. 0770 onward.
- California Points of Historical Interest that have been evaluated by the Office of Historic Preservation (OHP) and have been recommended to the State Historical Resources Commission for inclusion on the CRHR.

The criteria for eligibility of listing in the CRHR are based on the National Register criteria. To be eligible for listing in the CRHR, a property must be at least 50 years of age and possess significance at the local, state, or national level under one or more of four criteria:

A. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

B. It is associated with the lives of persons important to local, California, or national history.

C. It embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values.

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D. It has yielded, or has the potential to yield, information important in the prehistory or history of the local area, California, or the nation.

Historical resources eligible for listing in the CRHR may include buildings, sites, structures, objects, and historic districts. Resources less than 50 years of age may be eligible if it can be demonstrated that sufficient time has passed to understand their historical importance. Although the enabling legislation for the CRHR is less rigorous with regard to the issue of integrity, properties are expected to reflect their appearance during their period of significance, as stipulated in Public Resources Code Section 4852.

The CRHR may also include properties identified during historical resource surveys. However, in accordance with Public Resources Code Section 5024.1, the survey must meet all of the following criteria:

- The survey has been or will be included in the State Historical Resources Inventory.
- The survey and the survey documentation were prepared in accordance with OHP procedures and requirements.
- The resource is evaluated and determined by OHP to have a significance rating of Category 1 to 5 on a Department of Parks and Recreation (DPR) Form 523.

If the survey is five or more years old at the time of the resource's nomination for the CRHR, the survey is updated to identify historical resources that have become eligible or ineligible due to changed circumstances or further documentation and those that have been demolished or altered in a manner that substantially diminishes the significance of the resource.

California Public Resources Code

Archaeological, paleontological, and historical sites are protected pursuant to a wide variety of state policies and regulations enumerated under the California Public Resources Code. In addition, cultural and paleontological resources are recognized as nonrenewable resources and therefore receive protection under the California Public Resources Code and CEQA.

- **California Public Resources Code 5020–5029.5** continued the former Historical Landmarks Advisory Committee as the State Historical Resources Commission. The commission oversees the administration of the California Register of Historical Resources and is responsible for the designation of State Historical Landmarks and Historical Points of Interest.
- **California Public Resources Code 5079–5079.65** defines the functions and duties of the OHP. The OHP is responsible for the administration of federal- and state-mandated historic preservation programs in California and the California Heritage Fund.
- **California Public Resources Code 5097.5** prohibits a person from moving, destroying, injuring, or defacing, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other

archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over the lands.

- **California Public Resources Code 5097.9–5097.991** provides protection to Native American historical and cultural resources, and sacred sites and identifies the powers and duties of the Native American Heritage Commission. It also requires notification of discoveries of Native American human remains to descendants and provides for treatment and disposition of human remains and associated grave goods.

California Code of Regulations Title 14 (CEQA Guidelines)

CEQA Guidelines Section 15064.5 defines historical resources and significant impacts on such resources. Resources eligible for listing on the CRHR (see criteria A through D above) are considered historical resources. Refer also to Section 5.4.2 of this DEIR.

Local

City of Duarte General Plan Historic Preservation Element

- Historic Preservation Goal 1: To make citizens and decision-makers aware of Duarte's history and historic built environment.
  - Objective 1.1: Create an educational program which focuses on providing information to allow residents and decision-makers to make informed decisions and supportable conclusions about the protection of historic resources.
    - Policy HP 1.1.1: Establish and support all appropriate media for reaching all segments of the community to educate residents and decision-makers concerning the protection of historical resources.
    - Policy HP 1.1.2: Encourage public outreach and access to historical information.
  - Objective 1.2: Promote the development of a comprehensive preservation program.
    - Policy HP 1.2.1: Utilize creative funding sources to promote the development of a comprehensive historic preservation program for the City.
  - Objective 1.3: Integrate historic preservation into the operations of the Community Development Department.
    - Policy HP1.3.1: Encourage training of City staff related to the development and application of historic preservation.
    - Policy HP1.3.2: Develop a database and update maps which identify potentially historical resources and designated resources.
- Historic Preservation Goal 2: To maintain and update the City's inventory of historical resources.
  - Objective 2.1: Preserve Duarte's historical resources by supporting continued research related to the City's historic resources inventory.
    - Policy HP 2.1.1: Encourage ongoing research regarding the City's history and built environment.

- Historic Preservation Goal 3: To promote the preservation of local historical resources.
  - Objective 3.1: Preserve the City's inventory of historical resources for future generations to enjoy.
    - Policy HP 3.1.1: Encourage property owners to preserve the character defining features of historical resources.
    - Policy HP 3.1.2: Promote the preservation of historic and cultural resources by providing incentives and technical assistance.

City of Irwindale General Plan Resource Management Plan

Resource Management Element Programs

- **Cultural Resource Management**. Should archaeological or paleontological resources be encountered during excavation and grading activities, all work would cease until appropriate salvage measures are established. Appendix K of the California Environmental Quality Act (CEQA) Guidelines shall be followed for excavation monitoring and salvage work that may be necessary. Salvage and preservation efforts will be undertaken pursuant to Appendix K requirements outlined in CEQA.

- **Historic Building Code**. The City will investigate the feasibility of adopting alternate building code standards for historic structures, as authorized by the State Historical Building Code. The initial step will require City staff to amend the development code to include provisions for the maintenance, rehabilitation, and preservation of historic structures.

5.4.1.2 NATURAL SETTING

The project site is in the northern portion of the Los Angeles Basin in the San Gabriel Mountain Assemblage. The San Gabriel Mountain Assemblage is a complex mosaic of faults disrupting basement rocks of Proterozoic and Paleozoic metamorphic and igneous rocks, the late Triassic Mount Lowe Intrusive Suite (218 million years old [Ma]), the late Cretaceous-Paleocene Pelona Schist (99.6–55.8 Ma), and the Oligocene (33.9–23.03 Ma) granodiorite of Telegraph Peak (Nourse 2002). Tertiary sediments belonging to the Topanga Group (18–12 Ma; Campbell, McCulloh and Vedder 2009) and the Puente Formation (15–12 Ma) overlie the basement igneous and metamorphic rocks. These rocks form a thick sequence of marine sandstones, siltstones, shales, and conglomerates (SWCA 2016b).

The project site is located just south of where the San Gabriel Mountains end in the Los Angeles Basin, an area that has seen large amounts of sediment deposited from the mountains since the early Pleistocene. Because of steep gradients in the mountains and the high degree of faulting, landslide deposits are common throughout the assemblage. The Los Angeles Basin is a massive, complex structural depression that formed during episodes of crustal extension and faulting during the Miocene (23–5 Ma); this stretching exposed the Mesozoic Catalina Schist on the basin floor, upon which 5,500 meters (16,400 feet) of sediment was uncomfortably stacked. Most of the basin-filling material was deposited during the last 4 million years and is largely composed of marine sediments topped off by a relatively thin terrestrial sequence. During the Pliocene (5.3–3.6 Ma), the basin was at its deepest—over 4,000 feet below sea level (SWCA 2016b). By the Holocene, with global sea level drop and continued uplift of the region, the Los Angeles Basin had assumed its modern elevation and appearance (Woodring, Bramlette and Kew 1946).

The project site is just south of the Sierra Madre fault zone, which forms the southern boundary of the San Gabriel Mountains and is an active reverse thrust fault system today. This fault, combined with the Cucamonga Fault, is primarily responsible for uplift of the San Gabriel Mountains (Crook et al. 1987). Around Azusa, which is just to the east of the project area, the Sierra Madre Fault has uplifted basement Cretaceous rocks over the younger Tertiary sedimentary sequence, a vertical displacement of over 10,000 feet (Morton and Miller 2006).

5.4.1.3 CULTURAL SETTING

Historical Resources

Twenty-five buildings in the study area were identified as potential historical resources because they are over 45 years of age. None of the buildings in the project site are currently listed in the National or California Registers. One building, the House of Hope, was previously evaluated as eligible for the National and California Registers in 2010. The OHP recommends updating evaluations every five years, and the House of Hope was reevaluated. The remaining buildings in the study area were evaluated for listing in the National and California Registers for the first time as part of the cultural resources report (see Appendix E1).

During the field inspection conducted for the Historical Resources Report for the City of Hope by GPA Consulting dated March 2016, consideration was given to whether the properties might collectively form one or more historic districts. Upon inspection, subsequent research, and evaluation, it was readily determined that a historic district was not present. Figure 5.4-1, *Historical Resources and Construction Dates,* identifies buildings that were constructed before 1971 and evaluated by GPA Consulting as well as the construction dates by decade (GPA 2016).

The City of Hope campus was not developed according to a designed plan, but in a piecemeal manner. Funds were raised for the construction of each new building or wing as the need arose. Because the buildings were constructed over several decades and designed by a variety architects and builders, they do not form an important collection of architectural types or specimens and thus do not form one or more historic districts. Likewise, the buildings do not collectively represent any particular phase in the history of City of Hope. They were constructed on an as-needed basis and lack architectural cohesion. Therefore, the properties were evaluated individually in the report prepared by GPA Consulting.

City of Hope is associated with two contexts under Criterion A (associated with events that have made a significant contribution to the broad patterns of our history): the sanatorium movement (1913–1949) and health and medicine in Los Angeles County (1950–1970). Though many buildings on the City of Hope campus have been used for medical treatment and research, only two buildings—the Visitor Center and House of Hope—are eligible for significant associations with these contexts. The Main Medical building, constructed in 1947, is the oldest medical building from the period when the institution functioned as a tuberculosis sanatorium. However, it no longer reflects that period because the distinctive shape of the building has been lost by the removal of wings and the construction of additions. There was no evidence that any of the other buildings evaluated on the campus played a historically significant role within these contexts or were eligible under Criterion B for associations with any historic personages. Criterion B applies to properties associated with individuals whose specific contributions to history can by documented.

5. Environmental Analysis
CULTURAL RESOURCES

The research and analysis of the report prepared by GPA Consulting concluded that the majority of the existing buildings over 45 years of age on the campus were constructed after 1948 in utilitarian or undistinguished Modern forms and styles. The House of Hope was found eligible under Criterion C as an excellent example of Classical Revival architecture. No other buildings were found eligible under Criterion C for embodying the distinctive characteristics of a type, period, or method of construction, representing the work of a master, or possessing high artistic values.

Those buildings evaluated for listing in the National or California Registers were documented on Department and Parks and Recreation inventory forms (DPR 523A and 523B). Table 5.4-1 lists the buildings over 45 years of age on the campus and whether or not they are eligible for listing in the National and California Registers based on the above criteria.

Table 5.4-1 Potentially Historical Buildings Analyzed within Campus Plan area

Building Name	Building Code	Year Constructed	Evaluation and Criteria
Visitor Center	042	1935	Evaluated as eligible for listing in the National and California Register under Criteria A/1.
House of Hope	043	1940	Evaluated as eligible for listing in the National and California Register under Criteria A/1 and C/3.
Main Medical	023	1947	Evaluated as ineligible for listing in the National and California Register.
East Unit B	024	1948	Evaluated as ineligible for listing in the National and California Register.
East Unit A	025	1948	Evaluated as ineligible for listing in the National and California Register.
Wing 4	026	1948	Evaluated as ineligible for listing in the National and California Register.
East Unit C / Wing 1	020	1951	Evaluated as ineligible for listing in the National and California Register.
Smith Research	007	1953 (circa)	Evaluated as ineligible for listing in the National and California Register.
Building #35 (old Eng'r)	035	1955	Evaluated as ineligible for listing in the National and California Register.
Cafeteria Conference Rooms (51c) Central Processing (51a) Central Services	051C 051A 051	1954	Evaluated as ineligible for listing in the National and California Register.
Med. Rec / Old Laundry	013	1955 (circa)	Evaluated as ineligible for listing in the National and California Register.
Hope Village	058	1957	Evaluated as ineligible for listing in the National and California Register.
Hope Village	059	1957	Evaluated as ineligible for listing in the National and California Register.
Hope Village	060	1957	Evaluated as ineligible for listing in the National and California Register.
Hope Village	061	1957	Evaluated as ineligible for listing in the National and California Register.
Hope Village	062	1957	Evaluated as ineligible for listing in the National and California Register.

Table 5.4-1 Potentially Historical Buildings Analyzed within Campus Plan area

Building Name	Building Code	Year Constructed	Evaluation and Criteria
Hope Village Office	064	1957	Evaluated as ineligible for listing in the National and California Register.
Machris	052	1957	Evaluated as ineligible for listing in the National and California Register.
Piness	067	1963 (moved to campus in 1963)	Evaluated as ineligible for listing in the National and California Register.
Warehouse A (ITS)	069	1966	Evaluated as ineligible for listing in the National and California Register.
Lippman-Graff	068	1966	Evaluated as ineligible for listing in the National and California Register.
Horticulture / Grounds	073	`1969	Evaluated as ineligible for listing in the National and California Register.
Amado	072	1969 (circa)	Evaluated as ineligible for listing in the National and California Register.
Utah	005	1970	Evaluated as ineligible for listing in the National and California Register.
Goodman	075	1970	Evaluated as ineligible for listing in the National and California Register.

Source: SWCA 2017.

Two buildings were evaluated as eligible for listing in the National and California Registers. The Visitor Center building is significant under Criterion A because it is one of the last remaining buildings on the campus that represents the history of the origins of the City of Hope institution in the sanatorium movement. Although it has been altered, the building retains sufficient integrity to convey its significance. The building is therefore eligible for listing on the National Register under Criterion A.

The House of Hope building is significant under Criterion A in the context of the sanatorium movement in Los Angeles County because it is one of the oldest remaining buildings at City of Hope that is relevant to the institution's Jewish origins. The House of Hope is one of only a few buildings on the campus that dates from the period when the institution functioned as a tuberculosis sanatorium. The House of Hope is also significant under Criterion C as the embodiment of the Classical Revival style of architecture. The building retains sufficient aspects of integrity to convey its significance. The building is therefore eligible for listing on the National Register under Criteria A and C.

Archaeological Resources

Archaeological sites include prehistoric and historic sites. An archaeological site is the location of a significant event; a prehistoric or historic occupation or activity; or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archaeological value regardless of the value of any existing structure (OHP 1995).

SWCA conducted an intensive-level survey of all undeveloped areas of the project area, consisting of approximately 17 acres, and a reconnaissance-level survey of all developed areas, consisting of approximately 99 acres. Surface visibility within the project area was varied; in undeveloped areas it was very good, at approximately 80 percent, with very little vegetation cover. Ground visibility in developed areas was very poor, at approximately 15 percent due to landscaping and paving. During the survey, SWCA identified one line of repurposed wood utility poles and one isolated historic-era glass jar (34076-ISO-1001). The wood utility poles retain no diagnostic temporal information and cannot be dated. Therefore, these were not formally recorded as a resource (SWCA 2017). No additional cultural resources were identified within the project area.

Paleontological Resources

Paleontological resources are fossils—recognizable remains or evidence of past life on earth—that include bones, shells, leaves, tracks, burrows, and impressions. Certain geologic formations or deposits have higher potential to contain fossils than others. A summary of the data provided by the Los Angeles County Natural History Museum (LACM) indicates that there are no known fossil localities within the project site. The nearest fossil locality that is known to the LACM occurs approximately 24 kilometers (15 miles) west of the project area in Eagle Rock. Two significant fossils are known from this locality, a turkey (*Parapavo californicus*) and a nearly complete mammoth (*Mammuthus*). These fossils occurred in geologic deposits similar to those in the subsurface of the project area—Pleistocene alluvium—at depths of approximately 5 meters (15 feet) below the surface (SWCA 2016b).

5.4.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

C-1 Cause a substantial adverse change in the significance of an historical resource pursuant to Section 15064.5.

C-2 Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.

C-3 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

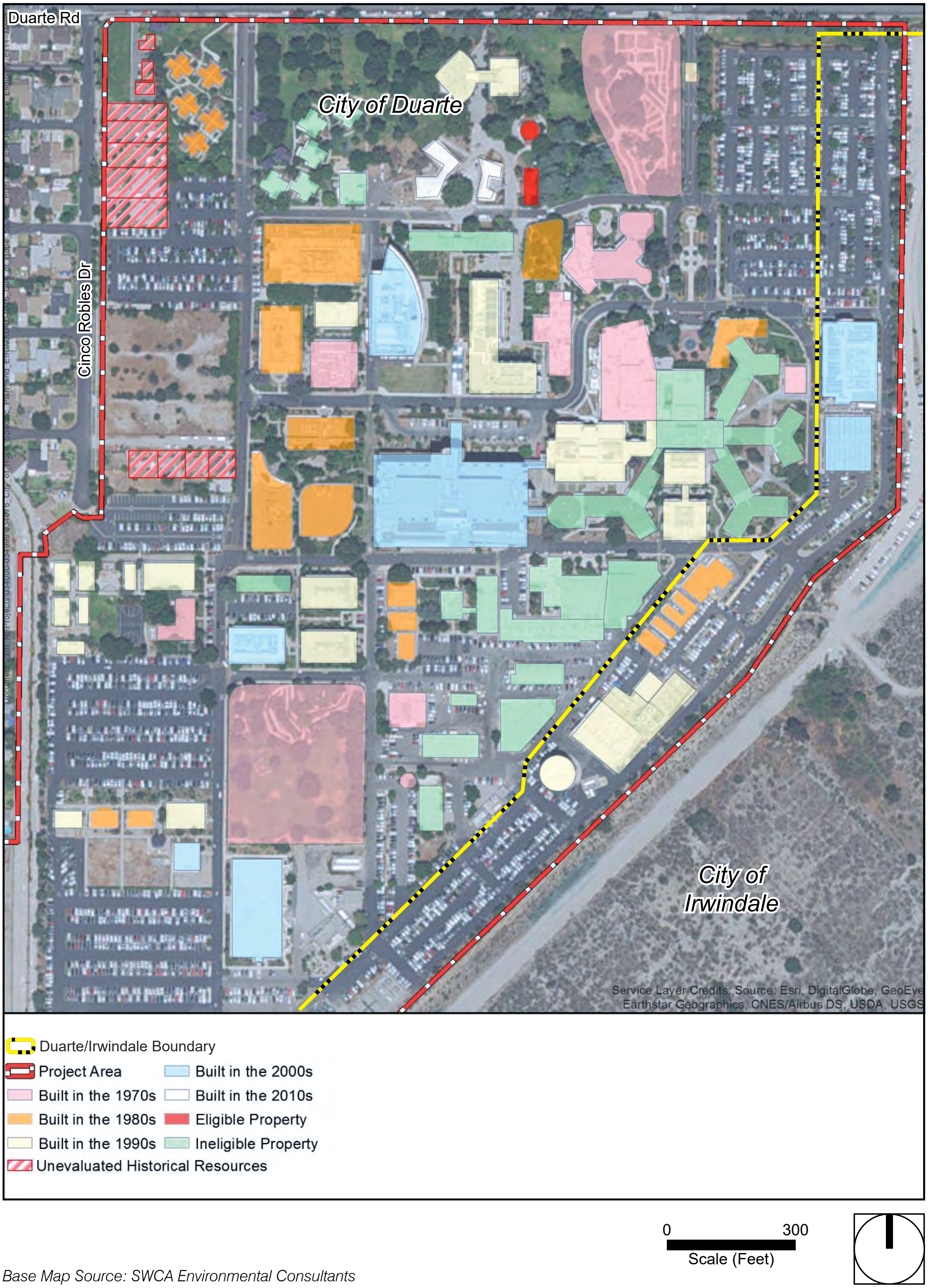
C-4 Disturb any human remains, including those interred outside of formal cemeteries.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant:

- Threshold C-4: Impacts from potential disturbance of human remains during project ground-disturbing activities would be less than significant after compliance with California Health and Safety Code Section 7050.5, CEQA Guidelines Section 15064.5, and Public Resources Code Section 5097.98, which set forth procedures required in the event of such discovery.

This impact will not be addressed in the following analysis.

Figure 5.4-1 - Historical Resources and Construction Dates



Base Map Source: SWCA Environmental Consultants

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Historical Resources

CEQA Guidelines Section 15064.5 provides direction on determining the significance of impacts to archaeological and historical resources. Generally, a resource is considered "historically significant" if it meets the criteria for listing on the California Register of Historical Resources:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated the with lives of persons important in our past;
- Embodies the distinctive characteristics of a type, period, region or method of construction, or 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. (PRC § 5024.1; 14 CCR § 4852)

The fact that a resource is not listed in the California Register of Historical Resources, not determined to be eligible for listing, or not included in a local register of historical resources does not preclude a lead agency from determining that it may be a historical resource.

Paleontological Resources

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered significant if one or more of the following criteria apply:

- The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct.
- The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein.
- The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas.
- The fossils demonstrate unusual or spectacular circumstances in the history of life.
- The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

Significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation are also critically important—particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology. Paleontological remains are recognized as nonrenewable resources significant to the history of life.

5.4.3 Environmental Impacts

Methodology

Historical and Archaeological Resources

GPA Consulting reviewed the California Historical Resources Inventory System (CHRIS), which includes, properties listed and determined eligible for listing in the National Register of Historic Places, listed and determined eligible for listing in the California Register of Historical Resources, California Registered Historical Landmarks, Points of Historical Interest, as well as properties that have been evaluated in historic resource surveys and other planning activities; conducted a field inspection of the study area in 2015 to identify potential historical resources; researched the history of the study area to determine the context(s) in which the buildings located therein were to be evaluated as potential historical resources; and reviewed and analyzed ordinances, statutes, regulations, bulletins, and technical materials relating to federal, state, and local historic preservation designations programs.

In order to identify cultural resources and analyze any potentially significant adverse impacts, SWCA conducted records searches, site inspections, intensive-level surveys, background research, and Native American coordination. The National Register of Historic Places and CRHR criteria were used and a sacred lands file search from NAHC was conducted. Please refer to Appendix E1 “Methods” for specific details on methodology.

Paleontological Resources

SWCA conducted thorough background research and analysis, including geologic map and literature reviews, and previous locality data searches, to evaluate the paleontological sensitivity of the project area. Specifically, SWCA conducted a paleontological records search with the LACM. The purpose of the museum records search was to 1) determine whether any previously recorded fossil localities occur in the project area; 2) assess the potential for disturbance of these localities during construction; and 3) evaluate the paleontological sensitivity of the project area.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.4-1: Buildout of the Campus Plan could impact an identified historic resource. [Threshold C-1]

Impact Analysis: As described above, there are two historical resources in the study area, the House of Hope and Visitors Center buildings. These resources are eligible for listing under both the National Register of Historic Places and California Register of Historic Resources.

Under CEQA, a project has a significant impact on a historical resource if it "would result in the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resources would be materially impaired" (CEQA Guidelines Section 15064.5(b)(1)). Material impairment would occur if the project would result in demolition or material alteration of those physical characteristics that convey the resource's historical significance (CEQA Guidelines Section 15064.5(b)(2)).

Direct Impacts

The proposed Campus Plan would have no direct impact on a known historical resource. The two known historical resources, the House of Hope and Visitors Center buildings, and their immediate surroundings are located in the Cultural Amenity District. No new construction is proposed for the Cultural Amenity District; therefore the historical building would not be physically altered in any way. Furthermore, the intent of the Campus Plan is to preserve these historical resources. No known historical resources would be demolished, altered, or relocated as a result of the project. Impacts to known historical resources are considered less than significant.

The historical report evaluated buildings on site that were 45 years or older. However, the project site also includes a number of properties that have not been evaluated for historical significance and that will pass the age criteria threshold during the lifetime of the project. Generally, properties must be at least 50 years old to be eligible for listing in the National Register of Historic Places. Because the California Register and local register are modeled after the National Register, the industry standard is 50 years as the minimum age requirement for eligibility. However, to capture properties that might turn 50 years old during the development of a project or survey, 45 years old is the minimum age requirement for evaluation. Since buildout would occur over a minimum 20-year period, future development has the potential to impact buildings that become 45 years or older. A formal historical resources evaluation would be required at that time. Future development or improvements within the project site could potentially impact unknown historical resources and result in a significant impact.

Indirect Impacts

Implementation of the Campus Plan would have the potential to result in indirect impacts to historical resources if it would result in new development that is incompatible, spatially obstructive, or would otherwise damage the integrity of a historical resource.

The Secretary of the Interior's Standards (Standard) Number 9 and 10 provide guidance in evaluating the potential for indirect impacts. Standard Number 9 states:

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> New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

The new construction proposed in the Campus Plan is in the Core Medical District to the south and west of the two historical resources. New research and hospitality buildings would replace existing buildings and are set back from the street. All proposed buildings are physically distant from both the House of Hope and Visitors Center buildings. Given the physical separation between the historical resources and proposed buildings, there would be no destruction of any historic materials or features.

The maximum building height for the Core Medical District is 140 feet and the minimum setback is 10 feet from internal roadways. Because all proposed new construction is physically removed from the historical resources, this proposed maximum building height would have no impact on the historical resources. The maximum building height for the Cultural Amenity District is 50 feet, and the minimum setback is 10 feet from internal roadways. This is appropriate and acceptable and would ensure that any new construction in the Cultural Amenity District does not visually overwhelm the historical resources.

The existing landscape and open space around the House of Hope and Visitors Center buildings would be maintained as part of the Campus Plan. Therefore, the spatial relationships that characterize the buildings would not be affected.

Standard #10 states:

> New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Similar to the analysis of project impacts under Standard #9, new construction proposed as part of the Campus Plan would not impair the essential form or integrity of the historical resources on campus. The new construction would be physically removed from both the House of Hope and Visitors Center buildings, so that its removal in the future would not affect the integrity of either building. The environment surrounding both buildings would also remain intact. As stated above, the existing open space around the buildings would be maintained by the proposed Campus Plan. Therefore, the integrity of the surrounding environment would also be unimpaired. In summary, both identified historical resources would continue to convey their significance under the proposed Campus Plan. Therefore, the proposed plan would have a less than significant impact on historical resources.

Impact 5.4-2: Buildout of the Campus Plan could impact archaeological resources. [Threshold C-2]

Impact Analysis: Only one isolated historic artifact was identified within the project site as a result of SWCA's study. Isolated artifacts are not considered cultural resources under CEQA, but are used in determining sensitivity for archaeological resources. However, it is possible that buried deposits could be present within the project area. If identified, these may contain data that would change the significance recommendation of the site and thus would require evaluation. In addition, coordination with Native American groups indicates that there is a potential to encounter buried prehistoric deposits in the project area. Buried or obscured archaeological resources may be encountered during construction. Impacts to archaeological resources are considered potentially significant.

Impact 5.4-3: Buildout of the Campus Plan could impact paleontological resources or a unique geologic feature. [Threshold C-3]

Impact Analysis: Construction activities—including surficial and/or shallow excavations within the surficial young alluvial fan deposits or in areas of previous disturbance—are unlikely to result in adverse impacts to significant paleontological resources. The surficial sediments are too young to preserve paleontological resources and therefore have low paleontological sensitivity. However, the older Quaternary sediments that are likely present in the subsurface (and which are therefore not visible on the surficial geologic map) are of an age to preserve fossils. As indicated by the records search of the LACM, these sediments have preserved significant vertebrate fossils elsewhere in the region (SWCA 2016b) and have high paleontological sensitivity. Therefore, construction activities requiring excavations to a depth below the thickness of the younger alluvial sediments may have an adverse impact to paleontological resources unless proper mitigation measures are implemented. Impacts to paleontological resources are considered potentially significant.

5.4.4 Cumulative Impacts

Cultural resources impacts are site specific and generally do not combine to result in cumulative impacts. In the immediate vicinity of the project site, no significant cultural resources were identified that if altered could combine with the effects of the project to result in a cumulatively significant impact to cultural resources. Additionally, cultural resources investigations would be required for other projects before the cities of Duarte or Irwindale would permit ground disturbances or demolition or substantial alteration of existing structures. Such investigations would identify resources on the affected project sites that are or appear to be eligible for listing on the National or California Registers. Such investigations would also recommend mitigation measures to protect and preserve cultural resources. The proposed project includes mitigation measures to ensure proper identification, treatment, and preservation of cultural resources on the project site. Implementation of these measures would reduce the potential for adverse impacts on cultural resources both individually and cumulatively. Therefore, cumulative impacts to cultural resources would be less than significant.

5.4.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to cultural resources and were described in detail in Sections 5.4.1.1 of this DEIR and are listed below.

Federal

- National Historic Preservation Act

- Executive Order 11593, 36 Code of Federal Regulations, Section 8921 as incorporated into Title 16, United States Code, Section 470
- Archaeological Resources Protection Act
- American Indian Religious Freedom Act, Title 42 United States Code, Section 1996
- Native American Graves Protection and Repatriation Act, Title 25, United States Code Section 3001, et seq.

State

- California Public Resources Code 5020–5029.5, 5079–5079.65, and 5097.9–5097.991
- California Register of Historic Resources
- California Historical Building Code
- Health and Safety Code Sections 7052 and 7050.5

Local

- City of Duarte General Plan, Historic Preservation Element
- City of Irwindale General Plan, Resource Management Plan

5.4.6 Level of Significance Before Mitigation

Without mitigation, these impacts would be **potentially significant**:

- **Impact 5.4-1** Buildout of the Campus Plan could impact unknown historical resources.
- **Impact 5.4-2** Buildout of the Campus Plan could impact buried or obscured archaeological resources during construction.
- **Impact 5.4-3** Buildout of the Campus Plan could impact buried paleontological resources during construction

5.4.7 Mitigation Measures

Impact 5.4-1

CUL-1 Prior to the issuance of any permits allowing development within the Specific Plan area that involves demolition or alteration to properties (buildings, structures, and landscape areas) that are at least 45 years of age at the time of such activity, and that were not previously identified for evaluation in the 2016 historical resources survey (GPA 2016), the City of Duarte or City of Irwindale, as applicable, shall require the applicant to prepare a Historical

Resources Evaluation Report (HRER) to evaluate such properties. The HRER shall be prepared by a qualified architectural historian or historian who meets the Secretary of the Interior's Professional Qualifications Standards in architectural history or history. The qualified architectural historian or historian shall conduct an intensive-level evaluation in accordance with the guidelines and best practices promulgated by the State Office of Historic Preservation to identify any potential historical resources within the proposed development area. All evaluated properties shall be documented on Department of Parks and Recreation Series 523 Forms. For all properties determined to qualify as potential historical resources, the HRER shall include a discussion of those properties' character defining features. The character-defining features documented will include site plan features, overall massing, scale, and spatial relationships between buildings and landscaping/circulation corridors, architectural details and design composition, and all contributing materials, features, and finishes. Properties with interiors that were historically accessible to the public will also be evaluated for potential historic significance. The HRER shall be submitted to the City of Duarte or City of Irwindale, as applicable, for review and concurrence.

- **Secretary's Standards Project Review Memorandum:** For all properties identified as potential historical resources in the HRER, during the planning phase for the development in the Campus Plan area that may impact such properties (prior to any construction activities), input shall be sought from a California architectural historian or historic architect meeting the Secretary of the Interior's Professional Qualifications Standards to ensure that the development complies with the Secretary's Standards for the Treatment of Historic Properties (Standards). The findings and recommendations of the architectural historian or historic architect shall be documented in a Secretary's Standards Project Review Memorandum (Memorandum), at the schematic design phase. This Memorandum shall analyze all components of the development for compliance with the Standards. Components to be analyzed shall include direct and indirect changes to historical resources and their setting. Should design modifications be necessary to bring the development into compliance with the Standards, the Memorandum will document those recommendations. The intent of the Memorandum is to ensure that the development complies with the Standards in order to avoid significant adverse direct or indirect impacts to historic resources, such that no further environmental review is required. The Memorandum shall be submitted to the City of Duarte or City of Irwindale, as applicable, for review.
- To avoid impacts to the two historical resources identified in the 2016 historical resources survey (the City of Hope Visitor's Center and the House of Hope/Temple Beth Hatikvah), any alterations to either property shall comply with the Standards and be carried forward for analysis and documentation through a Secretary's Standards Project Review Memorandum, as discussed above. No new additions shall be added to these buildings except for any potential changes for complying with applicable

accessibility requirements. A minimum 20-foot buffer shall be maintained around the two historical resources. This will preserve the immediate setting and spatial relationships between the properties. No new construction shall be completed between the buildings and open space shall be maintained to preserve their immediate setting.

Impact 5.4-2

CUL-2 Prior to issuance of any permits allowing ground-disturbing activities within the Campus Plan area, the City of Duarte and/or City of Irwindale, as appropriate, shall ensure that an archeologist who meets the Secretary of the Interior's Standards for professional archaeology has been retained for the project and will be on call during all grading and other significant ground-disturbing activities. The Qualified Archaeologist shall ensure that the following measures are followed for the project:

- Prior to any ground disturbance, the Qualified Archaeologist, or their designee, shall provide Worker Environmental Awareness Protection (WEAP) training to construction personnel regarding regulatory requirements for the protection of cultural (prehistoric and historic) resources. As part of this training, construction personnel shall be briefed on proper procedures to follow should unanticipated cultural resources be made during construction. Workers will be provided contact information and protocols to follow in the event that inadvertent discoveries are made. The WEAP training can be in the form of a video or PowerPoint presentation. Printed literature (handouts) can accompany the training and can also be given to new workers and contractors to avoid the necessity of continuous training over the course of the project.
- In the event that unanticipated cultural material is encountered during any phase of project construction, all construction work within 50 feet (15 meters) of the find shall cease and the Qualified Archaeologist shall assess the find for importance. Construction activities may continue in other areas. If, in consultation with the appropriate City, the discovery is determined to not be important, work will be permitted to continue in the area.
    - If a find is determined to be important, additional work may be warranted, or the find can be preserved in place and construction allowed to proceed.
    - Additional work can include scientific recording and excavation of that portion of the find making the find important.
    - If excavation of a find occurs, the Qualified Archaeologist shall draft a report within 60 days of conclusion of excavation that identifies the find and summarizes the analysis conducted. The completed report shall be approved by the City and filed with the County and with the South Central Coastal Information Center at California State University, Fullerton.
    - Excavated finds shall be curated at a repository determined by the Qualified Archaeologist and approved by the City.

Impact 5.4-3

CUL-3 Prior to the issuance of any permits allowing ground-disturbing activities within the Campus Plan area, the City of Duarte and/or City of Irwindale, as appropriate, shall ensure that a paleontological monitor has been retained for the project. If ground-disturbing activities will exceed a depth of 6 feet below the ground surface, prior to the issuance of grading permits, the City of Duarte and/or City of Irwindale, as appropriate, shall ensure that a qualified paleontologist has been retained for the project. The paleontologist shall prepare a paleontological monitoring program. All grading and other significant ground-disturbing activities more than 6 feet below the ground surface will be monitored by a paleontological monitor. If any evidence of paleontological resources is discovered, the following measures shall be taken:

- All below-grade work shall stop within a 50-foot radius of the discovery. Work shall not continue until the discovery has been evaluated by a qualified paleontologist.
- A qualified paleontologist in coordination with the City shall assess the find(s) and determine if they are scientifically important. If the find(s) are of value then:
  - Scientifically important fossils shall be prepared by the paleontologist and/or his/her designee(s) to the point of identification, identified to the lowest taxonomic level possible, and curated in a museum repository with permanent, retrievable storage.
  - Significant paleontological resources found shall be preserved as determined necessary by the paleontological monitor.
  - Excavated finds shall be offered to the Los Angeles County Museum of Natural History or its designee for curation on a first-refusal basis. After which, finds shall be offered to an accredited and permanent scientific institution for the benefit of current and future generations.
  - Within 60 days of completion of the end of earth-moving activities, the paleontologist shall draft a report summarizing the finds and shall include the inspection period, an analysis of any resources found, and the present repository of the items.
  - The paleontologist's report shall be approved by the City. Any resulting reports shall also be filed with the permanent scientific institution where the resources are curated.

5.4.8 Level of Significance After Mitigation

Impact 5.4-1

No direct impacts to known historical resources were identified. As stated, development of the Campus Plan would occur over a number of years, and buildings and structure may become historic during Campus Plan buildout. Implementation of Mitigation Measure CUL-1 would ensure that buildings and structures that become 45 years of age or older and would be affected by a site specific development would be analyzed to determine its significance as a historical resource and to ensure that the development complies with the Secretary's Standards for the Treatment of Historic Properties (Standards). No demolition of a historical resource would be allowed. Further Mitigation Measure CUL-1, also ensure that no indirect impacts the existing historical resources– the City of Hope Visitor's Center and the House of Hope/Temple Beth Hatikvah–would occur. With implementation of Mitigation Measure CUL-1, impacts would be less than significant.

Impact 5.4-2

Implementation of Mitigation Measure CUL-2 would reduce potential impacts associated with archeological resources to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating to cultural resources have been identified.

Impact 5.4-3

Implementation of Mitigation Measure CUL-3 would reduce potential impacts associated with paleontological resources to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating to cultural resources have been identified.

5.4.9 References

Campbell, R. H., T. H. McCulloh, and J. G. Vedder. 2009. The Miocene Topanga Group of Southern California: A 100-year History of Changes in Stratigraphic Nomenclature. Open-File Report 2007–1385. U.S. Geological Survey.

Crook, R., C. R. Allen, B. Kamb, C. M. Payne, and R. J. Proctor. 1987. Recent Reverse Faulting in the Transverse Ranges, California. Professional Paper 1339. U.S. Geological Survey.

Galvin Preservation Associates (GPA) Consulting. 2016, March. Historical Resource Report: City of Hope Specific Plan

Morton, D.M., and F. K. Miller. 2003. Preliminary Geologic Map of the San Bernardino 30' × 60' Quadrangle, California. Open File Report 03-293. U.S. Geological Survey. Scale 1:100,000.

———. 2006. Geologic Map of the San Bernardino and Santa Ana 30' × 60' Quadrangles, California. Open File Report 2006-1217. U.S. Geological Survey. Scale 1:100,000.

Nourse, J. A. 2002. Middle Miocene Reconstruction of the Central and Eastern San Gabriel Mountains, Southern California, with Implications for Evolution of the San Gabriel Fault and Los Angeles Basin. Special Paper 365. Geological Society of America.

Office of Historic Preservation (OHP). 1995, March. Instructions for Recording Historical Resources. http://ohp.parks.ca.gov/pages/1054/files/manual95.pdf.

———. 2012, October 24. California Historical Resources. http://ohp.parks.ca.gov/listedresources/.

SWCA Environmental Consultants (SWCA). 2016a, March 16. Summary of Cultural Resources Identification Efforts and Preliminary Results for the City of Hope Specific Plan and Environmental Impact Report, Cities of Duarte and Irwindale, Los Angeles County, California

———.2016b, April. Paleontological Resources Impact Assessment Report for the City of Hope Specific Plan, City of Duarte, Los Angeles County, California.

———.2017, July. Cultural Resources Technical Report for the City of Hope Specific Plan, City of Duarte, Los Angeles County, California.

Woodring, W. P, M. N. Bramlette, and W. S. W. Kew. 1946. Geology and Paleontology of the Palos Verdes Hills, California. Professional Paper 207. U.S. Geological Survey.

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5.5 GEOLOGY AND SOILS

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for implementation of the City of Hope Campus Plan to impact geological and soil resources in the cities of Duarte and Irwindale. The analysis in this section is based in part on a summary completed by LGC Geotechnical of previous geotechnical investigation reports for projects on the City of Hope campus.

- *Geotechnical Summary Regarding the City of Hope Specific Plan, Located in the Cities of Duarte and Irwindale, California*, LGC Geotechnical Inc., February 29, 2016.

The above-referenced report summarized the following four geotechnical investigation reports, which were prepared for developments within the project site and are referenced and cited as needed:

- *Report of Geotechnical Consultation, Proposed Transfusion Medicine Center, City of Hope National Medical Center*, MACTEC Engineering and Consulting, October 17, 2005.

- *Report of Geotechnical Investigation, Proposed Cancer Immunotherapeutics and Tumor Immunology (CITI) Building,* MACTEC Engineering and Consulting, December 28, 2005.

- *Geotechnical Foundation Investigation, Proposed Gonda Building Expansion, Duarte, California,* RTF&A, September 25, 2008.

- *Geotechnical Foundation Recommendations, Buena Vista First Floor Tenant Improvements, 2240 Buena Vista Street, Irwindale, California 91010*, RTF&A, March 9, 2009.

Complete copies of these studies are included in Appendix F to this DEIR.

5.5.1 Environmental Setting

5.5.1.1 REGULATORY BACKGROUND

State

California Alquist-Priolo Earthquake Fault Zoning Act

The California Alquist-Priolo Earthquake Fault Zoning Act was signed into state law in 1972 and subsequently amended, with its primary purpose being to mitigate the hazard of fault rupture by prohibiting the location of structures for human occupancy across the trace of an active fault. This act (or state law) was a direct result of the 1971 San Fernando Earthquake, which caused extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. The act requires the State Geologist (California Geologic Survey) to delineate regulatory zones known as "earthquake fault zones" along faults that are "sufficiently active" and "well defined," and to issue and distribute appropriate maps to all affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. Pursuant to this act and as stipulated in Section 3603(a) of the California Code of Regulations, structures for human occupancy are

5. Environmental Analysis
GEOLOGY AND SOILS

not permitted to be placed across the trace of an active fault. The act also prohibits structures for human occupancy within 50 feet of the trace of an active fault, unless it is proven by an appropriate geotechnical investigation and report that the development site is not underlain by active branches of the active fault, as stipulated in Section 3603(a) of the California Code of Regulations. Furthermore, the act requires that cities and counties withhold development permits for sites within an earthquake fault zone until geologic investigations demonstrate that the sites are not threatened by surface displacement from future faulting, as stipulated in Section 3603(d) of the California Code of Regulations.

Seismic Hazard Mapping Act

The Seismic Hazard Mapping Act was adopted by the state in 1990 to protect the public from the effects of earthquake hazards other than surface fault rupture, including strong ground shaking, liquefaction, seismically induced landslides, or other ground failure. The goal of the act is to minimize loss of life and property by identifying and mitigating seismic hazards. The California Geological Survey prepares and provides local governments with maps of seismic hazard zones that identify areas susceptible to amplified shaking, liquefaction, earthquake-induced landslides, and other ground failures.

California Building Code

Current law states that every local agency enforcing building regulations, such as cities and counties, must adopt the provisions of the California Building Code (CBC) within 180 days of its publication. The publication date of the CBC is established by the California Building Standards Commission, and the code is updated every three years. It is in Title 24, Part 2, of the California Code of Regulations. The most recent building standard adopted by the legislature and used throughout the state is the 2013 CBC; local jurisdictions may add amendments based on local geographic, topographic, or climatic conditions. These codes provide minimum standards to protect property and people by regulating the design and construction of excavations, foundations, building frames, retaining walls, and other building elements to mitigate the effects of seismic shaking and adverse soil conditions. The CBC's provisions for earthquake safety are based on factors such as occupancy type, the types of soil and rock onsite, and the strength of ground. The CBC is updated on a three-year cycle; the 2016 CBC took effect on January 1, 2017.

Requirements for Geotechnical Investigations

Requirements for geotechnical investigations for subdivisions requiring tentative and final maps and for other types of structures are in California Health and Safety Code, Sections 17953 to 17955, and in Section 1802 of the CBC. Testing of samples from subsurface investigations is required, such as from borings or test pits. Studies must be done as needed to evaluate slope stability, soil strength, position and adequacy of load-bearing soils, the effect of moisture variation on load-bearing capacity, compressibility, liquefaction, differential settlement, and expansiveness.

Local

The City of Duarte Municipal Code Section 19.46.040(E)(1) requires geologic and soils reports prepared by a registered geotechnical engineer for all development applications.

The City of Irwindale adopts the current Los Angeles County Building Code in Chapter 15.04, Building Code, of the City of Irwindale Municipal Code.

5.5.1.2 REGIONAL SETTING

Geologic Setting

The project site is near the northern edge of the Los Angeles Basin, a coastal plain extending from the Pacific Ocean on the south to the Santa Monica Mountains and Puente Hills on the north. The Los Angeles Basin is at the north end of the Peninsular Ranges Geomorphic Province, a northwest-trending series of mountain ranges and valleys. The San Gabriel Mountains, which are about 1.3 miles north of the project site, are part of the Transverse Ranges Geomorphic Province, an east-west-trending series of steep mountain ranges and valleys extending from Santa Barbara County on the west to Riverside County on the east.

Seismic Hazards

Earthquake Faults

The nearest known active faults to the project site are the Duarte Fault, about 0.9 mile to the north; the Sierra Madre Fault Zone, about 1.5 miles to the north; the Raymond Fault, about 2.5 miles to the northwest; the Whittier Fault, about 10.5 miles to the south; and the Cucamonga Fault, about 17 miles to the east (CGS 2016a) (see Figures 5.5-1, *Local Fault Map*, and 5.5-2, *Regional Fault Map*).[1]

Ground Shaking

The energy released by an earthquake is measured as moment magnitude, which is a logarithmic scale; therefore, each one-point increase in magnitude reflects a tenfold increase in amplitude of the waves as measured at a specific location and a 32-fold increase in energy. That is, a magnitude 7 earthquake produces 100 times (10 x 10) the ground motion amplitude of a magnitude 5 earthquake.

The estimated peak ground acceleration onsite with a 2 percent probability of exceedance in 50 years—that is, an average return period of 2,475 years—is 0.860g, where g is the acceleration of gravity (CGS 2016b). Seismic design parameters for the project site were calculated in the geotechnical reports prepared by RTF&A in 2008 and 2009 (see Appendix F).[2] Ground acceleration of 0.860g correlates with intensity IX on the Modified Mercalli Intensity (MMI) Scale (Wald 1999), a subjective scale of how earthquakes feel to people and affect buildings. The MMI Scale is a 12-point scale—Intensity I earthquakes are generally not felt by people, and Intensity XII earthquakes cause total damage and throw objects into the air. In an intensity IX earthquake, damage is considerable in specially designed structures, and well-designed frame structures are thrown out of plumb. Damage is great in substantial buildings, with partial collapse. Buildings are shifted off of foundations (USGS 2016).

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[1] Distances to faults are from the edge of the City of Hope campus, and thus differ slightly from distances in the above-cited geotechnical reports, which are for specific areas within the campus.

[2] Seismic design parameters were a new requirement introduced in the 2007 California Building Code and so were not calculated in the two MACTEC geotechnical reports dated 2005.

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GEOLOGY AND SOILS

Historic Earthquakes

Historic earthquakes of magnitude 6.0 or greater that occurred within 50 miles of the project site within the last 100 years are listed in Table 5.5-1.

Table 5.5-1 Selected Historic Earthquakes in the Region

Earthquake	Year	Magnitude	Fault	Notable Effects
Northridge	1994	6.7	Northridge Thrust and others	57 deaths; $13–40 billion property damage.
San Fernando	1971	6.6	San Fernando fault zone	65 deaths; over $500 million property damage.
Long Beach	1933	6.4	Newport-Inglewood	120 deaths; over $50 million in property damage; many schools destroyed (children not in school during quake).
North San Jacinto Fault	1923	6.3	San Jacinto	Minor damage; greatest in San Bernardino and Redlands.

Source: SCEDC 2016.

5.5.1.3 PROJECT SITE

The locations of the four previous geotechnical investigations on the project site (Appendix F) are shown on Figure 5.5-3, *Locations of Previous Geotechnical Investigations.*

Topography

The site is flat with a southwest grade of about 1.3 percent. Elevations onsite range from about 460 feet above mean sea level (amsl) at the northwest corner of the site, to 485 feet amsl at the northeast corner, to 435 feet asml at the south corner.

Geologic Units

The project site is underlain by alluvial soils ranging in particle size from silty sand to boulders; most soils are sand and gravel. Artificial fill ranging up to 4.5 feet thick overlies native alluvial soils.

Groundwater

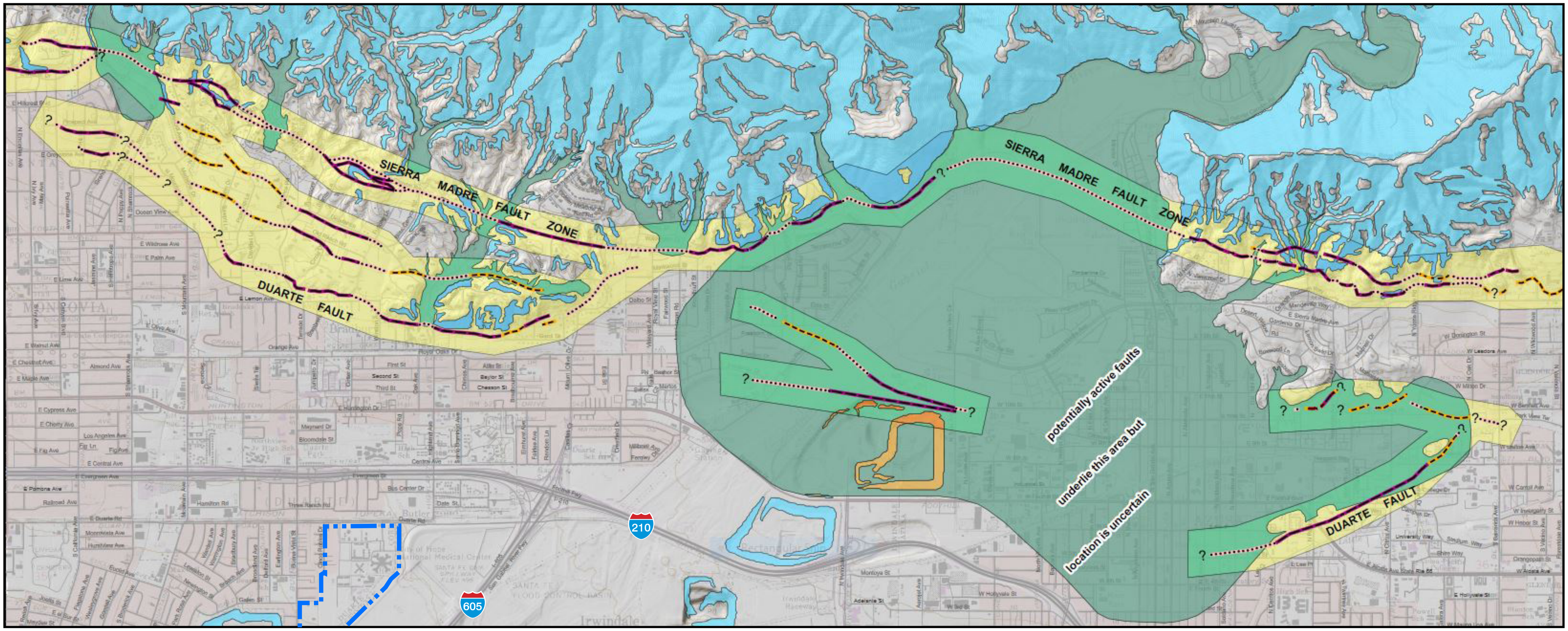
Groundwater was not observed under the project site in borings to depths of up to 50 feet below ground surface (bgs). Historic high groundwater levels are approximately 150 feet bgs.

Other Hazards

Subsidence

The major cause of ground subsidence is the excessive withdrawal of groundwater. The project site is above the Main San Gabriel Groundwater Basin (Basin). Groundwater levels in the Basin are managed by the Main San Gabriel Valley Watermaster to avoid overdraft of the Basin (MSGBW 2016). Therefore, there is little potential for future subsidence.

Figure 5.5-1 - Local Fault Map



ALQUIST-PRIOLO EARTHQUAKE FAULT ZONES

Earthquake Fault Zones
Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

Active Fault Traces
Faults considered to have been active during Holocene time and to have potential for surface rupture: Solid Line in Black or Red where Accurately Located; Long Dash in Black or Solid Line in Purple where Approximately Located; Short Dash in Black or Solid Line in Orange where Inferred; Dotted Line in Black or Solid Line in Rose where Concealed; Query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

1906 C ? ?

Project Boundary

SEISMIC HAZARD ZONES

Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslide Zones
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Overlapping Liquefaction and Earthquake-Induced Landslide Zones
Areas that lie within zones of required investigation for both liquefaction and earthquake-induced landslides.

OVERLAPPING ALQUIST-PRIOLO AND SEISMIC HAZARD ZONES

Overlap of Earthquake Fault Zone and Liquefaction Zone
Areas that are covered by both Earthquake Fault Zone and Liquefaction Zone.

Overlap of Earthquake Fault Zone and Earthquake-Induced Landslide Zone
Areas that are covered by both Earthquake Fault Zone and Earthquake-Induced Landslide Zone.

Overlap of Earthquake Fault Zone and Seismic Hazard Zones
Areas that are covered by Earthquake Fault Zone, Liquefaction Zones and Earthquake-induced Landslide Zone.

**Note: Mitigation methods differ for each zone –
AP Act only allows avoidance; Seismic Hazard Mapping Act allows mitigation by engineering/geotechnical design as well as avoidance.**

0 3,500
Scale (Feet)

Base Map Source: CGS, 2014

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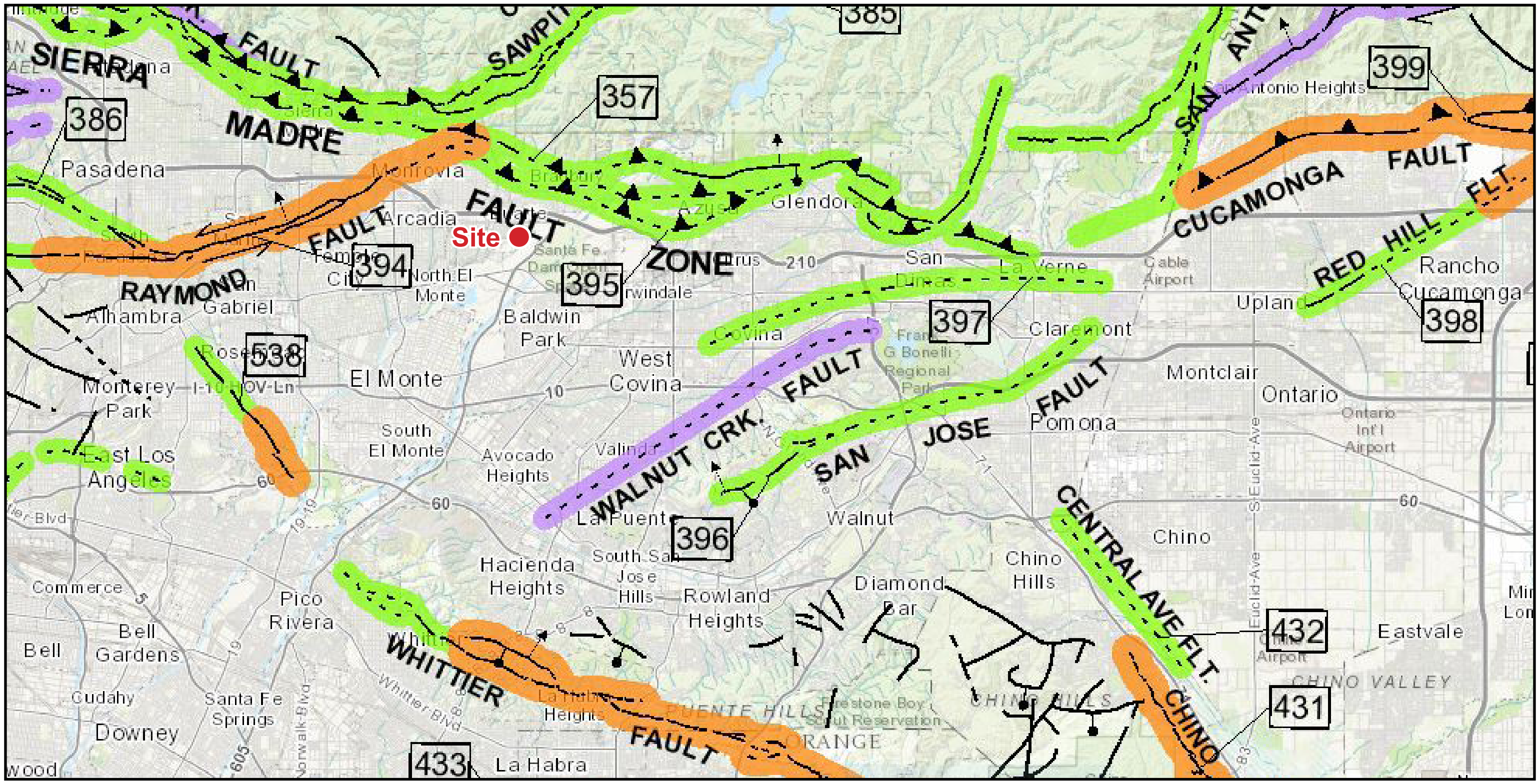
Figure 5.5-2 - Regional Fault Map

5. Environmental Analysis



SYMBOL EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain. All offshore faults based on seismic reflection profile records are shown as solid lines where well defined, dashed where inferred, queried where uncertain.

FAULT CLASSIFICATION COLOR CODE
(Indicating Recency of Movement)

Fault along which historic (last 200 years) displacement has occurred.

A triangle to the right or left of the date indicates termination point of observed surface displacement. Solid red triangle indicates known location of rupture termination point. Open black triangle indicates uncertain or estimated location of rupture termination point.

Date bracketed by triangles indicates local fault break.

No triangle by date indicates an intermediate point along faultbreak.

Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.

Square on fault indicates where fault creep slippage has occured that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).

Holocene fault displacement (during past 11,700 years) without historic record.

Late Quaternary fault displacement (during past 700,000 years).

Quaternary fault (age undifferentiated).

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement.

0 5
Scale (Miles)

Base Map Source: CGS, 2016

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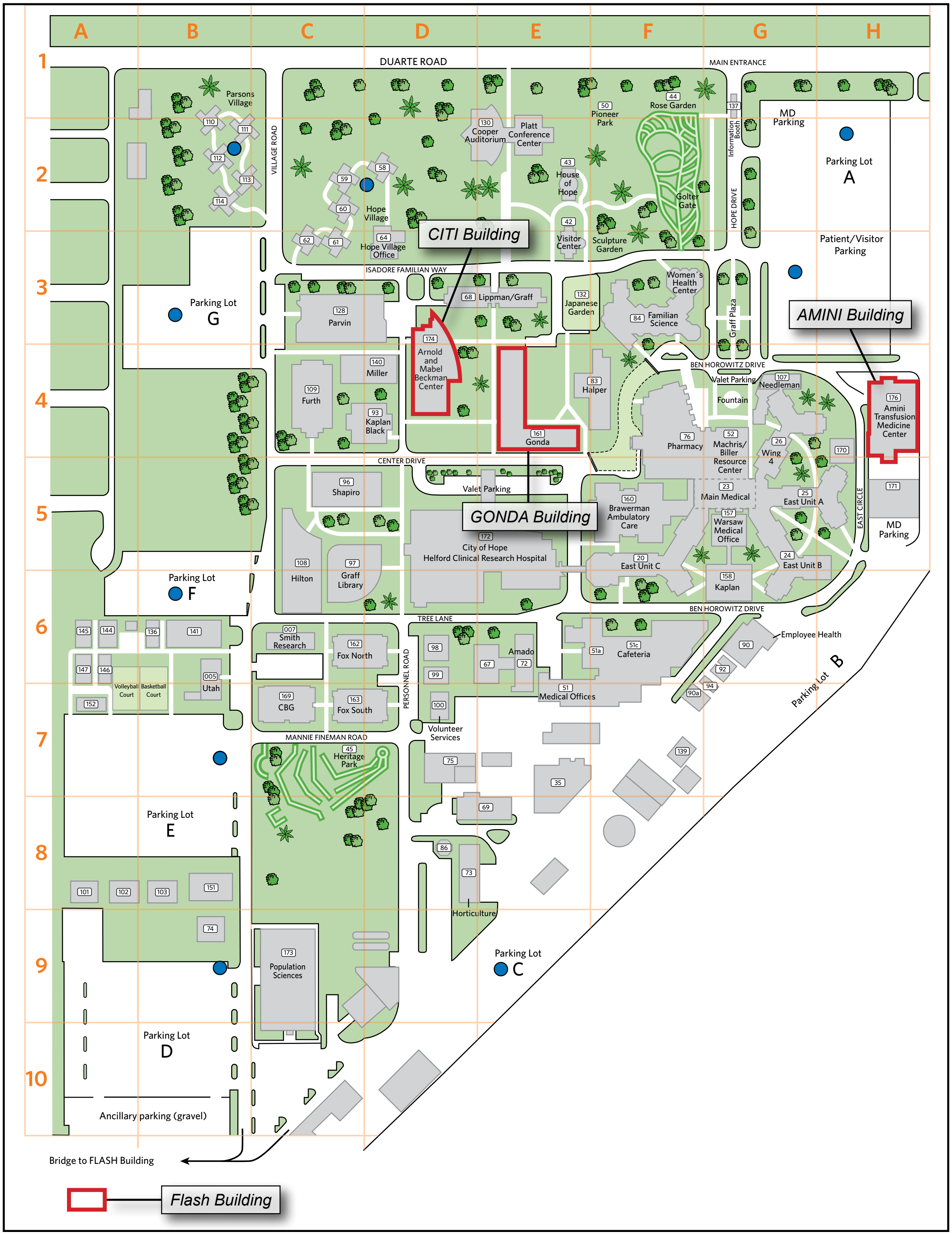
Figure 5.5-3 - Locations of Previous Geotechnical Investigations

5. Environmental Analysis



0 700
Scale (Feet)

Base Map Source: COH, 2015

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Collapsible Soils

Collapsible soils shrink upon being wetted and/or being subject to a load. The geotechnical investigation reports recommended that artificial fill soils onsite be removed to expose natural soils during site grading; removal depths were estimated to be up to two feet below existing grades.

Expansive Soils

Expansive soils contain substantial amounts of clay that swells when wetted and shrinks when dried; the swelling or shrinking can shift, crack, or break structures built on such soils. Samples of subsurface site soils tested during the geotechnical investigations yielded expansion indices ranging from 0 to 35 (RTF&A 2008). Soils with expansion indices of over 20 are considered expansive per CBC Section 1803.5.3.

5.5.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

G-1 Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

- i) 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. (Refer to Division of Mines and Geology Special Publication 42.)
- ii) Strong seismic ground shaking.
- iii) Seismic-related ground failure, including liquefaction.
- iv) Landslides.

G-2 Result in substantial soil erosion or the loss of topsoil.

G-3 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 on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.

G-4 Be located on expansive soil, as defined in Table 18-1B of the Uniform building Code (1994), creating substantial risks to life or property.

G-5 Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant:

- Threshold G-1.i: No active faults pass through or abut the project site.
- Threshold G-1.iii: The project site is not within a liquefaction zone.
- Threshold G-1.iv: The project site and surroundings are flat, with a southwest slope of about 1.5 percent grade and is not susceptible to landslide hazards.
- Threshold G-2: Construction and operation of projects under the Campus Plan would include implementation of Best Management Practices for erosion control and sediment control, as required under State Water Resources Control Board and Regional Water Quality Control Board permits.
- Threshold G-5: Developments under the Campus Plan would include installation of sewer laterals to existing sewer mains.

These impacts will not be addressed in the following analysis.

5.5.3 Environmental Impacts

Methodology

To determine the geologic and soil conditions and potential for geological hazards to occur on the project site, LGC Geotechnical reviewed readily available geotechnical data, information, published maps, and geotechnical reports prepared on the project site. Refer to Appendix F for additional information.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.5-1: Project workers, visitors, and structures would be subject to strong ground shaking. [Threshold G-I.ii])

Impact Analysis: Structures that would be built and renovated by the project would likely be subject to strong ground shaking within their design lifetimes.

The estimated peak ground acceleration onsite with a 2 percent probability of exceedance in 50 years—that is, an average return period of 2,475 years—is 0.860g, where g is the acceleration of gravity (CGS 2016b). Seismic design parameters for the project site were calculated in the geotechnical reports prepared by RTF&A in 2008 and 2009 (see Appendix F).[3] Ground acceleration of 0.860g correlates with intensity IX on the Modified Mercalli Intensity (MMI) Scale (Wald 1999), a subjective scale of how earthquakes are felt by people and the effects of earthquakes on buildings. The MMI Scale is a 12-point scale where Intensity I earthquakes are generally not felt by people; in Intensity XII earthquakes damage is total, and objects are thrown into the air. In an intensity IX earthquake, damage is considerable in specially designed structures and well-designed

[3] Seismic design parameters were a new requirement introduced in the 2007 California Building Code and so were not calculated in the two MACTEC geotechnical reports dated 2005.

frame structures are thrown out of plumb. Damage is great in substantial buildings, with partial collapse. Buildings are shifted off of foundations (USGS 2016).

Pursuant to CBC requirements, projects developed pursuant to the Campus Plan would be required to conduct geotechnical investigations conducted for their project sites. The geotechnical investigation reports would include seismic design parameters calculated based on CBC requirements. The design and construction of buildings and other improvements developed in conformance with the Campus Plan are required to comply with recommendations of such geotechnical reports. Seismic performance goals for structures generally expect that some property damage will be sustained in a moderate to large earthquake, but damage should be repairable and not life threatening. Structures should be able to resist minor earthquakes with no damage; resist moderate earthquakes with some nonstructural damage; and resist major earthquakes with some structural damage, but with a low likelihood of collapse.

The CBC contains provisions for earthquake safety based on factors including occupancy type, the types of soil and rock onsite, and the strength of ground motions with specified probability of occurring at the site. Many of the proposed buildings would be essential facilities as defined in CBC Section 1604.5, which include buildings containing surgical facilities and buildings containing certain quantities of highly toxic materials. Geotechnical reports would be required to take this into consideration when designing recommendations. Upon implementation of applicable CBC provisions, impacts related to seismic shaking would be less than significant.

Impact 5.5-2: Project workers, visitors, and structures would not be subjected to substantial hazards from ground subsidence, collapsible, or expansive soils. [Thresholds G-3 and G-4]

Impact Analysis:

Ground Subsidence

The major cause of ground subsidence is the excessive withdrawal of groundwater. The project site is above the Main San Gabriel Groundwater Basin (Basin). Groundwater levels in the Basin are managed by the Main San Gabriel Valley Watermaster to avoid overdraft of the Basin (MSGBW 2016); historic high groundwater levels are approximately 150 feet bgs. Because the basin is actively managed and there is a low groundwater table, project development would not subject workers, visitors, or structures to substantial hazards arising from ground subsidence, and impacts would be less than significant.

Collapsible Soils

Collapsible soils shrink upon being wetted and/or being subject to a load. The geotechnical investigation reports recommended that artificial fill soils onsite be removed to expose natural soils during site grading; removal depths were estimated to be up to two feet below existing grades. Geotechnical investigation reports for specific projects developed in accordance with the Campus Plan would test subsurface soil samples to determine the suitability of such soils for supporting the proposed buildings. Such reports would include recommendations for removal of unsuitable soils and replacement with engineered compacted soils; and for foundation design to adequately support buildings on soils after finish grading. Such development projects would comply with recommendations in geotechnical investigation reports for each respective project. Campus Plan buildout would not subject people or structures to substantial hazards arising from collapsible soils after geotechnical investigations and compliance with recommendations in ensuing reports. Impacts would be less than significant.

Expansive Soils

Expansive soils contain substantial amounts of clay, which swells when wetted and shrinks when dried. The swelling or shrinking can shift, crack, or break structures built on such soils. Samples of subsurface site soils tested during the geotechnical investigations yielded expansion indices ranging from 0 to 35 (RTF&A 2008). Soils with expansion indices of over 20 are considered expansive per CBC Section 1803.5.3. Geotechnical investigation reports for specific projects developed in accordance with the Campus Plan would test subsurface soil samples for expansion index. Such reports would include recommendations for engineering site soils and for foundation design to adequately support buildings on soils after finish grading. Such development projects would comply with recommendations in geotechnical investigation reports for each respective project. Campus Plan buildout would not subject people or structures to substantial hazards arising from expansive soils, and impacts would be less than significant.

5.5.4 Cumulative Impacts

Geology and soils impacts are site specific and generally do not combine to result in cumulative impacts. As discussed above, the Campus Plan project would result in less than significant geology and soils impacts. In addition, the project site and none of the immediately surrounding properties are within an area of identified geologic hazards. Future development projects in the vicinity of the project site would be required to have a site-specific geotechnical investigation prepared for the project applicant/developer and to comply with recommendations in the geotechnical investigation report, as well as comply with the provisions of the CBC. Therefore, no significant cumulative impact would occur.

5.5.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to geology and soils and were described in detail in Section 5.5.1.1 of this DEIR and are listed below.

State

- California Public Resources Code Sections 2621 et seq.:Alquist-Priolo Earthquake Fault Zoning Act
- California Public Resources Code Section 2695: Seismic Hazard Mapping Act
- California Building Code (California Code of Regulations Title 24 Part 2)
- California Health and Safety Code, Sections 17953 to 17955: Geotechnical Investigation Requirements

Local

- Duarte Municipal Code Section 19.46.040(E)(1): Requires geologic and soils reports

5.5.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.5-1 and 5.5-2.

5.5.7 Mitigation Measures

No mitigation measures are required.

5.5.8 Level of Significance After Mitigation

Impacts would be less than significant.

5.5.9 References

California Geological Survey (CGS). 2016a, August 23. Fault Activity Map of California (2010). http://maps.conservation.ca.gov/cgs/fam/.

———. 2016b, August 23. Ground Motion Interpolator. http://www.quake.ca.gov/gmaps/PSHA/psha_interpolator.html.

LGC Geotechnical Inc. 2016, February 29.Geotechnical Summary Regarding the City of Hope Specific Plan, Located in the Cities of Duarte and Irwindale, California.

Main San Gabriel Basin Watermaster (MSGBW). 2016, August 24. About Us. http://www.watermaster.org/geninfo.html.

Southern California Earthquake Data Center (SCEDC). 2016, August 9. Significant Earthquakes and Faults: Chronological Earthquake Index. http://www.data.scec.org/significant/chron-index.html.

US Geological Survey (USGS). 2016, April 7. The Modified Mercalli Intensity Scale. http://earthquake.usgs.gov/learn/topics/mercalli.php.

Wald, David J., et al. 1999, August. "Relationships between Peak Ground Acceleration, Peak Ground Velocity, and Modified Mercalli Intensity in California." *Earthquake Spectra* 15 No. 3.

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5.6 GREENHOUSE GAS EMISSIONS

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for implementation of the City of Hope Campus Plan to cumulatively contribute to greenhouse gas (GHG) emissions impacts. Because no single project is large enough to result in a measurable increase in global concentrations of GHG emissions, climate change impacts of a project are considered on a cumulative basis.

This evaluation is based on the methodology recommended by the South Coast Air Quality Management District (SCAQMD). Transportation-sector impacts are based on average daily vehicle trips associated with the project and vehicle miles traveled provided by Fehr and Peers (see Appendix J1). Overall GHG emissions are quantified using the California Emissions Estimator Model (CalEEMod), Version 2016.3.1. Modeling output sheets for the project are included in Appendix C1 of this DEIR.

Terminology

- **Greenhouse gases (GHG).** Gases in the atmosphere that absorb infrared light, thereby retaining heat in the atmosphere and contributing to a greenhouse effect.
- **Global warming potential (GWP).** Metric used to describe how much heat a molecule of a greenhouse gas absorbs relative to a molecule of carbon dioxide (CO_2) over a given period of time (20, 100, and 500 years). CO_2 has a GWP of 1.
- **Carbon dioxide-equivalent (CO_2e).** The standard unit to measure the amount of greenhouse gases in terms of the amount of CO_2 that would cause the same amount of warming. CO_2e is based on the GWP ratios between the various GHGs relative to CO_2.
- **$MTCO_2e$.** Metric ton of CO_2e.
- **$MMTCO_2e$.** Million metric tons of CO_2e.

5.6.1 Environmental Setting

5.6.1.1 GREENHOUSE GASES AND CLIMATE CHANGE

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHGs, to the atmosphere. The primary source of these GHGs is fossil fuel use. The Intergovernmental Panel on Climate Change (IPCC) has identified four major GHGs—water vapor, carbon dioxide (CO_2), methane (CH_4), and ozone (O_3)—that are the likely cause of an increase in global average temperatures observed within the 20th and 21st centuries. Other GHGs identified by the IPCC that contribute to global warming to a lesser extent are nitrous oxide (N_2O), sulfur hexafluoride (SF_6),

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hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons (IPCC 2001).[1],[2] The major GHGs are briefly described below.

- **Carbon dioxide (CO_2)** enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and respiration, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (sequestered) when it is absorbed by plants as part of the biological carbon cycle.

- **Methane (CH_4)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in landfills and water treatment facilities.

- **Nitrous oxide (N_2O)** is emitted during agricultural and industrial activities as well as during the combustion of fossil fuels and solid waste.

- **Fluorinated gases** are synthetic, strong GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as high GWP gases.

  - ***Chlorofluorocarbons (CFCs)*** are GHGs covered under the 1987 Montreal Protocol and used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants. Since they are not destroyed in the lower atmosphere (troposphere), CFCs drift into the upper atmosphere where, given suitable conditions, they break down the ozone layer. These gases are therefore being replaced by other compounds that are GHGs covered under the Kyoto Protocol.

  - ***Perfluorocarbons (PFCs)*** are a group of human-made chemicals composed of carbon and fluorine only. These chemicals (predominantly perfluoromethane [CF_4] and perfluoroethane [C_2F_6]) were introduced as alternatives, along with hydrofluorocarbons (HFCs), to ozone-depleting substances. In addition, PFCs are emitted as by-products of industrial processes and are used in manufacturing. PFCs do not harm the stratospheric ozone layer, but they have a high GWP.

  - ***Sulfur Hexafluoride (SF_6)*** is a colorless gas soluble in alcohol and ether, and slightly soluble in water. SF_6 is a strong GHG used primarily in electrical transmission and distribution systems as an insulator.

[1] Water vapor (H_2O) is the strongest GHG and the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant because it is considered part of the feedback loop rather than a primary cause of change.

[2] Black carbon contributes to climate change both directly, by absorbing sunlight, and indirectly, by depositing on snow (making it melt faster) and by interacting with clouds and affecting cloud formation. Black carbon is the most strongly light-absorbing component of particulate matter (PM) emitted from burning fuels such as coal, diesel, and biomass. Reducing black carbon emissions globally can have immediate economic, climate, and public health benefits. California has been an international leader in reducing emissions of black carbon, with close to 95 percent control expected by 2020 due to existing programs that target reducing PM from diesel engines and burning activities (CARB 2017a). However, state and national GHG inventories do not include black carbon due to ongoing work resolving the precise global warming potential of black carbon. Guidance for CEQA documents does not yet include black carbon.

- ***Hydrochlorofluorocarbons (HCFCs)*** contain hydrogen, fluorine, chlorine, and carbon atoms. Although they are ozone-depleting substances, they are less potent than CFCs. They have been introduced as temporary replacements for CFCs.

- ***Hydrofluorocarbons (HFCs)*** contain only hydrogen, fluorine, and carbon atoms. They were introduced as alternatives to ozone-depleting substances to serve many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are also used in manufacturing. They do not significantly deplete the stratospheric ozone layer, but they are strong GHGs. (IPCC 1995; USEPA 2017)

GHGs are dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Some GHGs have a stronger greenhouse effect than others. These are referred to as high GWP gases. The GWP of GHG emissions are shown in Table 5.6-1, *GHG Emissions and their Relative Global Warming Potential Compared to* CO_2. The GWP is used to convert GHGs to CO_2 equivalence (CO_2e) to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. For example, under IPCC's Fourth Assessment Report (AR4) GWP values for CH_4, a project that generates 10 metric tons (MT) of CH_4 would be equivalent to 250 MT of CO_2. [3]

Table 5.6-1 GHG Emissions and their Relative Global Warming Potential Compared to CO_2

GHGs	Second Assessment Report Atmospheric Lifetime (Years)	Fourth Assessment Report Atmospheric Lifetime (Years)	Second Assessment Report Global Warming Potential Relative to CO_2[1]	Fourth Assessment Report Global Warming Potential Relative to CO_2[1]
Carbon Dioxide (CO_2)	50 to 200	50 to 200	1	1
Methane[2] (CH_4)	12 (±3)	12	21	25
Nitrous Oxide (N_2O)	120	114	310	298
Hydrofluorocarbons:				
HFC-23	264	270	11,700	14,800
HFC-32	5.6	4.9	650	675
HFC-125	32.6	29	2,800	3,500
HFC-134a	14.6	14	1,300	1,430
HFC-143a	48.3	52	3,800	4,470
HFC-152a	1.5	1.4	140	124
HFC-227ea	36.5	34.2	2,900	3,220
HFC-236fa	209	240	6,300	9,810
HFC-4310mee	17.1	15.9	1,300	1,030
Perfluoromethane: CF_4	50,000	50,000	6,500	7,390
Perfluoroethane: C_2F_6	10,000	10,000	9,200	12,200
Perfluorobutane: C_4F_{10}	2,600	NA	7,000	8,860
Perfluoro-2-methylpentane: C_6F_{14}	3,200	NA	7,400	9,300
Sulfur Hexafluoride (SF_6)	3,200	NA	23,900	22,800

3 CO_2-equivalence is used to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The global warming potential of a GHG is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

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Table 5.6-1 GHG Emissions and their Relative Global Warming Potential Compared to CO_2

GHGs	Second Assessment Report Atmospheric Lifetime (Years)	Fourth Assessment Report Atmospheric Lifetime (Years)	Second Assessment Report Global Warming Potential Relative to CO_2[1]	Fourth Assessment Report Global Warming Potential Relative to CO_2[1]

Source: IPCC 1995; IPCC 2007.
Notes: The IPCC has published updated global warming potential (GWP) values in its Fifth Assessment Report (2013) that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO_2. However, GWP values in AR4 are used by SCAQMD to maintain consistency in statewide GHG emissions modeling. In addition, the 2014 Scoping Plan Update was based on AR4 GWP values.
[1] Based on 100-year time horizon of the GWP of the air pollutant relative to CO_2.
[2] The methane GWP includes direct effects and indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

California's GHG Sources and Relative Contribution

California is the 20th largest GHG emitter in the world and the second largest emitter of GHG emissions in the United States, surpassed only by Texas (CARB 2014a). However, California also has over 12 million more people than Texas. Because of more stringent air emission regulations, in 2014, California ranked third lowest in energy-related carbon emissions per capita (EIA 2014).

In 2016, the statewide GHG emissions inventory was updated for 2000 to 2014 emissions using the GWPs in IPCC's AR4.[4] Based on these GWPs, California produced 442 $MMTCO_2e$ GHG emissions in 2014. California's transportation sector remains the single largest generator of GHG emissions, producing 36.1 percent of the state's total emissions. Industrial sector emissions made up 21.1 percent and electric power generation made up 20.0 percent of the state's emissions inventory. Other major sectors of GHG emissions include commercial and residential (8.7 percent), agriculture (8.2 percent), high-GWP GHGs (3.9 percent), and recycling and waste (2.0 percent) (CARB 2016a).

Human Influence on Climate Change

For approximately 1,000 years before the Industrial Revolution, the amount of GHGs in the atmosphere remained relatively constant. During the 20th century, however, scientists observed a rapid change in the climate and the quantity of climate change pollutants in the Earth's atmosphere that is attributable to human activities. The amount of CO_2 in the atmosphere has increased by more than 35 percent since preindustrial times and has increased at an average rate of 1.4 parts per million per year since 1960, mainly due to combustion of fossil fuels and deforestation (IPCC 2007). These recent changes in the quantity and concentration of climate change pollutants far exceed the extremes of the ice ages, and the global mean temperature is warming at a rate that cannot be explained by natural causes alone. Human activities are directly altering the chemical composition of the atmosphere through the buildup of climate change pollutants (CAT 2006). In the past, gradual changes in the earth's temperature changed the distribution of species, availability of water, etc. However, human activities are accelerating this process so that environmental impacts associated with climate change no longer occur in a geologic time frame but within a human lifetime (IPCC 2007).

[4] Methodology for determining the statewide GHG inventory is not the same as the methodology used to determine statewide GHG emissions under Assembly Bill 32 (2006).

Like the variability in the projections of the expected increase in global surface temperatures, the environmental consequences of gradual changes in the Earth's temperature are also hard to predict. Projections of climate change depend heavily upon future human activity. Therefore, climate models are based on different emission scenarios that account for historic trends in emissions and on observations of the climate record that assess the human influence of the trend and projections for extreme weather events. Climate-change scenarios are affected by varying degrees of uncertainty. For example, there are varying degrees of certainty on the magnitude of the trends for:

- Warmer temperatures and fewer cold days and nights over most land areas.
- Warmer temperatures and more frequent hot days and nights over most land areas.
- An increase in frequency of warm spells/heat waves over most land areas.
- An increase in frequency of heavy precipitation events (or proportion of total rainfall from heavy falls) over most areas.
- Larger areas affected by drought.
- Intense tropical cyclone activity increases.
- Increased incidence of extremely high sea level (excludes tsunamis).

Observed changes over the last several decades across the western United States reveal clear signs of climate change. Statewide average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been greatest in the Sierra Nevada. By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase from 4.1 to 8.6°F, depending on emissions levels (CCCC 2012).

Potential Climate Change Impacts for California

In California and western North America, observations of the climate have shown: 1) a trend toward warmer winter and spring temperatures; 2) a smaller fraction of precipitation falling as snow; 3) a decrease in the amount of spring snow accumulation in the lower and middle elevation mountain zones; 4) an advanced snowmelt of 5 to 30 days earlier in the springs; and 5) a similar shift (5 to 30 days earlier) in the timing of spring flower blooms (CAT 2006). According to the California Climate Action Team, even if actions could be taken to immediately curtail climate change emissions, the potency of emissions that have already built up, their long atmospheric lifetimes (see Table 5.6-1), and the inertia of the Earth's climate system could produce as much as 0.6°C (1.1°F) of additional warming. Consequently, some impacts from climate change are now considered unavoidable. Global climate change risks to California are listed in Table 5.6-2, *Summary of GHG Emissions Risks to California*, and include impacts to public health, water resources, agriculture, coastal sea level, forest and biological resources, and energy.

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Table 5.6-2 Summary of GHG Emissions Risks to California

Impact Category	Potential Risk
Public Health Impacts	Heat waves will be more frequent, hotter, and longer Fewer extremely cold nights Poor air quality made worse Higher temperatures increase ground-level ozone levels
Water Resources Impacts	Decreasing Sierra Nevada snow pack Challenges in securing adequate water supply Potential reduction in hydropower Loss of winter recreation
Agricultural Impacts	Increasing temperature Increasing threats from pests and pathogens Expanded ranges of agricultural weeds Declining productivity Irregular blooms and harvests
Coastal Sea Level Impacts	Accelerated sea level rise Increasing coastal floods Shrinking beaches Worsened impacts on infrastructure
Forest and Biological Resource Impacts	Increased risk and severity of wildfires Lengthening of the wildfire season Movement of forest areas Conversion of forest to grassland Declining forest productivity Increasing threats from pest and pathogens Shifting vegetation and species distribution Altered timing of migration and mating habits Loss of sensitive or slow-moving species
Energy Demand Impacts	Potential reduction in hydropower Increased energy demand

Sources: CEC 2006; CEC 2009; CCCC 2012; CNRA 2014.

Specific climate change impacts that could affect the proposed project include:

- **Water Resources Impacts.** By the late twenty-first century, all projections show drying, and half of the projections suggest 30-year average precipitation will decline by more than 10 percent below the historical average. This drying trend is caused by an apparent decline in the frequency of rain and snowfall. Even in projections with relatively small or no declines in precipitation, central and southern parts of the state can be expected to be drier from the warming effects alone because the spring snowpack will melt sooner, and the moisture in soils will evaporate during long dry summer months (CCCC 2012).

- **Wildfire Risks.** Earlier snowmelt, higher temperatures, and longer dry periods over a longer fire season will directly increase wildfire risk. Indirectly, wildfire risk will also be influenced by potential climate-related changes in vegetation and ignition potential from lightning. Human activities will continue to be the biggest factor in ignition risk. The number of large fires statewide is estimated to increase from 58 percent to 128 percent above historical levels by 2085. Under the same emissions scenario, estimated burned area will increase by 57 percent to 169 percent, depending on location (CCCC 2012).

- **Health Impacts.** Many of the gravest threats to public health in California stem from the increase of extreme conditions, principally more frequent, more intense, and longer heat waves. Particular concern centers on the increasing frequency of multiple hot days in succession, and simultaneous heat waves in several regions throughout the state. Public health could also be affected by climate change impacts on air quality, food production, the amount and quality of water supplies, energy pricing and availability, and the spread of infectious diseases. Higher temperatures also increase ground-level ozone levels. Furthermore, wildfires can increase particulate air pollution in the major air basins of California (CCCC 2012).

- **Increased Energy Demand.** Increases in average temperature and higher frequency of extreme heat events combined with new residential development across the state will drive up the demand for cooling in the increasingly hot and long summer season and decrease demand for heating in the cooler season. Warmer, drier summers also increase system losses at natural gas plants (reduced efficiency in the electricity generation process from higher temperatures) and hydropower plants (lower reservoir levels). Transmission of electricity will also be affected by climate change. Transmission lines lose 7 percent to 8 percent of transmitting capacity in high temperatures while needing to transport greater loads. This means that more electricity needs to be produced to make up for the loss in capacity and the growing demand (CCCC 2012).

5.6.1.2 REGULATORY SETTING

This section describes the federal, state, and local regulations applicable to GHG emissions.

Federal Laws

The US Environmental Protection Agency (EPA) announced on December 7, 2009, that GHG emissions threaten the public health and welfare of the American people and that GHG emissions from on-road vehicles contribute to that threat. The EPA's final findings respond to the 2007 US Supreme Court decision that GHG emissions fit within the Clean Air Act definition of air pollutants. The findings did not themselves impose any emission reduction requirements, but allowed the EPA to finalize the GHG standards proposed in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation (USEPA 2009).

To regulate GHGs from passenger vehicles, EPA was required to issue an endangerment finding. The finding covers emissions of six key GHGs—CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and SF_6—that have been the subject of scrutiny and intense analysis for decades by scientists in the United States and around the world. The first three are applicable to the proposed project's GHG emissions inventory because they constitute the majority of GHG emissions, and according to SCAQMD guidance are the GHG emissions that should be evaluated as part of a project's GHG emissions inventory.

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US Mandatory Reporting Rule for GHGs (2009)

In response to the endangerment finding, the EPA issued the Mandatory Reporting of GHG Rule that requires substantial emitters of GHG emissions (large stationary sources, etc.) to report GHG emissions data. Facilities that emit 25,000 $MTCO_2e$ or more per year must submit an annual report.

Update to Corporate Average Fuel Economy Standards (2010/2012)

The current Corporate Average Fuel Economy standards (for model years 2011 to 2016) incorporate stricter fuel economy requirements promulgated by the federal government and California into one uniform standard. Additionally, automakers are required to cut GHG emissions in new vehicles by roughly 25 percent by 2016 (resulting in a fleet average of 35.5 miles per gallon by 2016). Rulemaking to adopt these new standards was completed in 2010. California agreed to allow automakers who show compliance with the national program to also be deemed in compliance with state requirements. The federal government issued new standards in 2012 for model years 2017–2025, which will require a fleet average of 54.5 miles per gallon in 2025. However, the EPA is reexamining the 2017-2025 emissions standards.

EPA Regulation of Stationary Sources under the Clean Air Act (Ongoing)

Pursuant to its authority under the Clean Air Act, the EPA has been developing regulations for new stationary sources such as power plants, refineries, and other large sources of emissions. Pursuant to former President Obama's 2013 Climate Action Plan, the EPA will be directed to develop regulations for existing stationary sources also. However, the EPA is reviewing the Clean Power Plan under President Trump's Energy Independence Executive Order.

State Laws

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in Executive Orders S-03-05 and B-30-15, Assembly Bill 32 (AB 32), Senate Bill 32 (SB 32), and SB 375.

Executive Order S-03-05

Executive Order S-03-05, signed June 1, 2005, set the following GHG reduction targets for the state:

- 2000 levels by 2010
- 1990 levels by 2020
- 80 percent below 1990 levels by 2050

Assembly Bill 32, the Global Warming Solutions Act (2006)

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in AB 32, the Global Warming Solutions Act. AB 32 was passed by the California state legislature on August 31, 2006, to place the state on a course toward reducing its contribution of GHG emissions. AB 32 follows the 2020 tier of emissions reduction targets established in Executive Order S-03-05.

CARB 2008 Scoping Plan

The final Scoping Plan was adopted by CARB on December 11, 2008. The *2008 Scoping Plan* identified that GHG emissions in California are anticipated to be approximately 596 $MMTCO_2e$ in 2020. In December 2007, CARB approved a 2020 emissions limit of 427 $MMTCO_2e$ (471 million tons) for the state (CARB 2008). In order to effectively implement the emissions cap, AB 32 directed CARB to establish a mandatory reporting system to track and monitor GHG emissions levels for large stationary sources that generate more than 25,000 $MTCO_2e$ per year, prepare a plan demonstrating how the 2020 deadline can be met, and develop appropriate regulations and programs to implement the plan by 2012.

First Update to the Scoping Plan

CARB completed a five-year update to the 2008 Scoping Plan, as required by AB 32. The First Update to the Scoping Plan was adopted at the May 22, 2014, board hearing. The update highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals defined in the original 2008 Scoping Plan. As part of the update, CARB recalculated the 1990 GHG emission levels with the updated GWPs in the Fourth Assessment Report, and the 427 $MMTCO_2e$ 1990 emissions level and 2020 GHG emissions limit, established in response to AB 32, is slightly higher at 431 $MMTCO_2e$ (CARB 2014b).

As identified in the Update to the Scoping Plan, California is on track to meeting the goals of AB 32. However, the update also addresses the state's longer-term GHG goals within a post-2020 element. The post-2020 element provides a high level view of a long-term strategy for meeting the 2050 GHG goals, including a recommendation for the state to adopt a midterm target. According to the Update to the Scoping Plan, local government reduction targets should chart a reduction trajectory that is consistent with or exceeds the trajectory created by statewide goals (CARB 2014b). CARB identified that reducing emissions to 80 percent below 1990 levels will require a fundamental shift to efficient, clean energy in every sector of the economy. Progressing toward California's 2050 climate targets will require significant acceleration of GHG reduction rates. Emissions from 2020 to 2050 will have to decline several times faster than the rate needed to reach the 2020 emissions limit (CARB 2014b).

Executive Order B-30-15

Executive Order B-30-15, signed April 29, 2015, sets a goal of reducing GHG emissions within the state to 40 percent below 1990 levels by year 2030. Executive Order B-30-15 also directs CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the state and requires state agencies to implement measures to meet the interim 2030 goal as well as the long-term goal for 2050 in Executive Order S-03-05. It also requires the Natural Resources Agency to conduct triennial updates of the California adaption strategy, Safeguarding California, in order to ensure climate change is accounted for in state planning and investment decisions.

Senate Bill 32 and Assembly Bill 197

In September 2016, Governor Brown signed SB 32 and AB 197 into law, making the Executive Order goal for year 2030 into a statewide mandated legislative target. AB 197 established a joint legislative committee on climate change policies and requires the CARB to prioritize direction emissions reductions rather than the market-based cap-and-trade program for large stationary, mobile, and other sources.

2017 Climate Change Scoping Plan Update

Executive Order B-30-15 and SB 32 required CARB to prepare another update to the Scoping Plan to address the 2030 target for the state. On January 20, 2017, CARB released the *Draft 2017 Climate Change Scoping Plan Update* with adoption hearings planned for December of 2017. The *Draft 2017 Climate Change Scoping Plan Update* includes the potential regulations and programs including strategies consistent with AB 197 requirements to achieve the 2030 target. The 2017 Scoping Plan establishes a new emissions limit of 260 $MMTCO_2e$ for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030 (CARB 2017b).

California's climate strategy will require contributions from all sectors of the economy, including the land base, and will include enhanced focus on zero- and near-zero emission (ZE/NZE) vehicle technologies; continued investment in renewables, including solar roofs, wind, and other distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (methane, black carbon, and fluorinated gases); and an increased focus on integrated land use planning, to support livable, transit-connected communities and conservation of agricultural and other lands. Requirements for direct GHG reductions at refineries will further support air quality co-benefits in neighborhoods, including in disadvantaged communities historically located adjacent to these large stationary sources, as well as efforts with California's local air pollution control and air quality management districts (air districts) to tighten emission limits on a broad spectrum of industrial sources. Major elements of the 2017 Scoping Plan framework include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which include increasing zero-emissions buses and trucks;
- Low Carbon Fuel Standard (LCFS), with an increased stringency (18 percent by 2030);
- Implementation of SB 350, which expands the Renewables Portfolio Standard (RPS) to 50 percent RPS and doubles energy efficiency savings by 2030;
- California Sustainable Freight Action Plan, which improves freight system efficiency, utilizes near-zero emissions technology, and deployment of zero-emissions trucks;
- Implementing the proposed Short-Lived Climate Pollutant Strategy (SLPS), which focuses on reducing methane and hydroflurocarbon emissions by 40 percent and anthropogenic black carbon emissions by 50 percent by year 2030;
- Continued implementation of SB 375;
- Post-2020 Cap-and-Trade Program that includes declining caps;

- 20 percent reduction in GHG emissions from refineries by 2030[5]; and
- Development of a Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

In addition to the statewide strategies listed above, the *2017 Climate Change Scoping Plan* also identified local governments as essential partners in achieving the State's long-term GHG reduction goals and identified local actions to reduce GHG emissions. As part of the recommended actions, CARB recommends that local governments achieve a community-wide goal to achieve emissions of no more than 6 $MTCO_2e$ or less per capita by 2030 and 2 $MTCO_2e$ or less per capita by 2050. For CEQA projects, CARB states that lead agencies may develop evidenced-based bright-line numeric thresholds—consistent with the Scoping Plan and the State's long-term GHG goals—and projects with emissions over that amount may be required to incorporate on-site design features and mitigation measures that avoid or minimize project emissions to the degree feasible; or, a performance-based metric using a climate action plan or other plan to reduce GHG emissions is appropriate (CARB 2017b).

The Scoping Plan scenario is set against what is called the business-as-usual (BAU) yardstick—that is, what would the GHG emissions look like if the State did nothing at all beyond the existing policies that are required and already in place to achieve the 2020 limit, as shown in Table 5.6-3, *2017 Climate Change Scoping Plan Emissions Reductions Gap to Achieve the 2030 GHG Target*. It includes the existing renewables requirements, advanced clean cars, the "10 percent" Low Carbon Fuel Standard (LCFS), and the SB 375 program for more vibrant communities, among others. However, it does not include a range of new policies or measures that have been developed or put into statute over the past two years. As also shown in the table, the known commitments are expected to result in emissions that are 50 $MMTCO_2e$ above the target in 2030. In order to make up the "gap", a new Post- 2020 Cap-and-Trade Program and refinery measure are key components of the 2017 Scoping Plan.

Table 5.6-3 2017 Climate Change Scoping Plan Emissions Reductions Gap to Achieve the 2030 GHG Target

Modeling Scenario	2030 GHG Emissions $MMTCO_2e$
Reference Scenario (Business-as-Usual)	392.4
With Known Commitments	310
2030 GHG Target	**260**

Source: CARB 2017b

[5] The plan includes policies to require direct GHG reductions at some of the State's largest stationary sources and mobile sources in accordance with AB 197. These policies include the use of lower GHG fuels, efficiency regulations, and the Cap-and-Trade Program, which constrains and reduces emissions at covered sources.

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Table 5.6-4, *2017 Climate Change Scoping Plan Emissions Change by Sector to Achieve the 2030 Target*, provides estimated GHG emissions by sector, compared to 1990 levels, and the range of GHG emissions for each sector estimated for 2030.

Table 5.6-4 2017 Climate Change Scoping Plan Emissions Change by Sector to Achieve the 2030 Target

Scoping Plan Sector	1990 $MMTCO_2e$	2030 Proposed Plan Ranges $MMTCO_2e$	% Change from 1990
Agricultural	26	24-25	-4% to -8%
Residential and Commercial	44	38-40	-9% to -14%
Electric Power	108	42-62	-43% to -61%
High GWP	3	8-11	167% to 267%
Industrial	98	77-87	-11% to -21%
Recycling and Waste	7	8-9	14% to 29%
Transportation (including TCU)	152	103-111	-27% to -32%
Net Sink[1]	-7	TBD	TBD
Sub Total	431	300-345	-20% to -30%
Cap-and-Trade Program	NA	40-85	NA
Total	431	260	-40%

Source: CARB 2017b
Notes: TCU = Transportation, Communications, and Utilities; TBD: To Be Determined.
[1] Work is underway through 2017 to estimate the range of potential sequestration benefits from the natural and working lands sector.

Senate Bill 1383

On September 19, 2016, the Governor signed SB 1383 to supplement the GHG reduction strategies in the Scoping Plan to consider short-lived climate pollutants, including black carbon and CH_4. Black carbon is the light-absorbing component of fine particulate matter (PM) produced during incomplete combustion of fuels. SB 1383 requires the state board, no later than January 1, 2018, to approve and begin implementing that comprehensive strategy to reduce emissions of short-lived climate pollutants to achieve a reduction in methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030, as specified. The bill also establishes targets for reducing organic waste in landfill. On March 14, 2017, CARB adopted the *Final Short-Lived Climate Pollutant Strategy*, which identifies the state's approach to reducing anthropogenic and biogenic sources of short-lived climate pollutants. Anthropogenic sources of black carbon include on- and off-road transportation, residential wood burning, fuel combustion (charbroiling), and industrial processes. According to CARB, ambient levels of black carbon in California are 90 percent lower than in the early 1960s, despite the tripling of diesel fuel use (CARB 2017a). In-use on-road rules are expected to reduce black carbon emissions from on-road sources by 80 percent between 2000 and 2020. SCAQMD is one of the air districts that require air pollution control technologies for chain-driven broilers, which reduces particulate emissions from these char broilers by over 80 percent (CARB 2017a). Additionally, SCAQMD Rule 445, wood-burning devices limits installation of new fireplaces in the SoCAB.

Senate Bill 375

In 2008, SB 375, the Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions reductions targets established in the 2008 Scoping Plan for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions reduction targets for each of the 18 metropolitan planning organizations (MPOs). The Southern California Association of Governments (SCAG) is the MPO for the Southern California region, which includes the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial.

Pursuant to the recommendations of the Regional Transportation Advisory Committee, CARB adopted per capita reduction targets for each of the MPOs rather than a total magnitude reduction target. SCAG's targets are an 8 percent per capita reduction from 2005 GHG emission levels by 2020 and a 13 percent per capita reduction from 2005 GHG emission levels by 2035 (CARB 2010).

The 2020 targets are smaller than the 2035 targets because a significant portion of the built environment in 2020 has been defined by decisions that have already been made. In general, the 2020 scenarios reflect that more time is needed for large land use and transportation infrastructure changes. Most of the reductions in the interim are anticipated to come from improving the efficiency of the region's transportation network. The targets would result in 3 $MMTCO_2e$ of reductions by 2020 and 15 $MMTCO_2e$ of reductions by 2035. Based on these reductions, the passenger vehicle target in CARB's Scoping Plan (for AB 32) would be met (CARB 2010).

2017 Update to the SB 375 Targets

CARB is currently in the process of updating the next round of targets and methodology to comply with the requirement for updates every eight years. In June 2017, CARB released updated targets and technical methodology. The updated targets consider the need to further reduce VMT, as identified in the draft 2017 Scoping Plan Update, while balancing the need for additional and more flexible revenue sources to incentivize positive planning and action toward sustainable communities. Like the 2010 targets, the updated SB 375 targets are in units of percent per capita reduction in GHG emissions from automobiles and light trucks relative to 2005. This excludes reductions anticipated from implementation of state technology and fuels strategies and any potential future state strategies such as statewide road user pricing. The proposed targets call for greater per capita GHG emission reductions from SB 375 than are currently in place, which for 2035, translate into proposed targets that either match or exceed the emission reduction levels in the MPOs' currently adopted SCSs. As proposed, CARB staff's proposed targets would result in an additional reduction of over 10 $MMTCO_2e$ in 2035 compared to the current targets. For the next round of SCS updates, CARB's updated targets for the SCAG region are an 8 percent per capita GHG reduction in 2020 from 2005 levels (unchanged from the 2010 target) and a 21 percent per capita GHG reduction in 2035 from 2005 levels (compared to the 2010 target of 13 percent) (CARB 2017c). CARB anticipates adoption of the updated targets and methodology in Fall 2017. The updated targets and methodology will take effect on January 1, 2018, and SCS adopted in 2018 and later would be subject to these new targets.

SCAG's 2016-2040 RTP/SCS

SB 375 requires the MPOs to prepare a sustainable communities strategy in their regional transportation plan. For the SCAG region, the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) was adopted on April 7, 2016, and is an update to the 2012 RTP/SCS (SCAG 2016). In general, the SCS outlines a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce vehicle miles traveled from automobiles and light duty trucks and thereby reduce GHG emissions from these sources.

The 2016-2040 RTP/SCS projects that the SCAG region will meet or exceed the passenger per capita targets set in 2010 by CARB. It is projected that VMT per capita in the region for year 2040 would be reduced by 7.4 percent with implementation of the 2016-2040 RTP/SCS compared to a no-plan year 2040 scenario. Under the 2016-2040 RTP/SCS, SCAG anticipates lowering GHG emissions 8 percent below 2005 levels by 2020, 18 percent by 2035, and 21 percent by 2040. The 18 percent reduction by 2035 over 2005 levels represents a 2 percent increase in reduction compared to the 2012 RTP/SCS projection. Overall, the SCS is meant to provide growth strategies that will achieve the aforementioned regional GHG emissions reduction targets. Land use strategies to achieve the region's targets include planning for new growth around high quality transit areas and livable corridors, and creating neighborhood mobility areas to integrate land use and transportation and plan for more active lifestyles (SCAG 2016). However, the SCS does not require that local general plans, specific plans, or zoning be consistent with the SCS; instead, it provides incentives to governments and developers for consistency.

Assembly Bill 1493

California vehicle GHG emission standards were enacted under AB 1493 (Pavley I). Pavley I is a clean-car standard that reduces GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016 and is anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. California implements the Pavley I standards through a waiver granted to California by the EPA. In 2012, the EPA issued a Final Rulemaking that sets even more stringent fuel economy and GHG emissions standards for model year 2017 through 2025 light-duty vehicles (see also the discussion on the update to the Corporate Average Fuel Economy standards under *Federal Laws*, above). In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards. Under California's Advanced Clean Car program, by 2025, new automobiles will emit 34 percent less global warming gases and 75 percent less smog-forming emissions.

Executive Order S-01-07

On January 18, 2007, the state set a new low carbon fuel standard (LCFS) for transportation fuels sold within the state. Executive Order S-01-07 sets a declining standard for GHG emissions measured in carbon dioxide equivalent gram per unit of fuel energy sold in California. The LCFS requires a reduction of 2.5 percent in the carbon intensity of California's transportation fuels by 2015 and a reduction of at least 10 percent by 2020. The standard applies to refiners, blenders, producers, and importers of transportation fuels, and would use market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods.

Senate Bills 1078, 107, X1-2, and Executive Order S-14-08

A major component of California's Renewable Energy Program is the renewables portfolio standard (RPS) established under SBs 1078 (Sher) and 107 (Simitian). Under the RPS, certain retail sellers of electricity were required to increase the amount of renewable energy each year by at least 1 percent in order to reach at least 20 percent by December 30, 2010. Executive Order S-14-08 was signed in November 2008, which expands the state's renewable energy standard to 33 percent renewable power by 2020. This standard was adopted by the legislature in 2011 (SBX1-2). Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. The increase in renewable sources for electricity production will decrease indirect GHG emissions from development projects, because electricity production from renewable sources is generally considered carbon neutral.

Senate Bill 350

SB 350 (de Leon), was signed into law September 2015 and establishes tiered increases to the RPS—40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 also set a new goal to double the energy-efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

Executive Order B-16-2012

On March 23, 2012, the state identified that CARB, the California Energy Commission (CEC), the Public Utilities Commission, and other relevant agencies worked with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to accommodate zero-emissions vehicles in major metropolitan areas, including infrastructure to support them (e.g., electric vehicle charging stations). The executive order also directs the number of zero-emission vehicles in California's state vehicle fleet to increase through the normal course of fleet replacement so that at least 10 percent of fleet purchases of light-duty vehicles are zero-emission by 2015 and at least 25 percent by 2020. The executive order also establishes a target for the transportation sector of reducing GHG emissions from the transportation sector 80 percent below 1990 levels.

California Building Code: Building Energy Efficiency Standards

Energy conservation standards for new residential and nonresidential buildings were adopted by the California Energy Resources Conservation and Development Commission (now the CEC) in June 1977 and most recently revised in 2013 (Title 24, Part 6, of the California Code of Regulations [CCR]). Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods. On June 10, 2015, the CEC adopted the 2016 Building Energy Efficiency Standards, which went into effect on January 1, 2017.

The 2016 Standards will continue to improve upon the current 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. Under the 2016 Standards, residential buildings are 28 percent more energy efficient than the 2013 Standards, and nonresidential buildings are 5 percent more energy efficient than the 2013 Standards (CEC 2015a). Buildings that are constructed in accordance with the 2013 Building Energy Efficiency Standards are 25 percent (residential) to 30 percent (nonresidential) more energy efficient than the 2008 standards as a result of better windows, insulation, lighting, ventilation systems, and other features. The 2016 standards do not achieve zero net energy, they do get very close to the state's goal and make important steps toward changing residential building practices in California. The 2019 standards will take the final step to achieve zero net energy for newly constructed residential buildings throughout California (CEC 2015b).

California Building Code: CALGreen

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (24 CCR, Part 11, known as "CALGreen") was adopted as part of the California Building Standards Code. CALGreen established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants.[6] The mandatory provisions of CALGreen became effective January 1, 2011, and were last updated in 2016. The 2016 Standards became effective on January 1, 2017.

2006 Appliance Efficiency Regulations

The 2006 Appliance Efficiency Regulations (20 CCR §§ 1601–1608) were adopted by the CEC on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally regulated appliances and non–federally regulated appliances. Though these regulations are now often viewed as "business as usual," they exceed the standards imposed by all other states, and they reduce GHG emissions by reducing energy demand.

Solid Waste Regulations

California's Integrated Waste Management Act of 1989 (AB 939, Public Resources Code §§ 40050 et seq.) set a requirement for cities and counties throughout the state to divert 50 percent of all solid waste from landfills by January 1, 2000, through source reduction, recycling, and composting. In 2008, the requirements were modified to reflect a per capita requirement rather than tonnage. To help achieve this, the act requires that each city and county prepare and submit a source reduction and recycling element. AB 939 also established the goal for all California counties to provide at least 15 years of ongoing landfill capacity.

AB 341 (Chapter 476, Statutes of 2011) increased the statewide goal for waste diversion to 75 percent by 2020 and requires recycling of waste from commercial and multifamily residential land uses.

The California Solid Waste Reuse and Recycling Access Act (AB 1327, Public Resources Code §§ 42900 et seq.) requires areas to be set aside for collecting and loading recyclable materials in development projects. The act required the California Integrated Waste Management Board to develop a model ordinance for adoption

6 The green building standards became mandatory in the 2010 edition of the code.

by any local agency requiring adequate areas for collection and loading of recyclable materials as part of development projects. Local agencies are required to adopt the model or an ordinance of their own.

Section 5.408 of the 2016 CALGreen also requires that at least 65 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse.

In October of 2014 Governor Brown signed AB 1826 requiring businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate per week. This law also requires that on and after January 1, 2016, local jurisdictions across the state implement an organic waste recycling program to divert organic waste generated by businesses, including multifamily residential dwellings that consist of five or more units. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste.

Water Efficiency Regulations

The 20x2020 Water Conservation Plan was issued by the Department of Water Resources (DWR) in 2010 pursuant to Senate Bill 7, which was adopted during the 7th Extraordinary Session of 2009–2010 and therefore dubbed "SBX7-7." SBX7-7 mandated urban water conservation and authorized the DWR to prepare a plan implementing urban water conservation requirements (20x2020 Water Conservation Plan). In addition, it required agricultural water providers to prepare agricultural water management plans, measure water deliveries to customers, and implement other efficiency measures. SBX7-7 requires urban water providers to adopt a water conservation target of 20 percent reduction in urban per capita water use by 2020 compared to 2005 baseline use.

The Water Conservation in Landscaping Act of 2006 (AB 1881) requires local agencies to adopt the updated DWR model ordinance or an equivalent. AB 1881 also requires the CEC to consult with the DWR to adopt, by regulation, performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

Local

The following discusses the applicable Duarte and Irwindale plans and regulations that would contribute to reducing GHG emissions. Per the Alfred E. Alquist Hospital Facilities Seismic Safety Act of 1983, the Office of Statewide Health Planning and Development (OSHPD) is the enforcement agency for hospital buildings, acute psychiatric hospitals, skilled nursing facilities, and intermediate care facilities—as defined in Section 129725 of the Health and Safety Code—with regard to the applicable Title 24 building standards, preempting the local jurisdiction. However, the City of Duarte or City of Irwindale would have jurisdiction over parts of the proposed Specific Plan that are not under OSHPD's jurisdiction—such as surface parking, landscaping, parking structure, and other buildings not subject to OSHPD.

5. Environmental Analysis
GREENHOUSE GAS EMISSIONS

City of Duarte

City of Duarte Energy Action Plan

The City of Duarte prepared the Energy Action Plan (EAP) in conjunction with the San Gabriel Valley Council of Governments—a sub-entity of SCAG—and Southern California Edison as part of supporting the California Long-Term Energy Efficiency Strategic Plan. The EAP is a stand-alone document and was prepared to be equivalent to an electricity efficiency chapter of a climate action plan. It identifies both municipal and community-wide strategies to achieve long-term electricity efficiency goals. It also serves as part of the state and regional effort for achieving energy efficiency and reducing GHG emissions. The specific objectives of the EAP are to:

- Create a long-term vision for energy efficiency.
- Provide and assess information related to energy use and GHG emissions.
- Establish reduction targets for energy efficiency.
- Identify goals, policies, and actions to achieve energy reductions.
- Provide a framework to implement the identified goals, policies, and actions.

Under the premise of meeting the state-recommended GHG reduction target of 15 percent below baseline levels by year 2020, the EAP sets the following energy efficiency targets for Duarte:

- Residential: Reduce annual existing residential electricity usage by 20 percent below year 2005 baseline levels by year 2020.
- Nonresidential: Reduce annual existing nonresidential electricity usage by 10 percent below year 2005 baseline levels by year 2020.
- Municipal: Achieve platinum-level status in Southern California Edison's Energy Leader Partnership Model.
- Residential and Nonresidential: Achieve a net zero electricity use in new residential and nonresidential buildings by year 2020.

The EAP strategy to meet these electricity reduction targets involves setting goals, policies, and implementation actions focused around seven topic areas: 1) existing residential buildings, 2) existing nonresidential buildings, 3) new development, 4) planning framework, 5) urban cooling, 6) water and electricity efficiency, and 7) municipal operations. The goals corresponding to these seven topic areas include:

- **Goal 1:** Reduce average household energy costs.
- **Goal 2:** Transform Duarte's nonresidential buildings into a model for energy efficient communities.

- **Goal 3:** By 2020, new residential construction with five units or more and new nonresidential construction projects of 25,000 square feet or more in Duarte will have no net impact on community-wide energy demand.
- **Goal 4:** Generate citizen interest and support for an energy efficient local economy.
- **Goal 5:** Optimize shading and cooling to reduce community-wide energy demand.
- **Goal 6:** Integrate water conservation efforts into new and existing development to conserve energy used to pump, treat, and convey water.
- **Goal 7:** Conserve energy and limited fiscal resources through energy efficiency improvements to City facilities and infrastructure.

City of Duarte Sustainable Development Practices

The City of Duarte Sustainable Development Practices is codified in Chapter 19.52, Article 3, of the City's Development Code. This chapter includes guidelines and standards focused on conservation of natural resources, increase in energy efficiency, and also on transit (e.g., transportation demand management, active transit design, etc.). Under this chapter, specific sustainable design requirements are dependent upon the level of development a particular project is categorized based on size (e.g., number of dwelling units, amount of non-residential square footage). There are four levels of development, Level 1 to Level 4, with Level 1 requiring the least requirements and Level 4 requiring the most requirements.

City of Irwindale

City of Irwindale Energy Action Plan

The City of Irwindale also prepared the EAP in conjunction with the San Gabriel Valley Council of Governments and Southern California Edison. Under the premise of meeting the state-recommended GHG reduction target of 15 percent below baseline levels by year 2020, the EAP sets the following energy efficiency targets for Irwindale:

- Support state actions to achieve a 15 percent reduction below baseline community-wide GHG emissions by 2020.
- Achieve a 20 percent reduction in electricity use per capita from the 2008 baseline by 2020.
- Achieve a 15 percent reduction in municipal electricity use from the 2008 baseline by 2020.

Similar to the Duarte EAP, the Irwindale EAP strategy to meet these electricity reduction targets involves setting goals, policies, and implementation actions focused around the same seven topic areas: 1) existing residential buildings, 2) existing nonresidential buildings, 3) new development, 4) planning framework, 5) urban cooling, 6) water and electricity efficiency, and 7) municipal operations. The goals corresponding to these seven topic areas include:

- **Goal 1:** Improve energy efficiency in existing residential development and reduce residential energy costs.
- **Goal 2:** Improve energy efficiency in existing nonresidential development and reduce residential energy costs.
- **Goal 3:** Reduce the average electricity intensity of new construction and move toward net zero construction by 2020.
- **Goal 4:** Create a logical business and regulatory environment that fosters, incentivizes, and prioritizes energy efficiencies.
- **Goal 5:** Maximize use of shading and cooling to sustain a comfortable and energy-efficient urban environment.
- **Goal 6:** Expand knowledge and education related to water conservation and improve water efficiency in new and existing development.

City of Irwindale Green Building Standards Code

The City of Irwindale has incorporated the Los Angeles County Green Building Standards Code, which incorporates the 2013 CALGreen.

5.6.1.3 EXISTING CONDITIONS

The planning area consists of the existing City of Hope medical campus. Operation of the City of Hope generates GHG emissions from natural gas used for energy, heating, and cooking; electricity usage; vehicle trips for staff, patrons, visitors, and deliveries; area sources such as landscaping equipment and consumer cleaning products; water demand; waste generation; and solid waste generation. Table 5.6-5, *Existing Annual Operational Phase GHG Emissions Inventory*, shows the existing emissions currently associated with the City of Hope campus.

Table 5.6-5 Existing Annual Operational Phase GHG Emissions Inventory

Sector	GHG Emissions $MTCO_2e$/Year	Percent of Total
Land Uses		
Area	2	<1%
Energy[1]	13,276	28%
On-Road Transportation[2]	28,524	59%
Solid Waste Disposal	5,499	11%
Water/Wastewater[3]	778	2%
Total	48,080	—
Service Population (SP)[4]	6,448	—
$MTCO_2e$/SP	7.5	—
Stationary Equipment		
Central Utilities Plant[5]	14,354	—

Source: CalEEMod 2016.3.1. Based on IPCC's AR4 GWPs.
Notes: Totals may not add to 100 percent due to rounding.
1 Existing residential and nonresidential building energy use modeled using historical energy demand rates in CalEEMod.
2 Transportation emissions are based on trip generation and VMT data provided by Fehr & Peers. Assumed vehicle fleet mix based on the annual average daily trips identified by Caltrans for the segment of Interstate 210 west of interstate 605 (Caltrans 2016a).
3 Water use is based on the water demand rates provided by KPFF.
4 Service population based on inpatients, outpatients, and full- and part-time employees (Fehr & Peers 2016).
5 Emissions are provided by LSA and are based on the existing stationary equipment currently operating at the City of Hope central utilities plant. Per CalEEMod methodology, emissions associated with boilers in the Energy sector are based on building energy demand and are encompassed within the total Energy sector emissions shown. In addition, emissions from permitted stationary equipment such as installed in the central utilities plant (e.g., boilers) are controlled through the SCAQMD permitting process.

5.6.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

GHG-1 Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

GHG-2 Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

South Coast Air Quality Management District

Permitted GHG Threshold

SCAQMD has adopted a significance threshold of 10,000 $MTCO_2e$ per year for permitted (stationary) sources of GHG emissions for which SCAQMD is the designated lead agency.

Land Use Development Project GHG Thresholds

To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, SCAQMD convened a GHG CEQA Significance Threshold Working Group (Working Group).

5. Environmental Analysis
GREENHOUSE GAS EMISSIONS

Based on the last Working Group meeting (Meeting No. 15) in September 2010, SCAQMD identified a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency (SCAQMD 2010):

- **Tier 1.** If a project is exempt from CEQA, project-level and cumulative GHG emissions are less than significant.

- **Tier 2.** If the project complies with a GHG emissions reduction plan or mitigation program that avoids or substantially reduces GHG emissions in the project's geographic area (i.e., city or county), project-level and cumulative GHG emissions are less than significant.

For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, SCAQMD requires an assessment of GHG emissions. SCAQMD Working Group has identified a "bright-line" screening-level threshold of 3,000 $MTCO_2e$ annually for all land use types or the following land-use-specific thresholds: 1,400 $MTCO_2e$ for commercial projects, 3,500 $MTCO_2e$ for residential projects, or 3,000 $MTCO_2e$ for mixed-use projects. These bright-line thresholds are based on a review of the Governor's Office of Planning and Research database of CEQA projects. Based on their review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line thresholds. Therefore, projects that do not exceed the bright-line threshold would have a nominal, and therefore, less than cumulatively considerable impact on GHG emissions:

- **Tier 3.** If GHG emissions are less than the screening-level threshold, project-level and cumulative GHG emissions are less than significant.

- **Tier 4.** If emissions exceed the screening threshold, a more detailed review of the project's GHG emissions is warranted.

The SCAQMD Working Group has identified an efficiency target for projects that exceed the bright-line threshold: a 2020 efficiency target of 4.8 $MTCO_2e$ per year per service population ($MTCO_2e$/year/SP) for project-level analyses and 6.6 $MTCO_2e$/year/SP for plan level projects (e.g., general plans). Service population is generally defined as the sum of residential and employment population of a project. The per capita efficiency targets are based on the AB 32 GHG reduction target and 2020 GHG emissions inventory prepared for CARB's 2008 Scoping Plan.[7]

Project-related GHG emissions include on-road transportation, energy use, water use and wastewater generation, solid waste disposal, area sources, off-road emissions, and construction activities. The SCAQMD Working Group identified that because construction activities would result in a "one-time" net increase in GHG emissions, construction activities should be amortized into the operational phase GHG emissions inventory based on the service life of a building. For buildings, in general, it is reasonable to look at a 30-year time frame, since this is a typical interval before a new building requires the first major renovation.

[7] SCAQMD took the 2020 statewide GHG reduction target for land use only GHG emissions sectors and divided it by the 2020 statewide employment for the land use sectors to derive a per capita GHG efficiency metric that coincides with the GHG reduction targets of AB 32 for year 2020.

For the purpose of this proposed project, SCAQMD's project-level threshold for all land use types is used as the plan-level efficiency metric is more appropriate for general plan-level analysis. If projects exceed the thresholds, GHG emissions would be considered potentially significant in the absence of mitigation measures. However, as the proposed project's horizon year is beyond year 2020 with an anticipated buildout of 2035, the efficiency target has been adjusted based on the mid-term GHG reduction target of SB 32, which establishes a target of 40 percent below 1990 levels by 2030, and the long-term reduction goal of Executive Order S-03-05, which sets a goal of 80 percent below 1990 levels by 2050 (see Table 5.6-6, *Forecasting the Post-2020 GHG Reduction Targets*).

Table 5.6-6 Forecasting the Post-2020 GHG Reduction Targets

1990 Emissions Sector[1]	GHG Emissions $MTCO_2e$/Year	Tailoring the CARB Land Use Inventory
Electricity	95,964,000	Removed Industrial energy use
Transportation	140,906,000	Includes the on-road transportation sector emissions only
Landfills	7,448,000	Landfill extracted from the Industrial sector
Wastewater	3,581,000	Wastewater treatment extracted from the Industrial sector
Commercial	13,873,000	Removed National Security emissions
Residential	29,740,000	Includes all emissions from this sector
Other	1,269,000	Not specified/various
Construction	673,000	—
1990 Land Use Sector Total	**293,454,000**	—
2035 Land Use Sector GHG Target[2]	**146,727,000**	Trend-line: 50 Percent Reduction from 1990 Levels by 2035.
2035 Population and Employment Forecasts	**Demographics**	**Notes**
Population[3]	**44,085,600**	Based the California Department of Finance forecasts
Employment[4]	**20,027,660**	Based on Caltrans socio-economic forecasts
Service Population	**64,113,260**	—
2035 Efficiency Target	**2.3 $MTCO_2e$/SP**	—

Sources:
1 CARB 2016b. Based on AR4 GWPs.
2 Based on the 2030 target of 40 percent below 1990 levels by 2030 under SB 32 and the goal of 80 percent below 1990 levels by 2050 under Executive Order S-03-05.
3 DOF 2016.
4 Caltrans 2016b.

Based on these long-term targets, project emissions are compared to the SCAQMD's project-level efficiency threshold of:

- The 2020 GHG estimated efficiency target would be 4.8 $MTCO_2e$/SP/yr to align with SCAQMD's efficiency target, identified in its CEQA Guidelines, which is consistent with AB 32.
- The 2035 GHG estimated efficiency target would be 2.3 $MTCO_2e$/SP/yr to align with the midterm GHG reduction target of SB 32 and the long-term reduction goal of Executive Order S-03-05.

Calculating Service Population for Nonresidential Uses

Service population is traditionally defined as the number of residents and employees that are generated by a project. The service population metric is derived from CARB's 2008 Scoping Plan. The Scoping Plan identified that, based on the GHG emissions inventories for the state, people living in California generate approximately 14 tons of GHG emissions per capita and need to reduce GHG emissions to approximately 10 tons per capita to meet the GHG reduction target of AB 32. Because people who live in California generally work in California, the service population metric in the Scoping Plan did not include employees. As CEQA significance thresholds were being developed by individual air districts, air districts considered applying this type of efficiency metric to the air district's boundaries. In line with the methodology developed by the Regional Targets Advisory Committee as part of SB 375 target setting discussions, the definition of service population for a local air district was amended to include employees as well as residents because the transportation sector is the primary source of project-related GHG emissions and, unlike the state as a whole, people who work in one county/air district may not live in the same air district/city/county. However, it should be noted that people who live and work within the air district/city/county would also have other trip ends to services such as schools, retail uses, and parks. Therefore, for an air district/city/county as a whole, the per capita metric does not include other users (e.g., park visitors, restaurant patrons, etc.…). However, a project encompasses a much smaller area than an air district/city/county, and for commercial and other nonresidential development projects, the primary users of a site are not only the employees, but patrons as well. Depending on the land use, these may include patients, customers, students, clients, etc. Therefore, for the purpose of this project, whose primary users would be the patients of the City of Hope, the service population includes employees and patients.

5.6.3 Environmental Impacts

Methodology

The analysis in this section is based on buildout of the proposed campus as modeled using CalEEMod, Version 2016.3.1, using 2035 emission rates.

- **Transportation:** GHG emissions are based on the annual average trip generation and vehicle miles traveled data provided by Fehr & Peers (see Appendix J1 of this DEIR). For purposes of this analysis, an average trip distance of 14.3 miles per trip is used for both the existing and project buildout scenarios. Based on the estimated 11,903 average daily trips generated under existing conditions and the 16,645 average daily trips generated under full buildout conditions, approximately 170,213 vehicle miles per day are generated currently, and 238,024 vehicle miles per day would be generated under full buildout conditions (Fehr & Peers 2016).

- **Solid Waste Disposal:** Indirect emissions from waste generation are based on California Department of Resources, Recycling, and Recovery solid waste generation rates for all uses except for the hospital land use, which is based on the solid waste generation rate provided in CalEEMod 2016.3.1.

- **Water/Wastewater:** GHG emissions from this sector are associated with the embodied energy used to supply water, treat water, distribute water, and then treat wastewater and fugitive GHG emissions from wastewater treatment. Emissions are based on average water demand and wastewater generation provided by KPFF (see Appendices K1 and K2).

- **Area Sources:** Area and stationary sources are based on the CalEEMod defaults for use of consumer products and cleaning supplies.

- **Energy:** GHG emissions from this sector are from use of electricity and natural gas by the proposed buildings and the existing buildings. For purposes of this analysis, new buildings are assumed to comply with the 2016 Building Energy Efficiency Standards, which are 5 percent more energy efficient for nonresidential buildings than the 2013 Building Energy Efficiency Standards. In addition, the non-Title 24 energy intensity for the proposed 30,000-square-foot data center is assumed at 800 kilowatt-hours per square foot per year based on information provided by the City of Hope. Lastly, the existing buildings are assumed to comply with the 2005 Building Energy Efficiency Standards.

- **Stationary Sources:** Per CalEEMod methodology, emissions associated with operation of boilers are encompassed within the energy sector emissions associated with building energy demand. In addition, specific planned future improvements to the City of Hope central utilities plant are currently unknown and speculative. Furthermore, any future improvements to the central utilities plant that includes modifications to or the addition of new stationary equipment would require a permit to operate from SCAQMD per SCAQMD Regulation XIII, New Source Review. Permitting would require future CEQA processing and discretionary approval by SCAQMD and provide a control for stationary-source emissions. However, for purposes of this analysis, emissions from the potential installation of two new boilers (Phase 2 and Phase 4) at the existing City of Hope central utilities plant are included for informational purposes only and are not additive to the overall total operational-phase emissions. While two new emergency generators could also be installed, operation of an emergency generator would only occur during emergencies and periodic testing and its operation would be minimal overall. Also, and as stated, installation of a new emergency boiler would be subject to the SCAQMD permitting process. Thus, emissions from the assumed two new boilers are not quantified. Boiler emissions are based on the following:

  - Boilers:
    - Fuel Type: Compressed natural gas
    - Boiler Rating: 4 MMBtu per hour
    - Daily Heat Input Per Boiler: 131.79 MMBtu per day
    - Annual Heat Input Per Boiler: 49,003 MMBtu per year

- **Construction:** Construction emissions are based on the construction information provided by City of Hope (see Section 5.2.3 of this DEIR for further details). Emissions are amortized over a 30-year period and are included as part of the overall inventory.

Life cycle emissions are not included in this analysis because not enough information is available for the proposed project, and therefore life cycle GHG emissions would be speculative.[8] Black carbon emissions are not included in the GHG analysis because CARB does not include this pollutant in the state's AB 32 inventory and treats this short-lived climate pollutant separately.[9]

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.6-1: Buildout of the City of Hope Campus Plan would generate a substantial increase in GHG emissions compared to existing conditions and would have a significant impact on the environment. [GHG-1]

Impact Analysis: Global climate change is not confined to a particular project area and is generally accepted as the consequence of global industrialization over the last 200 years. A typical project, even a very large one, does not generate enough greenhouse gas emissions on its own to influence global climate change significantly; hence, the issue of global climate change is, by definition, a cumulative environmental impact.

Implementation of the proposed project would contribute to global climate change through direct emissions of GHG from on-site area sources and vehicle trips generated by the proposed project, and indirectly through off-site energy production required for on-site activities, water use, and waste disposal. Annual GHG emissions were calculated for construction and operation of the proposed project. The emissions associated with the proposed project include emissions associated with the new facilities, the overall growth in the service population (e.g., mobile-source emissions), and the existing remaining facilities. Total construction emissions were amortized over 30 years and included in the emissions inventory to account for the short-term, one-time GHG emissions from the construction phase of the proposed project. The total and net annual GHG emissions associated with full buildout of the proposed project are shown in Table 5.6-7, *Annual Operational Phase GHG Emissions*.

8 Life cycle emissions include indirect emissions associated with materials manufacture. However, these indirect emissions involve numerous parties, each of which is responsible for GHG emissions of their particular activity. The California Resources Agency, in adopting the CEQA Guidelines Amendments on GHG emissions found that lifecycle analyses was not warranted for project-specific CEQA analysis in most situations, for a variety of reasons, including lack of control over some sources, and the possibility of double-counting emissions (see Final Statement of Reasons for Regulatory Action, December 2009). Because the amount of materials consumed during the operation or construction of the proposed project is not known, the origin of the raw materials purchased is not known, and manufacturing information for those raw materials are also not known, calculation of life cycle emissions would be speculative. A life-cycle analysis is not warranted (OPR 2008).

9 Particulate matter emissions, which include black carbon, are analyzed in Section 5.2, *Air Quality*. Black carbon emissions have sharply declined due to efforts to reduce on-road and off-road vehicle emissions, especially diesel particulate matter. The State's existing air quality policies will virtually eliminate black carbon emissions from on-road diesel engines within 10 years (CARB 2017a).

Table 5.6-7 Annual Operational Phase GHG Emissions

Sector	GHG Emissions $MTCO_2e$/Year						
	Existing	Phase 1	Phase 2	Phase 3	Full Buildout	Change from Existing	Percent Change from Existing
Land Uses							
Area	2	2	2	2	2	<1	(-19%)
Energy[1]	13,276	18,349	21,373	30,423	31,336	18,061	136%
On-Road Transportation[2]	28,524	23,010	23,125	23,703	25,496	-3,028	(-11%)
Solid Waste Disposal	5,499	4,921	7,577	8,280	8,466	2,967	54%
Water/Wastewater[3]	778	953	1,043	1,104	1,220	442	57%
Amortized Construction[4]	NA	191	366	465	557	557	NA
Total	**48,080**	**47,427**	**53,487**	**63,978**	**67,078**	18,998	40%
SCAQMD Bright-Line Threshold	—	—	—	—	—	3,000	—
Exceed Threshold?	—	—	—	—	—	Yes	—
Full Buildout Service Population (SP)[5]	6,448	—	—	—	9,393	2,945	—
$MTCO_2e$/SP	7.4	—	—	—	7.1	-0.4	—
2035 Per Service Population Threshold[6]	—	—	—	—	2.3	—	—
Exceed Threshold?	—	—	—	—	**Yes**	—	—
New Potential Stationary Sources							
Central Utilities Plant – Boiler[7]	—	—	*2,616*	—	***5,233***	—	—

Source: CalEEMod 2016.3.1. Based on IPCC's AR4 GWPs.
Notes: Totals may not add to 100 percent due to rounding.

1 Existing residential and nonresidential building energy use modeled using historical energy demand rates in CalEEMod. New buildings would achieve the 2016 Building Energy Efficiency Standards which are 5 percent more energy efficient for nonresidential structures compared to the 2013 Building Energy Efficiency Standards. For purposes of this analysis and per the City of Hope, the proposed data center is assumed to have a non-Title 24 electricity usage rate of 800 kWh per square foot per year.
2 Transportation emissions are based on trip generation and VMT data provided by Fehr & Peers. Assumed vehicle fleet mix based on the annual average daily trips identified by Caltrans for the segment of Interstate 210 west of interstate 605 (Caltrans 2016a).
3 Water use is based on the water demand rates provided by KPFF.
4 Total construction emissions during the buildout period are amortized over a 30-year project lifetime in accordance with SCAQMD guidance and incorporated into the operational emissions analysis.
5 Service population based on inpatients, outpatients, and full- and part-time employees (Fehr & Peers 2016).
6 Based on the SCAQMD 2020 per capita target of 4.8 $MTCO_2e$ per service population and extrapolating it for the mid-term year 2030 GHG reduction target of SB 32 and the long term GHG reduction goals of Executive Order S-03-05 for 2050.
7 Shown for informational purposes. For purposes of this analysis, it is assumed a new boiler would be installed at the City of Hope central utilities plant in Phase 2 and Phase 4 for a total of two new boiler units. Per CalEEMod methodology, the Energy sector emissions calculated for land uses encompasses emissions associated with boilers. In addition, installation of new or additional boilers and other stationary equipment such as an emergency generator would require a permit to operate from SCAQMD and would be subject to SCAQMD Regulation XIII, New Source Review.

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As shown in the table, implementation of the proposed project would result in a net increase of 18,998 $MTCO_2e$ per year compared to the existing campus and would exceed SCAQMD's bright-line threshold of 3,000 $MTCO_2e$ per year. Consequently, the proposed project's emissions are compared to the SCAQMD's efficiency threshold. Implementation of the proposed project would generate approximately 7.1 $MTCO_2e$ per service population per year. Implementation of the proposed project under full buildout conditions would result in slightly lower GHG emissions on a per service population basis compared to the existing City of Hope land uses (7.1 $MTCO_2$/SP compared to 7.5 $MTCO_2e$/SP), but the proposed project would exceed the forecast year 2035 efficiency metric threshold of 2.3 $MTCO_2e$ per service population per year. The increase in overall emissions would be attributable to the additional buildings and facilities as well as the increases in the numbers of new employees and people served. Although the newer buildings would be more energy efficient, the proposed project would result in a large increase in overall building space onsite, resulting in an overall increase in energy usage. Overall, the proposed project's cumulative contribution to the long-term GHG emissions impacts in the state would be considered potentially significant.

Impact 5.6-2: Implementation of the proposed City of Hope Campus Plan would not conflict with plans adopted for the purpose of reducing GHG emissions. [Threshold GHG-2]

Impact Analysis: Applicable plans adopted for the purpose of reducing GHG emissions include CARB's Scoping Plan, SCAG's 2016 RTP/SCS, and local GHG reduction plans adopted by the City of Duarte and the City of Irwindale. A consistency analysis with these plans is presented below:

CARB Scoping Plan

The CARB Scoping Plan is applicable to state agencies, but is not directly applicable to cities/counties and individual projects (i.e., the Scoping Plan does not require the City to adopt policies, programs, or regulations to reduce GHG emissions). However, new regulations adopted by the state agencies outlined in the Scoping Plan result in GHG emissions reductions at the local level. As a result, local jurisdictions benefit from reductions in transportation emissions rates, increases in water efficiency in the building and landscape codes, and other statewide actions that would affect a local jurisdiction's emissions inventory from the top down. Statewide strategies to reduce GHG emissions include the low-carbon fuel standard and changes in the corporate average fuel economy standards (e.g., Pavley I and Pavley California Advanced Clean Cars programs).

The proposed project is required to adhere to the programs and regulations identified by the Scoping Plan and implemented by state, regional, and local agencies. The proposed project would comply with these state GHG emissions reduction measures, since they are statewide strategies. For example, the new buildings under the proposed project would meet the applicable CALGreen and Building Energy Efficiency Standards. By 2030, the CEC anticipates that new nonresidential buildings will be required to achieve zero net energy. The proposed project's GHG emissions in Table 5.6-7 include reductions associated with statewide strategies that have been adopted since AB 32. Therefore, the proposed program would not obstruct implementation of the CARB Scoping Plan.

SCAG's Regional Transportation Plan/Sustainable Communities Strategy

SCAG's 2016-2040 RTP/SCS was adopted April 7, 2016. The RTP/SCS identifies multimodal transportation investments, including bus rapid transit, light rail transit, heavy rail transit, commuter rail, high-speed rail, active transportation strategies (e.g., bike ways and sidewalks), transportation demand management strategies, transportation systems management, highway improvements (interchange improvements, high-occupancy vehicle lanes, high-occupancy toll lanes), arterial improvements, goods movement strategies, aviation and airport ground access improvements, and operations and maintenance to the existing multimodal transportation system.

SCAG's RTP/SCS identifies that land use strategies that focus on new housing and job growth in areas served by high quality transit and other opportunity areas would be consistent with a land use development pattern that supports and complements the proposed transportation network. The overarching strategy in the 2016-2040 RTP/SCS is to allow the southern California region to grow in more compact communities in existing urban areas; provide neighborhoods with efficient and plentiful public transit and abundant and safe opportunities to walk, bike, and pursue other forms of active transportation; and preserve more of the region's remaining natural lands (SCAG 2016). The 2016-2040 RTP/SCS transportation projects help more efficiently distribute population, housing, and employment growth and forecast development that is generally consistent with regional-level general plan data. The projected regional development pattern, when integrated with the proposed regional transportation network identified in the RTP/SCS, would reduce per capita vehicular travel-related GHG emissions and achieve the GHG reduction per capita targets for the SCAG region.

As discussed in Impact 5.9-1 and shown in Table 5.9-2 of Chapter 5.9, *Land Use and Planning*, the proposed project would be consistent with the RTP/SCS goals. In addition, as discussed in Impact 5.11-1 of this DEIR, the new jobs anticipated to be created from implementation of the proposed Campus Plan would likely be filled by the local labor force. Based on the existing average service population of 6,448 persons and an estimated 170,585 VMT per day, the current VMT per capita is approximately 26.5 vehicle miles per person. At full buildout, the City of Hope's average daily service population would be 9,393 persons, who would generate approximately 238,553 VMT. This would equate to a VMT per capita of approximately 25.4 vehicle miles per person, which would be a 1-mile per person decrease over existing conditions. Thus, implementation of the proposed Campus Plan would be consistent with the overall RTP/SCS goal of reducing VMT. Therefore, overall, implementation of the proposed City of Hope Campus Plan would not interfere with SCAG's ability to implement the regional strategies in the RTP/SCS.

Local GHG Reduction Plans

City of Duarte Energy Action Plan

Portions of the project site within the City of Duarte would be subject to Duarte's EAP and development standards. Table 5.6-8, *Consistency with the Duarte Energy Action Plan*, evaluates the proposed project's consistency with the goals and policies in the EAP. The EAP goals and policies focus on reducing GHG emissions through reducing citywide and municipal electricity demand (Duarte 2012). As shown in the table, implementation of the City of Hope Campus Plan would replace some of the existing facility buildings with newer, more energy-efficient buildings that would comply with the current and future Building Energy Efficiency Standards. Additionally, the future individual projects under the proposed City of Hope Campus Plan would comply with the City of Duarte's Sustainable Development Practices (Article 3, Chapter 19.52 of the City of Duarte Development Code), which include a variety of requirements in energy efficiency and water conservation. Furthermore, the City of Hope Campus Plan design guidelines include measures that encourage and promote incorporation and inclusion of design features that would contribute to increasing energy efficiency, reducing energy demand, and conserving water. Therefore, overall, the proposed project would be consistent with the City's EAP.

Table 5.6-8 Consistency with the City of Duarte Energy Action Plan

EAP Goal	EAP Policies	Compliance with Goals
Goal 1: Reduce average household energy costs.	**Policy 1.1:** Propose energy conservation by residents of existing residential structures.	**Not applicable:** This goal is not applicable to the proposed project, which is a medical campus improvement project.
	Policy 1.2: Reduce energy use and plug load demand through upgrades to household appliances and equipment.	
	Policy 1.3: Facilitate voluntary residential energy efficiency improvements through energy benchmarking and retrofit programs.	
	Policy 1.4: Identify opportunities to improve the energy efficiency of renter-occupied housing units.	
Goal 2: Transform Duarte's nonresidential buildings into a model for energy efficient communities.	**Policy 2.1:** Identify opportunities to conserve additional energy resources in the nonresidential building sector.	**Consistent:** The proposed project would replace existing less energy-efficient buildings with newer, more energy-efficient buildings that would comply with the current 2016 Building Energy Efficiency Standards at minimum.
	Policy 2.2: Facilitate retrofits and energy efficiency improvements to existing nonresidential buildings.	
	Policy 2.3: Maximize energy efficiency in large nonresidential facilities greater than 25,000 square feet.	
Goal 3: By 2020, new residential construction with five units or more and new nonresidential construction projects of 25,000 square feet or more in Duarte will have no net impact on community-wide energy demand.	**Policy 3.1:** The City will work with project applicants to maximize the energy-efficient design and orientation of new buildings pursuant to the City's sustainable development practices.	**Consistent:** Implementation of the Specific Plan would comply with Duarte's sustainable development practices (Article 3, Chapter 19.52 of the development code) for the components not subject to the jurisdiction of OSHPD. Duarte's sustainable development practices include compliance with the latest Building Energy Efficiency Standards at minimum and 15 percent and 30 percent beyond the standards for projects categorized as a Level 3 or Level 4 development project; incorporating water efficiency landscape designs; and reducing heat island effect. Components subject to OSHPD jurisdiction would comply with the latest Building Energy Efficiency Standards. Additionally, the proposed Specific Plan design guidelines promote energy efficiency, such as encouraging buildings to integrate photovoltaic
	Policy 3.2: Regularly update the City's sustainable development practices to integrate new or revised building code standards that improve energy efficiency.	
	Policy 3.3: The City will encourage the use of energy-efficient appliances and equipment in new buildings.	

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Table 5.6-8 Consistency with the City of Duarte Energy Action Plan

EAP Goal	EAP Policies	Compliance with Goals
		panels and green roofs, incorporation of natural lighting and ventilation, and exceeding local and state energy efficiency building requirements (see the applicable Energy Efficiency and Conservation PDFs, below).
Goal 4: Generate citizen interest and support for an energy efficient local economy.	**Policy 4.1:** Identify funding opportunities and financing programs to support community energy efficiency upgrades and retrofits. **Policy 4.2:** Provide educational opportunities and recognize best practices to support energy efficient behaviors and practices.	**Not applicable:** This goal is applicable at the city level and is not applicable to the proposed project.
Goal 5: Optimize shading and cooling to reduce community-wide energy demand.	**Policy 5.1:** Increase shading and cooling capacity of the community's urban forest through additional tree planting, preservation of existing trees, and proper maintenance. **Policy 5.2:** Maximize the use of cool roofs and surfaces to reduce building energy use.	**Consistent:** Implementation of the Specific Plan will comply with Duarte's sustainable development practices. Future specific individual projects under the proposed project that are not subject to OSHPD jurisdiction would be subject to minimum sustainable design requirements for the development category they fall into (§ 19.52.020(B) of the development code). At minimum, except for components under OSHPD jurisdiction, all future projects would be required to incorporate designs to reduce the heat island effect. In addition, the proposed Specific Plan design guidelines encourage and promote use of shading design features, such as incorporating the use large specimen trees near major new buildings, creating shading through landscaping or man-made structures in landscaped areas, using shades for south- and west-facing windows (see the applicable Energy Efficiency and Conservation PDFs, below).
Goal 6: Integrate water conservation efforts into new and existing development to conserve energy used to pump, treat, and convey water.	**Policy 6.1:** Encourage voluntary water conservation, efficient use behaviors, and related energy efficiency efforts in the community. **Policy 6.2:** Promote water efficient landscaping practices. **Policy 6.3:** Facilitate the use of water-conserving appliances. **Policy 6.4:** Maximize the efficient use of limited water resources through efficient building and landscaping practices in new development.	**Consistent:** Implementation of the Specific Plan would comply with Duarte's sustainable development practices, for components not under OSHPD jurisdiction. Projects would be required to comply with Section 19.52.050(A), Water Conservation, of the development code. Additionally, the Specific Plan irrigation standards encourage use of water-efficient irrigation systems such as drip emitters, evapotranspiration controllers, and moisture sensors (see the Water Conservation PDFs, below).

Table 5.6-8 Consistency with the City of Duarte Energy Action Plan

EAP Goal	EAP Policies	Compliance with Goals
Goal 7: Conserve energy and limited fiscal resources through energy conservation improvements to City facilities and infrastructure.	**Policy 7.1:** Implement an energy-efficient procurement policy to ensure the purchase of efficient equipment that will result in energy costs savings that outweigh additional upfront costs.	**Not applicable:** This goal is applicable at the city level and to City facilities and infrastructure only.
	Policy 7.2: Identify additional opportunities to improve the energy efficiency of City facilities.	
	Policy 7.3: Work with the SCVCOG to use regional partners for creation of an energy management position to track energy use at City facilities, identify opportunities for efficiencies and cost savings, and implement energy efficiency projects.	

Source: Duarte 2012.

City of Irwindale Energy Action Plan

Portions of the project site within the City of Irwindale would be subject to Irwindale's EAP. Table 5.6-9, *Consistency with the City of Irwindale Energy Action Plan*, evaluates the proposed project's consistency with the goals and policies in the City's EAP. Implementation of the City of Hope Campus Plan would replace some of the existing facility buildings with newer, more energy-efficient buildings that would comply with the current and future Building Energy Efficiency Standards. Additionally, the Specific Plan design guidelines include measures that encourage and promote incorporation and inclusion of design features that would contribute to increasing energy efficiency, reducing energy demand, and conserving water. Therefore, overall, the proposed project would generally not be inconsistent with the City or Irwindale's EAP.

Table 5.6-9 Consistency with the City of Irwindale Energy Action Plan

EAP Goal	EAP Policies	Compliance with Goals
Goal 1: Improve energy efficiency in existing residential development and reduce residential energy costs.	**Policy 1.1:** Promote the use of energy-efficient appliances and equipment in homes.	**Not applicable:** The City of Hope is a medical campus and only has a few dwelling units to accommodate medical students.
	Policy 1.2: Encourage energy audits so that 30 percent to 40 percent of existing households participate in audits by 2020 and implement retrofits based on audit findings.	
	Policy 1.3: Develop a voluntary energy efficiency checklist at time of residential building sale.	
Goal 2: Improve energy efficiency in existing nonresidential development and reduce [non]-residential energy costs.	**Policy 2.1:** Promote the use of energy-efficient appliances and equipment in businesses.	**Consistent:** The proposed project would replace existing, less energy-efficient buildings with newer, more energy-efficient buildings that would comply with the current 2016 Building Energy Efficiency Standards at minimum. Additionally, the Specific Plan includes design guidelines that promote energy efficiency, such as encouraging buildings to integrate photovoltaic panels and green roofs,
	Policy 2.2: Encourage nonresidential building owners to achieve a 30 percent to 40 percent participation rate in audits by 2020 and implement retrofits based on audit findings.	
	Policy 2.3: Development educational materials and a voluntary energy efficiency checklist at time of nonresidential building sale.	

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Table 5.6-9 Consistency with the City of Irwindale Energy Action Plan

EAP Goal	EAP Policies	Compliance with Goals
	Policy 2.4: Maximize energy efficiency in large nonresidential facilities greater than 25,000 square feet.	incorporation of natural lighting and ventilation, and exceeding local and state energy efficiency building requirements (see the applicable Energy Efficiency and Conservation PDFs, below).
Goal 3: Reduce the average electricity intensity of new construction and move toward net zero construction by 2020.	**Policy 3.1:** Increase energy efficiency of all new construction.	**Consistent:** See Goal 2, above.
	Policy 3.2: Encourage the use of smart-grid technology, energy management systems, and energy-efficient appliances and equipment in new buildings.	
	Policy 3.3: Continue to conduct outreach and education to the community.	
Goal 4: Create a local business and regulatory environment that prioritizes energy efficiencies.	**Policy 4.1:** Integrate energy efficiency into the City's discretionary permit review framework.	**Not applicable:** This goal is applicable at the city level and is not applicable to the proposed project.
Goal 5: Maximize use of shading and cooling to sustain a comfortable and energy-efficient urban environment.	**Policy 5.1:** Maximize the cooling of buildings through tree planting and shading to reduce building electricity demands.	**Consistent:** The Specific Plan includes design guidelines encouraging and promoting use of shading design and features, such as incorporating large specimen trees near major new buildings, creation of shading through landscaping or man-made structures in landscaped areas, use of shades for south- and west-facing windows (see the applicable Energy Efficiency and Conservation PDFs, below).
	Policy 5.2: Reduce building electricity demands through voluntary standards and outreach to promote cool roofs and surfaces.	
Goal 6: Expand knowledge and education related to water conservation and improve water efficiency in new and existing development.	**Policy 6.1:** Continue to leverage City resources and programs to encourage water conservation.	**Not applicable:** This goal is applicable at the city level and is not applicable to the proposed project. However, the City of Hope Specific Plan includes irrigation standards that encourage use of water-efficient irrigation systems such as drip emitters, evapotranspiration controllers, and moisture sensors (see the Water Conservation PDFs, below).
	Policy 6.2: Encourage the use of water conserving landscaping practices that reduce electricity used for water pumping.	

Source: Irwindale 2012.

5.6.4 Cumulative Impacts

Project-related GHG emissions are not confined to a particular air basin, but are dispersed worldwide. Therefore, impacts identified under Impact 5.6-1 are not project-specific impacts to global warming, but the proposed project's contribution to this cumulative impact. The recommended mitigation measures would ensure that GHG emissions from buildout of the proposed project would be minimized. With mitigation, GHG emissions and the project's cumulative contribution to global climate change impacts would be less than cumulatively considerable, and therefore, less than significant.

5.6.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to greenhouse gas emissions and were described in detail in Sections 5.6.1.1 of this DEIR and are listed below

State

- California Global Warming Solutions Act (AB 32)
- California Global Warming Solutions Act of 2006: Emissions Limit (SB 32)
- Sustainable Communities and Climate Protection Act (SB 375)
- Greenhouse Gas Emission Reduction Targets (Executive Order S-03-05)
- Clean Car Standards – Pavley (AB 1493)
- Renewables Portfolio Standards (SB 1078)
- California Integrated Waste Management Act of 1989 (AB 939)
- California Mandatory Commercial Recycling Law (AB 341)
- California Advanced Clean Cars CARB (Title 13 CCR)
- Low-Emission Vehicle Program – LEV III (Title 13 CCR)
- Heavy-Duty Vehicle Greenhouse Gas Emissions Reduction Measure (Title 17 CCR)
- Low Carbon Fuel Standard (Title 17 CCR)
- California Water Conservation in Landscaping Act of 2006 (AB 1881)
- California Water Conservation Act of 2009 (SBX7-7)
- Statewide Retail Provider Emissions Performance Standards (SB 1368).
- Airborne Toxics Control Measure to Limit School Bus Idling and Idling at Schools (13 CCR 2480)
- Airborne Toxic Control Measure to Limit Diesel-Fuel Commercial Vehicle Idling (13 CCR 2485)
- In-Use Off-Road Diesel Idling Restriction (13 CCR 2449)
- Building Energy Efficiency Standards (Title 24, Part 6)
- California Green Building Code (Title 24, Part 11)
- Appliance Energy Efficiency Standards (Title 20)

Local

- City of Duarte Sustainable Development Practices, Chapter 19.52, Article 3 of the Development Code
- City of Irwindale Green Building Standards Code, Chapter 15.10, Title 15 of the Municipal Code

5.6.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impact would be less than significant: 5.6-2.

Without mitigation, this impact would be **potentially significant**:

- **Impact 5.6-1** Buildout of the City of Hope Campus Plan would generate a substantial increase in GHG emissions compared to existing conditions and would have a significant impact on the environment.

5.6.7 Mitigation Measures

Project Design Features (PDFs)

The following project design features (PDF) would contribute to reducing GHG emissions associated with the proposed project:

Energy Efficiency and Conservation

- Exceeding local and state energy-efficiency building requirements is encouraged.
- Energy-efficient design and natural lighting and ventilation should be used wherever possible.
- The use of materials that reduce heat transfer into and out of buildings (such as light-colored roofing materials) is encouraged.
- Whenever possible, building articulation and form should be expressive of and driven by environmental and site conditions, such as solar orientation, views, noise, prevailing winds, and local climate. South- and west-facing windows should either be tinted or shaded with an overhang, deciduous trees, or awnings to reduce summer exposure.
- Buildings are encouraged to integrate sustainable design features such as photovoltaic panels (especially on top of parking decks), renewable materials with proven longevity, and stormwater treatment where feasible.
- Green roofs may be considered as alternatives to active spaces and to help reduce the urban heat island effect.
- Planting of trees along southern and western building walls is encouraged to reduce the urban heating effect.
- Large specimen trees should be incorporated near major new buildings to provide a signature landscape element and to help increase the building's energy efficiency through additional shading.
- Lighting design should consider the use of control systems that reduce light levels during low-usage times whole not sacrificing uniformity or safety.

Healthy Design

- Recreational amenities should be incorporated on campus, including community gardens, gathering spaces, campus walking paths/routes, and areas for physical activity.
- Buildings should provide visibility and access to active/recreational areas.
- Bicycle storage and infrastructure should be secure, easily accessible and identifiable, and near building entrances.
- To facilitate pedestrian movement, a continuous, unobstructed path of travel must be maintained in any pathway.
- Pedestrian pathways can be used to connect less active outdoor spaces with more active uses.

Water Conservation

- Irrigation systems should use water-conserving methods and water-efficient technologies such as drip emitters, evapotranspiration controllers, and moisture sensors.
- Irrigation systems shall be operated automatically using an electric controller and low-voltage remove control valves.
- Plant material should incorporate native and low-water-use species consistent with the plant palettes recommended by the City of Duarte and City of Irwindale landscape regulations.
- Landscaping areas should use plants that require minimal water resources. Drought-tolerant grasses should be used for lawn areas where possible.

Mitigation Measures

Impact 5.6-1

GHG-1 Prior to the issuance of building permits for new development projects under the City of Hope Specific Plan, the City of Hope shall adhere to and comply with the following sustainable development features for all components of the project that are not subject to the jurisdiction of the Office of Statewide Health Planning and Development (OSHPD):

- Future Alternative Energy Production, Roof Layout Plan. Building orientation and layout shall be designed to facilitate future alternative energy production on-site. The City of Hope shall provide a roof layout plan that illustrates how future installation of a photovoltaic system could be accommodated, including plans that identify installation of conduit from the roof to the electrical room—or to electrical panels if no electrical room is provided—to accommodate future photovoltaic system or other collector/power generation installation.

- Energy Efficient Appliances. Projects shall incorporate energy-efficient appliances, such as tankless or solar water heaters and energy-efficient heating and cooling systems.

- Transit Stop Improvements. Building entrances and pedestrian walkways shall be designed to provide safe and efficient access to nearby public transit stops. Buildings that abut a transit stop shall install a bus pad, turnouts, benches, trash receptacles (and service), shade/shelter, security lighting, bike racks, water features, and/or landscaping. When practical, the bus stop shall be built into the project and be compatible with the development.

- Alternative Fuel Vehicles. The City of Hope shall provide preferential parking for alternative-fuel vehicles in the parking structures. The alternative-fuel vehicle parking space shall be provided with a sign that identifies the parking space as designated for use by alternative fuel vehicles. Preferential parking spaces shall be as close as possible to the primary entrance without conflicting with parking provided to meet the Americans with Disability Act requirements or preferential parking provided for carpool/vanpools.

- Energy Efficiency, Medium Sized Projects (i.e., nonresidential new construction or modifications of 25,000 to 49,999 square feet of gross floor area). At minimum, the City of Hope shall design medium-sized projects to meet the Tier 1 energy performance standard (Section A5.203.1.2.1) of the 2016 California Green Building Standards Code. If there are applicable local or state standards in effect at the time of project development that would provide higher building energy efficiency than the aforementioned CALGreen Tier 1 performance standard, development projects shall meet those local or state standards.

- Energy Efficiency, Large Sized Projects (i.e., nonresidential new construction or modifications of 50,000 or more square feet of gross floor area). At minimum, the City of Hope shall design large-sized projects to meet the Tier 2 energy performance standard (Section A5.203.1.2.2) of the 2016 California Green Building Standards Code. If there are applicable local or state standards in effect at the time of project development that would provide higher building energy efficiency than the aforementioned CALGreen Tier 2 performance standard, development projects shall meet those local or state standards.

- Energy Efficient Outdoor Lighting. The City of Hope shall provide overnight security and safety lighting or outdoor lighting on timers or motion detection sensors, or otherwise have the capacity to switch to a dimmer, less energy-intensive mode during hours of reduced activity.

- Shading, Medium and Large Size Projects. The City of Hope shall require medium- and large-sized projects to incorporate window shading devices into project design. Window shading devices could include any single or combination of elements, such as extended roof overhangs (i.e., greater than 12 inches), window awnings, decorative sail shades, trellises, or similar elements. Nonglare window tinting may, in appropriate circumstances, function as shading.

- Leadership in Energy and Environmental Design (LEED) Certification. The City of Hope shall design small projects (i.e., nonresidential new construction or modifications of less than 25,000 square feet of gross floor area) and medium projects so that they are built to achieve LEED certification (or its equivalent for design features). The City of Hope shall design large projects so that they are built to achieve LEED Silver compliance (or its equivalent for design features).

- Heat Island Effect. The City of Hope shall use lighter-colored paving or open-grid paving materials for surface parking areas, or break up large expanses of paved area with shade trees or shade structures, or use light colored roofing materials.

All project design features related to the above listed sustainable development features shall be noted on all building plans of future specific projects submitted to the City of Duarte or City of Irwindale, based on the location of the specific project. Adherence to and implementation of all applicable sustainable development features shall be verified by the City of Duarte or City of Irwindale prior to the issuance of a certificate of occupancy.

GHG-2 Components of future development projects within the City of Hope Specific Plan that are subject to the jurisdiction of the Office of Statewide Health Planning and Development (OSHPD) shall be required to comply with Mitigation Measure GHG-1 unless the requirements in these two mitigation measures are in direct conflict with the applicable regulations and building code requirements specific to components/facilities under OSHPD jurisdiction.

5.6.8 Level of Significance After Mitigation

Impact 5.6-1

Implementation of Mitigation Measures GHG-1 and GHG-2 would ensure that GHG emissions generated from implementation of the City of Hope Specific Plan would be minimized to the extent feasible. However, additional federal and state measures would be necessary to reduce GHG emissions to meet the midterm GHG reduction target of SB 32 and the long-term GHG reduction goal of Executive Order and S-03-05, which are, respectively, 40 percent of 1990 levels by 2030 and 80 percent of 1990 levels by 2050. Although the 2017 Scoping Plan Update is being prepared by CARB with a planned adoption in December of 2017, there is currently no adopted statewide plan past 2020 that achieves the midterm GHG reduction target of SB 32 or the long-term GHG reduction goal of S-03-05. Furthermore, at this time, the state cannot meet the 2050 goal without major advancements in technology (CCST 2012). Since no additional federal or state measures are currently available that would ensure that the City of Hope Specific Plan project could achieve the post-2020 targets, Impact 5.6-1 would remain ***significant and unavoidable***.

5.6.9 References

California Air Pollution Control Officers Association (CAPCOA). 2016. California Emissions Estimator Model (CalEEMod). Version 2016.3.1. Prepared by: Trinity Consultants and the California Air Districts.

California Air Resources Board (CARB). 2008, October. Climate Change Proposed Scoping Plan: A Framework for Change.

———. 2010, August. Proposed Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375. Staff Report.

———. 2014a, March 24. California Greenhouse Gas Inventory for 2000–2012: By Category as Defined by the Scoping Plan, http://www.arb.ca.gov/cc/inventory/data/data.htm.

———. 2014b, May 15. First Update to the Climate Change Scoping Plan: Building on the Framework. http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm.

———. 2016a, June. 2016 Edition California Greenhouse Gas Inventory for 2000-2014: By Category as Defined in the 2008 Scoping Plan. https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_00-14_20160509.xlsx.

———. 2016b. Greenhouse Gas Emission Inventory: Query Tool for Years 1990. 1st edition. https://www.arb.ca.gov/app/ghg/1990_1990/ghg_sector.php.

———. 2017a, March 14. Final Proposed Short-Lived Climate Pollutant Reduction Strategy. https://www.arb.ca.gov/cc/shortlived/shortlived.htm.

———. 2017b, January 20. The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target. https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf.

———. 2017c, June. Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets, https://www.arb.ca.gov/cc/sb375/sb375.htm.

California Climate Action Team (CAT). 2006, March. Climate Action Team Report to Governor Schwarzenegger and the Legislature.

California Climate Change Center (CCCC). 2012, July. Our Changing Climate 2012: Vulnerability and Adaptation to the Increasing Risks from Climate Change in California.

California Department of Finance (DOF). 2016. Report P-2: State and County Population Projections by Race/Ethnicity and Age (5-year groups). http://www.dof.ca.gov/Forecasting/Demographics/projections/documents/P-2_Age5yr_CAProj_2010-2060.xls.

California Department of Transportation (Caltrans). 2016a. Traffic Census Program: Traffic Counts, Year 2014. Annual Average Daily Traffic. Accessed October 18, 2016. http://traffic-counts.dot.ca.gov/.

———. 2016b. Long-Term Socio-economic Forecasts by County. http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic.html.

California Energy Commission (CEC). 2006. Our Changing Climate: Assessing the Risks to California. 2006 Biennial Report, California Climate Change Center. CEC-500-2006-077.

———. 2009, May. The Future Is Now: An Update on Climate Change Science, Impacts, and Response Options for California. CEC-500-2008-0077.

———. 2015a. 2016 Building Energy Efficiency Standards, Adoption Hearing Presentation. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/ June 10.

———. 2015b. 2016 Building Energy and Efficiency Standards Frequently Asked Questions. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf.

California Natural Resources Agency (CNRA). 2014, July. Safeguarding California: Reducing Climate Risk, An Update to the 2009 California Climate Adaptation Strategy.

Duarte, City of. 2012, November. Duarte Energy Action Plan.

Fehr & Peers. 2017, April. Transportation Impact Study for the City of Hope.

Governor's Office of Planning and Research (OPR). 2008, June. CEQA and Climate Change: Addressing Climate Change through CEQA Review. Technical Advisory. http://www.opr.ca.gov/ceqa/pdfs/june08-ceqa.pdf.

Intergovernmental Panel on Climate Change (IPCC). 1995. *Second Assessment Report: Climate Change 1995*.

———. 2001. *Third Assessment Report: Climate Change 2001*. New York: Cambridge University Press.

———. 2007. *Fourth Assessment Report: Climate Change 2007*. New York: Cambridge University Press.

———. 2013. *Fifth Assessment Report: Climate Change 2013*. New York: Cambridge University Press.

Irwindale, City of. 2012. City of Irwindale Energy Action Plan.

South Coast Air Quality Management District (SCAQMD). 2010, September 28. Agenda for Meeting 15. Greenhouse Gases (GHG) CEQA Significance Thresholds Working Group. http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-main-presentation.pdf?sfvrsn=2.

Southern California Association of Governments (SCAG). 2016, April 7. Final 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): A Plan for Mobility, Accessibility, Sustainability, and a High Quality of Life. http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx.

US Energy Information Administration (EIA). 2014. Rankings: Total Carbon Dioxide Emissions 2014. Website accessed on April 17, 2017 at http://www.eia.gov/state/rankings/#/series/226.

US Environmental Protection Agency (USEPA). 2009, December. EPA: Greenhouse Gases Threaten Public Health and the Environment. https://yosemite.epa.gov/opa/admpress.nsf/0/08d11a451131bca585257685005bf252.

———. 2017. Overview of Greenhouse Gases. http://www3.epa.gov/climatechange/ghgemissions/gases.html.

5.7 HAZARDS AND HAZARDOUS MATERIALS

This section evaluates the potential impacts of the proposed project on human health and the environment due to exposure to hazardous materials or conditions associated with the project site, project construction, and project operations. Potential project impacts and appropriate mitigation measures or standard conditions are included as necessary. The analysis in this section is based, in part, upon the following source(s):

- *Radius Map Report, City of Hope, 1500 E. Duarte Road, Duarte, CA 91010,* Environmental Data Resources (EDR), February 29, 2016.

A complete copy of this study is included in Appendix G to this DEIR.

The following City of Hope plans and procedure manuals, available on request, are referenced in this section:

- Emergency Operations Plan, October 2014
- Safe Handling of Hazardous Medications and Waste, July 2014
- Radioactive Materials, Receiving and Handling, October 2014
- Radiation Safety Manual, 2008
- Spill Management Assistance Response Team (S.M.A.R.T.), July 2015

5.7.1 Environmental Setting

5.7.1.1 REGULATORY SETTING

Federal

Comprehensive Environmental Response, Compensation and Liability Act

The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) protects water, air, and soil resources from the risks created by past chemical disposal practices. This law is also called the Superfund Act and regulates sites on the National Priority List, which are called Superfund sites.

Emergency Planning and Community Right-to-Know Act

In 1986, Congress passed the Superfund Amendments and Reauthorization Act, Title III of which was the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). The act required the establishment of state commissions, planning districts, and local committees to facilitate the preparation and implementation of emergency plans. Under the requirements, local emergency planning committees are responsible for developing a plan for preparing for and responding to a chemical emergency, including:

- An identification of local facilities and transportation routes where hazardous materials are present.

- The procedures for immediate response in case of an accident (this must include a community-wide evacuation plan).

- A plan for notifying the community that an incident has occurred.
- The names of response coordinators at local facilities.
- A plan for conducting drills to test the plan.

The emergency plan is reviewed by the State Emergency Response Commission and publicized throughout the community. The local emergency planning committee is required to review, test, and update the plan each year.

Another purpose of the EPCRA is to inform communities and citizens of chemical hazards in their areas. Sections 311 and 312 of EPCRA require businesses to report to state and local agencies the location and quantities of chemicals stored onsite. Under Section 313 of EPCRA, manufacturers are required to report chemical releases for more than 600 designated chemicals. In addition to chemical releases, regulated facilities are also required to report offsite transfers of waste for treatment or disposal at separate facilities, pollution prevention measures, and chemical recycling activities. The US Environmental Protection Agency (EPA) maintains the Toxic Release Inventory database that documents the information that regulated facilities are required to report annually.

Resource Conservation and Recovery Act

Federal hazardous waste laws are generally promulgated under RCRA. These laws provide for the "cradle to grave" regulation of hazardous wastes. Any business, institution, or other entity that generates hazardous waste is required to identify and track its hazardous waste from the point of generation until it is recycled, reused, or disposed. The California Department of Toxic Substances Control is responsible for implementing the RCRA program as well as California's own hazardous waste laws, which are collectively known as the Hazardous Waste Control Law. Under the Certified Unified Program Agency (CUPA) program, the California Environmental Protection Agency (CalEPA) has in turn delegated enforcement authority to the County of Los Angeles for state law regulating hazardous waste producers or generators.

Hazardous Materials Transportation Act

The United States Department of Transportation (USDOT) regulates hazardous materials transportation under Title 49 (Transportation) of the Code of Federal Regulations (CFR). State agencies that have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol and the California Department of Transportation (Caltrans). These agencies also govern permitting for hazardous materials transportation.

Federal Response Plan

The Federal Response Plan of 1999 is a signed agreement among 27 federal departments and agencies, including the American Red Cross, that: 1) provides the mechanism for coordinating delivery of federal assistance and resources to augment efforts of state and local governments overwhelmed by a major disaster or emergency; 2) supports implementation of the Robert T. Stafford Disaster Relief and Emergency Act as well as individual agency statutory authorities; and 3) supplements other federal emergency operations plans developed to address specific hazards. The Federal Response Plan is implemented in anticipation of a significant event likely to result in a need for federal assistance or in response to an actual event requiring federal assistance under a Presidential declaration of a major disaster or emergency.

Occupational Safety and Health in Hospitals

Guidelines for occupational safety and health of hospital workers are set forth in the Occupational Safety and Health Administration (OSHA) Technical Manual, Section VI, Chapters 1, *Hospital Investigations: Health Hazards*, and 2, *Controlling Occupational Exposure to Hazardous Drugs* (OSHA 2016). The National Institute of Occupational Safety and Health (NIOSH) issued its *Guidelines for Protecting the Safety and Health of Health Care Workers* in 1988.

Medical Waste

Several regulations govern the handling, storage, and disposal of medical waste.

- Regulations governing hospital, medical, and infectious waste incinerators are set forth in CFR Title 40, Parts 60 and 62.
- Regulations governing occupational exposure to blood-borne pathogens and administered by OSHA are set forth in CFR Title 29, Part 1910.
- The Food and Drug Administration regulates the types of containers used for storing medical wastes (CFR Title 21, Part 864).
- The packaging of medical waste for transport is regulated by USDOT (CFR Title 49, Part 173).

Radiologic Safety

Nuclear Regulatory Commission regulations, including those governing the licensing of medical uses of nuclear materials, standards for protection against radiation, and packaging and transport of radioactive material are set forth in CFR Title 10, Chapter 1.

State

Hazardous Substances Account Act

The Hazardous Substances Account Act (California Health and Safety Code Sections 25300 et seq.) authorizes the State to clean up hazardous materials release sites – including abandoned sites – not qualifying for cleanup under CERCLA; provides funds to pay for the state's share of costs of CERCLA cleanups; and provides compensation to persons injured by hazardous materials releases.

Hazardous Materials Release Notification

Many state statutes require emergency notification of a hazardous chemical release:

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HAZARDS AND HAZARDOUS MATERIALS

- California Health and Safety Codes Sections 25270.8, and 25507
- Vehicle Code Section 23112.5
- Public Utilities Code Section 7673 (PUC General Orders #22-B, 161)
- Government Code Sections 51018, 8670.25.5(a)
- Water Code Sections 13271, 13272
- California Labor Code Section 6409.1(b)10

Requirements for immediate notification of all significant spills or threatened releases cover owners, operators, persons in charge, and employers. Notification is required regarding significant releases from facilities, vehicles, vessels, pipelines, and railroads. In addition, all releases that result in injuries or harmful exposure to workers must be immediately reported to the California Division of Occupational Safety and Health (Cal/OSHA) pursuant to the California Labor Code Section 6409.1(b).

Hazardous Materials Disclosure Programs

The Unified Program administered by the State of California consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities for environmental and emergency management programs, which include: hazardous materials release response plans and inventories (business plans), the California Accidental Release Prevention (CalARP) Program, and the Underground Storage Tank (UST) Program. The Unified Program is implemented at the local government level by CUPAs.

Hazardous Materials Business Plans

Both the federal government (Code of Federal Regulations) and the State of California (California Health and Safety Code) require all businesses that handle more than a specified amount—or "reporting quantity"—of hazardous or extremely hazardous materials to submit a hazardous materials business plan to its CUPA. The preparation, submittal, and implementation of a business plan is required by any business that handles a hazardous material or a mixture containing a hazardous material in specified quantities.

Business plans must include an inventory of the hazardous materials at the facility. Businesses must update their business plan at least every three years and the chemical portion every year. Also, business plans must include emergency response plans and procedures to be used in the event of a significant or threatened significant release of a hazardous material. These plans need to identify the procedures for immediate notification of all appropriate agencies and personnel, identification of local emergency medical assistance appropriate for potential accident scenarios, contact information for all company emergency coordinators, a listing and location of emergency equipment at the business, an evacuation plan, and a training program for business personnel.

California Accidental Release Prevention Program

CalARP became effective on January 1, 1997, in response to Senate Bill 1889. CalARP aims to be proactive and therefore requires businesses to prepare risk management plans, which are detailed engineering analyses of the potential accident factors at a business and the mitigation measures that can be implemented to reduce this accident potential. This requirement is coupled with the requirements for preparation of hazardous materials business plans under the Unified Program, implemented by the CUPA.

Leaking Underground Storage Tanks

Leaking USTs have been recognized since the early 1980s as the primary cause of groundwater contamination from gasoline compounds and solvents. In California, regulations aimed at protecting against UST leaks have been in place since 1983 (Health and Safety Code). This occurred one year before RCRA was amended to add Subtitle I, requiring UST systems to be installed in accordance with standards that address the prevention of future leaks. The State Water Resources Control Board has been designated the lead California regulatory agency in the development of UST regulations and policy.

Older tanks are typically single-walled steel tanks. Many of these have leaked as a result of corrosion, punctures, and detached fittings. As a result, the State of California required the replacement of older tanks with new double-walled fiberglass tanks with flexible connections and monitoring systems. UST owners were given 10 years to comply with the new requirements—the deadline was December 22, 1998. However, many UST owners did not act by the deadline, so the state granted an extension for their replacement ending January 1, 2002. The State Water Resources Control Board, in cooperation with the Governor's Office of Emergency Services, maintain an inventory of leaking USTs in a statewide database.

California Code of Regulations, Title 22, Division 4.5

Title 22, Division 4.5, of the California Code of Regulations (CCR) sets forth the requirements for hazardous-waste generators, transporters, and owners or operators of treatment, storage, or disposal facilities. These regulations include the requirements for packaging, storage, labeling, reporting, and general management of hazardous waste prior to shipment. In addition, the regulations identify standards applicable to transporters of hazardous waste. These regulations specify the requirements for transporting shipments of hazardous waste, including manifesting, vehicle registration, and emergency accidental discharges during transportation.

California Fire Code

The California Fire Code (CFC; CCR Title 24 Part 9) includes requirements for building materials and methods pertaining to fire safety and life safety, fire protection systems in buildings, emergency access to buildings, and handling and storage of hazardous materials. The CFC is updated triennially; the 2016 CFC is scheduled to take effect January 1, 2017.

Asbestos

Asbestos is the name of a group of silicate minerals that are heat resistant, and thus were commonly used as insulation and fire retardant. Inhaling asbestos fibers has been shown to cause lung disease (asbestosis) and lung cancer (mesothelioma) (DTSC 2016). Beginning in the early 1970s, a series of bans on the use of certain asbestos-containing materials (ACM) in construction were established by the EPA and the Consumer Product Safety Commission. Most US manufacturers voluntarily discontinued the use of asbestos in certain building products during the 1980s. California Government Code Sections 1529 and 1532.1 provide for exposure limits, exposure monitoring, respiratory protection and good working practice by workers exposed to lead and ACM.

Requirements for limiting asbestos emissions from building demolition and renovation activities are also specified in South Coast Air Quality Management District (SCAQMD) Rule 1403 (Asbestos Emissions from Demolition/Renovation Activities). Numerous buildings onsite were built between 1935 and 1978 (see Section 5.4, *Cultural Resources*, of this DEIR), and thus may contain ACMs.

Lead

Lead was formerly used as an ingredient in paint (before 1978) and as a gasoline additive; both of these uses have been banned. Lead is listed as a reproductive toxin and a cancer-causing substance; it also impairs the development of the nervous system and blood cells in children (DTSC 2016). Paint containing lead at concentrations of 5,000 milligrams per kilogram (or parts per million) is considered lead-based paint (LBP). Structures built before 1978 are presumed to contain LBP. Lead must be contained during demolition activities (California Health & Safety Code Sections 17920.10 and 105255). CFR Title 29, Part 1926 establishes standards for occupational health and environmental controls for lead exposure. The standard also includes requirements addressing exposure assessment, methods of compliance, respiratory protection, protective clothing and equipment, hygiene facilities and practices, medical surveillance, medical removal protection, employee information and training, signs, recordkeeping, and observation or monitoring.

Polychlorinated Biphenyls

A group of toxic chemicals used for a variety of purposes including electrical applications, carbonless copy paper, adhesives, hydraulic fluids, and caulking compounds. PCBs do not breakdown easily and are listed as cancer-causing agents by the California Office of Environmental Health Hazard Assessment (DTSC 2017). Regulations governing the abatement and disposal of polychlorinated biphenyls in demolition activities are set forth in the Code of Federal Regulations, Title 40, Sections 761.61 et seq.

Mercury

Mercury is used in fluorescent lamps, thermostats, electrical switches, and other applications. is highly toxic and affects the nervous system, kidneys and other organs (DTSC 2017). Mercury-containing equipment is classified as universal waste by the Department of Toxic Substances Control and the EPA (DTSC 2010).

Regulations Governing Medical Waste

Medical Waste Management Act

The Medical Waste Management Act (California Health and Safety Code Sections 117600–118360) sets forth requirements for storage, transport, treatment, and disposal of medical waste administered by the California Department of Public Health Medical Waste Management Program.

Assembly Bill 333

Assembly Bill 333 (AB 333; Chapter 564, Statutes of 2014) sets forth additional requirements for transport of medical waste.

Senate Bill 225

Senate Bill 225 (SB 225; Chapter 352, Statutes of 2015) sets forth additional requirements for containment, storage, and transport of medical waste.

California Code of Regulations Title 8, Section 5193: Blood-Borne Pathogens

Section 5193 contains regulations governing occupational exposure of blood-borne pathogens. Guidelines for avoiding and minimizing exposure to blood-borne pathogens are issued by Cal/OSHA in "Exposure Control Plan for Bloodborne Pathogens" (2001a) and "A Best Practices Approach for Reducing Bloodborne Pathogen Exposure" (2001b).

Radiologic Safety Regulations

Radiation Control Law (California Health and Safety Code Sections 114960 et seq.)

The Radiation Control Law governs sources of ionizing radiation for the protection of occupational and public health and safety. Regulations implementing the Radiation Control Law, set forth in CCR Title 17, Sections 30100 et seq., are implemented by the California Department of Public Health.

Radiologic Technology Act (California Health and Safety Code Section 27[f])

The Radiologic Technology Act governs the use of radiologic equipment in health care, including x-ray machines. Regulations implementing the Radiologic Technology Act are set forth in CCR Title 17, Sections 30400 et seq.

Regional

South Coast Air Quality Management District

SCAQMD Rule 1403 governs the demolition of buildings containing asbestos materials. Rule 1403 specifies work practices with the goal of minimizing asbestos emissions during building demolition and renovation activities, including the removal and associated disturbance of ACM. The requirements for demolition and renovation activities include asbestos surveying, notification, ACM removal procedures and time schedules, ACM handling and cleanup procedures, and storage and disposal requirements for asbestos-containing waste materials.

Los Angeles County

A CUPA is a local agency that has been certified by CalEPA to implement the local Unified Program. The CUPA can be a county, city, or joint-powers authority. A participating agency is a local agency that has been designated by the local CUPA to administer one or more Unified Programs within its jurisdiction on behalf of the CUPA. A designated agency is a local agency that has not been certified by CalEPA to become a CUPA but is the responsible local agency that would implement the six Unified Programs outlined above until it is certified. Currently, there are 83 CUPAs in California. The Los Angeles County Fire Department (LACFD) Health Hazardous Materials Division (HHMD) is the certified CUPA for most of Los Angeles County, including Duarte and Irwindale, and consolidates and coordinates:

- Hazardous Materials Business Plans
- California Accidental Release Prevention Program
- Underground Storage Tank (UST) Program
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs
- California Uniform Fire Code: Hazardous Materials Management Plans and Hazardous Material Inventory Statements
- Aboveground Storage Tanks

The LACFD HHMD provides emergency response to hazardous materials releases.

City of Duarte

City of Duarte Municipal Code Section 19.50.030 regulates the use, handling, storage, and transport of hazardous materials with the intent of minimizing accidental or intentional release of such materials. Section 19.50.030 requires compliance with state and federal regulations governing the use, storage, manufacture, and disposal of hazardous materials.

City of Irwindale

City of Irwindale Municipal Code Section 8.20.060 regulates proper disposal of hazardous materials. The aforementioned Section prohibits the collection or transport of hazardous waste without a permit for such collection or transport issued by the Irwindale City Council. Hazardous materials are also regulated in other areas of the municipal code, including planned developments and quarry overlay zones.

5.7.1.2 CITY OF HOPE PLANS, POLICIES, AND PROCEDURES

City of Hope plans, policies, and procedures governing the use, storage, and disposal of hazardous wastes and hazardous materials include the following:

Emergency Operations Plan

The Emergency Operations Plan outlines procedures to be implemented by City of Hope staff in the event of an emergency situation. The Emergency Operations Plan sets forth roles and responsibilities of various staff and departments in responding to a variety of natural and man-made emergencies. The Emergency

Operations Plan was designed to facilitate quick decision-making when implementing emergency procedures in response to disasters.

Safe Handling of Hazardous Medications and Waste

Policy and Procedures Manual, Safe Handling of Hazardous Medications and Waste identifies hazardous medications and sets forth procedures for the safe handling of hazardous medications and wastes. The procedures address handling, waste disposal, and spill management of hazardous medications used on the City of Hope campus.

Spill Management Assistance Response Team (S.M.A.R.T.)

The *Policy and Procedure Manual, Spill Management Assistance Response Team (S.M.A.R.T.)* sets forth procedures for containing, cleaning up, and disposing of hazardous materials spills; and requesting assistance from the City of Hope Occupational Safety and Health Department as appropriate. The policies address cleanup of chemical, biohazard, radioactive, and hazardous drug/chemo agent spills. Cleanup of small spills can be handled by all City of Hope personnel; however, Occupational Safety and Health Department staff must be contacted to clean up large chemical spills or spills of material that are poisonous if inhaled.

Receiving and Handling Radioactive Materials

City of Hope personnel involved in receiving and handling radioactive materials are trained in safe handling and documentation procedures. The *Policy and Procedure Manual, Radioactive Materials, Receiving and Handling* sets forth procedures for receiving and handling radioactive materials, and transferring such materials to users. The policies and procedures for delivery of radioactive materials ensure that the materials are delivered to the correct location and accepted by trained staff. The policies and procedures outline the steps to be taken in the event that a radioactive item is received in a damaged condition or is leaking.

Radiation Safety Manual

In compliance with their Radioactive Materials License, the City of Hope has developed a Radiation Safety Program. The Radiation Safety Program ensures that all sources of ionizing radiation are handled in accordance with the City of Hope policies and procedures and federal and state regulations. As part of the Radiation Safety Program, the *Radiation Safety Manual* was developed to outline regulations and procedures for the safe handling and use of radioactive materials and machine sources to provide radiation protection for employees, patients, and the public.

Additional information about City of Hope plans, policies, and procedures is available on request from the City of Duarte Planning Division.

5.7.1.3 EXISTING CONDITIONS

Hazardous Materials and Hazardous Wastes Used, Stored, and/or Generated Onsite

Hazardous materials and hazardous wastes used, stored, and/or generated onsite can be classified into three categories:

5. Environmental Analysis
HAZARDS AND HAZARDOUS MATERIALS

1. **Chemical hazards:** substances and wastes which are toxic, corrosive, flammable, and/or reactive.[1] Chemical hazards onsite include:

   - Chemotherapy medicines. Poisons that destroy or control cancer cells, or ease symptoms of cancer; often by inhibiting cell division

   - Other hazardous drugs. A drug with any of the four following characteristics is considered hazardous:
     - Genotoxic
     - Carcinogenic
     - Teratogenic (causes birth defects; or other disturbances of embryonic or fetal development; or halts pregnancy altogether)
     - Toxic at low doses in animals or patients (OSHA 2016)

   - Sterilants, disinfectants, and other cleaning chemicals. Widely used sterilants and disinfectants include ethylene oxide and glutaraldehyde.

   - Laboratory chemicals

   - Pesticides

   - Compressed gases such as oxygen, carbon dioxide, nitrogen, and nitrous oxide ("laughing gas"). Oxygen can cause reproductive damage and mutations (NJDHSS 2007). Carbon dioxide can cause suffocation, may increase respiration and heart rate, and can cause frostbite (Praxair 2016). Nitrogen can displace oxygen and cause rapid suffocation; liquid nitrogen can cause cryogenic burns (Praxair 2014). Nitrous oxide is an oxidizer and intensifies combustion, can cause frostbite, can displace oxygen and cause rapid suffocation, and can cause drowsiness and dizziness (Airgas 2016).

2. **Biological hazards or biohazards:** include infectious agents; biological substances transported for diagnostic or investigative purposes; and waste or reusable material derived from medical treatment.

   - Biohazardous substances include:
     - Biotherapy (immunotherapy) agents—such as monoclonal antibodies and cytokines—that augment, modulate, or restore the patient's immune responses; directly interfere with tumor activity; or affect a tumor's ability to replicate (McCune 2013)
     - Human tissues or organs (such as for transplantation)
     - Human blood
     - Microbiological cultures and specimens

[1] Radioactive substances can also be classified as chemical hazards but here are classified separately.

- **Biohazardous wastes** include all of the following categories:
  - Human tissues, organs, or body parts
  - Human blood and other body fluids
  - Microbiological waste. Cultures and stocks of infectious agents and other microorganisms
  - Sharps. Hypodermic needles, syringes, pipettes, capillary tubes, and broken glass
  - Isolation wastes from patients with highly communicable diseases
  - Animal wastes—including carcasses, body parts, and bedding—that may have been exposed to infectious agents during research or testing (Hercenter.org 2016a)

3. **Radioactive Materials:** Common uses of radioactive materials onsite include materials implanted into patients; oral medications; substances injected, in relatively low doses, for diagnostic procedures; and substances used in radiation beams for diagnosis or treatment.

Medical Waste Transport and Disposal

One medical waste transfer station in the San Gabriel Valley is listed on the California Department of Public Health's Registered Medical Waste Transfer Stations and Treatment Facilities list—Veolia ES Technical Solutions, LLC, in the City of Azusa (CDPH 2016).

Environmental Database Search

An environmental database search was conducted on February 29, 2016, by Environmental Data Resources, Inc. (see Appendix G). Findings of the database search of listings within one-quarter mile of City of Hope are summarized in Table 5.7-1. A one-quarter mile radius is a standard search distance for environmental database searches that reasonably captures all potentially hazardous sites near a project site.

Table 5.7-1 Environmental Database Listings Within 0.25 Mile of City of Hope

Site and Address	Database, Reason for Listing, Regulatory Status
Onsite Listings	
City of Hope Gonda Expansion	NPDES (National Pollution Discharge Elimination System): water quality permits including stormwater permits
City of Hope	LQG: Large Quantity Generator of hazardous wastes on federal Resource Conservation and Recovery Act (RCRA) database
	UST: Permitted Underground Storage Tank
	SWEEPS UST (Statewide Environmental Evaluation and Planning System): historical USTs (5 tanks)
	HIST UST (Historical UST) (5 tanks)
	CA FID (Facility Inventory Database): Historical USTs
	US AIRS (Aerometric Information Retrieval System): compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies.
	EMI: Emissions Inventory Data: Toxic and criteria pollutant emissions data.
	HMS: Los Angeles County Department of Public Works database of Industrial waste and underground storage tank sites
	NPDES

5. Environmental Analysis
HAZARDS AND HAZARDOUS MATERIALS

Table 5.7-1 Environmental Database Listings Within 0.25 Mile of City of Hope

Site and Address	Database, Reason for Listing, Regulatory Status
	CHMIRS (2 listings): 1990: gasoline was released from an overturned vehicle after a collision 1991: a suspicious fire/explosion occurred in industrial equipment surrounded by a vacant lot
	ECHO: Enforcement and Compliance History Information (2 listings): one for City of Hope; 2nd for Southern California Edison Hopeful Substation onsite
	Haznet: Hazardous waste shipment manifests. 644 listings through 2014.
Offsite Listings	
Airgas West-Duarte 2250 Buena Vista Street Next to west site boundary	ICIS: Integrated Compliance Information System: national enforcement and compliance program
	ECHO
	Haznet: 17 shipments
Airco Duarte 2250 Buena Vista Street Next to west site boundary	SWEEPS UST: 1 tank
Circle R Investments 2250 Buena Vista Street Next to west site boundary	HMS
RBC Southwest Products 2240 Buena Vista St Next to west site boundary	Haznet: 95 shipments
Manuel Perez 1950 Cinco Robles Rd Next to west site boundary	PEST LIC: Pesticide Regulation Licenses issued by State Department of Pesticide Regulation
Southwest Productions Co. 2240 Buena Vista St Next to west site boundary	SQG (Small Quantity Generator of hazardous wastes, on RCRA database)
	EnviroStor: Sites with known contamination or reason for further investigation Voluntary Cleanup site. Release of benzene affected soil. Case closed (“No Further Action”) 1998.
	LUST: Leaking Underground Storage Tank Release of Waste Oil / Motor / Hydraulic / Lubricating oil affected soil Case closed 1994
	HIST UST: 2 tanks
	EMI
	HIST CORTESE: Historic database: underground storage tanks, solid waste facilities, and cleanup sites.
	LA Co. Site Mitigation: County Community Health Services database
	ECHO
	SWEEPS UST (2 tanks)
	HMS
Los Angeles County Sanitation District 2144 Buena Vista St Next to west site boundary	Haznet: 36 shipments
Allen Villa Service 1816 E Village Rd Next to west site boundary	Historical auto station
Forthun John 2060 E Village Rd Next to west site boundary	Historical cleaners

5. Environmental Analysis
HAZARDS AND HAZARDOUS MATERIALS

Table 5.7-1 Environmental Database Listings Within 0.25 Mile of City of Hope

Site and Address	Database, Reason for Listing, Regulatory Status
Wing G A 2084 E Village Rd Next to west site boundary	Historical auto station
Scott G N 2090 E Village Rd Next to west site boundary	–
Irwindale Iron & Metal 2401 Buena Vista Ave 140 feet south-southwest	SWEEPS UST: historic UST: 1 tank
Fifteen Cent Wash 1314 Duarte Rd 490 feet north-northwest	Historical cleaners
Vogue Dry Cleaners 1312 E Duarte Rd 490 feet north-northwest	Historical cleaners
Warren's Richfield Service Station 1300 Duarte Rd 680 feet north-northwest	Historical auto station
Tropicana Service Station 1300 Duarte Rd 680 feet north-northwest	Historical USTs (SWEEPS UST; CA FID UST; HMS)
Chevron 9-4104 1815 Buena Vista St 710 feet north-northwest	LUST: release of Waste Oil / Motor / Hydraulic / Lubricating oil affected soil Case closed 1990 Historical USTs (Hist Cortese; SWEEPS UST; Hist UST; 4 tanks)
Davis Geo M Chevron Service 1815 Buena Vista St 710 feet north-northwest	Historical auto station
Woodward HRT 1700 Business Center Dr 730 feet northeast	SQG
	TRIS: Toxics Release Inventory System
	ECHO
1700 Business Center Dr 730 feet northeast	AST: Aboveground storage tank
Former GE Aviation Systems 1700 Business Center Dr 730 feet northeast	EnviroStor: Voluntary cleanup program. Release of diesel, motor oil, and/or tributyl phosphate affected soil; case closed (*No Further Action*) 2014.
	NPDES
Smiths Aerospace Actuation 1700 Business Center Dr 730 feet northeast	Historical USTs (SWEEPS UST; CA FID UST)
	Haznet: 35 shipments
	WDS: Waste Discharge System
	WIP: Well Investigation Program Case in the San Gabriel and San Fernando valleys
Pioneer Electronics 1801 S Highland Ave 790 feet northeast	Historical USTs (SWEEPS UST; CA FID UST; HMS): 3 tanks

5. Environmental Analysis
HAZARDS AND HAZARDOUS MATERIALS

Table 5.7-1 Environmental Database Listings Within 0.25 Mile of City of Hope

Site and Address	Database, Reason for Listing, Regulatory Status
Holmes Body Shop Inc 1801 Highland Ave 790 feet northeast	SQG HMS ECHO
Pacific Scientific Htl/Kin-Tech Div 1800 Highland Ave 830 feet northeast	SQG TRIS ECHO Hist UST EMI Haznet: 3 shipments, 2013 NPDES WDS WIP
Cooks Collision of Duarte 1718 Highland Ave 930 feet northeast	SQG HMS ECHO
Golden State Hydraulics 1718 Highland Ave Unit A	SQG WIP ECHO
1718 Highland Ave 930 feet northeast	Historical auto station
Glasteel Industrial Laminates 1727 Buena Vista 940 feet north-northwest	Hist UST; SWEEPS UST; CA FID UST: 2 tanks EMI
Glasteel Tennessee Inc. 1727 Buena Vista 940 feet north-northwest	SQG HMS ECHO
Fibrwrap Construction Inc. 1710 Evergreen Street 1,050 feet north-northeast	CESQG: Conditionally Exempt Small Quantity Generator of hazardous wastes
1512 Highland Ave 1,090 feet northeast	Historical cleaners
Mead Wrecking Co. #313 1215 Duarte Road 1,250 feet north-northwest	LOS ANGELES CO. LF: Los Angeles County Landfill WMUDS/SWAT: Waste Management Unit Database/Solid Waste Assessment Test
Sari Art and Printing 1803 Business Center Dr 1,320 feet northeast	SQG Haznet: 5 shipments ECHO

Note: Addresses are omitted for onsite listings. All sites in Duarte except as specified.

Schools within 0.25 Mile of the Project Site

One school is within 0.25 mile of the project site, Beardslee Elementary School at 1212 Kellwil Way in Duarte, about 600 feet to the west.

Regional Groundwater Contamination

The San Gabriel Valley Area 2 ("Baldwin Park") Superfund Site is across the I-605 freeway from the project site. The Superfund site, approximately 17.5 square miles, is part of the Main San Gabriel Valley Groundwater Basin underlying portions of the cities of Irwindale, Azusa, Baldwin Park, and West Covina. The groundwater plume does not underlie the project site. The Superfund site addresses multiple, commingled plumes of groundwater contamination that are over a mile in width and eight miles in length. The depth to the groundwater varies from about 150 to 350 feet, and the groundwater contamination extends from the water table to more than 1,000 feet below ground surface. The most prevalent contaminants in the groundwater are trichloroethene (TCE), perchloroethylene (PCE), carbon tetrachloride, perchlorate, and N-nitrosodimethylamine (NDMA). Remediation is underway through several treatment facilities using a variety of treatment processes (Geosyntec 2016; MSGBW 2016).

Wildfire Hazard

The Santa Fe Flood Control Basin, next to the southeast site boundary, is designated a Very High Fire Hazard Severity Zone by the California Department of Forestry and Fire Prevention (CAL FIRE 2012).

5.7.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

H-1 Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

H-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.

H-3 Emit hazardous emissions or handle hazardous or acutely hazardous materials, substance, or waste within one-quarter mile of an existing or proposed school.

H-4 Be located on a site which is included on a list of hazardous materials compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.

H-5 For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would result in a safety hazard for people residing or working in the project area.

H-6 For a project in the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area.

H-7 Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

H-8 Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to the urbanized areas or where residences are intermixed with wildlands.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant:

- Threshold H-5: The project site is not in an airport land use plan, or within two miles of a public-use airport.
- Threshold H-6: There are no private airstrips near the project site.

These impacts will not be addressed in the following analysis.

5.7.3 Environmental Impacts

Methodology

This analysis evaluates the potential impacts of the proposed project on human health and the environment due to potential exposure of hazardous materials or conditions associated with the project site, project construction, and project operations. Numerous databases were searched as identified in Table 5.7-1 to determine the existing conditions of the site. The proposed project's operations and procedures were evaluated in the context of the on-site and surrounding environmental conditions to determine the project's potential hazard risks.

The following impact analysis addresses thresholds of significance for potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.7-1: Project construction and operations would involve the transport, use, and/or disposal of hazardous materials. [Thresholds H-1, H-2, and H-3]

Impact Analysis:

Construction

Construction in accordance with the Campus Plan would involve demolition, grading, and construction of new buildings. Potentially hazardous materials used during construction include substances such as paints, sealants, solvents, adhesives, cleaners, and diesel fuel. There is potential for these materials to spill or to create hazardous conditions. However, the materials used would not be in such quantities or stored in such a manner as to pose a significant safety hazard. These activities would also be short term or one time in nature. Project construction workers would be trained in safe handling and hazardous materials use.

To prevent hazardous conditions, existing local, state, and federal laws—such as those listed under Section 5.7.1.1, *Regulatory Framework*—are to be enforced at the construction sites. For example, compliance with existing regulations would ensure that construction workers and the general public are not exposed to any risks related to hazardous materials during demolition and construction activities. Cal/OSHA has regulations concerning the use of hazardous materials, including requirements for safety training, exposure warnings, availability of safety equipment, and preparation of emergency action/prevention plans. For example, all spills or leakage of petroleum products during construction activities are required to be immediately contained, the hazardous material identified, and the material remediated in compliance with applicable state and local regulations for the cleanup and disposal of that contaminant. All contaminated waste encountered would be required to be collected and disposed of at an appropriately licensed disposal or treatment facility.

Furthermore, strict adherence to all emergency response plan requirements set forth by the cities of Duarte and Irwindale and LACFD would be required throughout the duration of project construction. While construction activities would be near and in the vicinity of existing sensitive uses, including existing City of Hope buildings and Beardslee Elementary School, upon compliance with federal, state, and city regulations, construction activities in accordance with the proposed project would result in a less than significant impact on the public or environment through the use, transport, or disposal of hazardous materials. Therefore, hazards to the public or the environment arising from the routine use of hazardous materials during project construction would be less than significant.

Grading Activities

Grading activities of the development that would be allowed by the Campus Plan would involve the disturbance of onsite soils. Soils on certain parcels of the project area could be contaminated with hazardous materials due to current and historical operations. The transport of these materials and exposure to contaminated soils of workers and the surrounding environment could result in a significant impact. Any contaminated soils encountered on development sites in the Campus Plan area would be required to be removed prior to grading activities and disposed of offsite in accordance with all applicable regulatory guidelines. This is a potentially significant impact.

Demolition

Demolition of buildings has the potential to expose and disturb LBP, ACMs, PCBs, and mercury. Demolition can cause encapsulated ACMs (if present) to become friable and, once airborne, they are considered a carcinogen.[2] Demolition of the existing buildings and structures can also release of lead into the air if LPB is not properly removed and handled. The EPA has classified lead and inorganic lead compounds as "probable human carcinogens" (USEPA 2015). Such releases could pose significant risks to persons living and working in and around project site, as well as to project construction workers.

Abatement of all hazardous materials encountered during any future building demolition would be required to be conducted in accordance with all applicable laws and regulations, including those of the EPA (which regulates disposal), OSHA, US Department of Housing and Urban Development, Cal/OSHA (which regulates employee exposure), and SCAQMD. Lead hazards in Duarte and Irwindale are assessed and abated as necessary in accordance with several state laws and regulations. Asbestos hazards are assessed and abated

[2] When dry, an ACM is considered friable if it can be crumbled, pulverized, or reduced to powder by hand pressure. If it cannot, it is considered a nonfriable ACM. It is possible for nonfriable ACMs to become friable when subjected to unusual conditions, such as when demolishing a building or removing an ACM that has been glued into place.

as necessary in accordance with CCR Title 8, Section 1529. Mercury-containing equipment and PCBs would be disposed of as universal waste in accordance with CCR Title 22, Section 66261.9. Future projects would be required to abate and dispose of PCBs in accordance with Code of Federal Regulations, Title 40, Sections 761.61 et seq.

The EPA requires that all asbestos work performed within regulated areas be supervised by a competent person who is trained as an asbestos supervisor (EPA Asbestos Hazard Emergency Response Act, 40 CFR 763). SCAQMD's Rule 1403 requires that buildings undergoing demolition or renovation be surveyed for ACMs prior to any demolition or renovation activities. Should ACMs be identified, Rule 1403 requires that ACMs be safely removed and disposed of at a regulated site, if possible. If it is not possible to safely remove ACMs, Rule 1403 requires that safe procedures be used to demolish the building with asbestos in place without resulting in a significant release of asbestos. Additionally, during demolition, grading, and excavation, all construction workers would be required to comply with the requirements of CCR Title 8, Section 1529 (Asbestos), which provides for exposure limits, exposure monitoring, respiratory protection, and good working practices by workers exposed to asbestos.

Cal/OSHA regulates the demolition, renovation, or construction of buildings involving lead-based materials. It includes requirements for the safe removal and disposal of lead, and the safe demolition of buildings containing LBP or other lead materials. Additionally, during demolition, grading, and excavation, all construction workers would be required to comply with the requirements of CCR Title 8, Section 1532.1 (Lead), which provides for exposure limits, exposure monitoring, respiratory protection, and good working practice by workers exposed to lead.

The potential exposure of construction workers to ACMs, LBP, PCBs, or mercury is a potentially significant impact. Survey of existing structures prior to demolition would be required to characterize the potential exposure and further prevent impacts from the potential release of these materials.

Operation

Project buildout would increase building area of patient care and research land uses combined by approximately a net 870,000 square feet, thus increasing the amounts of hazardous materials that would be used in City of Hope patient care and research functions. The City of Hope uses and has specific protocols (discussed in Section 5.7.1.2 of this DEIR) for the use of chemical hazards, biohazards, and radioactive materials.

Chemical Hazards

Operation of the proposed facilities would involve use of hazardous chemicals such as chemotherapy medicines, sterilants, disinfectants, laboratory chemicals, pesticides, and compressed gases; and would generate wastes containing such chemicals. Hazardous chemicals would be used and disposed of in compliance with existing regulations and guidelines of OSHA, Cal/OSHA, NIOSH, USDOT, the EPA, California Department of Public Health, and LACFD. City of Hope policies and procedures for the safe use, storage and disposal of hazardous chemicals are set forth in its "Policy and Procedures Manual, Safe Handling of Hazardous Materials and Waste." City of Hope staff are properly trained in these regulations, guidelines, and procedures that govern the safe handling, transport, and disposal of hazardous chemical. When used and disposed of correctly and in compliance with existing laws and regulations, hazardous chemicals would not result in a significant hazard to employees, patients, or visitors.

Biohazards

Operation of the proposed facilities would involve use of biohazardous substances such as biotherapy agents, human tissues or organs, human blood, and microbiological cultures and specimens. Project operation would also generate all six categories of biohazardous wastes listed above (human tissues, organs, or body parts; human blood and other body fluids; microbiological waste; sharps; isolation waste; and animal wastes). Therefore, project operation could pose hazards to City of Hope workers, patients, and visitors. The use of biohazardous substances and the storage and transport of biohazardous wastes would be conducted in compliance with existing regulations and guidelines, including the Medical Waste Management Act, AB 333, SB 225, CCR Title 8 Section 5193, and OSHA and NIOSH guidelines. City of Hope policies and procedures for the safe use, storage, and disposal of biohazards are set forth in its "Policy and Procedures Manual, Safe Handling of Hazardous Materials and Waste." City of Hope staff are properly trained in these regulations, guidelines, and procedures that govern the safe handling, transport, and disposal of biohazardous substances. When used and disposed of correctly and in compliance with existing laws and regulations, biohazardous substances would not result in a significant hazard to employees, patients, or visitors.

Radioactive Materials

Operation of the proposed facilities would involve increased use of radioactive materials in diagnosis and treatment. Thus, project operation could pose radiologic hazards to City of Hope workers, patients, and visitors. Radioactive materials would be used, stored, transported, and disposed of in compliance with CFR Title 10, Chapter 1; the Radiation Control Law; the Radiologic Technology Act; and regulations implementing the latter two laws. City of Hope policies and procedures for the safe use of radiologic equipment and the safe handling, use, and storage of radiologic materials are set forth in its "Radiation Safety Manual and Policy and Procedure Manual, Receiving and Handling Radioactive Materials." and implemented as part of their Radiation Safety Program. Use of radioactive materials and radiological machines are supervised and conducted by City of Hope staff that have been properly trained in the policies and procedures for the safe use of radiation. These policies and procedures are in place to provide radiation protection to employees, patients, and the public and to ensure that radiation exposure standards are not exceeded. In addition, radioactive material deliveries are only received by qualified staff who are trained in the proper handling and storage of these materials. When handled, used, and disposed of correctly and in compliance with existing laws and regulations, radioactive materials would not result in a significant hazard to employees, patients, or visitors.

Summary

Regarding all three categories of hazardous materials addressed above, if new types of equipment involving use of hazardous materials or use of new categories of hazardous materials were introduced into City of

Hope, the policy and procedure manuals would be updated to ensure the safe handling, storage, transport, and disposal of hazardous materials.

Accidental Release of Hazardous Materials

The use, storage, and transport of hazardous materials and hazardous wastes in compliance with the laws and regulations mentioned above would minimize the potential for releases of hazardous materials that could pose substantial hazards to the public or the environment and would entail prompt containment and cleanup of spills, either by City of Hope staff or by emergency response agencies.

City of Hope policies and procedures for containing and cleaning up spills of hazardous materials and for protecting the health and safety of workers, patients, and the public in response to a hazardous materials release are set forth in City of Hope's "Policy and Procedure Manual, Spill Management Assistance Response Team (S.M.A.R.T.)," "Policy and Procedure Manual, Safe Handling of Hazardous Materials and Waste," and in the Emergency Operations Plan. In the event of a spill, City of Hope staff would implement the emergency response procedures outlined in these plans to ensure that the spill is promptly contained, cleaned up, and disposed of by appropriately trained staff. When spills are contained, cleaned up, and disposed of in compliance with City of Hope policies, procedures, and emergency operations plans, impacts from the accidental release of hazardous materials would be less than significant.

Hazards to Persons at Beardslee Elementary School

Project buildout would result in increased usage and storage of hazardous materials onsite and increased transportation of hazardous materials to and from the site. Thus, project operation could subject people on and near the site, including at Beardslee Elementary School, to increased hazards from hazardous materials. However, as discussed above, City of Hope already has extensive policies, programs, and procedures in place to ensure the safe handling of hazardous materials. Compliance with these regulations and guidelines would reduce hazards from hazardous materials to the public and the environment to less than significant levels.

Impact 5.7-2: The project site is on a list of hazardous materials sites. [Threshold H-4]

Impact Analysis: The EDR report searched the following databases to identify whether the project area was listed in any hazardous materials sites databases: NPL, CERCLIS, CERCLIS-NFRAP, Federal ERNS, RCRA Non-CORRACTS TSD Facilities, RCRA CORRACTS TSD Facilities, RCRA Generators, State Sites and State Spill Sites, Cortese List, Registered USTs, or SWF/LF. A listing of the facilities identified by state regulatory agencies within the project site and surrounding area is presented in Table 5.7-1. A complete listing of all the facilities identified is included in the EDR report in Appendix G.

City of Hope is listed on several environmental databases, as shown above in Table 5.7-1. There are two listings of documented hazardous materials releases onsite—California Hazardous Materials Incident Reporting System (CHMIRS) records for two incidents, one incident in 1990 and a second in 1991. All corrective action was taken in response to both of these incidents.[3]—. Other types of hazardous material site listings onsite include a stormwater permit, large quantity generator, existing and historical underground storage tanks, and several hazardous waste shipment manifests (644). RCRA Large Quantify Generators store and generate hazardous materials. New development could expose workers or other users to hazardous materials.

Due to the fact that there are a number of listings in hazardous materials databases for the project site, there is the potential that future development activities could expose persons and the environment to hazardous substance contamination. Development projects that would be allowed under the Campus Plan could impact areas of hazardous substance contamination existing or remaining from historical operations. Impacting these areas may also pose a significant health risk to existing and future residents and/or workers. This is considered a potentially significant impact.

Impact 5.7-3: Implementation of the Campus Plan would not interfere with an adopted emergency response plan or emergency evacuation plan. [Threshold H-7]

Impact Analysis: Future development would not interfere with any evacuation plan or operations of the LACFD. Immediate access to the project area is provided by the I-210, I-605, Duarte Road, and Huntington Road. Emergency response and evacuation for Duarte and Irwindale are based on numerous access routes and freeways. The Campus Plan would not interfere with an emergency response plans or impede roadway access through removal of any streets. All construction activities would be required to be performed per the cities' and LACFD's standards and regulations. For example, future development would be required to provide the necessary on- and offsite access and circulation for emergency vehicles and services during the construction and operation phases.

Implementation of the Campus Plan would improve circulation and access within the project site. Project development would include an expanded internal loop road and other roadways, pedestrian pathways, and sidewalk improvements. Thus, project buildout would have some favorable impact on emergency access within the City of Hope campus. Additionally, City of Hope has an Emergency Operations Plan designed to facilitate quick decision-making when implementing emergency procedures in response to an internal or external disaster. Compliance with the Emergency Operations Plan on the campus would be consistent with and help facilities the Cities emergency response or evacuation procedures. Impacts on emergency access to surrounding land uses would be less than significant.

Impact 5.7-4: A designated fire hazard zone in the Santa Fe Flood Control Basin abuts the southeast site boundary. Project buildout would not expose people or structures to substantial wildfire hazards. [Threshold H-8]

Impact Analysis: The Santa Fe Flood Control Basin, next to the southeast site boundary, is designated a Very High Fire Hazard Severity Zone by the California Department of Forestry and Fire Prevention (CAL

[3] In 1990 gasoline was released from an overturned vehicle after a collision. In 1991 a suspicious fire/explosion occurred in industrial equipment surrounded by a vacant lot. Five responders were decontaminated but no injuries were reported (OES 2017).

FIRE 2012. The project site does not contain wildland vegetation that be fuel for a wildfire. Infill development on the existing developed campus would not result in greater impacts related to wildfire hazard.

The LACFD provides fire protection and emergency medical services to the cities of Duarte and Irwindale, including the City of Hope campus. The City of Hope campus is in the first-in service area of Fire Station 44 at 1105 Highland Avenue in Duarte, about 0.6 mile to the northeast. The next two closest fire stations to the project site are Station 48 at 15546 Arrow Highway in Irwindale, about 4.2 miles by road to the southeast, and Station 169 at 5112 Peck Road in El Monte, approximately four miles by road to the southwest (Johnson 2016). The LACFD anticipates that it can serve the project with existing firefighting stations, apparatus, and staff, and that project development would not require the LACFD to build new or expanded fire stations or obtain additional apparatus and staff (Johnson 2016).

Future projects proposed on the project site would be reviewed and plan checked by the LACFD to ensure fire-safe building designs, adequate fire flow and access. Future development under the proposed project would not pose wildfire-related hazards to people or structures. Project buildout would not exacerbate an existing wildfire hazard, and impacts would be less than significant.

5.7.4 Cumulative Impacts

The area considered for cumulative impacts is the service area of LACFD HHMD's East County office, which spans the San Gabriel Valley, part of the easternmost San Fernando Valley, and part of the San Gabriel Mountains. Hazards and hazardous waste impacts are typically unique to each site and do not usually contribute to cumulative impacts. Cumulative development projects would be required to assess potential hazardous materials impacts on the development site prior to grading. The project and other cumulative projects would be required to comply with laws and regulations governing hazardous materials and hazardous wastes used and generated as described above in Section 5.7-1. Therefore, cumulative impacts related to hazards and hazardous materials would be less than significant after regulatory compliance.

Cumulative projects could propose structures for human occupancy in fire hazard severity zones. However, the design and construction of any structures developed in such zones would be required to comply with California Building Code Chapter 7A, Materials and Construction Methods for Exterior Wildfire Exposure, and CFC Chapter 49, Requirements for Wildland-Urban Interface Fire Areas.[4] Persons responsible for such structures would also be required to remove flammable vegetation surrounding the structures pursuant to California Public Resources Code, Sections 4291 et seq., as well as requirements in CFC Chapter 49. Furthermore, the project is not proximate to a high fire hazard severity zone with significant wildland fuels (e.g. heavy vegetation) and would not contribute to cumulative fire hazard impacts. Therefore, cumulative impacts related to fire hazards would be less than significant.

4 The California Building Code (CBC) is CCR Title 24, Part 2. The CBC and CFC are updated on a three-year cycle; the 2016 codes are scheduled to take effect January 1, 2017.

5.7.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to hazards and hazardous materials and were described in detail in Sections 5.7.1.1 of this DEIR and are listed below

Federal

Hazardous Materials Regulation: General

- United States Code Title 42 Sections 9601 et seq.: Comprehensive Environmental Response, Compensation and Liability Act and Superfund Amendments and Reauthorization Act
- United States Code Title 42, Sections 6901 et seq.: Resource Conservation and Recovery Act
- United States Code Title 42 Sections 11001 et seq: Emergency Planning & Community Right to Know Act
- United States Code Title 49 Sections 5101 et seq.: Hazardous Materials Transportation Act
- Code of Federal Regulations Title 40 Sections 761.62 et seq.: Polychlorinated biphenyls abatement and disposal

Hazardous Materials Regulation: Hospitals and Health Care

- Code of Federal Regulations Title 40 Parts 60 and 62: hospital and medical waste incinerators
- CFR Title 29 Part 1910: Occupational exposure to blood-borne pathogens
- CFR Title 10 Chapter 1: Radiologic safety and licensing
- CFR Title 49 Part 173: Packaging of medical waste for transport
- CFR Title 21 Part 864: Regulations governing the types of containers used for storing medical wastes
- Occupational Safety and Health Administration
  - Technical Manual
  - Section VI Chapter 1, Hospital Investigations: Health Hazards
  - Section VI Chapter 2, Controlling Occupational Exposure to Hazardous Drugs
- National Institute of Occupational Safety and Health
  - Guidelines for Protecting the Safety and Health of Health Care Workers

State

Hazardous Materials Regulation: General

- California Health and Safety Code Chapter 6.95 (Hazardous Materials Release Response Plans and Inventory)
- California Health and Safety Code Chapter 6.8: Hazardous Substances Account Act
- California Code of Regulations, Title 19, Section 2729: Business Emergency Plans
- California Building Code (CCR Title 24, Part 2)
- California Fire Code (CCR Title 24, Part 9)
- CCR Title 8, Section 1529: Worker Safety Standards (Asbestos)
- CCR Title 8, Section 1532.1: Lead

Hazardous Materials Regulation: Hospitals and Health Care

- California Health and Safety Code Sections 117600–118360: Medical Waste Management Act
- Assembly Bill 333 [2014]: Medical waste transport
- Senate Bill 225 [2015]: Containment, storage, and transport of medical waste
- CCR Title 8, Section 5193: Blood-Borne Pathogens
- California Health and Safety Code, Sections 114960 et seq.: Radiation Control Law
- California Health and Safety Code, Section 27[f]: Radiologic Technology Act

Wildfire Hazards

- CCR Title 24, Part 2 (California Building Code), Chapter 7A: Materials and Construction Methods for Exterior Wildfire Exposure
- CCR Title 24, Part 9 (California Fire Code), Chapter 49: Requirements for Wildland-Urban Interface Fire Areas
- California Public Resources Code, Sections 4291 et seq.: Defensible Space

Regional

- South Coast Air Quality Management District Rule 1403: Asbestos
- LACFD: Certified Unified Program Agency

- Hazardous Materials Business Plans
- California Accidental Release Prevention Program
- Underground Storage Tank (UST) Program
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs
- California Uniform Fire Code: Hazardous Materials Management Plans and Hazardous Material Inventory Statements
- Aboveground Storage Tanks
- Emergency Response for Hazardous Materials Releases

Local

- Duarte Municipal Code, Section 19.50.030: Use, storage, and transport of hazardous materials
- Irwindale Municipal Code, Section 8.20.060: Disposal of hazardous materials.

5.7.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, some impacts would be less than significant: 5.7-3 and 5.7-4.

Without mitigation, these impacts would be **potentially significant**:

- **Impact 5.7-1** Project construction and operations would involve the transport, use, and/or disposal of hazardous materials.
- **Impact 5.7-2** The project site is included on a list of hazardous materials sites.

5.7.7 Mitigation Measures

Impact 5.7-1

HAZ-1 Prior to the initiating any ground-disturbing activities pursuant to the Campus Plan, the project applicant shall prepare and submit a Phase I Environmental Site Assessment (ESA) for the entire Campus Plan area to the City of Duarte and City of Irwindale, to assess the existing environmental conditions of the Campus Plan area and evaluate the potential for contamination to be present. The Phase I ESA shall be prepared by an Environmental Professional in accordance with the American Society for Testing and Materials (ASTM) Standard E 1527.13, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process." Prior to issuance of a grading permit or building permit for new construction in the Campus Plan area, an Environmental Professional shall review the relevant portions of the site-wide Phase I ESA and may visit the individual development site to evaluate whether any recognized environmental conditions (RECs) related to soils or groundwater identified in the Phase I ESA are present at the site. If no RECs are identified for that individual development site, no further assessment or remediation shall be required. If RECs are identified for that individual development site, the project applicant shall take additional action, which shall include either (i) a Phase II subsurface investigation for that site, or (ii) localized soil removal/remediation activities in accordance with all applicable regulatory requirements. If a Phase II subsurface investigation is conducted, soil, soil gas, and/or groundwater sampling shall be performed. If contamination is confirmed at concentrations exceeding applicable regulatory thresholds, the project applicant shall perform a screening level risk assessment to evaluate if remedial actions are necessary. The project applicant will also consider the need to consult with the appropriate regulatory agency (e.g., California Department of Toxic Substances Control, Regional Water Quality Control Board, Los Angeles County Fire Department, etc.). All contaminated soils and/or material encountered that is confirmed by sampling to be hazardous under California or federal law shall be disposed of appropriately at a regulated site and in accordance with applicable laws and regulations prior to the completion of grading. The Phase I ESA conducted pursuant to this Mitigation Measure also shall include an assessment of the possible existence of lead-based paint and asbestos-containing materials in the Campus Plan area. Each individual development site that involves demolition activities shall include an inspection for lead-based paint conducted by a licensed or certified lead inspector/assessor and a survey for asbestos-containing materials conducted by a California Certified Asbestos Consultant. Prior to the issuance of a grading permit or a building permits, a report documenting the completion, results, and follow-up remediation on the recommendations, if any, shall be provided to the City of Duarte Community Development Director and/or City of Irwindale Community Development Director, as appropriate, evidencing that all site remediation activities have been completed.

Impact 5.7-2

Mitigation Measure HAZ-1 applies.

5.7.8 Level of Significance After Mitigation

Impact 5.7-1

Implementation of Mitigation Measure HAZ-1 would ensure the completion of Phase I Environmental Site Assessment and that any recognized environmental conditions identified in such site assessments were assessed and remedied as needed in accordance with regulations. Thus, Impact 5.7-1 would be less than significant after implementation of Mitigation Measure HAZ-1.

Impact 5.7-2

Implementation of Mitigation Measure HAZ-1 would ensure the completion of Phase I Environmental Site Assessment and that any recognized environmental conditions identified in such site assessments were assessed and remedied as needed in accordance with regulations. Thus, Impact 5.7-2 would be less than significant after implementation of Mitigation Measure HAZ-1.

5.7.9 References

Airgas. 2016, February 11. Safety Data Sheet: Nitrous Oxide. https://www.airgas.com/msds/001042.pdf.

ASTM International. 2013. ASTM E-1527-13: Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. https://www.astm.org/Standards/E1527.htm.

California Department of Forestry and Fire Prevention (CAL FIRE). 2012, May. Very High Fire Hazard Severity Zones in LRA: Los Angeles County. http://www.fire.ca.gov/fire_prevention/fhsz_maps_losangeles.php.

California Department of Public Health (CDPH). 2016, November 1. *Registered Medical Waste Transfer Stations and Treatment Facilities*. https://www.cdph.ca.gov/certlic/medicalwaste/Documents/MedicalWaste/2013/Treatment%20Facilities%20Transfer%20Stations.pdf.

California Division of Occupational Safety and Health (Cal/OSHA). 2001a. "Exposure Control Plan for Bloodborne Pathogens." Developed by the Education Unit, Cal/OSHA Consultation Service, California Department of Industrial Relations. http://www.dir.ca.gov/dosh/dosh_publications/expplan2.pdf.

———. 2001b. "A Best Practices Approach for Reducing Bloodborne Pathogen Exposure." Developed by the Education Unit, Cal/OSHA Consultation Service, California Department of Industrial Relations. http://www.dir.ca.gov/dosh/dosh_publications/BBPBest1.pdf.

City of Hope. 2008. Radiation Safety Manual.

———. 2014a, July. Safe Handling of Hazardous Medications and Waste.

———. 2014b, October. Emergency Operations Plan.

———. 2014c, October. Radioactive Materials, Receiving and Handling.

———. 2015, July. Spill Management Assistance Response Team (S.M.A.R.T.).

Department of Toxic Substances Control (DTSC). 2016, December 15. Glossary of Environmental Terms. http://www.dtsc.ca.gov/InformationResources/Glossary_of_Environmental_Terms.cfm.

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Environmental Data Resources (EDR). 2016, February 29. Radius Map Report, City of Hope, 1500 E. Duarte Road, Duarte, CA 91010.

Geosyntec Consultants. 2016, May 27. *2015 Annual Performance Evaluation Report*. Volume 1: Baldwin Park Operable Unit of the San Gabriel Valley Superfund Sites, Los Angeles County, California. https://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/f8d651c17285544f88257ffb005e941c/$FILE/Final%202015%20BPOU%20Annual%20PE%20Report%20Vol%201_text%20&%20tables_052716.pdf.

Healthcare Environmental Resource Center (hercenter.org). 2016a, November 2. Types of Regulated Medical Waste (RMW). http://www.hercenter.org/rmw/rmwtypes.cfm.

———. 2016b, November 2. Common Hazardous Materials in Healthcare Facilities. http://www.hercenter.org/hazmat/hazcommon.cfm.

Johnson, Kevin (Acting Chief). 2016, September 9. Written response to service questionnaire. Los Angeles County Fire Department Forestry Division.

Main San Gabriel Basin Watermaster (MSGBW). 2016, November. Five-Year Water Quality and Supply Plan, 2016-17 to 2010-21. http://media.wix.com/ugd/af1ff8_8f7f9eace4184cf780c0f6b7b0bb1b10.pdf.

McCune, Robin, RN. 2013, May 30. Biotherapy Update. Association of Pediatric Hematology/Oncology Nurses (APHON). http://www.aphon.org/files/public/renewalpacketcontent.pdf.

New Jersey Department of Health and Senior Services (NJDHSS). 2007, April. Hazard Substance Fact Sheet: Oxygen. http://nj.gov/health/eoh/rtkweb/documents/fs/1448.pdf.

Occupational Safety and Health Administration (OSHA). 2016, November 3. "Health Care Facilities." Section VI of *OSHA Technical Manual*. US Department of Labor. See https://www.osha.gov/dts/osta/otm/otm_toc.html.

Office of Emergency Services (OES). 2017, March 6. California Hazardous Materials Incident Reports.

Praxair. 2014, October 3. Nitrogen, Refrigerated Liquid. Safety Data Sheet P-4630. http://www.praxair.com/-/media/documents/sds/nitrogen/liquid-nitrogen-medipure-gas-n2-safety-data-sheet-sds-p4630.pdf?la=en.

———. 2016, July 19. Carbon Dioxide Safety. Data Sheet P-4574. http://www.praxair.com/-/media/documents/sds/carbon-dioxide/carbon-dioxide-medipure-co2-safety-data-sheet-sds-p4574.pdf?la=en.

Water Systems Consulting, Inc. (WSC). 2016, June 30. Final 2015 Urban Water Management Plan for the Southern Division: Los Angeles County District, California American Water. https://wuedata.water.ca.gov/public/uwmp_attachments/6452893912/Final%20Los%20Angeles%20County%20District%202015%20Urban%20Water%20Management%20Plan.pdf.

5.8 HYDROLOGY AND WATER QUALITY

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential impacts to hydrology and water quality conditions in the City of Duarte from implementation of the proposed City of Hope Campus Plan. Hydrology deals with the distribution and circulation of water, both on land and underground. Water quality deals with the quality of surface and groundwater resources. The following documents were used in preparation of this section:

- *Low Impact Development (LID) Study*, KPFF Consulting Engineers, revised August 16, 2016.
- *Hydrology Report*, KPFF Consulting Engineers, revised August 16, 2016.
- *Final Water Supply Assessment for the City of Hope Specific Plan,* Water Systems Consulting, Inc., September 22, 2017.

Complete copies of the LID Study and Hydrology Report are included in Appendices H1 and H2, and the Water Supply Assessment is included as Appendix L of this DEIR.

5.8.1 Environmental Setting

5.8.1.1 REGULATORY FRAMEWORK

Local laws, regulations, plans, or guidelines that are potentially applicable to the proposed Campus Plan are summarized in this section. They are designed to achieve regional water quality objectives and thereby protect the beneficial uses of the region's surface and groundwater.

Federal Regulations

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the United States Environmental Protection Agency (EPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The statute employs a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. The CWA authorizes the EPA to implement water quality regulations. The National Pollutant Discharge Elimination System (NPDES) permit program under Section 402(p) of the CWA controls water pollution by regulating stormwater discharges into the waters of the United States. California has an approved state NPDES program. The EPA has delegated authority for water permitting to the State Water Resources Control Board (SWRCB), which has nine regional boards. The Los Angeles Regional Water Quality Control Board (RWQCB) (Region 4) regulates water quality in the area that includes the project site.

Section 303(d) of the CWA requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., do not meet one or more of the water quality standards established by the state). These waters are identified in the Section 303(d) list as waters that are polluted and need further attention to support

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their beneficial uses. Once the water body or segment is listed, the state is required to establish a total maximum daily load (TMDL) for the pollutant causing the impairment. The TMDL is the maximum amount of a pollutant that a water body can receive and still meet water quality standards. Typically, a TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The intent of the Section 303(d) list is to identify water bodies that require future development of a TMDL to maintain water quality. In accordance with Section 303(d), the RWQCB has identified impaired water bodies within its jurisdiction and the pollutant or stressor responsible for impairing the water quality. The project site does not directly discharge stormwater to a 303(d) water. However, the county's storm drain system eventually discharges into Peck Road Park Lake, Rio Hondo, and Los Angeles River, which are listed on the Section 303(d) list for impairments for the contaminants listed in Section 5.8.1.2 below.

Sections 401 and 404 of the CWA are administered through the Regulatory Program of the U.S. Army Corps of Engineers and regulate the water quality of all discharges of fill or dredged material into waters of the United States, including wetlands and intermittent stream channels. Because the project site is currently developed and there are no ephemeral drainages and/or wetlands within the site boundaries, permits from the Corps under Section 404 of the CWA and/or water quality certification from the Los Angeles RWQCB under Section 401 of the CWA would not be required.

National Pollutant Discharge Elimination System

The NPDES permit program was established by the CWA to regulate municipal and industrial discharges to surface waters of the United States from their municipal separate storm sewer systems (MS4s). Under the NPDES Program, all facilities which discharge pollutants into waters of the United States are required to obtain an NPDES permit. Requirements for stormwater discharges are also regulated under this program. In California, the NPDES permit program is administered by the SWRCB through the nine RWQCBs.

The project site is subject to the waste discharge requirements of NPDES Permit No. CAS004001 and the Los Angeles County MS4 Permit (Order No. R4-2012-0175), as amended by Order WQ 2015-0075. The Los Angeles County Flood Control District, the County of Los Angeles, and 84 incorporated cities in Los Angeles County (including the City of Duarte and City of Irwindale) are permittees under the MS4 Permit. The permit covers approximately 3,100 square miles and serves a population of about 10 million. Permittees are required to comply with applicable water-quality-based effluent limitations, develop and implement procedures necessary to reduce the discharge of pollutants into the MS4s to the maximum extent practicable, and require implementation of best management practices (BMPs). Because the City of Duarte is a permittee under the MS4 Permit and the proposed project is within the city limits, onsite project activities will have to comply with the Los Angeles County MS4 Permit and the city's stormwater management program.

The Los Angeles County MS4 Permit allows permittees to develop a watershed management program to implement the requirements of the permit on a watershed scale through customized strategies, control measures, and BMPs. The Campus Plan site is within the Rio Hondo/San Gabriel River Watershed, which is pursuing compliance with the MS4 permit through development of an Enhanced Watershed Management

Plan (EWMP). The final version of the EWMP was submitted to the Los Angeles RWQCB on April 19, 2016, and subsequently approved.[1]

Los Angeles County's MS4 permit also requires new development and redevelopment projects to retain onsite a specified volume of stormwater runoff from a design storm event. The county has adopted a low-impact development (LID) ordinance and prepared an LID manual as a guideline for implementation of these requirements. The cities of Duarte and Irwindale used the county's LID manual and have also adopted their own LID ordinance and LID manual to meet the MS4 permit requirements.

National Flood Insurance Program

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program, which provides subsidized flood insurance to communities that comply with FEMA regulations limiting development in flood-plains. FEMA also issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection established by FEMA is the 100-year flood event, also described as a flood that has a 1-in-100 chance of occurring in any given year. FEMA mapping of flood hazards that includes the project site was updated in 2008. According to the most recent FIRMs that cover the project site (FIRM No. 06037C1415F and No. 06037C1700F), the project site is within Zone D, an area that has not been mapped but where there are possible but undetermined flood hazards. However in Zone D, flood insurance is not required.

State Regulations

Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Act (Water Code §§ 13000 et seq.) is the basic water quality control law for California. Under this act, the SWRCB has ultimate control over state water rights and water quality policy. Each regional board is required to adopt a water quality control plan or basin plan that designates beneficial uses and water quality objectives for the region's surface water and groundwater basins.

The project site is in the jurisdiction of Los Angeles RWQCB, Region 4, which encompasses the Los Angeles and Santa Monica Bay watersheds. The Basin Plan for Region 4 was adopted in 1995 and updated in 2014. It gives direction on the beneficial uses of the state waters; describes the water quality that must be maintained to support such uses; and provides programs, projects, and other actions necessary to achieve the standards in the Basin Plan. The Basin Plan also provides all relevant information necessary to carry out the state's anti-degradation policy for surface waters and groundwater, 303(d) listing of impaired waters, and related TMDLs. The project site would not directly discharge stormwater to a 303(d) water, although the county's storm drain system eventually discharges into Rio Hondo and Los Angeles River. Beneficial uses for water bodies and groundwater in the downstream reaches of the rivers that receive stormwater from the project site are described further below and listed in Table 5.8-1.

[1] *Enhanced Watershed Management Program: Rio Hondo/San Gabriel River Water Quality Group*, prepared by CWE, April 19, 2016.

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Table 5.8-1 Designated Beneficial Uses of Downstream Water Bodies

Water Body	Designated Beneficial Use
Surface Water	
Sawpit Wash	MUN (I), GWR (I), WARM (I), WILD, REC-1, REC-1, High Suspension Flow
Reaches 1 and 2, Rio Hondo (above Whittier Narrows Dam)	MUN (P), GWR (I), WARM (P), WILD (I), RARE, WET, , REC-1, REC-1, High Suspension Flow
Reach 2, Los Angeles River (Carson Street in City of Long Beach to Rio Hondo Reach 1)	MUN (P), IND (P), GWR, WARM, WILD (P), , REC-1, REC-1, High Suspension Flow
Groundwater	
Los Angeles Coastal Plain (Central Subbasin)	MUN, IND, PROC, AGR

Source: Los Angeles RWQCB 2014.
Notes: I = Intermittent, P = Potential
Municipal and Domestic Water Supply (MUN), Industrial Process Water Supply (PROC), Industrial Service Water Supply (IND), Agricultural Supply (AGR), Groundwater Recharge (GWR), Wildlife Habitat (WILD), Warm Freshwater Habitat (WARM), Rare, Threatened, or Endangered Species (RARE) Wetland Habitat (WET)

Construction General Permit (CGP)

Pursuant to the CWA, in 2001, the SWRCB issued a statewide general NPDES permit for stormwater discharges from construction sites (Order No. 2009-0009-DWQ, as amended by Order No. 2010-0014-DWQ and 2012-0006-DWQ; NPDES No. CAS000002). Under this permit, discharges of stormwater from construction sites with a disturbed area of one or more acres are required to either obtain individual NPDES permits for stormwater discharges or be covered by the general permit. Coverage by the Construction General Permit (CGP) is accomplished by completing and filing permit registration documents with the SWRCB, which include a notice of intent, risk assessment, site map, Storm Water Pollution Prevention Plan (SWPPP), annual fee, and signed certification statement. Each applicant under the CGP must ensure that a SWPPP is prepared prior to the start of grading, and provisions in the SWPPP must be implemented throughout the construction period. The SWPPP must list BMPs implemented on the construction site to protect stormwater runoff and must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented based on the risk level of the site; and inspection, reporting, training, and recordkeeping requirements. In the Los Angeles region, the SWRCB is the permitting agency and the Los Angeles RWQCB provides local oversight and enforcement.

Local Regulations

2014 Low Impact Development Standards Manual

The county has prepared the 2014 Low Impact Development Standards Manual to comply with the requirements of the NPDES MS4 permit for stormwater and non-stormwater discharges within the coastal watersheds of Los Angeles County (CAS004001, Order No. R4-2012-0175). The cities of Duarte and Irwindale use this document as part of their stormwater management programs. The LID manual is an update and compilation of the following documents:

- Development Planning for Storm Water Management: A Manual for the Standard Urban Storm Water Mitigation Plan (SUSMP Manual, September 2002)
- Technical Manual for Stormwater Best Management Practices in the County of Los Angeles (2004 Design Manual, February 2004)
- Stormwater Best Management Practice Design and Maintenance Manual (2010 Design Manual, August 2010)
- Low Impact Development Standards Manual (2009 LID Manual, January 2009)

The LID manual addresses the following objectives and goals:

- Lessen the adverse impacts of stormwater runoff from development and urban runoff on natural drainage systems, receiving waters, and other water bodies.
- Minimize pollutant loadings from impervious surfaces by requiring development projects to incorporate properly designed, technically appropriate BMPs and other LID strategies.
- Minimize erosion and other hydrologic impacts on all projects located within natural drainage systems that have not been improved by requiring projects to incorporate properly designed, technically appropriate hydromodification control development principles and technologies.

Los Angeles County Flood Control District

The Los Angeles County Flood Control District (LACFCD) was established in 1915 after a disastrous regional flood took a heavy toll on lives and property. The LACFCD is authorized to provide flood protection, water conservation, recreation, and aesthetic enhancement within the county. The LACFCD encompasses more than 3,000 square miles, 85 cities, and approximately 2.1 million land parcels. The drainage infrastructure includes 500 miles of open channel, 2,800 miles of underground storm drains, and an estimated 120,000 catch basins. The internal storm drain system within the project site discharges to the LACFCD's Duarte Channel, and the Duarte Channel discharges into Buena Vista Channel, Rio Hondo, and eventually into the Los Angeles River.

Duarte Municipal Code

Projects within the City of Duarte must also comply with the following requirements of the City's municipal code that pertain to hydrology and water quality:

- **Chapter 6.15, Stormwater and Urban Runoff Pollution Control.** The provisions of this chapter apply to the discharge, deposit, or disposal of any stormwater and/or urban runoff to the storm drain system and/or receiving waters within the City of Duarte. The purpose of the chapter is to protect and enhance the water quality located within and/or flowing out of the City of Duarte by imposing stormwater runoff requirements, reducing the discharge of pollutants to the storm drain system, and ensuring compliance with the provisions of the MS4 permit.

- **Chapter 6.15.070, Construction Pollutant Reduction.** Runoff from construction activities at all project sites must meet the following requirements: retain sediment on site using BMPs; retain construction-related materials, wastes, spills, and residues on site; contain non-stormwater runoff on site; and implement BMPs to control erosion, such as limiting grading during the wet season, inspecting graded areas during rain events, maintaining vegetation on slopes, and covering erosion susceptible slopes. Prior to the issuance of a grading permit, the project will be evaluated for compliance with the State CGP and the City's erosion and grading requirements to determine the potential for the generation of pollutants into the MS4 and the effectiveness of the SWPPP in complying with the requirements.

- **Chapter 6.15.130, New Development and Redevelopment Pollutant Reduction.** This section of the chapter provides requirements for construction activities and new development and redevelopment projects to comply with the MS4 permit and to integrate LID practices and standards for stormwater pollution mitigation through measures such as infiltration, evapotranspiration, biofiltration, and rainfall harvest and use. These requirements apply to all development projects that add 10,000 square feet or more of impervious surface and special projects, such as retail gasoline outlets, auto service facilities restaurants, and parking lots that create and/or add 5,000 square feet or more of impervious surface.

- **Chapter 6.15.140, Low Impact Development Plan.** Prior to issuance of a permit for new development or redevelopment projects, a LID plan must be submitted for approval to the Community Development Director. The LID Plan will be evaluated for compliance with the MS4 permit, the LA County LID Standards Manual, and the City's erosion and grading requirements. Upon approval and acceptance of the LID Plan by the City, the applicant must file a signed original of the LID Plan with the Los Angeles County Recorder, and operation and maintenance of stormwater treatment measures will be binding upon the applicant and its successors for perpetuity.

Irwindale Municipal Code

Projects within the City of Irwindale must also comply with the following requirements of the City's municipal code that pertain to hydrology and water quality:

- **Chapter 8.28, Storm Water and Urban Runoff Pollution.** The purpose of this chapter is to protect and improve the water quality of receiving waters by reducing pollutant loads in storm water and urban runoff and eliminating illicit discharges to the municipal storm water system. The ordinance requires project applicants to show proof of coverage under the GCP prior to the issuance of grading permits. The ordinance also requires new development and redevelopment projects to comply with the City's stormwater management program (SWMP) or watershed management program (WMP) and incorporate BMP and LID features in the project design in accordance with standard urban stormwater mitigation program (SUSMP) conditions assigned by the City. An LID Plan (previously a SUSMP) must be reviewed and approved by the City and must include a long term maintenance agreement to ensure all stormwater features remain effective and operational.

5.8.1.2 EXISTING CONDITIONS

Regional Drainage

The project site is within the Los Angeles Watershed, which spans 830 square miles within western, central, and southern Los Angeles County and some small areas of eastern Ventura County. The watershed extends from the San Gabriel Mountains on the northeast to the Santa Susana Mountains and Santa Monica Mountains on the northwest and west, and extends south to the mouth of the Los Angeles River in the City of Long Beach. The watershed includes all of the San Fernando Valley, much of central Los Angeles, and parts of south Los Angeles. Regional drainage in the vicinity of the site flows into Rio Hondo, which is a tributary of the Los Angeles River. The project site is within the Buena Vista sub-watershed, which encompasses approximately 2.17 square miles. Figure 5.8-1, *Regional Drainage*, shows the boundaries of the Los Angeles River Watershed and the Buena Vista sub-watershed with respect to the project site.

Local Surface Waters and Drainage

Based on information provided in the KPFF Hydrology Report, stormwater at the site generally flows from north to south. The project site currently contains an internal network of storm drain piping and catch basins that discharge to a 30- to 36-inch RCP storm drain that runs from east to west near the center of the site and a 24- to 30-inch RCP storm drain that runs along the southern border of the site. There also is a LACFCD channel (Duarte Channel) that runs from north to south along the western boundary of the site and then continues within the southern portion of the site. All of the storm drains east of the LACFCD channel eventually discharge to the channel either by means of sheet flow or through the internal storm drain system that connects to the 30-inch and 36-inch RCP storm drain lines. The portion of the site west of the LACFCD channel drains via sheet flow and discharges to Buena Vista Street. Duarte Channel discharges into Buena Vista Channel about 0.4 mile southwest of the project site. Buena Vista Channel discharges into Sawpit Wash, which discharges into Peck Road Park Lake, which is contiguous with the Rio Hondo. The Rio Hondo discharges into the Los Angeles River. The existing storm drain system is shown on Figure 5.8-2, *Local Storm Drain System*.

Groundwater

The project site is in the San Gabriel Valley Groundwater Basin (DWR 2003). The Basin encompasses 167 square miles and is bounded on the north by the San Gabriel Mountains, on the east by the San Jose Hills, on the south by the Puente Hills, and on the west by a series of hills and the Raymond Fault. The Basin is drained by the San Gabriel River and Rio Hondo, a tributary of the Los Angeles River. The principal water-bearing formations are unconsolidated and semi-consolidated sediments that range in size from coarse gravel to fine-grained sands. The main sources of recharge are infiltration of rainfall on the valley floor and percolation of runoff from the adjacent mountains. The Basin provides up to 90 billion gallons of groundwater annually to San Gabriel Valley's 1.4 million residents (CAWC 2016). Figure 5.8-3, *San Gabriel Valley Groundwater Basin*, shows the boundaries of the Basin with respect to the project site.

The Basin is an adjudicated basin because it has been in overdraft. California American Water (Cal Am) is the water purveyor for the City of Duarte and has two types of water allocation rights: pumping rights and

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surface water rights. Duarte has an adjudicated right to pump 1.85 percent of the annual operating safe yield of the Basin, which is established annually by the Main San Gabriel Basin Watermaster based on prevailing hydrologic conditions. Duarte also has a fixed surface water allocation of 1,672 acre feet per year.

Based on information provided in the seismic Hazard Zone Report for the Azusa quadrangle, shallow groundwater is between 150 and 200 feet below ground surface (DMG 1998). Therefore, subsurface excavations associated with new construction at the project site are not anticipated to encounter groundwater, and construction dewatering would not be necessary. Groundwater flow direction in the vicinity of the project site is typically to the west.

Water Quality

Surface Water Quality

As previously stated, stormwater runoff from the project site would be directed to the existing storm drain system and internal roads after passage through infiltration systems, with ultimate discharge into the LACFCD's Duarte Channel. This channel eventually discharges into Rio Hondo and then into the Los Angeles River. The Los Angeles RWQCB monitors surface water quality through implementation of the Basin Plan and designates beneficial uses for surface water bodies and groundwater within the region. The designated beneficial uses for water bodies and groundwater in the downstream reaches of the rivers that receive stormwater from the project site are listed in Table 5.8-1.

In addition to the establishment of beneficial uses and water quality objectives, another approach to improving water quality is a watershed-based methodology that focuses on all potential pollution sources and not just those associated with point sources. If a body of water does not meet established water quality standards under traditional point source controls, it is listed as an impaired water body under Section 303(d) of the CWA. For 303(d) listed water bodies, a limit is established that defines the maximum amount of pollutants (or TMDL) that can be received by that water body.

Figure 5.8-1 - Regional Drainage

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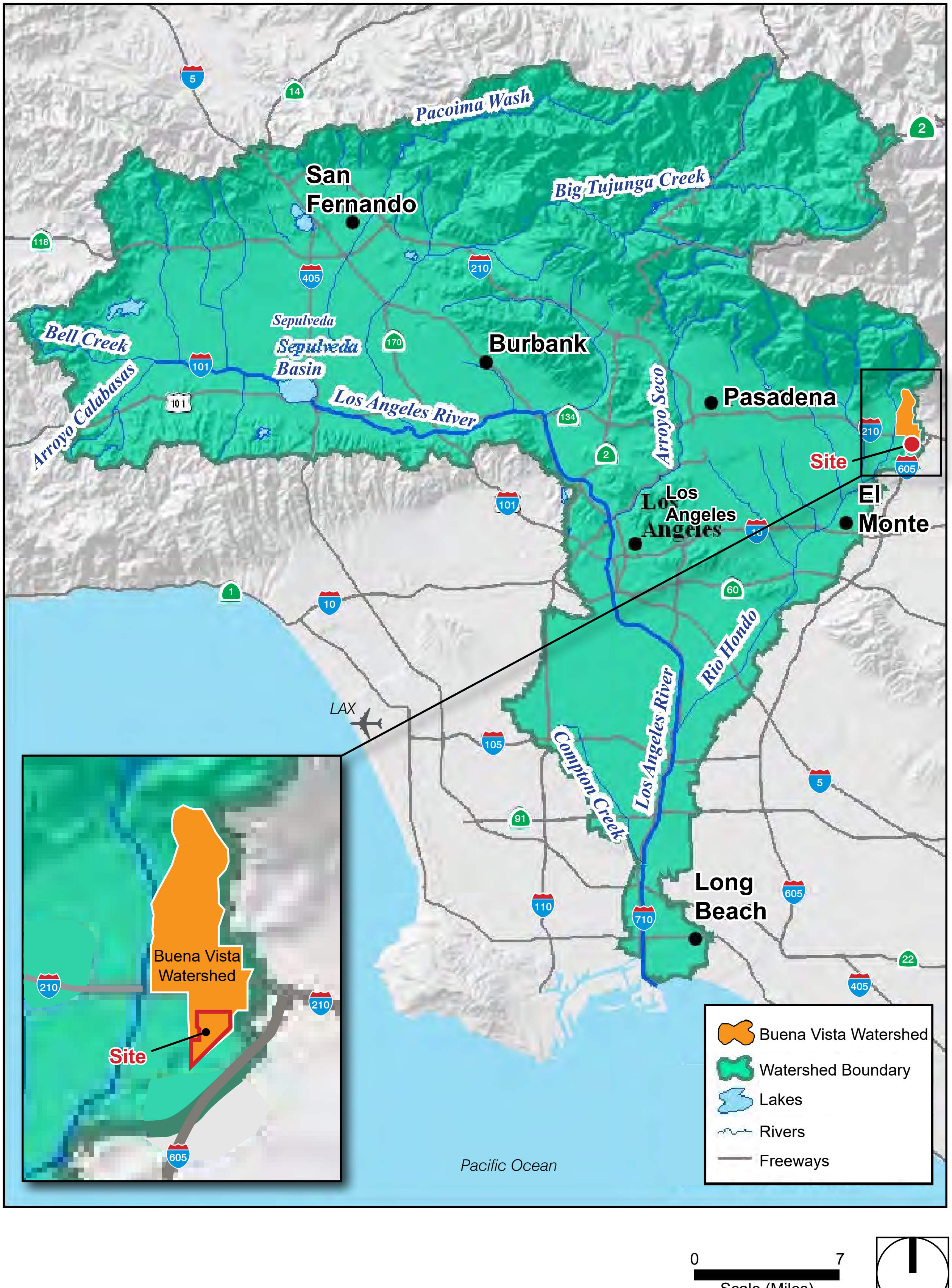

Base Map Source: LARWQCB, 2015

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Figure 5.8-2 - Local Storm Drain System

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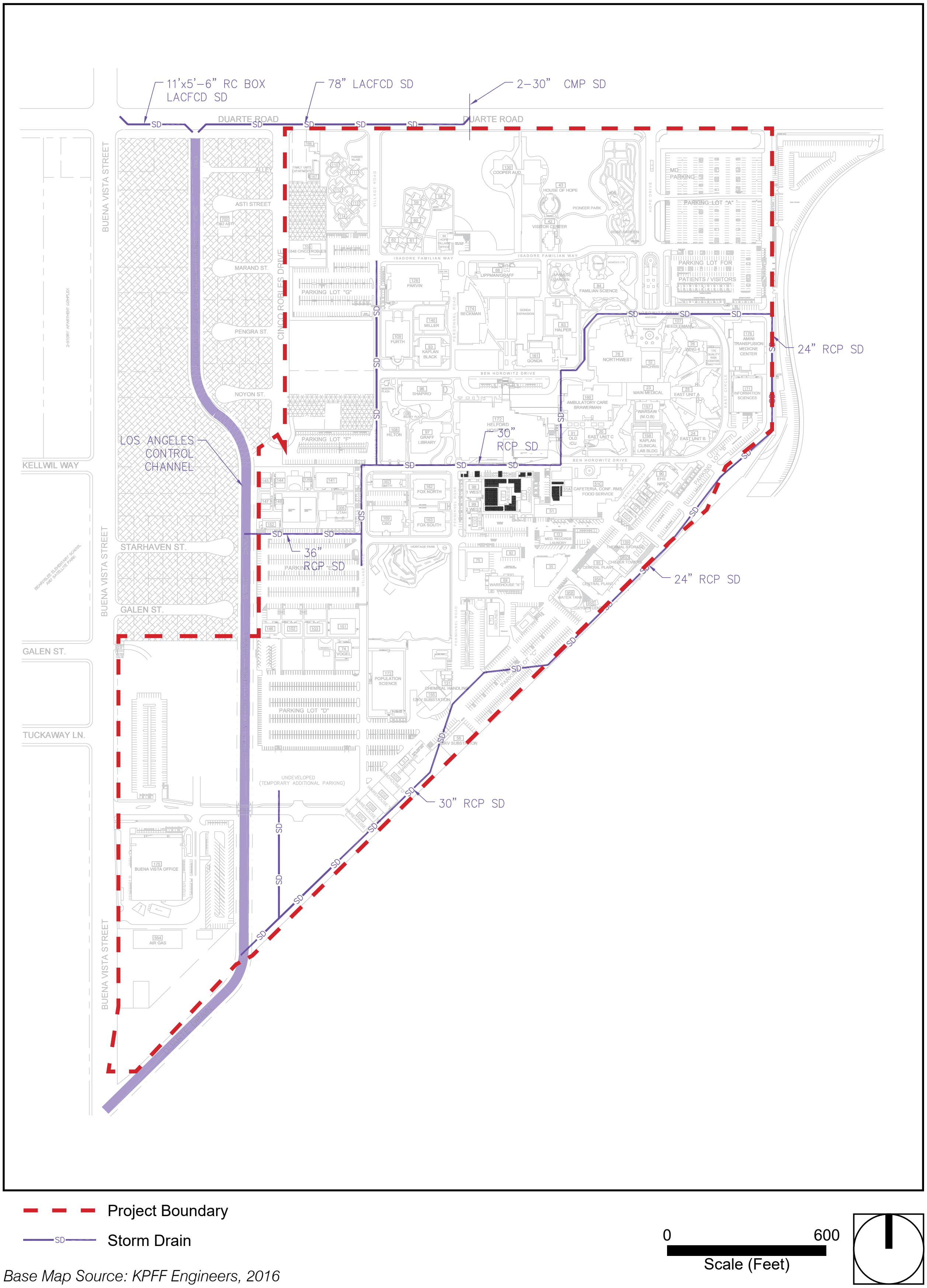

Base Map Source: KPFF Engineers, 2016

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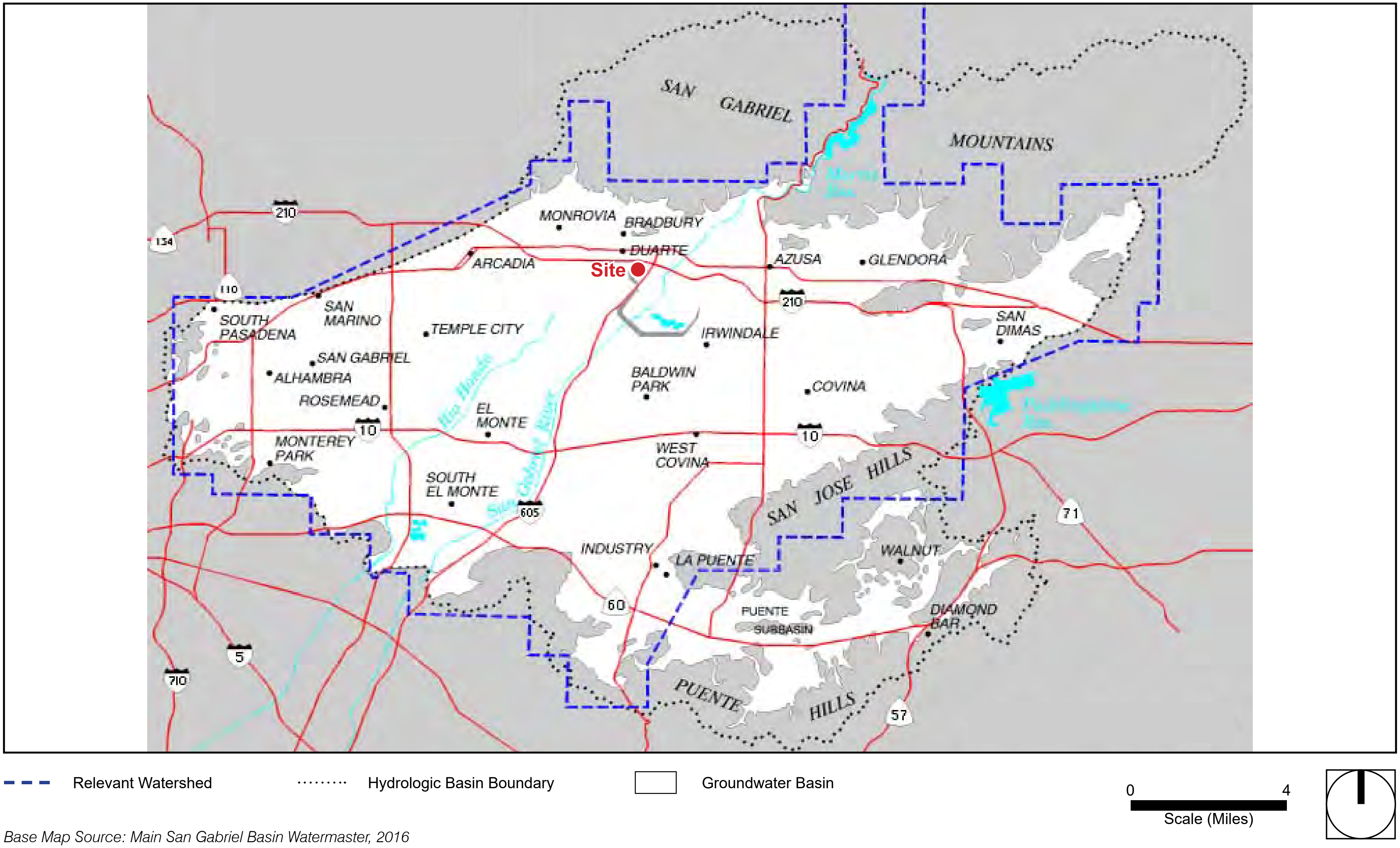
Figure 5.8-3 - San Gabriel Valley Groundwater Basin

5. Environmental Analysis



Base Map Source: Main San Gabriel Basin Watermaster, 2016

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Reach 2 of the Los Angeles River, Reaches 1 and 2 of the Rio Hondo, and Peck Road Park Lake are listed as impaired water bodies. The pollutants of concern and the status of TMDL implementation are listed in Table 5.8-2.

Table 5.8-2 Section 303(d) List of Impaired Water Bodies to Which Project Site Discharges

Water Body	Pollutant	Potential Source	Status of TMDL[1]
Peck Road Park Lake[2]	Chlordane (tissue)	Nonpoint source	Planned (2019)
	DDT (tissue)	Nonpoint source	Planned (2019)
	Lead	Nonpoint source	Planned (2019)
	Odor	Nonpoint source	Planned (2019)
	Organic Enrichment/Low Dissolved Oxygen	Nonpoint source	Planned (2019)
	Trash	Nonpoint source	Planned (2007)
Reach 2, Rio Hondo (I-5 to Whittier Narrows Dam)	Coliform bacteria	Nonpoint and point sources	Planned (2009)
	Cyanide	Unknown source	Planned (2021)
Reach 1, Rio Hondo (Los Angeles River Reach 2 to I-5)	Coliform bacteria	Nonpoint and point sources	Planned (2019)
	Copper	Nonpoint and point sources	Approved (2005)
	Lead	Nonpoint and point sources	Approved (2004)
	pH	Nonpoint and point sources	Approved (2004)
	Toxicity	Nonpoint and point sources	Planned (2021)
	Trash	Nonpoint sources, surface runoff, urban runoff/storm sewers	Approved (2008)
	Zinc	Nonpoint and point sources	Approved (2005)
Reach 2, Los Angeles River (Carson Street in City of Long Beach to Rio Hondo Reach 1)	Ammonia	Nonpoint and point sources	Approved (2004)
	Coliform bacteria	Nonpoint and point sources	Planned (2009)
	Copper	Source unknown	Approved (2005)
	Lead	Nonpoint and point sources	Approved (2005)
	Nutrients (algae)	Nonpoint and point sources	Approved (2004)
	Oil	Nonpoint source	Planned (2019)
	Trash	Nonpoint source, surface runoff, urban runoff/storm sewers	Approved (2008)

Source: 2012 Section 303(d) List, SWRCB 2016

1. Approved TMDLs are being implemented by the Los Angeles Regional Water Quality Control Board (LARWQCB) through amendments to the LARWQCB Basin Plan. TMDL development is planned over a 13-year period, and some planned TMDLs were not completed on schedule; thus, some planned TMDLs show past status dates. TMDL development consists of five phases: 1, involve stakeholders; 2, assess water body for pollutant loads and pollutant effects; 3, Define the total allowable pollutant load and allocate loads to pollutant sources; 4, develop implementation plan; and 5, amend the Basin Plan (SWRCB 2017).
2. Receiving water flows from Duarte Channel to Buena Vista Channel to Sawpit Channel to Peck Road Park Lake.

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Groundwater Quality

Overall, the groundwater in the San Gabriel Valley Groundwater Basin is of good quality and is characterized as primarily calcium carbonate in nature. No exceedances of water quality standards were reported in the latest water quality report from California American Water (2015). However, four areas of the Basin have been impacted by volatile organic compound (VOC) contaminants, primarily trichloroethylene (TCE), perchloroethylene (PCE), and carbon tetrachloride. The impacted areas are in the Whittier Narrows, Puente Basin, Baldwin Park, and El Monte. The project site and surrounding area have not been impacted by VOC plumes.

Flood Hazards

Designated Flood Zones

Flood hazard zones are areas subject to flood hazards that are identified on an official FIRM issued by FEMA. Flooding can be the result of intense rainfall or inadequate drainage. Areas within a 100-year floodplain have a 1 percent probability of flooding in a given year. According to FIRM Map Nos. 06037C1415F and 06037C1700F (September 26, 2008), the project site is Zone D, which is an area that has not been mapped and flood hazards are undetermined but possible. Given that the project site is more than 425 feet above mean sea level and there are no rivers, streams, or large water bodies in the immediate vicinity of the site, the probability of flooding is negligible.

Seismically Induced Dam Inundation

Dam failure is the uncontrolled release of impounded water behind a dam. Flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, and terrorism can all cause a dam to fail (CalEMA 2013). Dam failure can occur with little warning. Intense storms may produce floods in a few hours or even minutes for upstream locations. Flash floods occur within six hours of the beginning of heavy rainfall, and dam failure may occur within hours of the first signs of breaching. Other failures and breaches can take much longer to occur, from days to weeks. However, dam failure is a very rare occurrence. There is no historic record of dam failure that has impacted the City of Duarte (Duarte 2004).

The California Governor's Office of Emergency Services has established a dam failure inundation mapping and emergency procedures program to save lives and reduce injury in the event of a dam failure. Dam owners submit inundation maps to the Office of Emergency Services for review and approval, and cities and counties within the inundation area are required to adopt emergency procedures for the evacuation and control of populated areas below the dam. Dam owners and operators are also required to develop Emergency Action Plans for warning, evacuation, and post-flood actions in the event of a dam failure.

The California Division of Safety of Dams supervises and monitors all dams under its jurisdiction through the Dam Safety Program. All three of these dams are under its jurisdiction. The dams are inspected twice a year and continually monitored for seepage and settling. In addition, the dams are evaluated for seismic stability. The cities of Duarte and Irwindale also address dam failure, early flood warning systems, and evacuation plans and procedures in their local hazard mitigation plans (Duarte 2004; Irwindale 2012).

The project site is within the dam inundation areas of San Gabriel Dam and Morris Dam. San Gabriel Dam is approximately 8 miles northwest of the project site; Morris Dam is about 6 miles northwest of the site. Both dams have a similar inundation area, and the project site is at the western edge of both inundation zones. Sawpit Dam is approximately 3 miles north of the project site, and the site is within the southeast edge of the inundation zone. The dam inundation zones for all three dams are shown on Figure 5.8-4, *Dam Inundation Map*.

San Gabriel Dam is a rock-fill dam that was completed in 1939 and impounds the San Gabriel River. The dam provides flood control, groundwater recharge, and hydroelectricity for the San Gabriel Valley. Water is released gradually during the dry months to spreading grounds at San Gabriel Canyon (Azusa) and Peck Basin (near Arcadia) where it percolates into the groundwater basin. The dam is owned and operated by the Los Angeles County Department of Public Works. The San Gabriel Reservoir is nearly three miles long when full and stores 44,183 acre-feet of water. This is about 17 percent less than the original capacity because sedimentation has reduced the water volume. Flood control releases are coordinated in conjunction with Morris and Cogswell dams, as well as the Santa Fe and Whittier Narrows dams on the lower San Gabriel River. The dam supports a small hydroelectric plant owned by the City of Azusa.

The dam inundation maps for San Gabriel Dam show the arrival time of the flood wave at the project site would be 55 minutes (CalOES 2016), which would be sufficient time to initiate advance warning procedures. For portions of the existing campus that would be difficult to evacuate, such as the hospital, vertical evacuation to higher floors would be warranted. It should be noted that immediate catastrophic failure of this dam with no prior warning signs of structural issues would be highly unlikely, and the dam has been designed to withstand a maximum credible earthquake. In addition, the inundation map was based on a release from the dam at full capacity, and since the dam is currently operating at less than 83 percent of its original capacity, the inundation area would be much smaller.

Morris Dam is a concrete gravity dam downstream and operating in concert with the San Gabriel Dam. It was completed in 1935 and is 245 feet high and 750 feet long. The reservoir is about three miles long and has a current capacity of 27,800 acre-feet. Due to sedimentation over time, the reservoir's capacity has been reduced by about 29 percent. The Los Angeles County Department of Public Works owns and operates this dam. The dam serves primarily as flood control, flow regulation, and groundwater recharge. The Morris Dam along with the San Gabriel Dam and upstream Cogswell Dam have greatly reduced flood peaks on the San Gabriel River, saving downstream communities from property damage and flooding. The inundation map shows a time of arrival of the flood wave at the project site to be between 50 to 55 minutes (CalOES 2016), which would be sufficient to implement advance warning plans. As with the San Gabriel Dam, areas of the existing campus that would be difficult to evacuate off-site can reduce the potential risk with vertical evacuation to higher floors above the projected flood level. Also, this map was based on the assumption that the dam would be at full capacity at the time of failure. It is currently operating at 71 percent of full capacity, resulting in a much smaller inundation zone.

The project site was in the original dam inundation area for Sawpit Dam published in 1972. Sawpit Dam was constructed in 1927 in Sawpit Canyon and is a concrete arch dam with a crest height of 150 feet and a drainage area of 3.3 square miles. The dam is owned and operated by the Los Angeles Department of Public

Works and was originally designed for flood control and water conservation. Although the dam/reservoir had a former storage capacity of 406 acre-feet, the dam is now used as a debris basin and there is only a minimal amount of water impounded behind the dam, typically during years with heavy rainfall. The original dam inundation zone for this dam assumed that the reservoir was at full capacity prior to a dam failure. A subsequent dam inundation map was developed in 1974 based on use of the dam as a debris basin. The dam inundation area of this map does not reach the project site (CalOES 2016).

The California Office of Emergency Services also has dam inundation maps for Santa Fe Dam, part of which is next to the northeast Campus boundary. The campus is not in the inundation area for Santa Fe Dam.

Inundation from Aboveground Water Storage Tanks or Reservoirs

There currently are no active aboveground water storage tanks or reservoirs in close proximity to the project site that could cause flooding if the tanks or reservoirs were to fail during a maximum credible earthquake. Although there are groundwater spreading grounds immediately west and southwest of the project site, these facilities are at lower elevations and downgradient from the project site and would not result in flooding at the site. Therefore, there is no potential for flooding at the project site from water storage tanks or reservoirs.

Seiches and Tsunamis

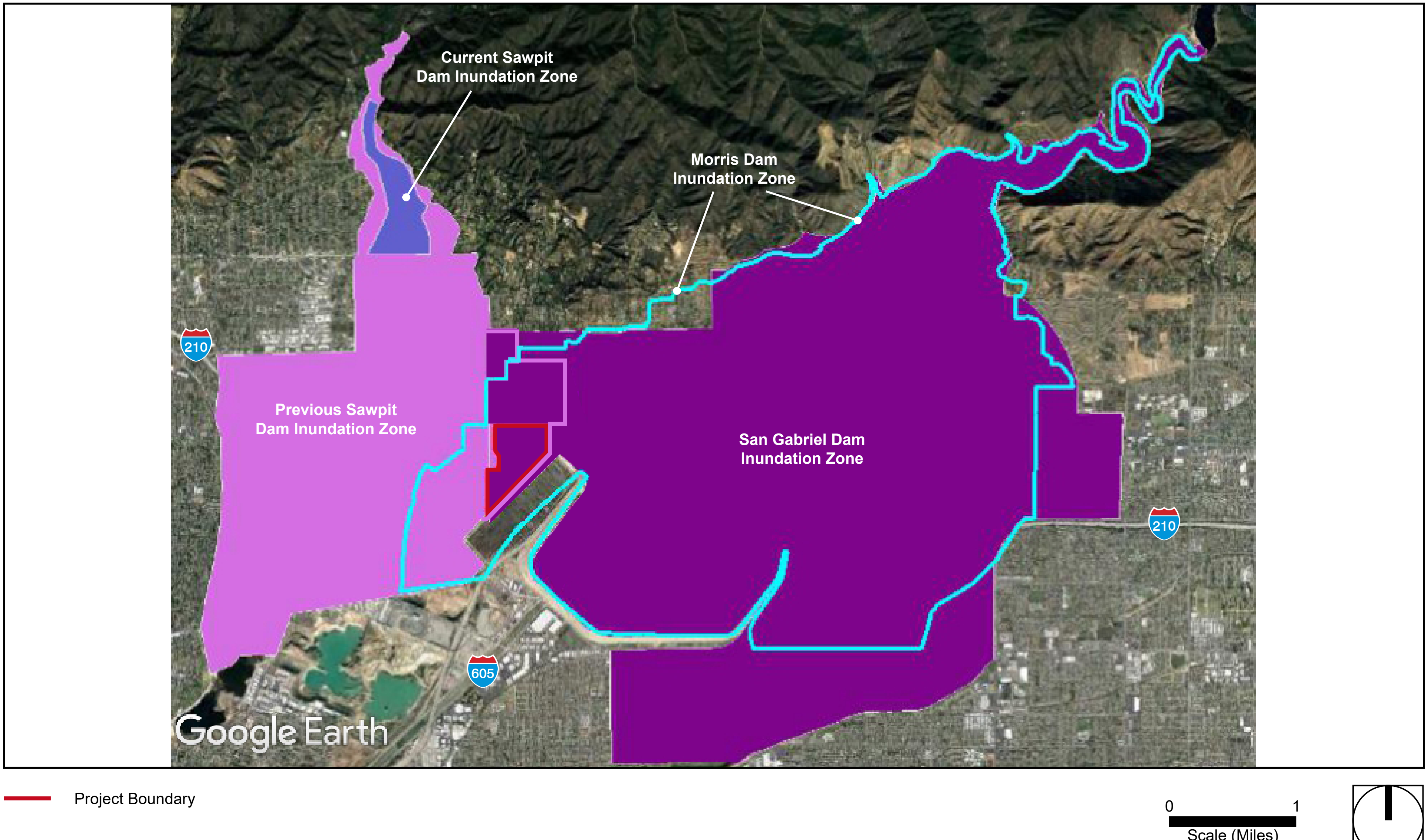
Seiches are waves that oscillate in enclosed water bodies, such as reservoirs, lakes, ponds, or semi-enclosed bodies of water. Seiches may be triggered by moderate or large earthquakes. The nearest reservoirs to the project site that could potentially cause flooding due to a seiche are San Gabriel Dam and/or Morris Dam. However, these reservoirs already have been mapped to determine flooding associated with potential dam failure, and any impact due to an earthquake-induced seiche would occupy an area much less than the mapped inundation zones.

A tsunami is a series of ocean waves caused by a sudden displacement of the ocean floor, most often due to earthquakes. The project site is approximately 30 miles inland from the Pacific Ocean, outside of the Tsunami Hazard Zone identified by the California Emergency Management Agency (CalEMA 2014). Therefore, the possibility of the project site being affected by a tsunami is negligible.

Mudflows and Debris Flows

Mud and debris flows are mass movements of dirt and debris that occur after intense rainfall, earthquakes, and severe wildfires. The speed of a mud or debris flow depends on the amount of precipitation, steepness of the slope, and alternate freezing and thawing of the ground but can reach speeds of more than 20 miles per hour. The most common cause of mud or debris flows is a combination of heavy rainfall, steep slopes, and loose soil. The project site and surrounding land are fully developed on nearly level ground. In addition, heavy rainstorms have caused little damage in the cities of Duarte and Irwindale due to the construction of several debris basins. Therefore, the project site is not susceptible to mud or debris flows.

Figure 5.8-4 - Dam Inundation Map



Base Map Source: CalOES, 2016

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5.8.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

HYD-1 Violate any water quality standards or waste discharge requirements.

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

HYD-3 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in a substantial erosion or siltation on- or off-site.

HYD-4 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

HYD-5 Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

HYD-6 Otherwise substantially degrade water quality.

HYD-7 Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

HYD-8 Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

HYD-9 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.

HYD-10 Be subject to inundation by seiche, tsunami, or mudflow.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant or no impact:

- Threshold HYD-3: At completion, individual development projects accommodated by the Campus Plan would consist of buildings, landscaped areas, roads, and other hardscape improvements; no bare areas of soil would be left vulnerable to erosion.

- Threshold HYD-7: The project site and surrounding—including the adjacent Santa Fe Flood Control Basin Spillway—are mapped as Flood Zone X by the Federal Emergency Management Agency, meaning that they are outside of 100-year and 500-year flood zones.
- Threshold HYD-8: See HYD-7 above.
- Threshold HYD-10: There are no aboveground water bodies that could pose a flood hazard to the site due to a seiche; the site is about 30 miles inland and not at risk of flooding due to tsunamis; and the site is flat and not subject to mudflows.

These impacts will not be addressed in the following analysis.

5.8.3 Environmental Impacts

Methodology

KPFF prepared technical reports to analyze drainage and water quality impacts on the site (see Appendices H1 and H2). Existing and proposed stormwater runoff was evaluate with the assumption that City of Hope does not receive off-site run-on because the roads bound the Campus have drainage systems that prevent run-on to the Campus. The analysis evaluated 10- and 50-year storm events, consistent with Los Angeles County methodology. Hydrology calculations for existing conditions are based on existing building and site plan documents, and satellite survey information. Ground water supply was based on a water supply assessment (see Section 5.16 of this DEIR).

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.8-1: Implementation of the Campus Plan would not violate any water quality standards or waste discharge requirements or otherwise degrade water quality. [Thresholds HYD-1 and HYD-6]

The proposed project would result in an increase in the overall amount of impervious surfaces, which can result in a greater potential to introduce pollutants to receiving waters. Urban runoff can carry a variety of pollutants, such as oil and grease, metals, sediments, and pesticide residues from roadways, parking lots, rooftops, and landscaped areas, and deposit them into an adjacent waterway via the storm drain system. Construction of the project could also result in the degradation of water quality with clearing and grading activities, potentially releasing sediment, oil and greases, and other chemicals to downstream water bodies.

Short-Term Construction Impacts

Clearing, grading, excavation, and construction activities associated with the proposed Campus Plan have the potential to impact water quality through soil erosion and increasing the amount of silt and debris carried in runoff. Additionally, the use of construction materials such as fuels, solvents, and paints may present a risk to surface water quality. Finally, the refueling and parking of construction vehicles and other equipment onsite during construction may result in oil, grease, or related pollutant leaks and spills that may discharge into the storm drain system.

To minimize these potential impacts, the development consistent with the Campus Plan would be required to comply with the NPDES CGP and prepare a SWPPP that incorporates BMPs to control sedimentation, erosion, and hazardous materials contamination of runoff during construction. The SWRCB mandates that projects that disturb one or more acres of land must obtain coverage under the Statewide CGP. The CGP also requires that prior to the start of construction activities, the project applicant must file permit registration documents with the SWRCB, which includes an NOI, risk assessment, site map, annual fee, signed certification statement, SWPPP, and post-construction water balance calculations. The SWPPP must be implemented at the project site and revised as necessary as administrative or physical conditions change. Prior to the issuance of a grading permit, the project applicant is required to provide proof of filing of the permit registration documents with the SWRCB.

In addition, projects in the portions of the project site in Duarte and Irwindale must comply with the City of Duarte's Municipal Code, Chapter 6.15.070, *Construction Pollutant Reduction,* and the City of Irwindale's Municipal Code, Chapter 8.28, *Storm Water and Urban Runoff Pollution,* respectively The project site must control runoff from all construction activities by: 1) retaining sediment on site using BMPs; 2) retaining construction-related materials, wastes, spills, and residues on site; 3) containing non-stormwater runoff on site; and 4) implementing BMPs to control erosion, such as limiting grading during the wet season, inspecting graded areas during rain events, maintaining vegetation on slopes, and covering erosion susceptible slopes. Prior to the issuance of a grading permit, the project would be evaluated for compliance with the State CGP and the cities' erosion and grading requirements to determine the potential for the generation of pollutants into the MS4 and the effectiveness of the SWPPP in complying with the requirements.

Construction BMPs include, but are not limited to, erosion controls, sediment controls, tracking controls, non-stormwater management, materials and waste management, and good housekeeping practices. The BMPs for construction activities are briefly discussed below in Table 5.8-3 below.

Table 5.8-3 Construction Best Management Practices (BMPs)

Category	Purpose	Examples
Erosion Controls and Wind Erosion Controls	Cover and/or bind soil surface, to prevent soil particles from being detached and transported by water or wind	Mulch, geotextiles, mats, hydroseeding, earth dikes, swales
Sediment Controls	Filter out soil particles that have been detached and transported in water.	Barriers such as straw bales, sandbags, fiber rolls, and gravel bag berms; desilting basin; cleaning measures such as street sweeping
Tracking Controls	Minimize the tracking of soil offsite by vehicles	Stabilized construction roadways and construction entrances/exits; entrance/outlet tire wash.
Non-Storm Water Management Controls	Prohibit discharge of materials other than stormwater, such as discharges from the cleaning, maintenance, and fueling of vehicles and equipment. Conduct various construction operations, including paving, grinding, and concrete curing and finishing, in ways that minimize non-stormwater discharges and contamination of any such discharges.	BMPs specifying methods for: paving and grinding operations; cleaning, fueling, and maintenance of vehicles and equipment; concrete curing; concrete finishing.

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Table 5.8-3 Construction Best Management Practices (BMPs)

Category	Purpose	Examples
Waste Management and Controls (i.e., good housekeeping practices)	Management of materials and wastes to avoid contamination of stormwater.	Spill prevention and control, stockpile management, and management of solid wastes and hazardous wastes.

Source: CASQA 2003.

With the implementation of the SWPPP and BMPs during all construction activities and compliance with the cities' erosion and sediment control requirements, the impact to water quality during construction activities would be less than significant.

Long-Term Operational Impacts

Once the project has been constructed, urban runoff could include a variety of contaminants that could impact water quality. Runoff from buildings and parking lots typically contain oils, grease, fuel, antifreeze, byproducts of combustion (such as lead, cadmium, nickel, and other metals), as well as fertilizers, herbicides, pesticides, and other pollutants. Precipitation at the beginning of the rainy season may result in an initial stormwater runoff (first flush) with high pollutant concentrations.

Pollutants of Concern

Since the land use remains the same, the proposed project would not create new pollutant sources. Based on the proposed land uses, the pollutants typically associated with the Campus Plan land use category are summarized in Table 5.8-4.

Table 5.8-4 Potential Pollutants Created by Land Use Type

	General Pollutant Categories								
Pollutant Category	Sediment/ Turbidity	Nutrients	Organic Compounds	Trash & Debris	Oxygen-Demanding Substances	Bacteria & Viruses	Oil & Grease	Pesticides	Heavy Metals
Commercial Development > 100,000 ft^2	P[1]	P[1]	P[2]	E	P[3]	P[4]	E	P[3]	--

Source: CASQA 2003, Table 2-1.
E = Expected P = Potential
1 A potential pollutant if landscaping exists
2 A potential pollutant if the project includes uncovered parking areas
3 Including solvents
4 A potential pollutant if the project involves food waste products

As stated previously, the project would be constructed and operated in accordance with the Los Angeles County MS4 Permit requirements and the guidance provided in the Los Angeles County Department of Public Works' LID Standards Manual. Under the MS4 permit, the project applicant is required to submit a LID Plan for review and approval by the Director of Public Works that provides details on how the project will comply with these requirements of the MS4 Permit and LID manual.

An LID Plan has been developed for this project and is provided as Appendix H2 of the Draft EIR. For redevelopment projects, where less than 50 percent of the impervious surface of the developed site is proposed to be altered, only the proposed alterations must meet the requirements of the LID Standards Manual. Current LID standards require the on-site retention of runoff from the 0.75-inch, 24-hour rainfall event or the 85th percentile, 24-hour rainfall event, whichever is greater, through infiltration, biofiltration/bioretention, and/or rainfall harvest and use.

As described in the LID Plan, the stormwater treatment features at the project site have been designed to retain the post-development Stormwater Quality Design volume (SWQDv) for all storms up to and including the 85th percentile, 24-hour rainfall event. The primary treatment system would be the installation of a proprietary subsurface perforated corrugated metal pipe CMP stormwater infiltration system at the southwest corner of the project site, just east of the LACFCD channel. Stormwater would be collected from drainage areas DA1 and DA2 and treated with a proprietary hydrodynamic separator that screens, separates, and traps trash, debris, sediment, and hydrocarbons prior to entry into the infiltration system. Drainage areas DA3 and DA4 would be treated with modified bioswales, which would serve as pretreatment systems, and smaller individual infiltration systems. The water quality features would target pollutants of concern in stormwater. A summary of the volume, flow rates, and sizing requirements for the stormwater treatment systems is provided in Table 5.8-5.

Table 5.8-5 Preliminary Sizing of Stormwater Treatment System

Drainage Area	New and Altered Impervious Area (Acres)	New and Altered Impervious Area (Acres)	Flow to be Treated (cfs)	Infiltration Footprint (LF x LF)
DA1	26.0	94,117	8.06	40 x 470
DA2	13.8	49,890	4.27	40 x 250
DA3	3.4	12,395	1.06	40 x 65
DA4	5.2	18,623	1.60	40 x 95

Source: KPFF 2016a.

LID features are required to be implemented as development occurs over buildout of the Campus Plan. Details regarding the proposed stormwater treatment system are provided in the LID Plan, which is attached as Appendix H2. The LID Plan also contains the operations and maintenance plan for the treatment measures.

With the implementation of the construction and operational BMPs and LID features and compliance with county and city regulatory requirements, the impact of project with respect to water quality would be less than significant.

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Impact 5.8-2:	Implementation of the Campus Plan would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. [Threshold HYD-2]

Impact Analysis:

Short-Term Construction Impact

Buildout associated with implementation of the Campus Plan will involve grading and excavation. Groundwater beneath the site is estimated to be between 150 and 200 feet below ground surface; project grading and excavation activities would not approach such depth. Therefore, groundwater would not be encountered during construction activities, and there would be no impact on groundwater recharge from construction activities. Construction activities are temporary in nature and would result in the use of water trucks primarily for dust control activities. This usage would not result in a substantial depletion of groundwater supplies that could result in a lowering of the groundwater table. Therefore, impacts to groundwater supplies or recharge during construction would be less than significant.

Long-Term Operational Impact

Although the project site is in an urbanized, developed area with a high percentage of impervious surfaces, implementation of the project would increase development intensity and the amount of impervious surfaces. The increase in impervious surfaces has the potential to reduce groundwater recharge.

Buildout of the Campus Plan would increase the amount of impervious surface from 80 percent to 85 percent in some areas of the site and from 90 percent to 95 percent in other areas of the site, according the KPFF Hydrology Report. However, the project is required to implement site design, source design, and stormwater treatment measures that will contribute to groundwater recharge and minimize stormwater runoff from the site. The proposed stormwater treatment measures, as specified in the KPFF LID Report, include modified bioswales and CMP infiltration systems, both of which contribute to groundwater recharge via infiltration. Although buildout of the project site would increase stormwater runoff by 3.9 cubic feet per second (cfs), the proposed infiltration systems would accommodate the 85th percentile runoff rate of 15.0 cfs. Therefore, the project would decrease the total stormwater flow from the site by 11.1 cfs and result in an increase in groundwater recharge compared to existing conditions.

Implementation of the Campus Plan would increase the number of workers, patients, and guests onsite and thus result in an increase in water demand. The City of Hope and City of Duarte are served by Cal Am, which obtains 100 percent of its water from groundwater wells in the Main San Gabriel Valley Groundwater Basin.

A Water Supply Assessment (WSA) has been prepared for the project and is provided in Appendix L (WSC 2017). Water supply is also discussed in further detail in Section 5.16, *Utilities and Service Systems*. Cal Am assesses whether the total projected water supplies available during average, single-dry, and multiple-dry water years during a 20-year projection would meet the projected water demand for the project, in addition to Cal Am's existing and planned future uses. The WSA determined that the project would require an additional 359 acre-feet per year of water at full buildout and that Cal Am's total projected water supplies available during average, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand for the project. However, the additional water demand of the proposed project would increase the existing well capacity deficit; this deficit could be met with one additional groundwater well that could be located on the City of Hope campus. Additional details are provided in Section 5.16 of this DEIR. With implementation of the Mitigation Measure USS-1, the impact of the project on groundwater recharge and/or groundwater supplies would be less than significant.

Impact 5.8-3: Implementation of the Campus Plan would not substantially alter the existing drainage pattern to result in adverse flooding impacts, create or contribute runoff water that would exceed the capacity of existing or planned stormwater systems, or provide substantial additional sources of polluted runoff. [Thresholds HYD-4 and HYD-5]

The KPFF Hydrology Report and the KPFF LID Plan, which are provided as Appendices H1 and H2, show the proposed stormwater drainage facilities with buildout under the Campus Plan. The project site has been divided into four drainage areas based on the way stormwater is conveyed and treated from these areas. Figure 5.8-5, *Proposed Storm Drainage System*, shows the site drainage areas as well as the treatment locations.

The proposed Campus Plan is within the boundaries of a developed site that is currently connected to an existing storm drain system. The proposed buildout does not involve the alteration of any natural drainage channels or any watercourse. The project site is currently 80 to 90 percent impervious, consisting of buildings, plazas, walkways, and parking structures and lots. The amount of impervious surface would increase to 85 to 95 percent impervious with the proposed redevelopment. However, the proposed project would require the implementation of stormwater treatment measures, including infiltration, which would reduce the amount of stormwater runoff leaving the site.

The KPFF Hydrology Report, which is provided in Appendix H1, calculates the stormwater runoff volumes and rates from the 10-year and 50-year storms under existing and proposed buildout conditions. The Los Angeles County HydroCalc calculator was used to determine the volume and flow rates of stormwater runoff from the site. The results are summarized in Table 5.8-6.

Table 5.8-6 Existing vs. Proposed Runoff Volumes and Flow Rates for 10-Year and 50-Year Storms

	Runoff Volume (ac-ft)			Peak Flow Rate (cfs)		
	Existing	Post-construction	Difference	Existing	Post-construction	Difference
10-Year Storm	35.09	36.79	+1.7 (4.8%)	136	141	+5 (3.7%)
50-Year Storm	49.34	51.65	+2.31 (4.7%)	221	225	+4 (1.8%)

Source: KPFF 2016b.

However, these calculations do not take into account the amount of stormwater that would be temporarily retained onsite. The Los Angeles County MS4 permit requires the capture and temporary detention of a stormwater quality design volume, based on the runoff produced from a 0.75-inch, 24-hour storm event or

85th percentile, 24-hour storm event, whichever is greater. As the 85th percentile storm event is greater in this case, it was used to determine the design volume.

The KPFF LID Study (in Appendix H2) indicates that the proposed stormwater treatment measures would retain a total volume of 4.0 acre-feet onsite and infiltrate a total flow rate of 15 cfs. As shown in Table 5.8-6, the 50-year storm would result in an increase of 4 cfs with implementation of the Campus Plan. However, the stormwater treatment measures would infiltrate 15 cfs; therefore, the project would result in an overall decrease in runoff of 11 cfs. The proposed LID features for the project are shown on Figure 5.8-5. With implementation of the proposed stormwater treatment measures and BMPs in accordance with regulatory requirements, the proposed project would not result in a significant increase in surface runoff flow rates or volumes in a manner that would cause flooding, and the impact would be less than significant.

The proposed project involves redevelopment on a property that is currently connected to an existing storm drain system that ultimately discharges into the county's storm drain system. Although the project will slightly increase the amount of impervious surfaces at the site, the implementation of required stormwater treatment measures will reduce flow rates by 15 cfs, which would result in lower flow rates than under existing conditions. The existing local storm drain system is shown on Figure 5.8-2 and the proposed connections with buildout of the Campus Plan are shown on Figure 5.8-5. Because flow rates would be lower with implementation of the project, there would be no exceedance of the capacity of the existing or planned storm drain system, and the impact would be less than significant.

As discussed previously in Impact 5.8-1, the project would implement site design, source control, and stormwater treatment measures in accordance with the Los Angeles County MS4 permit. Implementation of the modified bioswales, CDS pretreatment system, and stormwater infiltration systems would remove trash, debris, sediment, and hydrocarbons and provide natural filtration of pollutants from the stormwater runoff prior to discharge to the county's storm drain system. Therefore, implementation of buildout under the Campus Plan should reduce the amount of pollutants in stormwater exiting the site, and the impact to water quality would be less than significant.

Impact 5.8-4: Implementation of the Campus Plan would not expose people or structures to a significant risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam. [Threshold HYD-9]

Impact Analysis: The project is not in an area mapped as protected by levees; therefore, development with buildout of the Campus Plan would not place people or structures at risk of flooding due to levee failure. However, the project site is within the dam inundation zones of the San Gabriel Dam, Morris Dam, and Sawpit Dam. As discussed in Section 5.8.1.2, *Existing Conditions*, the Sawpit Dam is now used as a debris basin and only a minimal amount of water is impounded behind the dam, typically during years with heavy rainfall. A dam inundation map developed in 1974, based on use of the dam as a debris basin, shows that the dam inundation area of this map does not reach the project site. Therefore, this discussion focuses on the potential failure of the San Gabriel and Morris dams.

Figure 5.8-5 - Proposed Storm Drainage System

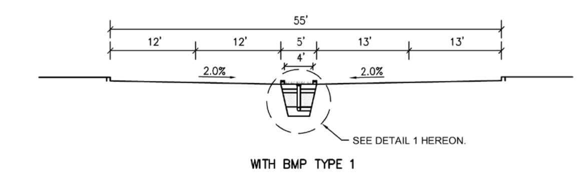
5. Environmental Analysis

LEGEND:

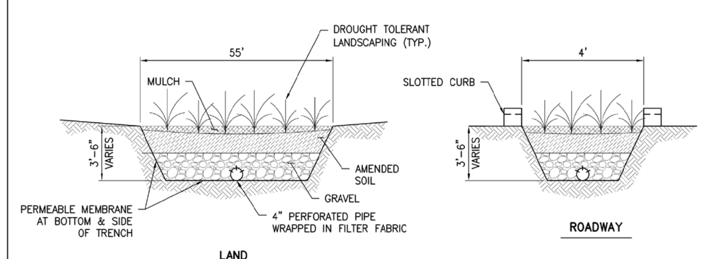
- DRAINAGE AREA 1
- FIRE ACCESS / NEW ROADWAY (DRAINAGE AREA 2)
- DRAINAGE AREA 3
- DRAINAGE AREA 4
- MODIFIED BIOSWALE
- BMP TYPE 2: SURFACE AREA MAY VARY DEPENDING ON TRIBUTARY SERVICE AREA, BMP TYPE & DEPTH, ETC WITH SUBSURFACE STORMWATER INFILTRATION SYSTEM
- STORM DRAIN
- PROJECT BOUNDARY
- CITY BOUNDARY

NOTES

- BMP CALCULATIONS ARE BASED ON THE L.A. COUNTY HYDROLOGY / SUSMP (LID) MANUAL.
- PROPOSED DEVELOPMENTS ARE ESTIMATED APPROXIMATELY 44.1% OF THE ENTIRE PROPERTY. THEREFORE, IT IS REQUIRED TO TREAT THE STORM WATER RUNOFF FROM THE IMPROVEMENT AREAS ONLY, NOT THE ENTIRE SITE.
- IT IS REASONABLY ASSUMED THAT THE SITE IS FEASIBLE FOR INFILTRATION.
- BIOFILTRATION VS. INFILTRATION (UNDERGROUND) BIOFILTRATION BMPS REQUIRE SURFACE AREAS ON-GRADE, BUT CAN BE INCORPORATED WITH LANDSCAPE THAT IT IS AESTHETICALLY PLEASING AND CONTRIBUTE TO SUSTAINABLE DESIGN. INFILTRATION BMPs (UNDERGROUND) MAY / MAY NOT TAKE UP MORE OF UNDERGROUND SURFACE AREAS, BUT SAVE THE LAND VALUE ABOVE GROUND, AND STILL MEET THE MS4 REQUIREMENTS.
- BMP TYPE 1 AND TYPE 2 ARE APPROXIMATELY SIZED TO HANDLE THE ENTIRE RUNOFF FROM THE NEW IMPROVEMENTS. THEY CAN BE SEPARATED BY PHASES, GRADING, AND SITE DESIGN/LAYOUT ETC.

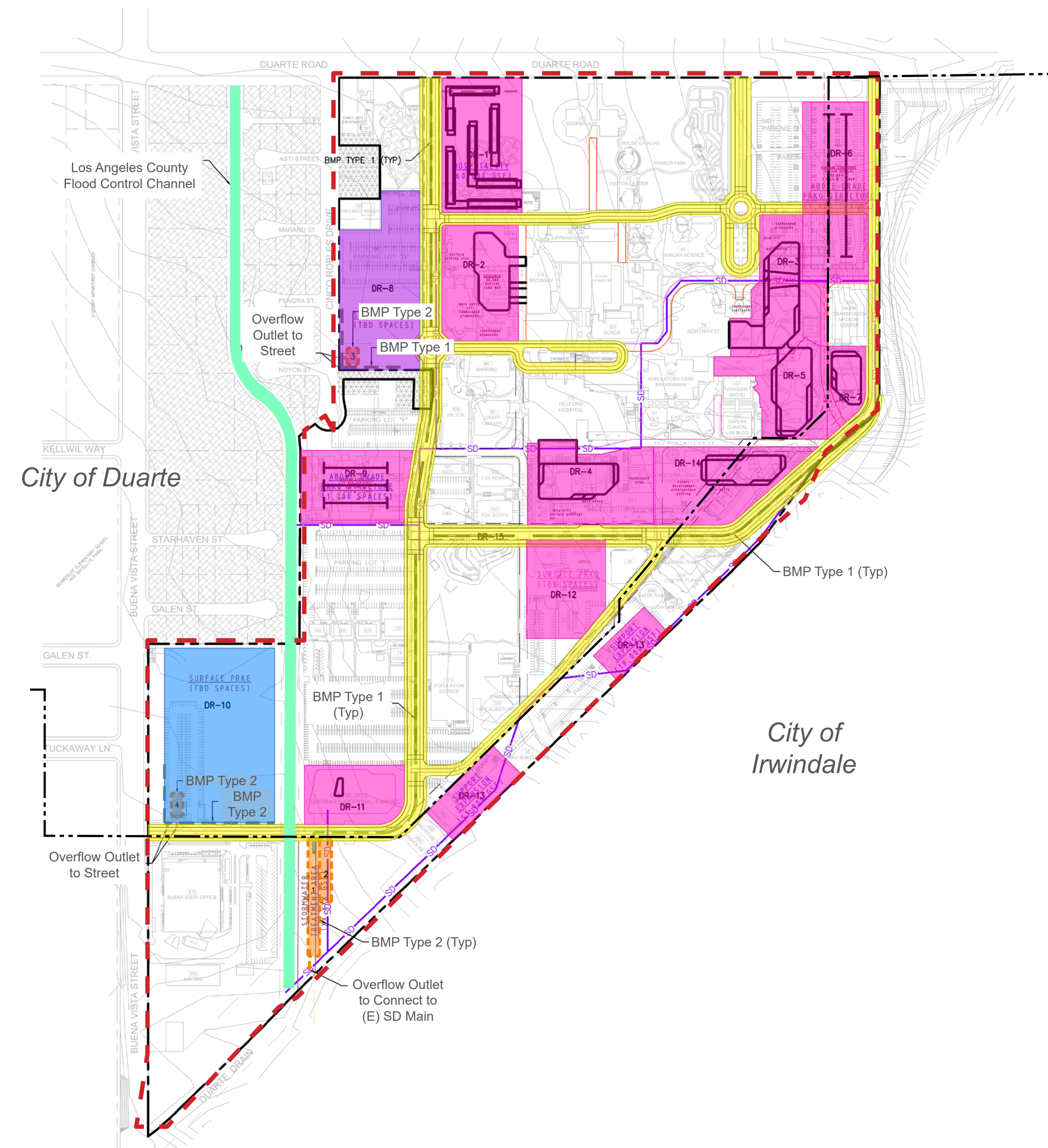


1 55 FOOT ROADWAY SECTION



1 BMP TYPE 1: MODIFIED BIOSWALE N.T.S.

2 BMP TYPE 2: SUBSURFACE PERFORATED CMP INFILTRATION SYSTEM N.T.S.



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Dam inundation zones are based on the highly unlikely scenario of a total catastrophic dam failure occurring in a very short period of time. Also, the dam inundation zones are based on the reservoirs being completely full (i.e., 100 percent storage capacity). As a result of sedimentation, these dams currently operate at 83 percent (San Gabriel) and 71 percent (Morris) capacity. Therefore, in the unlikely event of a dam failure, the dam inundation zones would be smaller than the mapped areas. Also, the dam inundation maps indicate that the first arrival time of the flood waves would be 50 to 55 minutes, which would allow time to implement early warning procedures and plans for evacuation. As stated previously, evacuation of the hospital and some of the other campus buildings in a short period of time may be difficult, but vertical evacuation to higher floors that are above the flood level is possible. According the City of Duarte's Local Hazard Mitigation Plan, the velocity and height of the water from a failure of Morris or San Gabriel Dams would rapidly diminish at the mouth of the San Gabriel River (Duarte 2004). The dam inundation maps do not provide water depths at various locations, including the project site, but because the site is near the edge of the inundation zones, the water depths would be minimal. Also, the dam inundation map for Morris Dam states that most of the flood waters would be intercepted and stored in the Santa Fe Flood Control Basin, spreading grounds, and gravel pits. There also are several debris basins downgradient from San Gabriel Dam and upgradient from the project site that would tend to attenuate any flood waves that would result with a dam failure.

The probability of dam failure is low, and all dams are continually monitored by the state and the Los Angeles County Department of Public Works (LACDPW). The LACDPW has developed Emergency Action Plans for these dams that include procedures for damage assessment and emergency warnings. The cities of Duarte and Irwindale are coordinating with LACDPW on establishing early flood warning systems and communication methods among all government agencies, as well as establishing city procedures and evacuation plans for addressing early flood warnings. Due to the length of time required for released water to reach the project site and the low probability of dam failure, implementation of the Campus Plan would not expose people or structures to a significant risk of loss, injury, or death in the case of dam failure, and impacts are considered less than significant.

5.8.4 Cumulative Impacts

The geographic area for addressing cumulative hydrology impacts is the Buena Vista Watershed (see Figure 5.8-1).

Although the area around the project site is almost fully built out, new projects in the area, both individually and cumulatively, could increase the impervious surface areas, increase the volume of stormwater runoff, and contribute to pollutant loading in the storm drain system with eventual discharge to Rio Hondo and the Los Angeles River. However, as with the proposed project, future projects within the cities of Duarte and Irwindale and Los Angeles County would be required to comply with drainage and grading regulations and ordinances that control runoff and regulate water quality at each development site. New development and redevelopment projects would be required to demonstrate that stormwater volumes could be managed by onsite and downstream conveyance facilities and would not induce flooding. New projects also would be required to comply with the county's MS4 permit. Each project that disturbs more than one acre of land would be required to develop a SWPPP, and all regulated projects would be required to develop an LID plan. The projects would be subject to review and approval by the appropriate City to ensure that appropriate

BMPs and treatment measures are implemented to reduce pollutants in stormwater and avoid adverse impacts to surface water quality. The county's MS4 permit and LID Ordinance also require new development and certain redevelopment projects to retain a specified volume of stormwater runoff onsite through incorporation of LID BMPs so that stormwater volumes are reduced to at or below existing conditions. As described above, the proposed project would result in a net reduction in the amount of stormwater runoff and pollutants currently entering the storm drain system from this project site under existing baseline conditions with the implementation of required LID and stormwater treatment measures. Therefore, cumulative impacts to hydrology and water quality would not be cumulatively considerable and would be less than significant.

5.8.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to hydrology and water quality and were described in detail in Section 5.8.1.1 of this DEIR and are listed below.

Federal

- Federal Emergency Management Agency, National Flood Insurance Program

State

- California Water Code Sections 13000 et seq.: Porter-Cologne Water Quality Act
- SWRCB Construction General Permit (Order No. 2009-0009-DWQ) as amended by 2010-0014-DWQ and 2012-0006-DWQ
- Emergency Services Act, California Government Code Section 8589.5(b)
- California Division of Safety of Dams, Dam Inspection Program

Regional

- Los Angeles RWQCB Municipal Regional Stormwater Permit (Order Number R4-2012-0175) and NPDES Permit No. CAS004001, as amended by Order No. WQ 2015-0075.

Local

- City of Duarte Municipal Code Chapter 6.15, Stormwater and Urban Runoff Pollution Control
- City of Duarte Municipal Code Chapter 6.15.070, Construction Pollution Reduction
- City of Duarte Municipal Code Chapter 6.15.140, Low Impact Development Plan

- City of Irwindale Municipal Code Chapter 8.28, Storm Water and Urban Runoff Pollution

5.8.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.8-1, 5.8-2, 5.8-3, and 5.8-4.

5.8.7 Mitigation Measures

No mitigation measures are necessary.

5.8.8 Level of Significance After Mitigation

Impacts would be less than significant.

5.8.9 References

California American Water Company (CAWC). 2015. 2015 Annual Water Quality Report.

———. 2016, June 30. Final 2015 Urban Water Management Plan for the Southern Division – Los Angeles County District. Prepared by Water Systems Consulting, Inc.

California Department of Water Resources (DWR), 2003. California's Groundwater. Bulletin 118. State of California.

California Emergency Management Agency (CalEMA). 2013. State of California Multi-Hazard Mitigation Plan.

California Office of Emergency Services (CalOES). 2016. Dam Inundation Registered Images and Boundary Files in Shape File Format, San Gabriel Dam, Morris Dam, and Sawpit Dam.

California Stormwater Quality Association (CASQA). 2003, January. Stormwater Best Management Practice Handbook: New Development and Redevelopment.

Division of Mines and Geology (DMG). 1998. Seismic Hazard Zone Report for the Azusa 7.5-Minute Quadrangle, Los Angeles County, California. Department of Conservation.

Duarte, City of. 2004. Local Hazard Mitigation Plan.

Federal Emergency Management Agency (FEMA). 2008, September 26. Flood Insurance Rate Maps (FIRMs) Nos. 06037C1415F and 06037C1700F.

Irwindale, City of. 2012. 2012 Hazard Mitigation Plan.

KPFF Consulting Engineers. 2016a, August 16 (revised). Low Impact Development (LID) Study.

———. 2016b, August 16 (revised). Hydrology Report for City of Hope Campus Plan.

———. 2016c, August 16 (revised). City of Hope Campus Plan: Revised Water Infrastructure and Demand Analysis.

Los Angeles, County of. 2014. Low Impact Development Standards Manual.

———. 2016. HydroCalc Calculator. http://dpw.lacounty.gov/wmd/dsp_LowImpactDevelopment.cfm.

Los Angeles County Department of Public Works (DPW). 2016. Los Angeles County Storm Drain System. Los Angeles County. http://dpw.lacounty.gov/fcd/stormdrain/index.cfm.

Los Angeles Regional Water Quality Control Board (LARWQCB). 2014. Water Quality Control Plan, Los Angeles Region, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.

State Water Resources Control Board (SWRCB). 2010. 2010 Integrated Report. Clean Water Act Section 303(d) List/303(b) Report.

———. 2017, May 3. Total Maximum Daily Load Program: Background. http://www.waterboards.ca.gov/water_issues/programs/tmdl/background.shtml#current.

Water Systems Consulting, Inc. (WSC). 2017, September 22. Final Water Supply Assessment for the City of Hope Specific Plan.

5.9 LAND USE AND PLANNING

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential impacts to land use in the City of Duarte and City of Irwindale from implementation of the proposed City of Hope Campus Plan. The analysis in this section is based on the proposed land use designations described in detail in Section 3, *Project Description*, and Section 3, "Land Use & Development Standards," and shown in Figure 6, "Campus Land Use Plan," of the City of Hope Specific Plan. The proposed Specific Plan has been evaluated for its consistency with relevant goals and policies in the City of Duarte General Plan and City of Irwindale General Plan, and the Southern California Association of Governments' (SCAG) Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS).

Land use impacts can be either direct or indirect. Direct impacts are those that result in land use incompatibilities, division of neighborhoods or communities, or interference with other land use plans, including habitat or wildlife conservation plans. This section focuses on direct land use impacts. Indirect impacts are secondary effects resulting from land use policy implementation, such as an increase in demand for public utilities or services, or increased traffic on roadways. Indirect impacts are addressed in other applicable sections of this DEIR.

5.9.1 Environmental Setting

5.9.1.1 REGULATORY FRAMEWORK

Regional and local laws, regulations, plans, or guidelines that are potentially applicable to the proposed City of Hope Campus Plan are summarized below.

Southern California Association of Governments

SCAG is a regional council of governments representing Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties, which encompass over 38,000 square miles. SCAG is the federally recognized metropolitan planning organization for this region and a forum for addressing regional issues concerning transportation, the economy, community development, and the environment. SCAG is also the regional clearinghouse for projects requiring environmental documentation under federal and state law. In this role, SCAG reviews proposed development and infrastructure projects to analyze their impacts on regional planning programs. As the southern California region's metropolitan planning organization, SCAG cooperates with the South Coast Air Quality Management District, the California Department of Transportation, and other agencies in preparing regional planning documents. SCAG has developed regional plans to achieve specific regional objectives, as discussed below.

The Campus Plan is considered a project of "regionwide significance" pursuant to the criteria in SCAG's *Intergovernmental Review Procedures Handbook* (November 1995) and Section 15206 of the CEQA Guidelines. Therefore, this section addresses the proposed project's consistency with the applicable SCAG regional planning guidelines and policies.

Regional Transportation Plan/Sustainable Communities Strategy

On April 7, 2016, SCAG adopted the 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (2016–2040 RTP/SCS), a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. The 2016 RTP/SCS includes a strong commitment to reduce emissions from transportation sources to comply with Senate Bill 375, improve public health, and meet the National Ambient Air Quality Standards. This long-range plan, required by the state of California and the federal government, is updated by SCAG every four years as demographic, economic, and policy circumstances change. The 2016 RTP/SCS is a living, evolving blueprint for the region's future (SCAG 2016).

Unique to the SCAG region is the option for subregions to create their own SCS. However, the San Gabriel Valley Council of Governments, of which the cities of Duarte and Irwindale are member jurisdictions, has chosen to rely on SCAG's 2016–2040 RTP/SCS.

Local Plans

City of Duarte General Plan

The Duarte General Plan was adopted in 2007 and is the community's blueprint for the future. It provides a vision for how the city is to be developed through 2020. For the portion of the project site in the City of Duarte (89.5 acres), the Duarte General Plan identifies six land use designations—Hospital (encompasses most of the project site), Medium-Density Residential, High-Density Residential, Research and Development, one corridor of Public Facility use (the Duarte Flood Control Channel), and one small Single-Family Residential parcel. The Hospital designation allows inpatient and outpatient medical facilities as well as other health-care-related uses. The Research and Development designation emphasizes medical-related research in office or industrial settings. The existing General Plan land use designations on the proposed Campus Plan site are shown in previous Figure 4-2, *Existing General Plan Designations*.

Table 5.9-1 Existing Duarte General Plan Land Use Designations

Land Use	Dwelling Units per Acre or Floor Area Ratio: Maximum	Dwelling Units per Acre or Floor Area Ratio: Anticipated	Description of Land Use Designation
Hospital	1.5:1 FAR	1.5:1 FAR	Properties owned by City of Hope and Saint Teresita
Single-Family Residential	1-6 du/ac	6 du/ac	Detached single family homes
Medium-Density Residential	7−21 du/ac	15 du/ac	Attached and/or detached housing
High-Density Residential	21−28 du/ac	23 du/ac	Attached housing
Public Facility	N/A	N/A	Utility, flood control, and railroad easements
Research and Development	1.5:1 FAR	1.5:1 FAR	Research and development

Source: Duarte 2007, Table LU-1, Land Use Classifications and Designations.
FAR = floor area ratio

The Duarte General Plan Land Use Element specifically calls out City of Hope in the following way:

Hospital Land Uses: Duarte is known as the City of Health, primarily because of the world renowned City of Hope. The City of Hope facility in Duarte has more than 300 physicians and scientists and more than 2,500 employees. The annual payroll for the City of Hope Duarte facility in 2005 was $160 million. Santa Teresita Medical Center currently employs 250 people.

1. Hospital: The Hospital designation is intended to accommodate hospitals, rest homes, sanitariums and residential uses requiring a state or county license. The designation is also intended to accommodate medical professional offices and attendant medical facilities. There are two areas that have the Hospital designation. One is City of Hope and the other is Santa Teresita. The zoning district that corresponds with this designation is the H zone. Uses permitted include general hospitals (excluding sanitariums, nursing homes, convalescent homes, maternity homes or rest homes); medical professional offices; attendant medical facilities, including, but not limited to, pharmacies, physical therapy offices, laboratories, and clinics. Conditional uses are those typically associated with hospitals such as confectionery stores; florist; gift shops and the like.

2. R&D: This is a new designation in the 2005–2020 General Plan. The R & D designation is intended to provide for research and development uses primarily, but not exclusively for medical related research and development. This designation will also incorporate standards for office and administrative uses sometimes associated with R&D activities. In addition, this designation provides for all uses in the hospital designation.[1]

The City of Duarte General Plan assumes the following community-wide characteristics by 2020: 25,418 residents, 7,702 housing units, and 9,953,071 non-residential square feet of structures. The Duarte General Plan assumes a 2020 buildout of 5,096,520 square feet of structures in the Hospital land use designation. There are approximately 1.4 million square feet of structures in the Hospital designation. Table LU-1 Land Use Classifications and Designations of the Duarte General Plan land use element defines the Hospital designation as only properties owned by City of Hope and Santa Teresita (Santa Teresita Medical Center).

City of Duarte Development Code

The City of Duarte Development Code includes site-specific zoning requirements. Per the zoning map, most of the City of Hope campus in Duarte is zoned H (Hospital). The H zoning designation permits general hospitals (excluding sanitariums, nursing homes, convalescent homes, maternity homes, or rest homes); medical professional offices; and attendant medical facilities, including, but not limited to, pharmacies, physical therapy offices, laboratories, and clinics. Portions of the project site on the western part of the campus are zoned for residential uses, with the current zoning designations of R-1 (Single-Family Residential), R-2 (Two-Family Residential), R-4 (Multiple Family Residential High Density), and Open Space

[1] The General Plan also noted that in 2007, City of Hope anticipates building 360,000 sq. ft. of new Science Park on their campus. In addition, a five story 108,000 sq. ft. Cancer Immunotherapeutics and Tumor Immunology Center. Employees for this center will come from work areas now housed in existing portable trailers on the City of Hope campus.

(OS). One parcel onsite, at 1969 Cinco Robles Drive, is zoned R-1; the parcel is developed as a community garden, and there is no single-family residential use onsite. The R-2 zone allows the development of medium-density detached or attached housing between 7 and 11 dwelling units per acre. The R-4 zone allows attached multistory residential up to 28 dwelling units per acre. The OS zone is part of the Duarte Flood Control Channel. The Duarte Channel is owned, operated, and maintained by the Los Angeles County Flood Control District, and is not part of the Campus Plan site. The existing zoning designations for the proposed Campus Plan site are shown in previous Figure 4-3, *Existing Zoning*. The following zoning descriptions are from the City of Duarte Development Code.

- **Hospital Zone (H):** The Hospital zone establishes areas appropriate for health care-related-uses (and limited accessory retail and service uses) that provide necessary community and regional facilities to support and promote good health and medical care, and that provide jobs for all educational and skill levels. Such uses generally benefit from good regional access.

- **Single-Family Residential Zone (R-1):** The R-1 zone provides areas for the development and preservation of residential subdivisions consisting of detached residences and accessory uses compatible with the residential use of the zone. Note that the one parcel onsite zoned R-1 is developed as a community garden, and there is no residential use within R-1 zoning onsite.

- **Two-Family Residential Zone (R-2):** The R-2 zone is established to provide for the development of medium-density residential homes that may consist of one or two-family detached or attached units, and that comprise a cohesive development that may incorporate common open space and/or private open space areas, at a density range from 7 to 11 dwelling units per net acre.

- **Multiple-Family Residential Zone (R-4):** The R-4 zone is established to accommodate higher-density, multi-story residential development, with a focus on providing an intensity and function at locations within easy walking distance to transit, recreation and community facilities, and commercial services. The maximum permitted density is 28 dwelling units per net acre.

- **Open Space (OS):** The Open Space zone is established to set aside areas necessary to maintain and protect open spaces for the purposes of recreation, natural resource protection and enhancement, hazards management, utility corridors, and the protection of prehistoric places, features, and objects.

City of Irwindale General Plan

The 2008 City of Irwindale General Plan governs future planning and development in Irwindale through 2020. The portion the proposed Campus Plan site in the City of Irwindale (26.5 acres) is categorized under three General Plan land use designations: Industrial/Business Park, Commercial, and Open Space/Easements. The allowable floor area ratio for Industrial/Business Park is 1.0. The IBP designation includes business and industrial buildings and multi-tenant complexes with common landscape and/or architectural theme. The Commercial designation accommodates hospital uses associated with City of Hope campus. The Open Space/Easement designation applies to all open space areas used for flood control, such as the Santa Fe Flood Control Basin adjacent to the City of Hope campus.

City of Irwindale Zoning Code

The zoning code provides specific regulations for development in the City of Irwindale. The part of the proposed Campus Plan that is within Irwindale is zoned A-1 (Agricultural), (C-2, Heavy Commercial)[2], and M-1 (Light Manufacturing). A-1 is a single-family detached residential zone that allows agricultural and horticultural crops and animal keeping. M-1 allows approximately 70 different uses related to fabrication.

5.9.1.2 EXISTING CONDITIONS

The Campus Plan area consists of 116 acres generally bounded by Duarte Road, Buena Vista Street, and the Santa Fe Flood Control Channel—89.5 acres in the City of Duarte and 26.5 acres in the City of Irwindale. The planning area includes properties owned by City of Hope as well as less than one-half acre of land owned by other entities.

The Campus Plan area primarily contains medical-related uses including hospitals, clinics, offices, research, hospitality (short-term stays for patients, their families, and City of Hope guests), and storage (industrial/warehousing). There are also open space amenities throughout the campus. There are existing residential uses on the far west side of the Campus Plan area. Existing land uses are shown in Figure 4-1, *Existing Land Uses*.

5.9.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

LU-1 Physically divide an established community.

LU-2 Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

LU-3 Conflict with any applicable habitat conservation plan or natural community conservation plan.

The Initial Study, included as Appendix A, substantiates that there would be no impacts associated with the following thresholds:

- Threshold LU-1: The project site is bounded by residential uses to the north opposite Duarte Road and to the west; and by the Santa Fe Dam and San Gabriel River to the east and south, respectively. Campus Plan buildout would not divide an established community.

[2] On September 26, 2007, the Irwindale City Council adopted Resolutions No. 2007-64-2250 and 2007-65-2251 and Ordinance No. 620 approving a general plan amendment (1-07), zone change (1-07), and site plan and design review permit (1-07) for the construction of a 60,000 square foot medical, laboratory, and office building at City of Hope campus (1500 East Duarte Road); it rezoned A-1 (Agricultural) to C-2 (Heavy Commercial).

- Threshold LU-3: The project site is not in a habitat conservation plan.

These impacts will not be addressed in the following analysis.

5.9.3 Environmental Impacts

Methodology

This analysis analyzes the proposed project's consistency with regional and local plans, policies and regulations for the purposes of avoiding or mitigating an environmental effect. Specifically, the proposed project was analyzed with respect to the applicable regional planning guidelines and strategies of SCAG's RTP/SCS, the Duarte General Plan, and the Irwindale General Plan.

The following impact analysis addresses one threshold of significance for which the Initial Study disclosed a potentially significant impact. The applicable threshold is identified in brackets after the impact statement.

Impact 5.9-1: Campus Plan implementation would not conflict with applicable plans adopted for the purpose of avoiding or mitigating an environmental effect. [Threshold LU-2]

Impact Analysis: The Campus Plan area consists of 116 acres, 89.5 of which are in the City of Duarte and 26.5 are in the City of Irwindale. The entire site currently includes approximately 1,600,850 square feet of development (1,594,832 non-residential) related to City of Hope inpatient (hospital), outpatient (clinic), office, research, hospitality, and industrial/warehousing uses. The proposed Campus Plan would demolish up to about 387,500 square feet of non-residential structures to be replaced with up to approximately 1,038,500 net new non-residential structures. Existing non-residential development plus net new development would result in a total of approximately 2,633,392 non-residential square feet (2,639,350 square feet when including existing housing units).

A general plan amendment and zone change for the 89.5-acre portion in the City of Duarte would be required to implement the Campus Plan. The current Duarte General Plan land use designations (Hospital, Medium-Density Residential, High-Density Residential, Single-Family Residential, Public Facility, and Research and Development) of this portion of the project site would be changed to Specific Plan, which would require a revision to the Duarte General Plan land use map and a narrative amendment to the Duarte General Plan, adding the City of Hope Specific Plan to the list of approved specific plans. The zoning designations (H [Hospital], R-1 [Single-Family Residential], R-2 [Two-Family Residential], and R-4 [Multiple-Family Residential]) of this portion of the project site would also be changed to Specific Plan, which would require a revision to the Duarte zoning map.[3] The zone change includes adoption of the City of Hope Specific Plan as part of the Duarte Municipal Code.

The Duarte Channel is not part of the Campus Plan site; the Duarte Channel is owned, operated, and maintained by the Los Angeles County Flood Control District, and would remain in flood control use upon Campus Plan approval and buildout.

[3] Note that the one parcel onsite zoned R-1 is developed as a community garden, and there is no residential use within R-1 zoning onsite.

Adoption of the Specific Plan also requires a general plan amendment and zone change for the 26.5-acre portion in the City of Irwindale. The current land use designations (Industrial/Business Park and Open Space/Easements) on the proposed site would be changed to Specific Plan, requiring a revision to the Irwindale General Plan narrative and land use map. The zoning designations (A-1 [Agricultural] and M-1 [Light Manufacturing]) of this area of the Campus Plan site would also be changed to Specific Plan, which would require a revision to the Irwindale zoning map. The zone change also includes adoption of the City of Hope Specific Plan in the Irwindale Municipal Code.

The proposed project is considered a project of regionwide significance pursuant to the criteria outlined in SCAG's *Intergovernmental Review Procedures Handbook* (November 1995) and CEQA Guidelines Section 15206, because it would involve a net increase of over 500,000 square feet of business establishment. Therefore, a consistency analysis with the applicable regional planning guidelines and strategies of SCAG's RTP/SCS is required.

2016–2040 SCAG RTP/SCS

Table 5.9-2 provides an assessment of the proposed Campus Plan's relationship to pertinent 2016–2040 SCAG RTP/SCS goals. The RTP/SCS goals are directed toward transit, transportation and mobility, and protection of the environment and health of residents. Consistency with SCAG population growth projections is addressed separately in Section 5.11, *Population and Housing*. The consistency analysis below focuses on the broad, policy-oriented goals of the 2016–2040 RTP/SCS to determine consistency between the two plans.

Table 5.9-2 Consistency with SCAG's 2016–2040 RTP/SCS Goals

RTP/SCS Goal	Project Compliance with Goal
RTP/SCS G1: Align the plan investments and policies with improving regional economic development and competitiveness.	**Not Applicable:** This is not a project-specific goal and is therefore not applicable.
RTP/SCS G2: Maximize mobility and accessibility for all people and goods in the region. **RTP/SCS G3:** Ensure travel safety and reliability for all people and goods in the region. **RTP/SCS G4:** Preserve and ensure a sustainable regional transportation system. **RTP/SCS G5:** Maximize the productivity of our transportation system.	**Consistent:** Campus Plan implementation would ensure that mobility, accessibility, travel safety, and reliability for people and goods would be maximized. The vehicular and pedestrian improvements called for in the City of Hope Campus Plan would be implemented and maintained to meet the needs of employees, patients and their families, and other guests. Fundamental changes to the campus's internal circulation network are not anticipated, although improvements are expected to increase pedestrian connectivity and visual experience; increase cyclist safety; and enhance the ease of patient arrivals, drop-offs, and departures. All modes of public and commercial transit throughout the City of Hope Campus Plan area would be required to follow safety standards set by state, regional, and local regulatory documents. For example, sidewalks must follow precautions established in Development Code Chapter 12.08 (Sidewalks, Pavements, Curbs and Gutters in New Construction Areas), in addition to the 6-foot-minimum-wide sidewalks along street-facing buildings requirement in the proposed Campus Plan. The proposed improvements to the nonvehicular modes of transportation (e.g., sidewalks, bicycle storage) would provide convenient, efficient, and safe access to uses within the campus.

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Table 5.9-2 Consistency with SCAG's 2016–2040 RTP/SCS Goals

RTP/SCS Goal	Project Compliance with Goal
	The proposed Campus Plan recognizes the importance of Metro Gold Line Foothill Extension's Duarte/City of Hope station, which is immediately north of the northeast corner of campus across Duarte Road. New bike lanes and paths are proposed to improve cyclist access to and from the Duarte/City of Hope station. All improvements to the existing traffic and transportation networks within the City of Hope Campus Plan area must also be assessed with some level of traffic analysis (e.g., traffic assessments, traffic impact studies) to determine how individual development projects would impact capacities. A transportation impact analysis was prepared for the proposed Campus Plan by Fehr & Peers and is included in its entirety in Appendix J1 of this DEIR. The findings, conclusions, and recommendations of the analysis are provided in Section 5.14, *Transportation and Traffic*.
RTP/SCS G6: Protect the environment and health of our residents by improving air quality and encouraging active transportation (non-motorized transportation, such as bicycling and walking).	**Consistent:** The CEQA process ensures that non-exempt projects at all levels of government in California consider all potential environmental impacts. Air quality impacts are addressed in Section 5.2 of this DEIR. The reduction of energy use, improvement of air quality, and promotion of more environmentally sustainable development would be encouraged through the existing and proposed alternative transportation modes, sustainable building and landscaping design techniques, and other best management practices for structures and non-structures. For example, there are design standards for connector spaces to improve pedestrian and cyclist access, safety, and overall non-motorized travel experience on campus. Project implementation would also maximize the protection of the environment and potential improvement of air quality by encouraging the use of the region's public transportation system by City of Hope workers, patients, and their families. The Campus Plan also calls for improved bicycle paths to the Metro Gold Line Foothill Extension's Duarte/City of Hope station. A transportation impact analysis was prepared for the proposed Campus Plan by Fehr & Peers and is included in its entirety in Appendix J1 of this DEIR. The findings, conclusions, and recommendations of the analysis are provided in Section 5.14, *Transportation and Traffic*.
RTP/SCS G7: Actively encourage and create incentives for energy efficiency, where possible.	**Consistent:** In the proposed Specific Plan, Goal 4, Sustainable Development and Design, reads, "Sustainable practices in building design, construction, and maintenance help to minimize the campus' impact on surrounding infrastructure and facilities." Objectives under this goal include: • Green Building Standards. Maximize energy efficiency, indoor air quality, energy-efficient lighting, building orientation, and shading through local and state standards and/or through implementation of LEED principles. • Building Systems. Replace older buildings and infrastructure that require high maintenance with more efficient, lower-maintenance, and environmentally sensitive systems. • Energy Generation. Consider building layout, siting, and design so as to not preclude on-site alternative energy production. Implementation of Mitigation Measures GHG-1 and GHG-2, requiring implementation of a GHG Reduction Plan as set forth in DEIR Section

Table 5.9-2 Consistency with SCAG's 2016–2040 RTP/SCS Goals

RTP/SCS Goal	Project Compliance with Goal
	5.6, *Greenhouse Gas Emissions*, would also be consistent with Goal G7.
RTP/SCS G8: Encourage land use and growth patterns that facilitate transit and active transportation.	**Consistent:** See responses to RTP/SCS Goals G2 through G5.
RTP/SCS G9: Maximize the security of the regional transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies.	**Not Applicable:** This is not a project-specific goal and is therefore not applicable.

Source: SCAG 2016.

As demonstrated above, the proposed Campus Plan is consistent with the goals identified in SCAG's 2016-2040 RTP/SCS.

City of Duarte General Plan

The relevant long-range planning document for 89.5 acres (77 percent) of the proposed City of Hope Campus Plan is the City of Duarte General Plan. Consistency with the 2007 General Plan is evaluated in Table 5.9-3. Although the General Plan contains numerous additional goals beyond those discussed in the following table, those goals are not related to the "purpose of avoiding or mitigating an environmental effect" and therefore are not analyzed in the table. Furthermore, consistency with the housing, open space conservation, noise, historic preservation, circulation, and safety elements is evaluated in other sections of this DEIR.

Table 5.9-3 Consistency with the City of Duarte General Plan

General Plan Goal	Project Compliance with Goal
Land Use Element	
Land Use Goal 1: Maintain a balanced community consisting of various residential housing types and densities, commercial activities, industrial development, mixed use where appropriate, and open space.	**Consistent:** The Campus Plan includes hospital, office, research, hospitality, industrial, and open space uses. Supportive uses such retail, child care, and places of worship would also be permitted in parts of the campus. Implementation of the proposed City of Hope Campus Plan will maintain the City of Duarte's ideal jobs/housing balance, as discussed in Section 5.11, *Population and Housing*, of this DEIR.
Land Use Goal 2: Develop compatible and harmonious land uses by providing a mix of uses consistent with projected future social, environmental and economic conditions.	**Consistent**: The proposed Campus Plan creates unique land use designations to ensure compatibility between on- and off-campus uses. The portions of the campus that include housing and are adjacent to existing residential uses are called the Residential Medical Flex and Transition Medical districts. These districts allow low intensity uses to reduce impacts on neighboring properties. As discussed in Section 5.11, *Population and Housing*, the proposed Campus Plan will contribute to reducing the rate of unemployment in Duarte and nearby communities. It would provide a range of short- and long-term jobs in fields related to construction, health care, administration, medical research, academia, hospitality, and maintenance, among others.

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Table 5.9-3 Consistency with the City of Duarte General Plan

General Plan Goal	Project Compliance with Goal
	The proposed Campus Plan establishes a City of Hope campus that would be "a valuable economic and cultural contributor to the health, economy, and culture of the surrounding community" (City of Hope Specific Plan Goal 1. A Community Resource). Objectives under this goal include: • Health Care Needs. Provide hospital and outpatient service resources that evolve with the health care needs of the surrounding community. • Economic Vitality. Provide for additional facilities and supporting uses that will create local jobs and improve economic vitality in Duarte and Irwindale. • Community Meeting and Gathering Space. Allow open areas on the City of Hope campus to serve as community gathering space for meetings and events. • Sensitivity to Surrounding Neighborhood. Plan, construct, and operate campus facilities in a manner that minimally disrupts the surrounding neighborhood.
Open Space and Conservation Element	
Conservation Goal 2: To protect and maintain the local water supply to ensure that the city's growing demand for water can be met.	**Consistent**: The proposed Specific Plan's design standards and guidelines incorporate sustainable practices such as using native and drought-tolerant landscaping to conserve water. Development projects pursuant to the Specific Plan shall follow the City of Duarte's sustainable development practices (DDC Chapter 19.52). Some examples of water-conserving guidelines and regulations in the proposed Specific Plan include: • Softscaping should integrate sustainable design approaches, such as replenishment of groundwater, the reduction of waste, and the preservation of existing natural ecosystems. • Plant material should incorporate native and low-water-use species. Drought-tolerant grasses should be used for lawn areas where possible. • All paved areas shall be sloped to drain at 1 percent except where accessibility requirements preclude it. • Irrigation systems should use water-conserving methods and water-efficient technologies such as drip emitters, evapotranspiration controllers, and moisture sensors. • Irrigation systems should be operated automatically using an electric controller and low-voltage remove control valves. • Drainage should be directed to subterranean retention systems, permeable areas, or small bioswales where feasible to minimize discharge to the storm drain system. • Pervious or open-grid paving is recommended to be used for parking areas, to reduce the negative effects of stormwater runoff and facilitate groundwater recharge.
Circulation Element	
Circulation Goal 3: To increase the use of alternative modes of transportation for traveling to, from, or through Duarte.	**Consistent**: The proposed Campus Plan area is accessible by several transit options. The project site is near the Duarte/City of Hope station of the Metro Gold Line. The light rail currently runs from downtown Los Angeles to Azusa via Chinatown, Montecito Heights, Highland Park,

Table 5.9-3 Consistency with the City of Duarte General Plan

General Plan Goal	Project Compliance with Goal
	South Pasadena, Pasadena, Monrovia, and Duarte. The next phase of Metro Gold Line expansion will link Duarte to the cities of Glendora, San Dimas, La Verne, Pomona, Claremont, and Montclair. The Duarte/City of Hope Station Gold Line Station is also a connection to Metro local bus 264 and Foothill Transit line 272. Metro local bus 264 serves the cities of El Monte, Arcadia, Pasadena, Altadena, and Duarte. Foothill Transit provides busing to and from the City of Hope Campus along Line 272, serving the cities of Duarte, Irwindale, Baldwin Park, and West Covina. Line 272 stops by the City of Hope, Queen of the Valley Hospital in West Covina, and Doctor's Hospital in West Covina. In addition to Metro and Foothill Transit, busing is also provided in the City of Duarte by Duarte Transit. Duarte Transit's Blue Route stop 13 is on the northwestern edge of the proposed Campus Plan (Buena Vista Street at Duarte Road), and stop 12 (Duarte Road by the main entrance of the City of Hope campus) serves the campus and connects it to the Metro Gold Line, route-264 bus, and Foothill Transit line 272. Duarte Transit's Green Route stops 24 and 39 (Duarte Road at City of Hope) serve the campus and connect to the Metro Gold Line and other bus routes. The proposed Campus Plan also includes new pedestrian and bicycle paths and amenities to improve multimodal transportation options and safety.

Sources: Duarte 2007.

City of Irwindale General Plan

The area of the proposed Campus Plan in the City of Irwindale consists of 26.5 acres, or 23 percent of the total plan area. Consistency with the Irwindale 2020 General Plan is evaluated in Table 5.9-4. Except for the housing element, the Irwindale General Plan provide policies instead of goals to guide future development and improvements. Irwindale General Plan policies that are not related to the "purpose of avoiding or mitigating an environmental effect" are not analyzed in the table.

Table 5.9-4 Consistency with the Irwindale General Plan

General Plan Policy	Project Compliance with Goal
Community Development Element	
Community Development Element Policy 1: The City of Irwindale, through continued comprehensive land use planning, will strive to preserve the overall mix of land uses and development in the community.	**Consistent**: The General Plan states: "…residential development accounts for only 1% of the City's total land area, compared to between 50% and 78% for the neighboring cities. Commercial uses account for one-quarter of one percent while industrial development represents approximately 15% of the City's total land area." Implementation of the proposed City of Hope Specific Plan would change the General Plan land use designations on campus from Industrial/Business Park, Commercial and Open Space/Easements to Specific Plan. The proposed Specific Plan land use for the Irwindale portion is Industrial/Utility. The proposed new uses in Industrial/Utility are consistent with Irwindale's industrial-oriented development pattern.

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Table 5.9-4 Consistency with the Irwindale General Plan

General Plan Policy	Project Compliance with Goal
	The buildout of the Campus Plan assumes approximately 10,744 net new square feet of warehousing and 130,409 net new square feet of industrial buildings in Irwindale.
Community Development Element Policy 3: The City of Irwindale will continue to ensure that the type, location, and intensity of all new development and intensified developments adhere to the requirements that are specified for their particular land use category in the General Plan.	**Consistent**: Implementation of the proposed Specific Plan would change the General Plan land use to Specific Plan, meaning that the Specific Plan would become the guiding legal document for the type, location, and intensity of all new development on the site. The proposed Specific Plan is consistent with General Plan policies, as documented throughout this table.
Infrastructure Element	
Infrastructure Element Policy 2: The City will continue to cooperate with those utility providers in the City to ensure that sufficient infrastructure capacity is available to meet current and future service demands.	**Consistent:** The proposed Campus Plan includes proposals for infrastructure improvements to ensure adequate services to meet future demand throughout the entire site (both in Duarte and Irwindale). Specific Plan Section 6, Infrastructure & Services, outlines proposed improvements to the water system, sanitary sewer system, drainage plan, and other utilities and public services. See the analysis provided in Section 5.16, *Utilities and Service Systems*, of this DEIR.
Infrastructure Element Policy 4: The City of Irwindale will strive to ensure that all new development implements its —fair-share of infrastructure improvements to offset the potential adverse impacts associated with the additional traffic that will be generated by the new development.	**Consistent**: See the response above.
Resource Management Element	
Resource Management Element Policy 11. The City of Irwindale supports the ethic of conservation of non-renewable resources. This includes efforts to reduce the use of energy (in any form), greenhouse gas (GHG) emissions (consistent with AB 32) and efforts to find new and more energy efficient methods for delivering services. The City supports the development of building standards that enable the community to design energy saving features such as solar energy systems, water efficient landscaping, and sustainable, green, and energy efficient building standards.	**Consistent**: In the proposed Specific Plan, Goal 4, Sustainable Development and Design, reads, "Sustainable practices in site development, building design, construction practices, and maintenance help to minimize the Campus's impact on surrounding infrastructure and facilities." Objectives under this goal include: • Green Building Standards. Maximize energy efficiency, indoor air quality, energy-efficient lighting, building orientation, and shading through local and state standards and/or through implementation of LEED principles, and ensuring new buildings on campus comply with CalGreen standards. • Building Systems. Replace older buildings and infrastructure that require high maintenance with more efficient, lower-maintenance, and environmentally sensitive systems. • Energy Generation. Consider building layout, siting, and design so as to not preclude on-site alternative energy production. The proposed Specific Plan's design standards and guidelines incorporate sustainable practices such as using native and drought-tolerant landscaping to conserve water. Some examples of water-conserving guidelines and regulations in the proposed Specific Plan include: • Softscaping should integrate sustainable design approaches, such as replenishment of groundwater, the reduction of waste, and the preservation of existing natural ecosystems. • Plant material should incorporate native and low-water-use species. Drought-tolerant grasses should be used for lawn areas where

Table 5.9-4 Consistency with the Irwindale General Plan

General Plan Policy	Project Compliance with Goal
	possible. • All paved areas shall be sloped to drain at 1 percent except where accessibility requirements preclude it. • Irrigation systems should use water-conserving methods and water-efficient technologies such as drip emitters, evapotranspiration controllers, and moisture sensors. • Irrigation systems should be operated automatically using an electric controller and low-voltage remove control valves. • Drainage should be directed to subterranean retention systems, permeable areas, or small bioswales where feasible to minimize discharge to the storm drain system. • Pervious or open-grid paving is recommended to be used for parking areas, to reduce the negative effects of stormwater runoff and facilitate groundwater recharge. Implementation of Mitigation Measures GHG-1 and GHG-2, requiring implementation of a GHG Reduction Plan as set forth in DEIR Section 5.6, *Greenhouse Gas Emissions*, would also be consistent with Resource Management Element goals and policies.

Sources: Irwindale 2008.

Conclusion

As demonstrated in Tables 5.9-2 through 5.9-4, the proposed Campus Plan embodies the goals and policies in the applicable long-range planning documents. Implementation of the proposed Campus Plan would not conflict with applicable plans adopted for the purpose of avoiding or mitigating an environmental effect. Impacts would be less than significant, and no mitigation is necessary.

5.9.4 Cumulative Impacts

Implementation of the Campus Plan is consistent with the applicable goals and policies of the SCAG 2016 RTP/SCS, City of Duarte General Plan, and City of Irwindale General Plan, as detailed in Tables 5.9-2 through 5.9-4, above. The proposed Specific Plan provides detailed development standards, location of permitted uses, design guidelines, sustainability and best management practices, infrastructure and services improvements, and strategies to improve multimodal circulation. Implementation of the proposed project would allow City of Hope to continue creating hospital, research and development, hospitality, and industrial related uses in a more cohesively designed, sustainable, and accessible campus.

As with the proposed Campus Plan, cumulative projects would be subject to compliance with the regional and local plans reviewed in this section. It is reasonable to assume that the cumulative projects would implement and support local and regional planning goals and policies. Cumulative projects would be subject to the applicable permit approval process for either the City of Duarte or the City of Irwindale, and would incorporate any mitigation measures necessary to reduce potential land use impacts. Therefore, with implementation of cumulative development in accordance with the SCAG RTP/SCS, City of Duarte General Plan, and City of Irwindale General Plan, cumulative land use impacts would be less than significant.

5.9.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to land use and planning and were described in detail in Section 5.9.1.1 of this DEIR and are listed below.

- City of Duarte Development Code
- City of Irwindale Zoning Code

5.9.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impact would be less than significant:

- Impact 5.9-1 (consistency with applicable plans)

5.9.7 Mitigation Measures

Project-level and cumulative impacts to land use and planning would be less than significant. No mitigation measures are required.

5.9.8 Level of Significance After Mitigation

No significant unavoidable adverse impacts relating to land use and planning would result on a project-specific or cumulative basis.

5.9.9 References

Duarte, City of. 2007, August. City of Duarte General Plan.
http://www.accessduarte.com/dept/cd/planning/general_plan.htm.

Irwindale, City of. 2008, June. City of Irwindale 2020 General Plan.
http://ci.irwindale.ca.us/DocumentCenter/View/38.

Southern California Association of Governments (SCAG). 2016. 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy.
http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS.pdf.

5.10 NOISE

This section discusses the fundamentals of sound; examines federal, state, and local noise guidelines, policies, and standards; reviews noise levels at existing receptor locations; evaluates potential noise impacts associated with the City of Hope Campus Plan project; and provides mitigation to reduce noise impacts at sensitive residential locations. This evaluation uses procedures and methodologies as specified by Caltrans and the Federal Highway Administration (FHWA).

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for implementation of the City of Hope Campus Plan to result in noise impacts in the Cities of Duarte and Irwindale. The eastern portion of the Campus Plan lies within the boundaries of the City of Irwindale. However, there are no nearby sensitive receptors in the City of Irwindale. As such, the presentation (in subsequent sections of this chapter) regarding the City of Irwindale's noise standards are provided for informational purposes.

5.10.1 Environmental Setting

In addition to the following sub-sections on noise and vibration fundamentals, existing regulations, and pertinent technical standards, Appendix I of this DEIR provides supplementary, project-specific background information, construction effects calculation worksheets, and project-generated traffic operations noise modeling results.

5.10.1.1 TECHNICAL TERMINOLOGY

Noise is most often defined as unwanted sound. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness." The following are brief definitions of terminology used in this chapter:

- **Sound.** A vibratory disturbance that, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise**. Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Hertz (Hz)**. A unit of frequency of change in state or cycle in a sound wave. The nearly universal usage is one (complete) cycle in one second. The unit 'Hertz', named after the German physicist Heinrich Hertz (1857-1894) replaces the previous 'cycles per second (cps)' nomenclature.
- **Decibel (dB)**. A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micropascals (20 μPa).
- **Vibration Decibel (VdB).** A unitless measure of vibration, expressed on a logarithmic scale and with respect to a defined reference vibration velocity. In the U.S., the standard reference velocity is 1 micro-inch per second ($1x10^{-6}$ in/sec).

- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels which approximates the frequency response of the human ear.

- **Equivalent Continuous Noise Level (L_{eq}); also called the Energy-Equivalent Noise Level.** The value of an equivalent, steady sound level which, in a stated time period (often over an hour) and at a stated location, has the same A-weighted sound energy as the time-varying sound. Thus, the L_{eq} metric is a single numerical value that represents the equivalent amount of variable sound energy received by a receptor over the specified duration.

- **Statistical Sound Level (L_n).** The sound level that is exceeded "n" percent of time during a given sample period. For example, the L_{50} level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the time (during each sampling period); that is, half of the sampling time, the changing noise levels are above this value and half of the time they are below it. This is called the "median sound level." The L_{10} level, likewise, is the value that is exceeded 10 percent of the time (i.e., near the maximum) and this is often known as the "intrusive sound level." The L_{90} is the sound level exceeded 90 percent of the time and is often considered the "effective background level" or "residual noise level."

- **Day-Night Level (L_{dn} or DNL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10 PM to 7 AM.

- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the A-weighted sound levels occurring during the period from 7 PM to 10 PM and 10 dB added to the A-weighted sound levels occurring during the period from 10 PM to 7 AM. For general community/environmental noise, CNEL and L_{dn} values rarely differ by more than 1 dB. As a matter of practice, L_{dn} and CNEL values are interchangeable and are treated as being equivalent in this assessment.

- **Sensitive Receptor.** Noise- and vibration-sensitive receptors include land uses where quiet environments are necessary for enjoyment and public health and safety. Residences, schools, motels and hotels, libraries, religious institutions, hospitals, and nursing homes are examples. For information on noise-sensitive biological resources please refer to Section 5.3, *Biological Resources*, of this DEIR.

5.10.1.2 SOUND FUNDAMENTALS

When an object vibrates, it radiates part of its energy in the form of a pressure wave. Sound is that pressure wave transmitted through the air. Technically, airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure that creates sound waves. Sound is described in terms of loudness or amplitude (measured in dB), frequency or pitch (measured in Hertz [Hz] or cycles per second), and duration or time variations (measured in seconds or minutes).

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Amplitude

The range of pressures that causes airborne vibrations (i.e., sound) is quite large and would be cumbersome to measure lineally. Therefore, noise is measured on a logarithmic scale, which has a more manageable range of numbers, and a decibel is the standard unit for measuring sound pressure amplitude.[1] All noise levels in this study—reported in terms of dB—are relative to the industry-standard reference sound pressure of 20 micropascals.

On a logarithmic scale, an increase of 10 dB is 10 times more intense than 1 dB, while 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud). Changes of 1 to 3 dB are detectable under quiet, controlled conditions, and changes of less than 1 dB are usually not discernible (even under ideal conditions). A 3 dB change in noise levels is considered the minimum change that is detectable with human hearing in outside environments. A change of 5 dB is readily discernible to most people in an exterior environment, and a 10 dB change is perceived as a doubling (or halving) of the sound. These relationships are summarized in Table 5.10-1.

Table 5.10-1 Noise Perceptibility

Noise Level (dBA)	Description of Perceptibility
± 3 dB	Threshold of human perceptibility
± 5 dB	Clearly noticeable change in noise level
± 10 dB	Half or twice as loud
± 20 dB	Much quieter or louder

Source: Bies and Hansen 2009.

Frequency

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all, but are "felt" more as a vibration. Similarly, though people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz.

When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to approximate the response of the human ear. The term "A-weighted" refers to a filtering of the noise signal in a manner corresponding to the way the human ear perceives sound. The A-weighted noise level has been found to correlate well with people's judgments of the "noisiness" of different sounds and has been used for many years as a measure of community and industrial noise.

[1] The commonly held threshold of audibility is 20 micropascals, and the threshold of pain is around 200 million micropascals, a ratio of one to 10 million. By converting these pressures to a logarithmic scale (i.e., decibels), the range becomes a more convenient 0 dB to 140 dB.

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Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level number means. To help relate noise level values to common experience, Table 5.10-2 shows typical noise levels from noise sources.

Table 5.10-2 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Onset of physical discomfort	120+	
	110	Rock Band (near amplification system)
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans 2009.

Although the A-weighted scale and the energy-equivalent metric are commonly used to quantify the range of human response to individual events or general community sound levels, the degree of annoyance or other response also depends on several other perceptibility factors, including:

- Ambient (background) sound level
- General nature of the existing conditions (e.g., quiet rural or busy urban)
- Difference between the magnitude of the sound event level and the ambient condition
- Duration of the sound event

- Number of event occurrences and their repetitiveness
- Time of day that the event occurs

Temporal Effects

Time variation in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called L_{eq}), or alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. For example, the L_{50} noise level represents the noise level that is exceeded 50 percent of the time; half the time the noise level exceeds this level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Similarly, the L_2, L_8 and L_{25} values represent the noise levels that are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour, respectively. These "n" values are typically used to demonstrate compliance for stationary noise sources with many cities' noise ordinances. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period, respectively.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law and many local jurisdictions use an adjusted 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level (L_{dn}). The CNEL descriptor requires that an artificial increment (or "penalty") of 5 dBA be added to the actual noise level for the hours from 7:00 PM to 10:00 PM and 10 dBA for the hours from 10:00 PM to 7:00 AM. The L_{dn} descriptor uses the same methodology except that there is no artificial increment added to the hours between 7:00 PM and 10:00 PM. Both descriptors give roughly the same 24-hour level, with the CNEL being only slightly more restrictive (i.e., higher). The CNEL or L_{dn} metrics are commonly applied to the assessment of roadway and airport-related noise sources.

Propagation

Sound dissipates exponentially with distance from the noise source. This phenomenon is known as "spreading loss." For a single-point source, sound levels decrease by approximately 6 dB for each doubling of distance from the source (conservatively neglecting ground attenuation effects, air absorption factors, and barrier shielding). For example, if a backhoe at 50 feet generates 84 dBA, at 100 feet the noise level would be 79 dBA, and at 200 feet it would be 73 dBA. This drop-off rate is conservative and is appropriate for noise generated by onsite operations from stationary equipment/activities at a project site. This approach is commonly used for construction equipment noise evaluations. For more detailed assessments, if ground-level absorptive vegetation or other "soft site" conditions are considered, the distance attenuation (drop-off) rate would be increased by 1.5 dB per distance doubling; for a total of 7.5 dB per propagation distance doubling.

If noise is produced by a line source, such as highway traffic, the sound decreases by 3 dB for each doubling of distance over a reflective ("hard site") surface such as concrete or asphalt. Line source noise in a relatively flat environment with ground-level absorptive vegetation decreases by 4.5 dB for each doubling of distance.

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Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. Extended periods of noise exposure above 90 dBA would result in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. When the noise level reaches 120 dBA, an unpleasant 'tickling' sensation occurs in the human ear; even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160 to 165 dBA will result in dizziness or loss of equilibrium. In comparison, for community environments, the ambient or background noise problem is widespread, though generally worse in urban areas than in outlying, less-developed areas. Elevated ambient noise levels can result in noise interference (e.g., speech interruption/masking, sleep disturbance, disturbance of concentration) and cause annoyance.

Loud noise can be annoying and it can have negative health effects (USEPA 1978, 1974, 1971) The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, learning.
- Physiological effects such as startling and hearing loss (both temporary and permanent).

In most cases, environmental noise produces effects in the first two categories only. However, unprotected workers in some industrial work settings may experience noise effects in the last category.

5.10.1.3 VIBRATION FUNDAMENTALS

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities stemming from operations of railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers.

Like noise, vibration is transmitted in waves, but through the earth or solid objects. Unlike noise, vibration is typically of a frequency that is felt rather than heard. Vibration can be either natural as in the form of earthquakes, volcanic eruptions, sea waves, landslides, or man-made as from explosions, the action of heavy machinery or heavy vehicles such as trains. Both natural and man-made vibration may be continuous such as from operating machinery, or transient as from an explosion. As with noise, vibration can be described by both its amplitude and frequency. Amplitude may be characterized in three ways: displacement, velocity, and acceleration.

Vibration displacement is the distance that a point on a surface moves away from its original static position. The instantaneous speed that a point on a surface moves is the velocity, and the rate of change of the speed is the acceleration. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is the maximum instantaneous peak of the vibration signal, and RMS is the square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage, and RMS is typically more suitable for evaluating human response.

The units for PPV and RMS velocity are normally inches per second (in/sec). However, vibration is often presented and discussed in dB units in order to compress the range of numbers (in a similar fashion as for sound energy). In this study, PPV and RMS velocities are in in/sec, and vibration levels are in dB relative to 1 micro-inch per second (abbreviated as VdB). Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Man-made vibration problems are therefore usually confined to relatively short distances from the source (500 to 600 feet or less).

Vibrations also vary in frequency and this affects perception. Typical construction vibrations fall in the 10 to 30 Hz range and usually occur around 15 Hz. Traffic vibrations exhibit a similar range of frequencies; however, due to their suspension systems, buses often generate frequencies around 3 Hz at high vehicle speeds. It is less common, but possible, to measure traffic frequencies above 30 Hz.

The way in which vibration is transmitted through the earth is called propagation. Propagation of groundborne vibrations is complicated and difficult to predict because of the endless variations in the soil and rock through which waves travel. There are three main types of vibration propagation: surface, compression and shear waves. Surface waves, or Raleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. Compression waves, or P-waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e. in a "push-pull" fashion). P-waves are analogous to airborne sound waves. Shear waves, or S-waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation." As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level striking a given point is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and void spaces. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

As with airborne sound, annoyance with vibrational energy is a subjective measure, depending on the level of activity and the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Persons accustomed to elevated ambient vibration levels, such as in an urban environment, may tolerate higher vibration levels. Table 5.10-3 displays the human response and the effects on buildings resulting from continuous vibration (in terms of various levels of PPV).

5. Environmental Analysis
NOISE

Table 5.10-3 Human Reaction to Typical Vibration Levels

Vibration Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.006–0.019	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibration begins to annoy people	Virtually no risk of "architectural" (i.e. not structural) damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Caltrans 2004.

Human response to ground vibration has been correlated best with the velocity of the ground, typically expressed in terms of the vibration decibel of VdB.[2] The U.S. Federal Transit Administration (FTA) has developed rational vibration limits that can be used to evaluate human annoyance to groundborne vibration. These criteria are primarily based on experience with rapid transit and commuter rail systems (FTA 2006). Railroad and transit operations are potential sources of substantial ground vibration depending on distance, the type and the speed of trains, and the type of track. Trains generate substantial vibration due to their engines, steel wheels, heavy loads, and wheel-rail interactions.

Similarly, construction operations generally include a wide range of activities that can generate groundborne vibration, which varies in intensity. In general, blasting and demolition as well as pile driving and vibratory compaction equipment generate the highest vibrations. Because of the impulsive nature of such activities, PPV is used to measure and assess groundborne vibration and assess the potential of vibration to induce structural damage and annoyance for humans. Vibratory compactors or rollers, pile drivers, and pavement breakers can generate perceptible amounts of vibration at up to 200 feet. Heavy trucks can also generate groundborne vibrations, which can vary, depending on vehicle type, weight, and pavement conditions. Potholes, pavement joints, discontinuities, differential settlement of pavement, all increase the vibration levels from vehicles passing over a road surface. Construction vibration is normally of greater concern than vibration from normal traffic flows on streets and freeways with smooth pavement conditions (Caltrans 2004).

2 The reference velocity is 1×10^{-6} in/sec RMS, which equals 0 VdB, and 1 in/sec equals 120 VdB.

5.10.1.4 REGULATORY FRAMEWORK

US Environmental Protection Agency

In addition to FHWA standards, the U.S. Environmental Protection Agency (EPA) has identified the relationship between noise levels and human response. The EPA Office of Noise Abatement and Control was originally established to coordinate federal noise-control activities. The office issued the Federal Noise Control Act of 1972, which set programs and guidelines to identify and address the effects of noise on public health and welfare, and the environment. Although the primary responsibility of regulating noise was transferred to state and local governments in 1982, the EPA provided guidelines for noise levels that would be considered safe for community exposure without the risk of adverse health or welfare effects.

The EPA found that to prevent hearing loss over the lifetime of a receptor, the yearly average L_{eq} should not exceed 70 dBA. Interference with activity and annoyance will not occur if exterior levels are maintained at an L_{eq} of 55 dBA and interior levels at or below 45 dBA. While these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA also set 55 dBA L_{dn} as the basic goal for exterior residential noise intrusion. However, other federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA L_{dn}, have settled on the 65 dBA L_{dn} level as their standard. At 65 dBA L_{dn}, activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

Occupational Health and Safety Administration

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Such limitations would apply to the operation of construction equipment and could also apply to any proposed industrial land uses. Noise exposure of this type is dependent on work conditions and is addressed through a facility's Health and Safety Plan, as required under OSHA, and is therefore not addressed further in this analysis.

US Department of Housing and Urban Development

The U.S. Department of Housing and Urban Development (HUD) has set a goal of 65 dBA L_{dn} as a desirable maximum exterior standard for residential units developed under HUD funding. (This level is also generally accepted within the State of California.) While HUD does not specify acceptable interior noise levels, standard construction of residential dwellings constructed under Title 24 standards typically provides in excess of 20 dBA of attenuation with the windows closed. Based on this premise, the interior L_{dn} should not exceed 45 dBA.

California Regulations

The California Department of Health Services' Office of Noise Control (ONC) has studied the correlation of noise levels and their effects on various land uses. As a result, a set of generalized exterior and interior noise standards was generated for residential, commercial, institutional/public, and open space land uses.[3] These noise standards, in terms of the CNEL noise metric, are summarized in Appendix I.

The ONC also prepared a land use compatibility chart for community noise which is intended to provide urban planners with a tool to gauge the compatibility of land uses relative to existing and future noise levels. The table identifies 'normally acceptable', 'conditionally acceptable', 'normally unacceptable' and 'clearly unacceptable' noise levels for various land use types. A 'conditionally acceptable' or 'normally unacceptable' designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and needed noise insulation features are incorporated in the design. By comparison, a 'normally acceptable' designation indicates that standard construction can occur with no special noise reduction requirements. These noise compatibility guidelines, also in terms of the CNEL noise metric, are shown in Table 5.10-4.

Since all city or county jurisdictions must include a noise element in their general plans, many jurisdictions have simply adopted the state compatibility guidelines, while other authorities modify the state chart to have a customized set of guidelines for their locale. The City of Duarte uses the State of California's Land Use Compatibility Guidelines; as presented in Table 5.10-4.

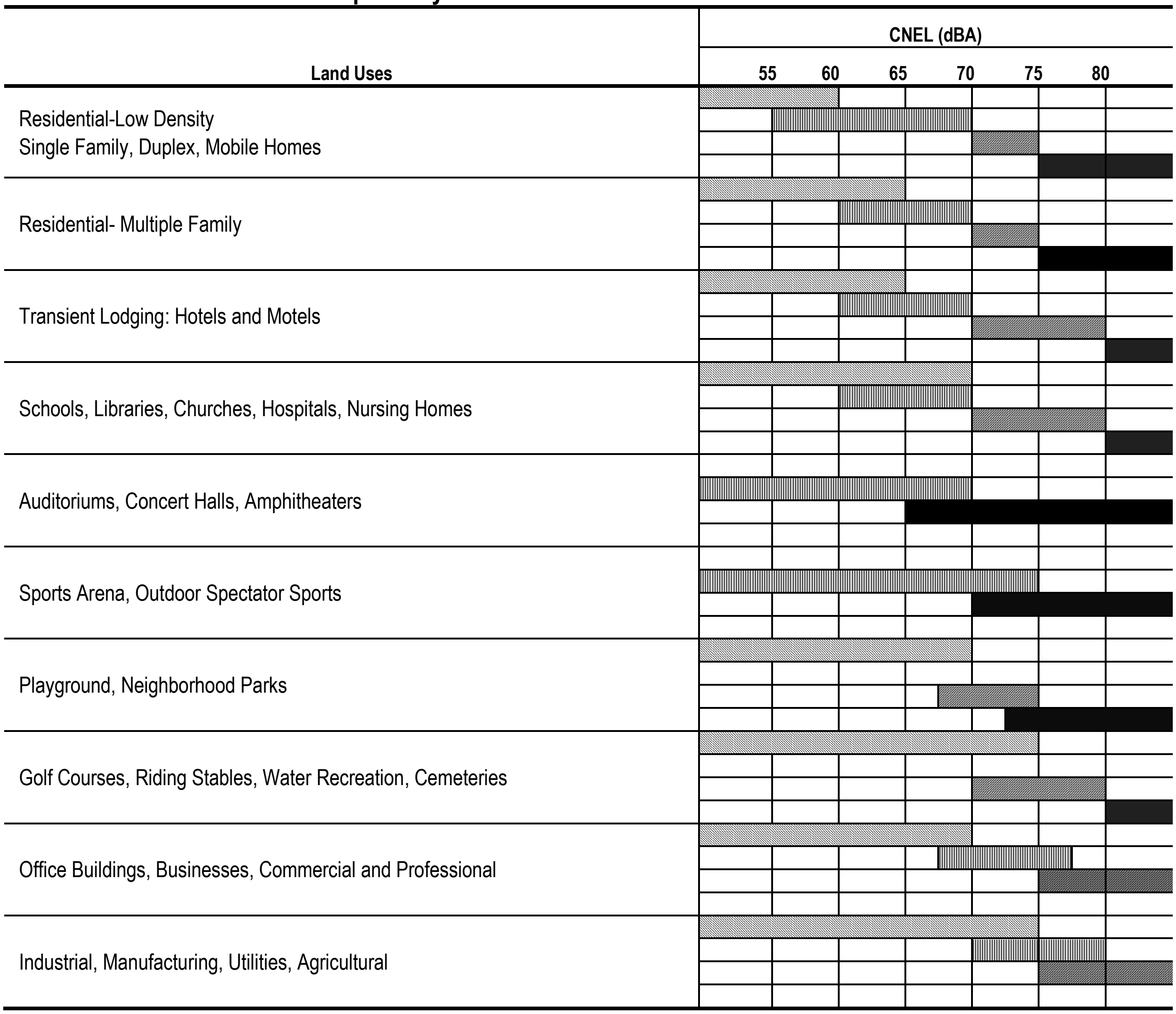
The California Building Code (CBC), Title 24, Part 2, Volume 1, Chapter 12, Interior Environment, Section 1207.11.2, Allowable Interior Noise Levels, requires that residences' interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric is evaluated as either the day-night average sound level (L_{dn}) or the community noise equivalent level (CNEL); using the noise metric that is consistent with the noise element of the particular local general plan.

The California Green Building Standards Code, Chapter 5, Division 5.5, has additional requirements for insulation that affect exterior-interior noise transmission for non-residential structures (which include multi-family structures 4-stories or greater). Pursuant to section 5.507.4.1, Exterior Noise Transmission, Prescriptive Method, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet:

- A composite sound transmission class (STC) rating of at least 50, or
- A composite outdoor-indoor transmission class (OITC) rating of no less than 40 with exterior windows of a minimum STC of 40, or
- OITC of 30 if the project location is within the 65 dBA CNEL or L_{dn} noise contour of an airport (military, public, private, or heliport), freeway, expressway, railroad, industrial source, or fixed-guideway source (as determined by the noise element of the general plan).

[3] Residential' includes single and multifamily, duplex, and mobile homes; 'Commercial' includes hotel, motel, transient housing, commercial retail, bank, restaurant, office building, research and development, professional offices, amphitheater, concert hall, auditorium, movie theater, gymnasium (multipurpose), sports club, manufacturing, warehouse, wholesale, utilities, and movie theaters uses; 'Institutional / Public' includes, hospital, school classrooms/playground, church, and library uses; and 'Open Space' includes parks.

Table 5.10-4 Land Use Compatibility Noise Guidelines



Explanatory Notes

Normally Acceptable:
With no special noise reduction requirements assuming standard construction.

Normally Unacceptable:
New construction is discouraged. If new construction does not proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Conditionally Acceptable:
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design.

Clearly Unacceptable:
New construction or development should generally not be undertaken.

Source: GOPR 2003.

Where noise contours are not readily available, projects exposed to a noise level of 65 dBA $L_{eq\text{-}1\ hr}$ during any hour of operation shall have building, addition or alteration exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum of STC 40 (or OITC 30).

Residential structures within the noise contours identified above require an acoustical analysis showing that the structure has been designed to limit intruding noise in the prescribed allowable levels. To comply with these regulations, applicants for new residential projects are required to submit an acoustical analysis report. The report is required to show topographical relationship of noise sources and dwelling site, identification of noise sources and their characteristics, predicted noise spectra at the exterior of the proposed dwelling structure considering present and future land usage, basis for the prediction (measured or obtained from published data), noise attenuation measures to be applied, and an analysis of the noise insulation effectiveness of the proposed construction showing that the prescribed interior noise level requirements are met. If interior allowable noise levels are met by requiring that windows be un-openable or closed, the design for the structure must also specify the means that will be employed to provide ventilation and cooling, if necessary, to provide a habitable interior environment.

City of Duarte Noise Standards

General Plan Noise Element

The noise element of the Duarte 2020 General Plan guides noise policy in the City. The purpose of the City of Duarte Noise Element is to provide a framework to limit noise exposure within the City. The noise element includes discussions on land use compatibility, the existing noise environment, significant noise sources within the City, sensitive receptors, and the future noise environment. The element defines three primary goals with the purpose of controlling noise within the City. These include the reduction of noise due to transportation sources, development of measures to control non-transportation noise, and the establishment of land uses compatible with the noise levels within the community. The goals are to be pursued through the various policies included in the element.

The noise element includes the standards shown in Table 5.10-4, *Land Use Compatibility Noise Guidelines*, as a guide to provide urban planners with a tool to gauge the compatibility of land uses relative to existing and future noise levels. The state's guidelines are discussed above under *California Regulations*.

Municipal Code

The City regulates noise through Chapter 9.68 of the Duarte Municipal Code. The City's noise ordinance is designed to protect people from non-transportation noise sources such as construction activity, machinery, air conditioners, maintenance, and landscaping activities.

General Stationary Noise Sources

Section 9.68.050 establishes the basic noise level limits for stationary sources. Enforcement of the exterior noise standards ensures that adjacent properties are not exposed to excessive noise from stationary sources. Table 5.10-5 shows the noise level limits by land use for stationary noise sources.

Table 5.10-5 Stationary Source Noise Level Limits

Zone	Day 7:00 A.M.- 9:00 P.M.	Night 9:00 P.M.- 7:00 A.M.
R-1 and R-2	55 dBA	45
R-3 and R-4	55 dBA	50
Commercial	60 dBA	55
Industrial and Light Manufacturing	70 dBA	70

Source: Duarte Municipal Code, Chapter 9.68.

The section of the code includes the following corrections for noise source duration that apply to the daytime noise levels in Table 5.10-5:

- Noise occurring more than 5 but less than 15 minutes per hour may exceed the standard by 5 dB.
- Noise occurring more than 1 but less than 5 minutes per hour may exceed the standard by 10 dB.
- Noise occurring less than 1 minute per hour may exceed the standard by 15 dB.

The following corrections for noise source character apply to the daytime noise levels in Table 5.10-5:

- For repetitive impulsive noise, pure tones and sound with cyclically varying amplitude, the standards are lowered by 5 dB.

- For sources exhibiting steady whine, screech, or hum, the standards are lowered by 5 dB.

Additional Considerations

In addition to the above basic noise level limit standards, Section 9.68.060 prohibits any loud, unnecessary or unusual noise which disturbs the peace and quiet of any neighborhood, or which causes discomfort or annoyance to residents of the area. The standards which shall be considered in determining whether a violation of the provisions of this section exists may include, but not be limited to, the following:

(a) The level of the noise;

(b) Whether the nature of the noise is usual or unusual;

(c) The nature and zoning of the area within which the noise emanates;

(d) The density of the inhabitation of the area within which the noise emanates;

(e) The time of day or night the noise occurs;

(f) The duration of the noise;

(g) Whether the noise is recurrent, intermittent, or constant; and

(h) Whether the origin of the noise is natural or unnatural.

Construction Noise

Section 9.68.120 exempts noise sources associated with construction, as long as the activities do not occur between the hours of 10 PM and 7 AM.

City of Irwindale Noise Standards

The eastern portion of the Campus Plan lies within the boundaries of the City of Irwindale. However, there are no nearby sensitive receptors in Irwindale. The City's noise standards are summarized below and are included herein for informational purposes.

General Plan Public Safety Element

The noise section within the public safety element of the 2020 General Plan describes the noise environment in the City. It includes calculated traffic noise levels along major arterials, as well as ambient noise monitoring measurement results. As the section does not include its own noise land use compatibility standards, it is assumed that the City has adopted the state's standards.

Municipal Code

The City regulates noise through Chapter 9.28 of the Irwindale Municipal Code. The City's noise ordinance is designed to protect people from non-transportation noise sources such as amplified sound, machinery, air conditioners, maintenance, and landscaping activities. Noise level limits are set at 5 dB above the (demonstrated) ambient noise level or (in the absence of data) 5 dB above the assumed ambient base level. For residential zones, the assumed base ambient levels are 45 dBA from 10 PM to 7 AM and50 dB from 7 AM to 10 PM.

Construction activities that exceed the ambient noise level by 5 dB are not allowed within 500 feet of a residential zone, except with authorization from the building inspector. In addition to said authorization, the Irwindale code establishes time-of-day restrictions such that construction cannot occur on Sundays or during the evening/nighttime periods (i.e., between 7 PM and the following 7 AM).

Project-Applicable Vibration Standards

Neither the City of Duarte nor the City of Irwindale has quantitative thresholds for vibration. In lieu of such quantified thresholds, it is common practice to rely on published information from the FTA. The FTA provides criteria for acceptable levels of ground-borne vibration for various types of special buildings that are sensitive to vibration. The FTA criteria are often used to evaluate vibration impacts during construction and are used herein for impact assessment thresholds.

FTA Noise and Vibration Impact Guidelines for construction impact identifies that an impact would occur if construction activities generate vibration that is strong enough to (a) physically damage buildings or (b) cause undue annoyance at sensitive receptors. The threshold for human annoyance at residential receptors during the daytime is 78 VdB. The threshold for vibration-induced architectural damage is 0.2 peak particle velocity (PPV) in inches per second (in/sec) for typical wood-framed buildings (FTA 2006).

Vibration-Related Annoyance

The human reaction to various levels of vibration is highly subjective and varies from person to person. The FTA criteria for annoyance are shown below in Table 5.10-6. These criteria are based on the work of many researchers that suggested that humans are sensitive to vibration velocities in the range of 8-80 Hz.

Table 5.10-6 Groundborne Vibration Criteria: Human Annoyance

Land Use Category	Max L_v (VdB)[1]	Description
Workshop	90	Distinctly felt vibration. Appropriate to workshops and non-sensitive areas
Office	84	Felt vibration. Appropriate to offices and non-sensitive areas.
Residential – Daytime	78	Barely felt vibration. Adequate for computer equipment.
Residential – Nighttime	72	Vibration not felt, but groundborne noise may be audible inside quiet rooms.

Source: FTA 2006.
[1] Lv is the velocity level in decibels, as measured in 1/3-octave bands of frequency over the frequency ranges of 8 to 80 Hz.

Vibration-Related Architectural Damage

Structures amplify groundborne vibration and wood-frame buildings, such as typical residential structures, are more affected by ground vibration than heavier buildings. The level at which groundborne vibration is strong enough to cause architectural damage has not been determined conclusively. The most conservative estimates are reflected in the FTA standards, shown in Table 5.10-7.

Table 5.10-7 Groundborne Vibration Criteria: Architectural Damage

Building Category	PPV (in/sec)	L_v (VdB)[1]
I. Reinforced concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: FTA 2006.
[1] RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.

5.10.1.5 EXISTING NOISE ENVIRONMENT

Project and Nearby Sensitive Receptors

Certain land uses are particularly sensitive to noise and vibration. In general, these uses include residences, schools, hospital facilities, houses of worship, and open space/recreation areas where quiet environments are necessary for the enjoyment, public health, and safety of the community. Commercial uses are not considered noise- or vibration-sensitive uses. Sensitive receptors near the project site include residences along Cinco Robles Drive, along Buena Vista Street, and across Duarte Road. Hospital and hospitality uses within the project are also considered sensitive receptors. The nearest school to the project area is the Beardslee Elementary School (within the Duarte Unified School District), located at 1212 Kellwil Way. The nearest portions of the school are approximately 1,800 feet from the center of City of Hope campus and approximately 600 feet from the nearest boundary of the Campus Plan area. This school is generally separated from the project by a block of houses east of Buena Vista Street and west of the flood control channel. At these distances and with these intervening buildings (and other, closer noise sources), the potential new stationary sources at the campus would not be expected to contribute any notable, future sound energy at the school. Further, the potential changes in traffic flows generated by the project would not materially change the community noise environment at the school site, even with increases along Buena Vista Street (which appears to be one of the main access ways for the school).[4] Given this lack of project-related noise increases for both stationary- and transportation-based sound sources, no further analyses of impacts at the Beardslee Elementary School are indicated.

Ambient Noise Measurements

To characterize the general community noise environment and to quantify the existing noise levels at and adjacent to the City of Hope Campus Plan area, noise monitoring was conducted by PlaceWorks staff in November of 2016.

Short-term (ST) noise level measurements were taken at seven locations for a period of 15 minutes during the daytime on November 3, 2016, between the hours of 12:00 PM and 3:00 PM. These seven locations were chosen to supplement the traffic-flow noise calculations and were deemed to be representative of a variety of sensitive-receptor situations both on and near the project area. For example, location ST-3 was representative of on-campus buildings that would be exposed to a combination of traffic flows on Duarte Road, offsite residential sources, and onsite mechanical equipment sounds. Conversely, location ST-6 was at the end of a cul-de-sac, removed from traffic flows on both Duarte Road and Buena Vista Street; thus, being a relatively quiet area near the southern portion of the project area.

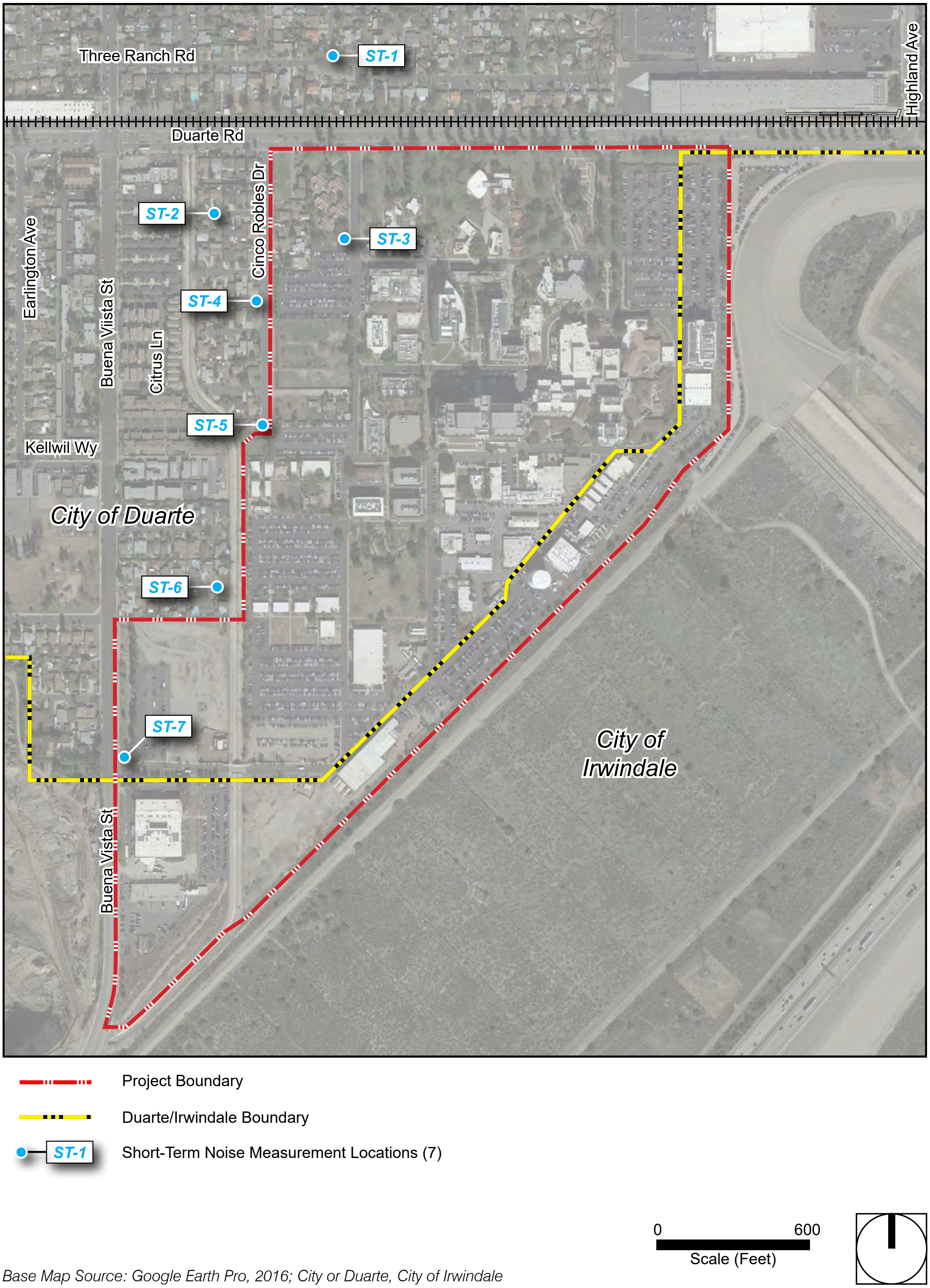
The general noise environment around the hospital area is a combination of noise due to the ventilation equipment atop hospital buildings, local and distant roadway noise, general urban noise, chirping birds and barking dogs, rustling vegetation, and various activities in the neighborhood (e.g. people talking, lawnmowers, etc.).

Noise monitoring was performed using a Larson-Davis Model 820 integrating/logging Sound Level Meter, which satisfy the American National Standards Institute standard for Type 1 general environmental noise measurement instrumentation. The sound level meters were programmed to acquire noise levels with the "slow" time constant and using the "A" weighting filter network. The sound level meter and microphone were mounted on a tripod 5 feet above the ground and equipped with a windscreen during all short-term measurements. The meters were field calibrated immediately prior to the first set of readings. The calibration was rechecked immediately after the conclusion of the readings and no notable meter "drift" was observed (i.e., less than ½ dB deviation). Noise measurement locations are described below and shown in Figure 5.10-1, *Noise Measurement Locations*.

[4] Results given below for the traffic modeling show that the project contribution to future conditions along the segment of Buena Vista Street next to the school to be less than 1 dB. This is an insignificant increase in noise at the school from project-generated traffic.

Figure 5.10-1 - Noise Measurement Locations

5. Environmental Analysis



Base Map Source: Google Earth Pro, 2016; City or Duarte, City of Irwindale

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Short-Term Sampling Location 1 (ST-1). Short-term noise monitoring Location 1 was in a residential community to the north of the hospital campus, beyond Duarte Road. The noise monitor was positioned at the corner of 3 Ranch Road and Brycedale Avenue. Fifteen minutes of noise measurements were taken beginning at 12:15 PM on Thursday, November 3, 2016, at which time the air temperature was 86°F with 31 percent relative humidity (RH), and wind speed was 2 to 3 miles per hour.

The noise environment of this site was characterized primarily by ambient neighborhood noise, property maintenance, and distant traffic noise from vehicles along Duarte Road. Additional noise from birds and rustling trees was also briefly noted at the site.

Short-Term Sampling Location 2 (ST-2). Short-term noise monitoring Location 2 was in a residential community to the northwest of the hospital campus, along Cinco Robles Drive. The noise monitor was positioned at the end of Asti Street. Fifteen minutes of noise measurements were taken beginning at 12:55 PM on Thursday, November 3, 2016, at which time the air temperature was 92°F with 25 percent RH, and wind speed was about 1.5 miles per hour.

The noise environment of this site was characterized primarily by the ventilation equipment atop the hospital buildings, ambient neighborhood noise, property maintenance, and distant traffic noise from vehicles along Cinco Robles Drive and Duarte Road. Additional noise from birds and rustling trees was also briefly noted at the site.

Short-Term Sampling Location 3 (ST-3). Short-term noise monitoring Location 3 was positioned near the northwest corner of the City of Hope Hospital Campus along Village Road. The monitor was between a parking lot and a multifamily home complex. Fifteen minutes of noise measurements were taken beginning at 1:58 PM on Thursday, November 3, 2016, at which time the air temperature was 91°F with 27 percent RH, and wind speed was 1 to 2 miles per hour.

The noise environment of this site was characterized primarily by the ventilation equipment atop the hospital buildings, parking lot noise (idling cars, people talking), ambient neighborhood noise, property maintenance, and traffic noise from vehicles along Village Road. Additional noise from birds and rustling trees was also noted at the site.

Short-Term Sampling Location 4 (ST-4). Short-term noise monitoring Location 4 was in a residential community to the west of the hospital campus, along Cinco Robles Drive. The noise monitor was positioned along Cinco Robles Drive, between Marand Street and Pengra Street. Fifteen minutes of noise measurements were taken beginning at 1:14 PM on Thursday, November 3, 2016, at which time the air temperature was 91°F with 26 percent RH, and wind speed was about 1.5 miles per hour.

The noise environment of this site was characterized primarily by the ventilation equipment atop the hospital buildings, ambient neighborhood noise, property maintenance, and traffic noise from vehicles along Cinco Robles Drive. Additional noise from birds and rustling trees was also briefly noted at the site.

Short-Term Sampling Location 5 (ST-5). Short-term noise monitoring Location 5 was in a residential community to the west of the hospital campus, at the south end of Cinco Robles Drive. Fifteen minutes of noise measurements were taken beginning at 1:33 PM on Thursday, November 3, 2016, at which time the air temperature was 92°F with 25 percent RH, and wind speed was about 1 mile per hour.

The noise environment of this site was characterized primarily by the ventilation equipment atop the hospital buildings, ambient neighborhood noise, property maintenance, and traffic noise from vehicles along Cinco Robles Drive. Additional noise from birds and rustling trees was also briefly noted at the site.

Short-Term Sampling Location 6 (ST-6). Short-term noise monitoring Location 6 was in a residential community near the southwest of the hospital campus, along Buena Vista Street. The noise monitor was positioned at the East end of Galen Street. Fifteen minutes of noise measurements were taken beginning at 2:38 PM on Thursday, November 3, 2016, at which time the air temperature was 93°F with 26 percent RH, and wind speed was about 1 mile per hour.

The noise environment of this site was characterized primarily by ambient neighborhood noise, property maintenance, traffic noise from vehicles along Buena Vista Street, and by the ventilation equipment atop the hospital buildings. Additional noise from birds and rustling trees was also noted at the site.

Short-Term Sampling Location 7 (ST-7). Short-term noise monitoring Location 7 was southwest of the project site, near the corner of Buena Vista Street and Village Road. The noise monitor was positioned north of Village Road, between Buena Vista Street and a parking lot. Fifteen minutes of noise measurements were taken beginning at 2:18 PM on Thursday, November 3, 2016, at which time the air temperature was 88°F with 26 percent RH, and wind speed was 2 to 3 miles per hour.

The noise environment of this site was characterized primarily by traffic along Buena Vista Street, parking lot noise (idling cars, people talking), and by the ventilation equipment atop the nearby hospital buildings.

Short-Term Monitoring Results

During the ambient noise survey, daytime energy-average noise levels in the areas surrounding the project site ranged from 50 to 61 dBA L_{eq}. Short-term noise measurement locations are shown in Figure 5.10-1, and the readings are summarized in Table 5.10-8, *Short-Term Noise Measurements Summary*.

Table 5.10-8 Short-Term Noise Measurements Summary[1]

Monitoring Location	Description (distance from center of City of Hope campus)[2]	Minimum Level L_{min}, dBA	Energy-Average Level L_{eq}, dBA	Maximum Level L_{max}, dBA
ST-1	3 Ranch Street & Brycedale Avenue (approximately 1,510 feet)	49	53	61
ST-2	End of Asti Street (approximately 1,440 feet)	46	50	58
ST-3	NW corner of Hospital Campus; on Village Road (approximately 925 feet)	57	61	73
ST-4	Cinco Robles Dr.; between Marand St. & Pengra St. (approximately 1,140 feet)	51	55	72
ST-5	Southern end of Cinco Robles Drive. (approximately 1,100 feet)	50	54	63
ST-6	East end of Galen Street. (approximately 1,550 feet)	43	51	59
ST-7	Corner of Buena Vista Street & Village Road (approximately 2,325 feet)	47	59	72

Source: Noise sampling conducted by PlaceWorks staff on Thursday, November 3, 2016.
1 All sampling periods were 15 minutes.
2 Campus center is defined as Center Street, just west of the east-to-north curve (Lat 34.129678°, Long -117.971879°)

In general, the noise environment around the City of Hope campus is typical for a medium-density residential area. Major roadways – including the I-210 and I-605 freeways, as well all major roads such as Huntington Drive and Duarte Road – tend to control the overall community noise soundscape in the area around the project. More locally, the ventilation equipment atop the hospital buildings[5] and other, onsite sources contributes to the ambient noise environment as a listener approaches the center of the hospital campus. The energy-averaged sound level in the vicinity of the proposed project site is in the 50 to 60 dBA range. For receivers that have a direct line of sight to the hospital's ventilation equipment (i.e., ST-3, ST-4), the L_{eq} was in the range of 55 to 61 dBA.

On-Road Vehicles

Noise from motor vehicles is generated by engine vibrations, the interaction between tires and the road, and the exhaust system. Reducing the average motor vehicle speed reduces the noise exposure of receptors adjacent to the road. Each reduction of five miles per hour reduces noise by about 1.3 dBA (Caltrans 2004).

Given the preponderance of mobile-source noise in the vicinity of the project, it is necessary to determine the noise currently generated by vehicles traveling through the project area. Average daily traffic volumes were based on the existing daily traffic volumes calculated using peak hour intersection movements provided by Fehr and Peers (Fehr and Peers 2016).

5 Note that the City of Hope campus has a central plant facility that includes chillers and boilers for creating campus-wide cooling and heating services. There are roof-top mechanical equipment on most buildings, but they are primarily related to air-handling (called "ventilation" herein) systems.

5. Environmental Analysis
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The traffic noise levels for this project were estimated using a version of the FHWA Highway Traffic Noise Prediction Model. The FHWA model determines a predicted noise level through a series of adjustments to a reference sound level. These adjustments account for traffic flows, speed, truck mix, varying distances from the roadway, length of exposed roadway, and noise shielding. Vehicle speeds on each roadway were assumed to be the posted speed limit, and no reduction in speed was assigned due to congested traffic flows. Current roadway characteristics, such as the number of lanes and speed limits, were determined from field observations and according to roadway classification.

The results of this modeling indicate that average noise levels along arterial segments currently range from approximately 55 dBA to 75 dBA CNEL (as calculated at a distance of 50 feet from the centerline of the road). Noise levels for existing conditions along analyzed roadways are presented in Table 5.10-9. *Existing Conditions Traffic Noise Levels*.

Table 5.10-9 Existing Conditions Traffic Noise Levels

Roadway	Segment	Daily Traffic Volumes	Noise Level at 50 Feet (dBA CNEL)	Distance to Noise Contour (feet)		
				70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
Huntington Dr	Mountain Ave to Buena Vista St	21,040	70.9	57	123	264
Huntington Dr	Buena Vista St to Highland Ave	20,240	70.7	56	120	258
Huntington Dr	Highland Ave to Mt Olive Dr	26,680	71.9	67	144	310
Huntington Dr	Mt. Olive Dr to Crestfield Dr	22,380	71.1	59	128	276
Central Ave	I-210 WB On-Ramp to Mountain Ave	9,880	65.4	25	53	114
Central Ave	Mountain Ave to Buena Vista St	12,580	66.4	29	62	134
Central Ave	Buena Vista St to I-210 WB Off-Ramp	11,370	66.0	27	58	125
Central Ave	I-210 WB Off-Ramp to Highland Ave	9,100	65.0	23	50	108
Central Ave	Highland Ave to Santo Domingo Ave	9,820	65.3	24	53	113
Evergreen St	I-210 EB Off-Ramp to Mountain Ave	7,050	63.9	20	42	91
Evergreen St	Mountain Ave to Buena Vista St	7,200	64.0	20	43	92
Evergreen St	Duncannon Ave to Highland Ave	1,980	58.4	8	18	39
Evergreen St	Highland Ave to Santo Domingo Ave	1,130	55.9	6	12	27
Three Ranch Rd	Bradbury Ave to Buena Vista St	410	48.2	2	4	8
Three Ranch Rd	Buena Vista St to Duncannon Ave	1,120	52.6	3	7	16
Business Center Dr	Fairdale Ave to Highland Ave	430	48.4	2	4	8
Business Center Dr	Highland Ave to Santo Domingo Ave	990	52.0	3	7	15
Duarte Rd	California Ave to Mountain Ave	9,900	67.6	34	74	160
Duarte Rd	Mountain Ave to Buena Vista St	10,850	68.0	37	79	170
Duarte Rd	Buena Vista St to Cinco Roberts Dr	13,450	68.9	42	91	196
Duarte Rd	Cinco Roberts Dr to Village Rd	12,380	68.5	40	86	186
Duarte Rd	Village Rd to Hope Dr	10,890	68.0	37	79	170
Duarte Rd	Hope Dr to Circle Rd	9,380	67.3	33	72	154
Duarte Rd	Circle Rd to Highland Ave	10,670	67.9	36	78	168

Table 5.10-9 Existing Conditions Traffic Noise Levels

Roadway	Segment	Daily Traffic Volumes	Noise Level at 50 Feet (dBA CNEL)	Distance to Noise Contour (feet) 70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
Arrow Hwy	Longden Ave to Live Oak Ave	32,250	74.0	92	199	428
Arrow Hwy	Live Oak Ave to Avenida Barbosa	23,830	72.7	75	162	350
Arrow Hwy	Avenida Barbosa to I-605 SB Off-Ramp	28,460	73.4	85	183	393
Arrow Hwy	I-605 SB Off-Ramp to I-605 NB On-Ramp	26,140	73.1	80	173	372
Live Oak Ave	Arrow Hwy to I-605 SB On-ramp	19,670	75.0	107	231	497
Live Oak Ave	I-605 SB On-Ramp to I-605 NB Off-Ramp	21,080	75.3	112	242	521
Live Oak Ave	I-605 NB Off-Ramp to Rivergrade Rd	21,860	75.4	115	248	534
Mountain Ave	Huntington Dr to Central Ave	14,240	69.2	44	95	204
Mountain Ave	Central Ave to Evergreen St	13,360	68.9	42	91	195
Mountain Ave	Evergreen St to Duarte Rd	10,790	68.0	37	79	169
Mountain Ave	Duarte Rd to Hurstview	7,040	66.1	27	59	127
Buena Vista St	Royal Oaks Dr to Huntington Dr	7,340	64.5	21	46	99
Buena Vista St	Huntington Dr to Central Ave	10,210	65.9	27	57	124
Buena Vista St	Central Ave to I-210 WB On-Ramp	14,230	67.3	33	72	154
Buena Vista St	I-210 WB On-Ramp to Evergreen St	12,630	66.8	31	66	143
Buena Vista St	Evergreen St to Three Ranch Rd	12,300	66.7	30	65	140
Buena Vista St	Three Ranch Rd to Duarte Rd	12,510	66.8	31	66	142
Buena Vista St	Duarte Rd to Village Rd	8,710	65.2	24	52	111
Buena Vista St	Village Rd to Avenida Barbosa	8,420	65.1	23	51	109
Avenida Barbosa	Buena Vista St to Arrow Hwy	12,390	69.8	49	105	226
Duncannon Ave	Central Ave to Evergreen St	1,340	53.4	4	8	18
Duncannon Ave	Evergreen St to Three Ranch Rd	1,380	53.5	4	9	18
Highland Ave	Royal Oaks Dr to Huntington Dr	4,610	62.4	16	34	73
Highland Ave	Huntington Dr to Central Ave	9,650	65.7	26	55	119
Highland Ave	Central Ave to Evergreen St	12,300	66.7	30	65	140
Highland Ave	Evergreen St to Business Center Dr	11,050	66.2	28	61	130
Highland Ave	Business Center Dr to Duarte Rd	10,610	66.1	27	59	127

Source: FHWA Highway Traffic Noise Prediction Model based on traffic volumes provided by Fehr and Peers in 2016. Calculations included in Appendix I.

Stationary Source Noise

Stationary sources of noises may occur from all types of land uses. Residential uses would generate noise from landscaping, maintenance activities, and air conditioning systems. Office and commercial uses would generate noise from ventilation systems, loading docks, parking lot activities, and other sources. Noise generated by residential, office, or commercial uses are generally short and intermittent. For the developed land surrounding the project site, land uses are primarily residential and commercial. Noise from stationary sources is regulated through the Cities' municipal code.

5.10.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would result in:

N-1 Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

N-2 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

N-3 A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

N-4 A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

N-5 For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

N-6 For a project within the vicinity of a private airstrip, expose people residing or working the project area to excessive noise levels.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would result in no impact:

- Threshold N-5: The project site is not within the land use plan or noise contours for the nearest airport, which is the San Gabriel Valley Airport, approximately 3.6 miles to the southwest.

- Threshold N-6: The proposed project would not expose people working or living onsite to excessive noise levels from aircraft noise the nearest heliport.

These impacts will not be addressed in the following analysis.

5.10.3 Environmental Impacts

Methodology

This section analyzes impacts related to short-term construction noise and vibration and operational stationary and roadway noise. Noise from vehicular traffic was assessed using a version of the U.S. Federal Highway Administration (FHWA) Traffic Noise Model and the traffic forecasts used in the traffic report (Appendix J1 of this DEIR). Noise impacts from non-transportation noise sources (e.g., HVAC units, loading docks, trash compactors) are based on the noise limits of the City of Duarte and City of Irwindale municipal codes.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.10-1: Implementation of the Campus Plan would result in temporary noise increases in the vicinity of construction activities. [Thresholds N-1 and N-4]

Impact Analysis: The City of Duarte recognizes that the control of construction noise is difficult at best and provides an exemption for this type of noise when the work is performed within the hours specified within the Duarte Municipal Code (i.e., 7:00 AM to 10:00 PM). The City of Irwindale Municipal Code states that construction activities that exceed the ambient noise level by 5 dB are not allowed within 500 feet of a residential zone, except with authorization from the building inspector. Compliance with the cities' municipal codes is mandatory.

Construction Vehicles

The transport of workers and equipment to the construction site would incrementally increase noise levels along site access roadways. Consistent with the construction and phasing assumptions used for air quality and greenhouse gas modeling data (see Appendix C1 of this DEIR), the number of construction-related vehicle trips would be up to 1,245 trips per day. Since the majority of these trips would likely use Duarte Road to access the project site, the result would be less than a 25 percent increase in total daily vehicle flows along likely trip routes (including Duarte Road and Village Road)[6]. This would result in a noise level increase of approximately 1 dB (in the traffic-focused CNEL noise level metric).[7] This increment of traffic noise would be inaudible, would be below thresholds for a significant change, and would, therefore, have a less than significant impact on noise receptors along the truck routes. While individual construction vehicle pass-bys may create momentary noise levels of up to approximately 85 dBA (L_{max}) at 50 feet from the vehicle, these occurrences will be no different than the similar, existing truck pass-bys that currently occur daily along these streets. Given that moment-by-moment sound levels would be comparable to existing conditions and that daily/weekly noise levels would not significantly change due to construction-related vehicle trips, construction vehicle noise will be less than significant.

Construction Equipment

Consistent with the construction and phasing assumptions used for air quality and greenhouse gas modeling data (see Appendix C1 of this DEIR), construction activities at the project site would occur in four phases over a cumulative period of approximately 17 years. Table 3-3 of this DEIR shows the proposed buildout by phase. Activities would take place in different locations within the site during the different phases, and noise effects at nearby receptors would vary over the course of construction.

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6 See Chapter 5-14 for mitigation measures regarding restrictions on haul routes during construction activities.
7 The noise levels increase for such a situation would nominally be $10*\log_{10}({}^{1.25}/_{1}) = 0.97$ dB.

Construction activities would increase noise levels on and near the project site above existing levels. In general, the site preparation and grading portions of construction would typically be the noisiest periods of activity, since the largest and most powerful equipment is typically used during these phases of construction. Thereafter, building construction, paving, and application of architectural coatings typically generate markedly less noise than do demolition and grading activities. Noise produced from construction equipment items is commonly held to decrease at a rate of at least 6 decibels (dB) per doubling of distance; conservatively ignoring other attenuation effects from air absorption, ground effects, and/or shielding/scattering effects.[8] For example, a dozer that generates 85 dBA at 50 feet would measure 79 dBA at 100 feet, 73 dBA at 200 feet, 67 dBA at 400 feet, and 61 dBA at 800 feet (at minus 6 dB per distance-doubling).

In order to aggregate individual equipment items into sets of common processes/activities, composite construction noise by phase has been characterized by Bolt, Beranek & Newman (1987). In their study, construction noise for ground clearing, excavation, foundations, erection, and finishing are aggregated by class of activity. For the majority of residential, commercial, industrial, and public works projects, the loudest phases are typically the site preparation and grading phases; each of which as an aggregate of 88 to 89 dBA L_{eq} (when measured at a distance of 50 feet from the summed construction effort)(USEPA/BBN, 1971). This summed value takes into account both the number of pieces and the spacing of the heavy equipment used in the construction effort. Further, noise levels are typically reduced from this value due to usage factors,[9] as well as the barrier effects provided by the physical structures themselves (once erected). Therefore, a value of 89 dBA L_{eq} is a reasonable and prudent value for representing most construction activities, and will be used in this analysis as the average noise level generated by project construction.

Phase 1

The nearest sensitive receptors to construction activities for Phase 1 are residences along Galen Street and across Buena Vista Street, near the construction site of the south parking lot. These residences are 350 feet from the center of the associated construction zone for that portion of the project. At these receptors, composite construction noise would be reduced to conservatively estimated levels of approximately 72 dBA L_{eq} due to distance attenuation alone.

Phase 2

The nearest sensitive receptors to construction activities for Phase 2 are the residences on the east of Buena Vista Street, and the residences along Cinco Robles Drive, near the construction site of the west parking structure. These residences are 300 feet from the center of construction activities in that vicinity. At these receptors, composite construction noise would be reduced to conservatively estimated levels of approximately 73 dBA L_{eq} due to distance attenuation alone.

[8] As sound energy travels outward from the source, spreading loss accounts for a 6 dB decrease in noise level. Soft ground and atmospheric absorption effects can provide an additional 1.5 dB of propagation reduction; for a total of minus 7.5 dB per distance doubling.

[9] Usage factor is the percentage of time during the workday that the equipment is operating at full power (on which the reference noise ratings for typical average and typical maximum noise emissions are based).

Phase 3

The nearest sensitive receptors to construction activities for Phase 3 are the residences along 3 Ranch Road, near the construction site of the hospitality building on the north side of the project site. These residences are 400 feet from the center of construction activities in that vicinity. At these receptors, composite construction noise would be reduced to conservatively estimated levels of approximately 71 dBA L_{eq} due to distance attenuation alone.

Phase 4

The nearest sensitive receptors to construction activities for Phase 4 are the residences along Cinco Robles Drive, near the construction site of the research building on the west side of the project site. These residences are 550 feet from the center of construction activities in that vicinity. At these receptors, composite construction noise would be reduced to conservatively estimated levels of approximately 68 dBA L_{eq} due to distance attenuation alone.

Onsite Receptors

Onsite hospital and hospitality uses would be considered sensitive receptors, and would experience varying noise levels depending on the proximity of the nearest construction activities. Throughout the four phases of construction, many buildings would experience noise levels well above the ambient levels. As such, construction noise impacts to onsite receptors would be potentially significant.

Offsite Receptors

Given their proximity to the construction site, the nearest sensitive receptors to construction activities during each of the phases – all within the City of Duarte – would experience noise levels well above ambient noise conditions. Activities would take place during the daytime (when people are least sensitive to construction noise and when many residents would be away from their homes), and timing would conform to the time-of-day restrictions (i.e., 7:00 AM to 10:00 PM) of Duarte's Municipal Code. Note that all sensitive/residential receptors within the City of Irwindale are well outside of the 500 foot threshold for triggering an authorization permit from the Irwindale building department.

Regardless of location (onsite or offsite), due to the duration of construction activities (three to four years for each phase) and the increased noise levels (relative to existing ambient conditions)[10], occupants present during the daytime may be exposed to potentially disruptive interior noise levels. Therefore, construction noise impacts would be potentially significant.

Impact 5.10-2: Campus Plan implementation would result in long-term operation-related noise that would not exceed local standards. [Thresholds N-1 and N-3]

Impact Analysis: A significant impact would occur if the project would result in an increase of traffic noise levels of 5 dBA if their resultant noise level were to remain within the objectives of the General Plan (e.g., 60

[10] Which, as discussed above in "Short-Term Monitoring Results" were generally in the range of 50 to 60 dBA L_{eq}.

dBA CNEL at single-family residential, 65 dBA CNEL at multifamily residential) or with an increase of 3 dBA if the resultant level were to meet or exceed the objectives of the General Plan. A significant stationary-source impact would occur if the activities or equipment at the project site produce noise levels at nearby sensitive receptors in excess of local standards.

Traffic Noise

Future development in accordance with the Campus Plan would cause increases in traffic along local roadways. A substantial increase is defined as a noise increase greater than 3 dBA over existing conditions. Sensitive land uses include residential, schools, churches, nursing homes, hospitals, and open space/recreation areas. Commercial and industrial areas are not considered noise sensitive and generally have higher tolerances for exterior and interior noise levels.

Traffic noise levels were estimated using the FHWA Highway Traffic Noise Prediction Model. The FHWA model predicts noise levels through a series of adjustments to a reference sound level. These adjustments account for distances from the roadway, traffic flows, vehicle speeds, car/truck mix, length of exposed roadway, and road width. Appendix I includes tables showing traffic CNEL noise levels and the distances to the 70, 65, and 60 CNEL contours for selected roadway segments in the vicinity of the proposed project for the four scenarios discussed below: Existing, Existing-Plus-Project, Future, and Future-Plus-Project. .

Table 5.10-10, *Campus Plan Existing Conditions Traffic Noise Increases*, presents the noise levels at 50 feet from the centerline of each roadway segment for scenarios related to existing conditions. The "Existing Plus Project" scenario represents the noise levels that would be generated by traffic flows resulting from the combination of existing traffic volumes and traffic generated by the project (Fehr and Peers 2017). "Project Contribution" represents the effect the project would have on traffic noise levels by comparing the difference between "Existing Plus Project" noise levels and existing noise levels[11].

Table 5.10-10 Campus Plan Existing Conditions Traffic Noise Increases

Roadway	Segment	dBA CNEL @ 50 ft.		
		Existing	Existing Plus Project	Project Contribution
Huntington Dr	Mountain Ave to Buena Vista St	70.9	70.9	0.0
Huntington Dr	Buena Vista St to Highland Ave	70.7	70.7	0.0
Huntington Dr	Highland Ave to Mt Olive Dr	71.9	72.0	0.1
Huntington Dr	Mt. Olive Dr to Crestfield Dr	71.1	71.2	0.1
Central Ave	I-210 WB On-Ramp to Mountain Ave	65.4	65.4	0.0
Central Ave	Mountain Ave to Buena Vista St	66.4	66.6	0.2
Central Ave	Buena Vista St to I-210 WB Off-Ramp	66.0	66.1	0.1
Central Ave	I-210 WB Off-Ramp to Highland Ave	65.0	65.0	0.0

[11] This methodology provides a conservative estimate for project contributions (as compared to the difference between "Future Plus Project" and "Future" scenarios which would have a slightly 'diluted' percentage increase since the project-related contributions would be compared to a larger aggregate in the future situation).

Table 5.10-10 Campus Plan Existing Conditions Traffic Noise Increases

Roadway	Segment	dBA CNEL @ 50 ft. Existing	Existing Plus Project	Project Contribution
Central Ave	Highland Ave to Santo Domingo Ave	65.3	65.3	0.0
Evergreen St	I-210 EB Off-Ramp to Mountain Ave	63.9	63.9	0.0
Evergreen St	Mountain Ave to Buena Vista St	64.0	64.0	0.0
Evergreen St	Duncannon Ave to Highland Ave	58.4	58.4	0.0
Evergreen St	Highland Ave to Santo Domingo Ave	55.9	55.9	0.0
Three Ranch Rd	Bradbury Ave to Buena Vista St	48.2	48.2	0.0
Three Ranch Rd	Buena Vista St to Duncannon Ave	52.6	52.6	0.0
Business Center Dr	Fairdale Ave to Highland Ave	48.4	48.4	0.0
Business Center Dr	Highland Ave to Santo Domingo Ave	52.0	52.0	0.0
Duarte Rd	California Ave to Mountain Ave	67.6	67.7	0.1
Duarte Rd	Mountain Ave to Buena Vista St	68.0	68.1	0.1
Duarte Rd	Buena Vista St to Cinco Roberts Dr	68.9	69.7	0.8
Duarte Rd	Cinco Roberts Dr to Village Rd	68.5	69.4	0.9
Duarte Rd	Village Rd to Hope Dr	68.0	68.6	0.6
Duarte Rd	Hope Dr to Circle Rd	67.3	67.7	0.4
Duarte Rd	Circle Rd to Highland Ave	67.9	68.2	0.3
Arrow Hwy	Longden Ave to Live Oak Ave	74.0	74.0	0.0
Arrow Hwy	Live Oak Ave to Avenida Barbosa	72.7	72.8	0.1
Arrow Hwy	Avenida Barbosa to I-605 SB Off-Ramp	73.4	73.5	0.1
Arrow Hwy	I-605 SB Off-Ramp to I-605 NB On-Ramp	73.1	73.1	0.0
Live Oak Ave	Arrow Hwy to I-605 SB On-ramp	75.0	75.1	0.1
Live Oak Ave	I-605 SB On-Ramp to I-605 NB Off-Ramp	75.3	75.3	0.0
Live Oak Ave	I-605 NB Off-Ramp to Rivergrade Rd	75.4	75.4	0.0
Mountain Ave	Huntington Dr to Central Ave	69.2	69.2	0.0
Mountain Ave	Central Ave to Evergreen St	68.9	68.9	0.0
Mountain Ave	Evergreen St to Duarte Rd	68.0	68.0	0.0
Mountain Ave	Duarte Rd to Hurstview	66.1	66.1	0.0
Buena Vista St	Royal Oaks Dr to Huntington Dr	64.5	64.5	0.0
Buena Vista St	Huntington Dr to Central Ave	65.9	66.1	0.2
Buena Vista St	Central Ave to I-210 WB On-Ramp	67.3	67.6	0.3
Buena Vista St	I-210 WB On-Ramp to Evergreen St	66.8	67.3	0.5
Buena Vista St	Evergreen St to Three Ranch Rd	66.7	67.5	0.8

Table 5.10-10 Campus Plan Existing Conditions Traffic Noise Increases

Roadway	Segment	dBA CNEL @ 50 ft.		
		Existing	Existing Plus Project	Project Contribution
Buena Vista St	Three Ranch Rd to Duarte Rd	66.8	67.6	0.8
Buena Vista St	Duarte Rd to Village Rd	65.2	66.0	0.8
Buena Vista St	Village Rd to Avenida Barbosa	65.1	65.6	0.5
Avenida Barbosa	Buena Vista St to Arrow Hwy	69.8	70.2	0.4
Duncannon Ave	Central Ave to Evergreen St	53.4	53.4	0.0
Duncannon Ave	Evergreen St to Three Ranch Rd	53.5	53.5	0.0
Highland Ave	Royal Oaks Dr to Huntington Dr	62.4	62.5	0.1
Highland Ave	Huntington Dr to Central Ave	65.7	65.9	0.2
Highland Ave	Central Ave to Evergreen St	66.7	66.9	0.2
Highland Ave	Evergreen St to Business Center Dr	66.2	66.5	0.3
Highland Ave	Business Center Dr to Duarte Rd	66.1	66.3	0.2

Source: FHWA Highway Traffic Noise Prediction Model based on traffic volumes provided by Fehr & Peers (April 2017). Calculations in Appendix I.

Table 5.10-10 shows that traffic noise increases resulting from the project contribution would range from 0.0 to 0.9 dBA CNEL. No segments would experience substantial noise increases (i.e., greater than 3 dB) over existing conditions.

Table 5.10-11, *Campus Plan Buildout Traffic Noise Increases*, presents the noise level increases on roadways over existing conditions at 50 feet from the centerline of each roadway segment due to the project (relative to the buildout horizon). The "Future Plus Project" traffic noise levels include effects of future regional ambient growth and growth due to the project (Fehr and Peers 2017). "Overall Increase" represents the effect the combination of the project and regional growth would have on noise levels at buildout of the project by comparing the difference between "Future Plus Project" and existing noise levels

Table 5.10-11 Campus Plan Buildout Traffic Noise Increases

Roadway	Segment	dBA CNEL @ 50 ft.		
		Existing	Future Plus Project	Overall Increase
Huntington Dr	Mountain Ave to Buena Vista St	70.9	71.8	0.9
Huntington Dr	Buena Vista St to Highland Ave	70.7	72.1	1.4
Huntington Dr	Highland Ave to Mt Olive Dr	71.9	73.1	1.2
Huntington Dr	Mt. Olive Dr to Crestfield Dr	71.1	71.9	0.8
Central Ave	I-210 WB On-Ramp to Mountain Ave	65.4	65.8	0.4
Central Ave	Mountain Ave to Buena Vista St	66.4	67.5	1.1
Central Ave	Buena Vista St to I-210 WB Off-Ramp	66.0	66.9	1.0

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Table 5.10-11 Campus Plan Buildout Traffic Noise Increases

Roadway	Segment	dBA CNEL @ 50 ft.		
		Existing	Future Plus Project	Overall Increase
Central Ave	I-210 WB Off-Ramp to Highland Ave	65.0	65.9	0.9
Central Ave	Highland Ave to Santo Domingo Ave	65.3	65.8	0.5
Evergreen St	I-210 EB Off-Ramp to Mountain Ave	63.9	64.6	0.7
Evergreen St	Mountain Ave to Buena Vista St	64.0	64.7	0.7
Evergreen St	Duncannon Ave to Highland Ave	58.4	59.6	1.2
Evergreen St	Highland Ave to Santo Domingo Ave	55.9	56.4	0.5
Three Ranch Rd	Bradbury Ave to Buena Vista St	48.2	49.2	1.0
Three Ranch Rd	Buena Vista St to Duncannon Ave	52.6	53.2	0.7
Business Center Dr	Fairdale Ave to Highland Ave	48.4	48.9	0.4
Business Center Dr	Highland Ave to Santo Domingo Ave	52.0	52.6	0.5
Duarte Rd	California Ave to Mountain Ave	67.6	68.4	0.9
Duarte Rd	Mountain Ave to Buena Vista St	68.0	69.0	1.0
Duarte Rd	Buena Vista St to Cinco Roberts Dr	68.9	71.0	2.0
Duarte Rd	Cinco Roberts Dr to Village Rd	68.5	70.7	2.2
Duarte Rd	Village Rd to Hope Dr	68.0	70.1	2.1
Duarte Rd	Hope Dr to Circle Rd	67.3	69.4	2.1
Duarte Rd	Circle Rd to Highland Ave	67.9	69.7	1.8
Arrow Hwy	Longden Ave to Live Oak Ave	74.0	74.9	0.9
Arrow Hwy	Live Oak Ave to Avenida Barbosa	72.7	74.3	1.6
Arrow Hwy	Avenida Barbosa to I-605 SB Off-Ramp	73.4	74.9	1.5
Arrow Hwy	I-605 SB Off-Ramp to I-605 NB On-Ramp	73.1	74.5	1.5
Live Oak Ave	Arrow Hwy to I-605 SB On-ramp	75.0	76.4	1.4
Live Oak Ave	I-605 SB On-Ramp to I-605 NB Off-Ramp	75.3	76.4	1.1
Live Oak Ave	I-605 NB Off-Ramp to Rivergrade Rd	75.4	76.4	1.0
Mountain Ave	Huntington Dr to Central Ave	69.2	69.7	0.6
Mountain Ave	Central Ave to Evergreen St	68.9	69.4	0.6
Mountain Ave	Evergreen St to Duarte Rd	68.0	68.5	0.6
Mountain Ave	Duarte Rd to Hurstview	66.1	66.6	0.5
Buena Vista St	Royal Oaks Dr to Huntington Dr	64.5	66.0	1.5
Buena Vista St	Huntington Dr to Central Ave	65.9	67.8	1.9
Buena Vista St	Central Ave to I-210 WB On-Ramp	67.3	68.9	1.5
Buena Vista St	I-210 WB On-Ramp to Evergreen St	66.8	68.6	1.8

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Table 5.10-11 Campus Plan Buildout Traffic Noise Increases

Roadway	Segment	dBA CNEL @ 50 ft.		
		Existing	Future Plus Project	Overall Increase
Buena Vista St	Evergreen St to Three Ranch Rd	66.7	68.8	2.1
Buena Vista St	Three Ranch Rd to Duarte Rd	66.8	68.8	2.0
Buena Vista St	Duarte Rd to Village Rd	65.2	66.7	1.5
Buena Vista St	Village Rd to Avenida Barbosa	65.1	66.3	1.2
Avenida Barbosa	Buena Vista St to Arrow Hwy	69.8	71.2	1.4
Duncannon Ave	Central Ave to Evergreen St	53.4	54.9	1.5
Duncannon Ave	Evergreen St to Three Ranch Rd	53.5	53.9	0.4
Highland Ave	Royal Oaks Dr to Huntington Dr	62.4	63.2	0.7
Highland Ave	Huntington Dr to Central Ave	65.7	67.1	1.4
Highland Ave	Central Ave to Evergreen St	66.7	68.0	1.3
Highland Ave	Evergreen St to Business Center Dr	66.2	67.7	1.5
Highland Ave	Business Center Dr to Duarte Rd	66.1	67.7	1.6

Source: FHWA Highway Traffic Noise Prediction Model based on traffic volumes provided by Fehr & Peers (April 2017). Calculations in Appendix I.

Table 5.10-11 shows that overall increases due to both the project and regional growth would range from 0.4 to 2.2 dBA CNEL. The project would not contribute substantial noise increases greater than 3 dB over existing conditions (see Table 5.10-10). Since no segments would experience increases of greater than 3 dB due to the project alone or the project combined with regional growth, impacts would be less than significant and no mitigation measures are necessary.

Stationary-Source Noise

According to Duarte's Municipal Code, stationary sources must not exceed 55 dBA L_{eq} at residential properties during the daytime or 45 dBA L_{eq} during the nighttime, with higher noise levels allowed for limited amounts of time. For sources exhibiting steady whine, screech, or hum, the standards are lowered by 5 dB. Irwindale's Municipal Code states that stationary noise must not exceed the residential standards (50 dBA L_{eq} during the daytime or 45 dBA L_{eq} during the nighttime) by more than 5 dB.

Onsite ventilation units and associated equipment at the project site would be acoustically engineered with appropriate procurement specifications, sound enclosures, and parapet walls to minimize noise—all in accordance with City of Duarte and City of Irwindale stationary noise requirements—to ensure that such equipment does not exceed allowable noise limits. Other stationary sources for medical uses include landscaping, maintenance, truck deliveries, trash pickup, and parking lot activity. Ventilation and any other sources of stationary noise at the project site would not have a notably different character or intensity (per source) than the noise produced by existing uses. Furthermore, given that community-wide ambient noise levels at the site are generally dominated by traffic flow noise on the I-605 and I-210 freeways, as well as major, nearby thoroughfares, these traffic-related sources would generally tend to overshadow any item-specific noise produced by ventilation or other stationary sources at the project site. Thus, through compliance with pertinent local noise regulations and with the traffic-dominated ambient noise levels at the project site, noise levels due to stationary sources would be less than significant.

As the proposed Campus Plan would not result in significant increases in traffic or stationary noise, long-term operational noise would not exceed local standards, and the impact would be less than significant.

Impact 5.10-3: Implementation of the Campus Plan would create short-term groundborne vibration and groundborne noise. [Threshold N-2]

Impact Analysis: Potential vibration impacts associated with development projects are usually related to the use of heavy construction equipment during (a) demolition and grading phases of construction and/or (b) the operation of large trucks over uneven surfaces during project operations.

Long-Term Operational Impact

Typically, the types of projects that could result in vibration concerns are industrial uses that use heavy machinery or rail projects where passing trains could generate perceptible levels of vibration. The proposed project includes medical research, treatment, and office building uses. As such, there would be no significant vibration-generating sources as part of the proposed project. Therefore, the proposed project would not generate substantial levels of operations vibration and no operations impacts would occur. Operations vibration impacts would be less than significant.

Short-Term Construction Impact

Construction operations can generate varying degrees of ground vibration, depending on the construction procedures and equipment. Operation of construction equipment generates vibrations that spread through the ground and diminish with distance from the source. The effect on buildings in the vicinity of the construction site varies depending on soil type, ground strata, and receptor-building construction. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight structural damage at the highest levels. Vibration from construction activities rarely reaches the levels that can damage structures, but can achieve the audible and perceptible ranges in buildings close to the construction site. Table 5.10-12 lists vibration levels for typical construction equipment.

Table 5.10-12 Vibration Levels for Typical Construction Equipment

Equipment	Approximate Velocity Level at 25 Feet (VdB)	Approximate RMS[1] Velocity at 25 Feet (in/sec)
Pile Driver (impact) Upper Range	112	1.518
Pile Driver (impact) Lower Range	104	0.644
Pile Driver (sonic) Upper Range	105	0.734
Pile Driver (sonic) Lower Range	93	0.170
Large Bulldozer	87	0.089
Caisson Drilling	87	0.089
Jackhammer	79	0.035
Small Bulldozer	58	0.003
Loaded Trucks	86	0.076
FTA Criteria – Human Annoyance (Residential Daytime/ Residential Nighttime)	78/72	—
FTA Criteria – Human Annoyance (Office)	84	—
FTA Criteria – Structural Damage	—	0.200

Source: FTA 2006.
1 RMS velocity calculated from vibration level (VdB) using the reference of 1 microinch/second.

As shown in Table 5.10-12, vibration generated by certain, vibration-intensive construction equipment has the potential to be substantial, since these items have the potential to exceed the FTA criteria for structural damage of 0.200 in/sec. However, groundborne vibration is almost never annoying to people who are outdoors, so it is usually evaluated in terms of indoor receivers (FTA 2006).

Construction equipment at the proposed project would include concrete saws, dozers, backhoes, graders, forklifts, cranes, excavators, rollers, pavers, and welders. The use of high-vibration equipment, such as pile drivers, is not anticipated.

Construction at the project site would start as early as late 2017 and would occur in four phases over a cumulative period of approximately 17 years.

Vibration-Induced Architectural Damage

The threshold at which there is a risk of architectural damage to typical wood-framed buildings is 0.2 in/sec (FTA 2006). Building damage is not normally a factor unless a project requires blasting and/or pile driving (FTA 2006). No blasting, pile driving, or hard rock ripping/crushing activities are anticipated for the project. Small construction equipment generates vibration levels less than 0.1 PPV in/sec at 25 feet away. Since single-event exceedance of the 0.200 in/sec threshold could potentially result in architectural damage, impacts are evaluated in terms of the maximum vibration levels that are expected to be experienced throughout the course of construction activities[12]. Therefore, vibration level calculations represent a worst-case scenario of

12 The equation used to determine maximum vibration levels at receptors is $RMS = ref*(25/dist)^{1.5}$, where “RMS” represents the maximum vibration level experienced at the receptor, “ref” represents the FTA reference vibration level at 25 feet, and “dist” represents the distance from the boundary of construction activity to the receptor.

the levels that would be experienced if the given construction equipment were operating on the project boundary at the point nearest to the receptor.

Phase 1

During Phase 1 construction, the nearest offsite structures to construction activities would be single-family residences along Galen Street, adjacent to the site for the south parking lot. These homes are as near as 25 feet from the construction boundary, and some pools are as close as 10 feet away[13]. Table 5.10-13 summarizes the predicted construction vibration levels at these nearest receptors. More-distant receptors would experience lower levels than those shown below due to attenuation from increased distances.

Table 5.10-13 Maximum Vibration Levels (PPV) at Nearest Structures

Equipment	Peak Particle Velocity in inches per second (in/sec): Hardscape features at homes along Galen St. (at < 15 feet[1])	Peak Particle Velocity in inches per second (in/sec): Homes along Galen St. (at 25 feet)
Vibratory Roller	**>0.452**	**0.210**
Large Bulldozer	>0.191	0.089
Loaded Trucks	>0.164	0.076
Jackhammer	>0.075	0.035
Small Bulldozer	>0.006	0.003

Source: FTA 2006
Notes: **Bold values** indicate levels above the acceptable threshold.
Distances measured from boundary of construction site.
[1] Use of "less than 15 feet" in place of the "10 feet" value listed in the text above is explained in the associated text footnote.

As shown in Table 5.10-13, the maximum construction-related vibration level would have potential to exceed the threshold for architectural damage at the homes along Galen Street and the pools in the backyards. The threshold would be exceeded if a vibratory roller is operated within approximately 30 feet of an offsite residential structure. Also, the operation of large bulldozers or loaded trucks may potentially approach or exceed the damage criterion at hardscape features (such as swimming pools or sheds) if that equipment is operated within 15 feet of the receiving structure/feature.

Remaining Phases

During Phase 2, the nearest offsite structures are residences 75 feet from the boundary of construction activities at the west parking structure. During Phase 3, residences along 3 Ranch Road are the nearest offsite structures to the boundary of construction at the hospitality building, at a distance of 160 feet. The nearest offsite structures to Phase 4 activities are residences 430 feet from the boundary of construction at the research building. At a distance of 75 feet, vibration levels produced by a vibratory roller would be 0.040 PPV in/sec, and would be lower at farther distances. Therefore, for these receptors, vibration produced by any

[13] The FTA equations used to calculate vibration levels become less accurate as the input values for distances decrease toward zero feet. The reliability of the calculations for distances of less than 15 feet becomes increasingly uncertain. Therefore, for receptors located at distances of less than 15 feet, the only reasonable statement that can be made is that vibration levels are assumed to be greater than values calculated using a distance of 15 feet.

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standard construction equipment would not exceed the threshold for architectural damage. Impacts are less than significant.

Onsite Historical Buildings

The Visitor Center and House of Hope buildings on the project site are classified as historic buildings and may be more sensitive to architectural damage than typical wood-framed buildings. Construction areas for each of the four phases would be over 300 feet from these historic buildings. Even when using the highly conservative threshold of 0.120 PPV in/sec for "buildings extremely susceptible to vibration damage," construction-generated vibration levels would be well below the threshold for architectural damage.

Other Onsite Buildings

Any onsite buildings adjacent to construction activities would be potentially susceptible to vibration-induced architectural damage. Use of vibratory rollers within 30 feet, or use of large bulldozers within 15 feet of onsite buildings would exceed the 0.200 in/sec PPV limit for architectural damage. Throughout the four phases of construction, construction-related vibration could potentially exceed the threshold at various buildings near construction activities on the project site.

Vibration Damage Summary

For onsite historical buildings, vibration levels would not have the potential to cause architectural damage. Vibration levels at other onsite buildings could exceed the threshold, resulting in a potentially significant impact. For offsite buildings, while the threshold would not be exceeded during Phases 2, 3, or 4, architectural-damage vibration impacts during Phase 1 would be potentially significant.

Vibration Annoyance

Vibration is typically noticed nearby when objects in a building generate noise from rattling windows or picture frames. It is typically not perceptible outdoors, and therefore impacts are based on the distance to the nearest building. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. As such, vibration annoyance is typically assessed via a spatial-averaging methodology (i.e., as heavy construction equipment moves around the project site, average vibration levels at the nearest structures would diminish with increasing distance between structures and the equipment). This methodology is implemented by using the distance from the center of the construction zone to the nearest sensitive receptors[14]. The threshold for vibration annoyance at vibration-sensitive (residential) uses during daytime construction hours is 78 VdB (FTA 2006). Annoyance vibration levels for these residences are summarized in the discussion below.

Phase 1

The nearest sensitive receptors to construction activities for Phase 1 are residences along Galen Street and across Buena Vista Street, near the construction site of the south parking lot. These residences are 350 feet

[14] The equation used to determine average vibration levels at receptors is VdB = ref - 20*Log(dist/25), where "VdB" represents the average vibration level experienced at the receptor, "ref" represents the FTA reference vibration level at 25 feet, and "dist" represents the distance from the center of construction activity to the receptor.

from the center of construction activities in that vicinity. At these receptors, average vibration levels due to operation of a vibratory roller would be 71 VdB. Other standard equipment would result in lower vibration levels, and construction activities would not result in levels that would exceed the FTA threshold for vibration-induced annoyance.

Phase 2

The nearest sensitive receptors to construction activities for Phase 2 are the residences on the east of Buena Vista Street, and the residences along Cinco Robles Drive, near the construction site of the west parking structure. These residences are 300 feet from the center of construction activities in that vicinity. At these receptors, average vibration levels due to operation of a vibratory roller would be 72 VdB. Other standard equipment would result in lower vibration levels, and construction activities would not result in levels that would exceed the FTA threshold for vibration-induced annoyance.

Phase 3

The nearest sensitive receptors to construction activities for Phase 3 are the residences along 3 Ranch Road, near the construction site of the hospitality building on the north side of the project site. These residences are 400 feet from the center of construction activities in that vicinity. At these receptors, average vibration levels due to operation of a vibratory roller would be 70 VdB. Other standard equipment would result in lower vibration levels, and construction activities would not result in levels that would exceed the FTA threshold for vibration-induced annoyance.

Phase 4

The nearest sensitive receptors to construction activities for Phase 4 are the residences along Cinco Robles Drive, near the construction site of the research building on the west side of the project site. These residences are 550 feet from the center of construction activities in that vicinity. At these receptors, average vibration levels due to operation of a vibratory roller would be 67 VdB. Other standard equipment would result in lower vibration levels, and construction activities would not result in levels that would exceed the FTA threshold for vibration-induced annoyance.

Onsite

Any onsite buildings within 100 feet from the center of construction zones would likely experience average vibration levels that would exceed the 78 VdB limit for annoyance due to the operation of a vibratory roller. However, throughout the four phases of construction, there are no onsite buildings within 100 feet of the center of any construction areas for individual buildings or parking structures in accordance with the project. Therefore, construction activities would not result in levels that would exceed the FTA threshold for vibration-induced annoyance at onsite buildings.

Vibration Annoyance Summary

Vibration levels at nearby sensitive receptors – both offsite and onsite – would generally be well below the FTA's annoyance threshold of 78 VdB during all phases of construction. Additionally, construction would take place during the portions of the day when the majority of residents would be expected to be away from their homes. There may be, however, brief periods[15] when heavy equipment would operate at or near the project boundary or near existing City of Hope campus buildings. During these brief periods, annoyance-connected groundborne vibration levels may be higher than the results shown in the above table and, thus, may be perceptible at the nearest receptor locations. However, as heavy construction equipment moves around the project site, average vibration levels at the nearest structures would diminish with increasing distance between structures. Therefore, such limited periods of perceptibility would be temporary, intermittent, and relatively brief such that impacts related to general construction vibration annoyance would not be significant and mitigation is not necessary.

5.10.4 Cumulative Impacts

Operational Noise

To specifically estimate the proposed project's contribution to traffic noise, existing noise levels were compared to those projected with buildout of the proposed project. As demonstrated above, the proposed project's contribution to increases in ambient noise levels and vibration would be less than significant, even when accounting for traffic increases forecast in the project study area.

As discussed above, potential new stationary sources at the campus would not be expected to contribute any notable, future sound energy to offsite receptors. Additionally, onsite ventilation units and associated equipment at the project site would be acoustically engineered with appropriate procurement specifications, sound enclosures, and parapet walls to minimize noise—all in accordance with City of Duarte and City of Irwindale stationary noise requirements—to ensure that such equipment does not exceed allowable noise limits. Other stationary sources for medical uses include landscaping, maintenance, truck deliveries, trash pickup, parking lot activity, ventilation, and any other sources of stationary noise at the project site would not have a different character or intensity than the noise produced by similar, existing uses. Of particular note with all existing and future stationary sources associated with the project is that they are generally localized in nature (as opposed to more area-wide sources such as roadways and freeways). For example, a single, roof-top ventilation unit or a single lawn-mower will only potentially affect listeners in the immediate vicinity; say within 100 feet (for discussion purposes). Given this relatively limited sphere of influence for any given, single stationary source, coupled with the dispersed placement of such sources across City of Hope campus, the aggregation of noise stationary sources from the project in combination with operational noise from other cumulative projects, would not be anticipated to cause a cumulatively significant noise impact. Therefore, cumulative noise impacts would be less than significant.

Construction Noise

It is theoretically possible that construction activities at the proposed project and at other, future (unrelated) projects may occur simultaneously and in close proximity to noise-sensitive receptors, resulting in significant impacts. Although the specific construction details of potential future development projects in the immediate project area are currently unknown, all cumulative development projects would be required to comply with the applicable noise ordinance in the cities where those projects would be located. Additionally, given the

[15] Estimated to be approximately 10 to 20 percent of the overall construction duration for each phase.

distances from this project site to other, potential construction zones (for future projects), including the Duarte Station Specific Plan area, construction noise from the project, in combination with construction noise from other cumulative projects that may be constructed at the same time would not be anticipated to cause a cumulatively significant construction noise impact. Therefore, no significant cumulative impacts related to construction noise would occur.

Operational Vibration

As discussed above, development of the proposed project would include medical research, treatment, and office building uses. These uses would not generate substantial levels of operations vibration. Cumulative projects would not involve the use of heavy machinery or include rail projects. As such, operations vibration from the project, in combination with operations vibration from cumulative projects, would not be anticipated to cause a cumulatively significant operations vibration impact. Therefore, no significant cumulative impacts related to operations vibration would occur.

Construction Vibration

It is theoretically possible that construction activities at the proposed project and at other, future (unrelated) projects may occur simultaneously and in close proximity to structures that could be susceptible to vibration-induced architectural damage. The specific construction details of potential future development projects in the immediate project area are currently unknown. However, given the distances from this project site to other, potential construction zones (for future projects), including the Duarte Station Specific Plan area, construction vibration from the project, in combination with construction vibration from other cumulative projects that may be constructed at the same time would not be anticipated to cause a cumulatively significant construction vibration impact. Therefore, no significant cumulative impacts related to construction vibration would occur.

5.10.5 Existing Regulations

Local

- City of Duarte Municipal Code, Chapter 9.68, Noise Regulations
- City of Irwindale Municipal Code, Chapter 9.28, Noise Regulation

5.10.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.10-2.

Without mitigation, the following impacts would be **potentially significant**:

- **Impact 5.10-1** Construction activities would result in temporary noise increases in the vicinity of the project.

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- **Impact 5.10-3** Construction activities could result in vibration-induced architectural damage at nearby structures or hardscape features.

5.10.7 Mitigation Measures

Impact 5.10-1

N-1 Prior to issuance of permits to perform construction, a construction noise mitigation plan shall be prepared, reviewed, and approved by the City of Duarte Community Development Director or the Irwindale Community Development Director, as applicable. The plan shall be implemented during project construction per the following methods:

1. At least 90 days prior to the start of construction activities, residents within 250 feet of the project site shall be notified of the planned construction activities. The notification shall include a brief description of the project, the activities that would occur, the duration and hours when construction would occur. The notification should include the telephone number of the City's authorized representative to respond in the event of a vibration or noise complaint.

2. At least 10 days prior to the start of construction activities, a sign shall be posted at the entrance to the job site, clearly visible to the public, which contains a contact name and telephone number of the City's authorized representative to respond in the event of a vibration or noise complaint. If the authorized representative receives a complaint, he/she shall investigate, take appropriate corrective action, and report the action to the City.

3. During the entire active construction period and to the extent feasible, limit construction-related trips (including worker commuting, material deliveries, and debris/soil hauling) from residential areas around the project site. For example, such construction-related trips should maximize site access along Village Road (from either Duarte Road from the north or from Buena Vista Street from the south), while minimizing trips along either Cinco Robles Road (south of Duarte Road) or Buena Vista Street (north of Village Road) since both these segments are adjacent to residential/ school receptors).

4. During the entire active construction period, all heavy construction equipment used on the proposed project shall be maintained in good operating condition, with all internal combustion, engine-driven equipment fitted with intake and exhaust mufflers, air intake silencers, and engine shrouds no less effective than as originally equipped by the manufacturer.

5. During the entire active construction period and to the extent feasible, use electrically powered equipment instead of pneumatic or internal combustion powered equipment, since the former are generally quieter than the latter. For example, operating temporary

lighting masts using construction-dedicated power blocks/outlets would be preferable to lighting masts that were powered by an on-board, gasoline-fueled generator. Likewise electric drills (either battery- or outlet-powered) are generally quieter than air-driven drills.

6. During the entire active construction period and to the extent feasible, all stationary noise-generating equipment shall be located as far away as possible from neighboring property lines, onsite sensitive receptors (i.e. hospital and hospitality uses), and the Santa Fe Flood Control Basin (which generally delineates the noise-sensitive biological resources to the southeast of the Specific Plan Area)

7. During the entire active construction period and to the extent feasible, limit all internal combustion engine idling both on the site and at nearby queuing areas to no more than five minutes for any given vehicle or machine (as is consistent with state air quality requirements per In-Use Off-Road Diesel Idling Restriction [Code of Regulations Title 13, Article 4.8, Chapter 9, Section 2449] and as required by Mitigation Measure AQ-2). Signs shall be posted at the job site and along queueing lanes to reinforce the prohibition of unnecessary engine idling.

8. During the entire active construction period and to the extent feasible, the use of noise producing signals, including horns, whistles, alarms, and bells will be for safety warning purposes only. Use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with human spotters.

9. Erect a temporary noise barrier/curtain between residential receptors that (a) share a boundary with the project site and any project construction zones within 100 feet of the shared boundary and (b) when such a nearby construction zone will use any equipment items rated at 80 dBA or above per FTA Manual Table 12-1.[16] A temporary noise barrier/curtain shall also be placed between a construction zone within 100 feet (or a distance recommended by a qualified biologist) of the southeast boundary and the Santa Fe Flood Control Basin to minimize construction noise impacts to sensitive biological resources in the basin. The temporary sound barrier would block line of sight noise levels to adjacent properties and substantially reduce noise levels at the Santa Fe Flood Control Basin due to its elevation which is lower than the project site. The sound barrier shall have a minimum height of 12 feet and be free of gaps and holes and must achieve a Sound Transmission Class (STC) of 35 or greater. The barrier can be (a) a ¾-inch-thick plywood wall or (b) a hanging blanket/curtain with a surface density or at least 2 pounds per square foot. For either configuration, the construction side of the barrier shall have an exterior lining of sound absorption material with a Noise Reduction Coefficient (NRC) rating of at least 0.7.

[16] If a particular equipment item is not listed in this table, then the default assumption should be that it would have an 80 dBA or above rating and that this mitigation measure would apply (FTA 2006, Table 12-1).

10. During the entire active construction period and to the extent feasible, high noise-producing activities shall be scheduled so as to minimize disruption at both onsite and offsite sensitive land uses.

The above conditions shall be implemented by the construction contractor(s) via a designated health, safety and environmental coordinator or a similar person. The details of the construction noise mitigation plan, including those listed above, shall be included as part of the permit application drawing set and as part of the construction drawing set. Verification shall be performed by the City building inspection staff.

Impact 5.10-3

N-2 Prior to issuance of permits to perform demolition, construction, grading, foundation, and erection activities that would use vibration-producing equipment, a construction vibration mitigation plan shall be prepared, reviewed, and approved by the City of Duarte Community Development Director or the Irwindale Community Development Director, as applicable. The plan shall be implemented during project construction per the following methods:

1. Prior to the start of construction activities, the construction contractor shall document, the pre-construction baseline conditions by inspecting and reporting on the then-current foundation and structural condition of the buildings and/or structures with ground-based foundations (including pools, hot-tubs, and spas) within 50 feet of any construction site boundaries. Such inspections and documentation may be needed at offsite, private properties. In such cases, the Contractor shall make a good-faith, reasonable effort to contact the owners of these private properties and request their permission to conduct such inspection/documentation efforts (to establish the pre-construction baseline). If such good-faith, reasonable efforts be rejected by any given property owner (or if such contact attempts are met with no cooperation or silence from the property owner), the implementation at such a property shall be considered as not feasible at that given property.

2. During the entire active construction period and to the extent feasible, vibratory rollers shall not be operated within 30 feet of buildings or other structures, and large bulldozers and loaded trucks shall not be operated within 15 feet of buildings or other structures. This measure ensures that vibratory rollers or large bulldozers do not exceed the potential damage threshold and eliminates the source of any potentially significant vibration impact.

3. During the entire active construction period, if any vibration levels cause cosmetic or structural damage to the offsite buildings within 50 feet of the project site and that were previously inspected and documented [per point 1 above], City staff shall immediately issue "stop-work" orders to the construction contractor to prevent further damage. Such cosmetic or structural damage shall include, but not limited to, cracks in walls or ceilings [particularly around doors and windows], sticking/rubbing doors or openable windows,

fallen or displaced ceiling tiles, and/or items displaced from shelving. Work shall not restart until the buildings are stabilized and/or preventive measures are implemented to relieve further damage to the building(s).

The above conditions shall be implemented by the construction contractor(s) via a designated health, safety and environmental coordinator or a similar person. The details of the construction vibration mitigation plan, including those listed above, shall be included as part of the permit application drawing set and as part of the construction drawing set. Verification shall be performed by the City building inspection staff.

5.10.8 Level of Significance After Mitigation

Impact 5.10-1

With implementation of Mitigation Measure N-1, construction noise impacts due to construction activities would be reduced to the extent feasible. There are no definitive, bright-line sound level thresholds for construction noise. Given the expected noise levels and, in particular, the extended length of the construction activities (three to four years for each of the four phases), significant construction noise impacts would remain. Impact 5.10-1 would remain ***significant and unavoidable***.

Impact 5.10-3

With the implementation of Mitigation Measure N-2, which would place limitations on certain equipment and/or their use at certain distances, impacts would be reduced to less than FTA criteria. Impacts would be less than significant after mitigation.

5.10.9 References

Beranek, Leo. 1988. *Noise and Vibration Control*. Revised edition. Washington, D.C.: Institute of Noise Control Engineering.

Bies, David A. and Colin H. Hansen. 2009. *Engineering Noise Control: Theory and Practice*. 4th edition. New York: Spon Press.

Bolt, Beranek & Newman. 1987. Noise Control for Buildings and Manufacturing Plants.

California Department of Transportation (Caltrans). 2006. Traffic Noise Analysis Protocol.

———. 2009, November. Technical Noise Supplement ("TeNS"). Prepared by ICF International.

California Department of Transportation (Caltrans), Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office. 2004, June. Transportation- and Construction-Induced Vibration Guidance Manual. Prepared by ICF International. Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office.

5. Environmental Analysis
NOISE

California Department of Transportation (Caltrans), Division of Environmental Analysis. 2002, February. Transportation Related Earthborne Vibration (Caltrans Experiences). Technical Advisory, Vibration. TAV-02-01-R9601. Prepared by Rudy Hendricks.

Federal Highway Administration (FHWA). 1978, December. Federal Highway Traffic Noise Prediction Model. United States Department of Transportation Report No. FHWA-RD77-108.

Federal Transit Administration (FTA). 2006, May. Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. US Department of Transportation.

Fehr and Peers. 2017, April. Transportation Impact Study for the City of Hope.

Governor's Office of Planning and Research (GOPR). 2003, October. State of California General Plan Guidelines.

Harris, Cyril M. 1998. *Handbook of Acoustical Measurements and Noise Control.* 3rd edition. Woodbury, NY: Acoustical Society of America.

US Environmental Protection Agency (USEPA). 1971, December. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances. Prepared by Bolt, Beranek & Newman (Cambridge, MA) for the U.S. EPA Office of Noise Abatement and Control. Washington, D.C.

———. 1974, March. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Washington, D.C.: U.S. EPA Office of Noise Abatement and Control.

———. 1978, November. Protective Noise Levels. EPA 550/9-79-100. (Condensed version of 1971 and 1974 documents.)

5.11 POPULATION AND HOUSING

This section of the Draft Environmental Impact Report (DEIR) examines the potential for socioeconomic impacts of the proposed City of Hope Campus Plan on the City of Duarte and City of Irwindale, including changes in population, employment, and demand for housing, particularly housing cost/rent ranges defined as "affordable."

The analysis in this section is based, in part, upon sources of information from the following agencies:

- *American FactFinder,* US Census, 2009-2013
- *City of Duarte Housing Element,* February 2014
- *City of Irwindale General Plan Section 3 Housing Element,* September 2013
- *Kyser Center for Economic Research of the Los Angeles County Economic Development Corporation,* San Gabriel Valley Economic Forecast and Regional Overview, May 2016
- *Table 2: E-5 City/County Population and Housing Estimates,* California Department of Finance, January 2016
- *The 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy*, Southern California Association of Governments, April 2016

5.11.1 Environmental Setting

5.11.1.1 REGULATORY FRAMEWORK

California planning and zoning law requires each city and county to adopt a general plan for future growth (California Government Code § 65300). This plan must include a housing element that identifies housing needs for all economic segments and provides opportunities for housing development to meet that need. At the state level, the Housing and Community Development Department (HCD) estimates the relative share of California's projected population growth in each county based on California Department of Finance (DOF) population projections and historical growth trends. These figures are compiled by HCD in a Regional Housing Needs Assessment (RHNA) for each region of California. Where there is a regional council of governments, HCD provides the RHNA to the council. Such is the case for the County of Los Angeles, which is a member of SCAG. The council, in this case SCAG, assigns a share of the regional housing need to each of its cities and counties. The process gives cities and counties the opportunity to comment on the proposed allocations. HCD oversees the process to ensure that the council of governments distributes its share of the state's projected housing need.

State law recognizes the vital role that local governments play in the supply and affordability of housing. To that end, California Government Code requires that the housing element achieve legislative goals to:

- Identify adequate sites to facilitate and encourage the development, maintenance, and improvement of housing for households of all economic levels, including persons with disabilities.
- Remove, as legally feasible and appropriate, governmental constraints to the production, maintenance, and improvement of housing for persons of all incomes, including those with disabilities.
- Assist in the development of adequate housing to meet the needs of low and moderate income households.
- Conserve and improve the condition of housing and neighborhoods, including existing affordable housing. Promote housing opportunities for all persons regardless of race, religion, sex, marital status, ancestry, national origin, color, familial status, or disability.
- Preserve for lower income households the publicly assisted multifamily housing developments in each community.

California housing element laws (California Government Code §§ 65580–65589) require that each city and county identify and analyze existing and projected housing needs within its jurisdiction and prepare goals, policies, and programs to further the development, improvement, and preservation of housing for all economic segments of the community commensurate with local housing needs.

Current and Future Housing Needs

City of Duarte Housing Element

The 2014−2021 Housing Element was adopted by the City Council in February 2014. The City's RHNA through 2021 is 337 units. The Housing Element identified entitled projects in progress, vacant residential sites, Gold Line Transit Oriented Development, second units, and a senior housing project as having the potential to provide 657 units. This is well above the RHNA.

Additionally, in May 2005, the City of Duarte adopted an Inclusionary Housing Ordinance to help create affordable housing in conjunction with new residential development projects and substantial residential building rehabilitation projects. The City also complies with California's Density Bonus laws to incentivize the creation of deed-restricted affordable housing.

City of Irwindale Housing Element

The City of Irwindale RHNA for the 2013−2021 planning period is 15 housing units. In the adopted Housing Element, the City identified opportunities for 15 new units and 15 substantially rehabilitated units, satisfying state requirements.

Regional Planning

Southern California Association of Governments

SCAG is a council of governments representing Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. SCAG is the federally recognized metropolitan planning organization for this region, which encompasses over 38,000 square miles. SCAG actions in the San Gabriel Valley subregion, including the cities of Duarte and Irwindale, are partially the result of recommendations and other input from the San Gabriel Valley Council of Governments (SGVCOG).

SCAG is responsible for the development of the regional transportation plan every four years and the regional transportation improvement plan every two years. SCAG uses regional transportation plans to focus on the relationship between jobs and housing and how it impacts mobility, minimizes congestion, and protects quality of life. Unique to the SCAG region is the option for subregions to create their own SCS. However, SGVCOG has chosen to rely on SCAG's 2016-2040 RTP/SCS. The 2016 RTP/SCS includes a strong commitment to reduce emissions from transportation sources to comply with Senate Bill 375, improve public health, and meet the National Ambient Air Quality Standards. It balances the region's future mobility and housing needs with economic, environmental, and public health goals (SCAG 2016a). The RTP/SCS is required by the state of California and the federal government and is updated by SCAG every four years as demographic, economic, and policy circumstances change.

5.11.1.2 EXISTING CONDITIONS

Growth Projections

The entire City of Hope Campus Plan site is in the SGVCOG, a joint powers authority of 31 incorporated cities as well as several unincorporated communities and water districts. SGVCOG cities and communities are a subregion within SCAG, which provides forecasts of population, households, and employment for all member jurisdictions. Since the City of Hope Campus Plan includes 89.5 acres in the City of Duarte and 26.5 acres in the City of Irwindale, data and projections for both cities and the SGVCOG subregion are described below.

Population

As shown in the Table 5.11-1, the population of the City of Duarte was estimated as 21,500 in 2012, and is forecast to increase to 24,300 by 2040, an increase of 2,800 residents or 13 percent from 2012. The City of Irwindale's population is forecast to increase from 1,400 in 2012 to 2,000 by 2040, an increase of approximately 42 percent (SCAG 2016b).

5. Environmental Analysis
POPULATION AND HOUSING

Table 5.11-1 Adopted SCAG Existing Conditions and Forecasts

Area	2012	2040	Change 2012–2040	Percent Increase 2012–2040
Population				
All SGVCOG Cities	1,508,000	1,693,500	185,500	12.3
Duarte	21,500	24,300	2,800	13.0
Irwindale	1,400	2,000	600	42.3
Households (Housing Units)				
SGVCOG Cities	460,000	535,900	75,900	16.5
Duarte	7,000	8,200	1,200	17.1
Irwindale	400	500	100	25.0
Employment				
SGVCOG Cities	678,900	808,300	129,400	19.1
Duarte	10,100	11,900	1,800	17.8
Irwindale	18,800	21,500	2,700	19.4
Jobs/Housing Ratio				
SGVCOG Cities	1.48	1.51	0.03	2.0
Duarte	1.44	1.45	0.01	0.7
Irwindale	47.00	43.00	-4.0	8.5

Source: SCAG 2016b.

The existing population in the Campus Plan area can be estimated by applying the 2016 DOF persons per household estimate (3.05 residents per household) to the number of homes (ten). Given these assumptions, there are an estimated 31 residents in the Campus Plan area.

Households

The DOF tracks population, housing unit type, vacancy rates, and persons per household in cities and counties across the state. In 2016 the DOF reported that the average household size was 3.05 persons in Duarte and 3.76 persons in Irwindale. The average household size for all cities within SGVCOG was 3.24 persons per household.

There are ten existing housing units in the Campus Plan area providing shelter for ten households. All are located within the City of Duarte portion of the Project Site.

Employment

Table 5.11-2 shows Duarte's workforce by occupation and industry. According to estimates calculated by the US Census for 2012 (selected for consistency with the SCAG RTP/SCS data), Duarte had 9,428 people age 16 years and over in the civilian workforce. The largest occupational category was "management, business, science, and arts occupations," which accounted for almost 34 percent of the civilian workforce. The most common industry for Duarte workers was "educational services, and health care and social assistance," comprising approximately 29 percent of all civilian workers.

Potential annual income information was found in the California Employment Development Department Occupational Employment Statistics and Wages data tables. The mean annual wage of all "Healthcare Practitioners and Technical Occupations" in the Los Angeles-Long Beach-Glendale Metropolitan Statistical Area was $94,003 in the first quarter of 2016. According to the City of Hope Campus Plan Parking Study prepared by Walker Parking Consultants in June 2016, approximately 729 of the total jobs would be for physicians (see Appendix J3 of this DEIR). Physicians reported earning a mean annual wage of $228,443.

Table 5.11-2 Existing Duarte Employment by Business Sector, 2012

Occupation/Industry	Number	Percent
Occupation		
Management, business, science, and arts occupations	3,179	33.7%
Service occupations	1,862	19.7%
Sales and office occupations	2,435	25.8%
Natural resources, construction, and maintenance occupations	905	9.6%
Production, transportation, and material moving occupations	1,047	11.1%
Total	**9,428**	**100%**
Industry		
Agriculture, forestry, fishing and hunting, and mining	89	0.9%
Construction	695	7.4%
Manufacturing	864	9.2%
Wholesale trade	242	2.6%
Retail trade	1,244	13.2%
Transportation and warehousing, and utilities	550	5.8%
Information	150	1.6%
Finance and insurance, and real estate and rental and leasing	467	5.0%
Professional, scientific, and management, and administrative and waste management services	1,176	12.5%
Educational services, and health care and social assistance	2,712	28.8%
Arts, entertainment, and recreation, and accommodation and food services	498	5.3%
Other services, except public administration	434	4.6%
Public administration	307	3.3%
Total	**9,428**	**100%**

Source: US Census 2016.
Note: Employment figures count civilian employees only.

Table 5.11-3 shows Irwindale's workforce by occupation and industry. The City of Irwindale had 652 employed civilian workers age 16 years and over in 2012 (see Table 5.11-3). The most common occupations were "management, business, science, and arts," "service," and "sales and office" jobs. The most common industry was "educational services, and health care and social services" with 20 percent of all reported fields.

5. Environmental Analysis
POPULATION AND HOUSING

Table 5.11-3 Existing Irwindale Employment by Business Sector, 2012

Occupation/Industry	Number	Percent
Occupation		
Management, business, science, and arts occupations	168	25.8%
Service occupations	160	24.5%
Sales and office occupations	139	21.3%
Natural resources, construction, and maintenance occupations	63	9.7%
Production, transportation, and material moving occupations	122	18.7%
Total	**652**	**100%**
Industry		
Agriculture, forestry, fishing and hunting, and mining	7	1.1%
Construction	48	7.4%
Manufacturing	102	15.6%
Wholesale trade	37	5.7%
Retail trade	67	10.3%
Transportation and warehousing, and utilities	19	2.9%
Information	6	0.9%
Finance and insurance, and real estate and rental and leasing	37	5.7%
Professional, scientific, and management, and administrative and waste management services	24	3.7%
Educational services, and health care and social assistance	131	20.1%
Arts, entertainment, and recreation, and accommodation and food services	114	17.5%
Other services, except public administration	13	2.0%
Public administration	47	7.2%
Total	**652**	**100%**

Source: US Census 2016.
Note: Employment figures count civilian employees only.

According to the City of Hope Campus Plan Parking Study prepared by Walker Parking Consultants in June 2016, the City of Hope provided approximately 4,051 jobs (3,080 full-time employees, 553 part-time employees, and 418 physicians) at the campus in 2015 (Walker 2016; see Appendices J2 and J3). In addition, 1,311 contractors worked at the project site.

Jobs/Housing Balance

The jobs/housing balance is a general measure of the total number of jobs and number of housing units in a defined geographic area, without regard to economic constraints or individual preferences. The jobs/housing ratio is one indicator of a project's effect on growth and quality of life in the project area. SCAG applies the jobs/housing ratio at the regional and subregional levels to analyze the fit between jobs, housing, and infrastructure. A major focus of SCAG's regional planning efforts has been to improve this balance. No ideal jobs/housing ratio has been adopted in state, regional, or local policies; jobs/housing goals and ratios are advisory only. SCAG applies the jobs/housing ratio at the regional and subregional level to analyze the fit between jobs, housing, and infrastructure (SCAG 2016a). The American Planning Association is an authoritative resource for community planning best practices, including recommendations for assessing jobs/housing ratios. Although the American Planning Association recognizes that an ideal jobs/housing ratio will vary from jurisdiction to jurisdiction, its recommended target for an appropriate jobs/housing ratio is 1.5, with a recommended range of 1.3 to 1.7 (Weltz 2003).

Based on SCAG RTP/SCS data, the City of Duarte jobs/housing balance was 1.44 in 2012 and is projected to be 1.45 in 2040. Per the range provided by the American Planning Association, the City of Duarte currently has and would have an ideal jobs/housing balance in the future. The same data set identified a 2012 jobs/housing balance of 47 for the City of Irwindale, which reflects the city's high percentage of industrial, business park, and commercial uses. SCAG forecasts indicate that the City of Irwindale will become more balanced by 2040, with a jobs/housing ratio of 43. The entire San Gabriel Valley jobs/housing balance is expected to remain ideal, changing from 1.48 in 2012 to 1.51 in 2040.

5.11.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

P-1 Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).

P-2 Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

P-3 Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

5.11.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Methodology

The potential impacts of the proposed project were evaluated relative to the following conditions and characteristics of the proposed Campus Plan area:

- Demographic conditions such as population, housing units, and the relationship between growth potentially associated with the proposed Campus Plan and overall subregional growth.

- Jobs and housing balance relationships within the general vicinity of the proposed Campus Plan as they relate to mass transit to reduce vehicle miles traveled from home to work and associated air quality considerations.

5. Environmental Analysis
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- Socioeconomic profiles including employment by industry and potential income levels from jobs supported by the proposed Campus Plan. And any potential impacts on the supply of affordable housing in the vicinity of the proposed Campus Plan.

Population data, including patients, employees, contractors, physicians and residents were provided by City of Hope on June 17, 2016 and based on a parking study prepared by Walker Parking Consultants in June 2016 (Walker 2016; also see Appendix J2 of this DEIR).

Impact 5.11-1: Implementation of the Campus Plan could result in population growth in the project area. [Threshold P-1]

Impact Analysis: Implementation of the proposed Campus Plan would increase jobs in the Cities of Duarte and Irwindale, which would have the potential to increase demand for housing in the area. The project would result in approximately 1,038,500 gross square feet of net new development on the project site; 964,340 square feet within the City of Duarte and 74,160 square feet within the City of Irwindale.

The construction phase of individual development projects accommodated by the Campus Plan would generate temporary employment opportunities. Implementation of the proposed Campus Plan would generate short-term design, engineering, and construction jobs during project construction. Construction related jobs would not result in a significant population increase because they would be filled by workers in the region. Construction would occur intermittently over a period of 20 years. Construction would not result in a significant increase in population because the construction phase would be temporary and buildings would be developed as the market demands.

The increase in square footages and uses at the project site would increase employment at the project site, which has the potential to induce population growth in the area. The proposed Campus Plan would result in the creation of 1,530 new employees; an increase from 3,633 jobs[1] in 2015 to 5,163 jobs in 2035; the existing contractors are expected to remain the same at approximately 1,311. The proposed number of physicians are expected to increase by 311 from 418 to 729 (see Table 3-3). Therefore, the Campus Plan would result in the creation of 1,841 new jobs. The proposed Campus Plan includes new open space, hospitality (short-term stays for patients, their families, and City of Hope guests), inpatient (hospital), office, outpatient (clinic), research, and warehousing uses. This estimated 1,841 new jobs would be related to health care, administration, scientific research, academia, facilities maintenance, and hospitality.

According to the San Gabriel Valley 2016 Economic Forecast and Regional Overview by the Kyser Center for Economic Research (Kyser), health care services and professional and business services sectors accounted for 32 percent of all jobs in the San Gabriel Valley (18.3 percent and 13.4 percent, respectively). The proposed Campus Plan would provide health care and other skilled worker employment opportunities to residents in the project area as well as throughout the SGVCOG subregion,[2] reducing the existing unemployment rate. The US Census shows the civilian unemployment rate in the City of Duarte was 9.2 percent in 2012 and 11.2

[1] Jobs includes full-time and part-time employees.
[2] Based on data obtained from the SCAG 2012 RTP Travel Demand Model, people who travel to work at City of Hope (Home-Based Work trips) average a distance of 16.1 miles (Appendix J1 of this DEIR).

percent in 2015. The same datasets show that the unemployment rate in the City of Irwindale was 14.7 percent in 2012 and 16 percent in 2015.

"The San Gabriel Valley is home to many highly-educated workers…. The overall level of educational attainment in the San Gabriel Valley is slightly higher than that of Los Angeles County. For the valley as a whole, 78.2% of the population (25 years and older) has a high school diploma (or equivalent) and 30.4% has earned a Bachelor's degree or higher" (Kyser 2016). The SGVCOG skilled labor force includes 122,500 health care services workers and 90,000 workers in professional and business services (Kyser 2016). As stated previously, this accounts for 32 percent of employment in the San Gabriel Valley. The increase in jobs on the campus would be drawn from this labor force.

However, even if the project increase in employees added equivalent population to the project site, added growth of 1,841 residents over buildout of the Campus Plan would be commensurate with the growth projections assumed for the cities of Duarte and Irwindale. As shown in the Table 5.11-1, in 2040 the number of residents in the City of Duarte is forecast to increase by 12,800 beyond 2012, or approximately 13 percent. The population of the City of Irwindale are forecast to increase by 600 by 2040, an increase of approximately 42 percent.

With the number of available employees and skilled workers in the project area, implementation of the Campus Plan is not expected to induce substantial population growth. The proposed project is also consistent with the City of Duarte and City of Irwindale Housing Elements. None of the Campus Plan area parcels are identified in either Housing Element as being needed to meet their respective Regional Housing Needs Allocations. Impacts due to increased population would be less than significant.

Impact 5.11-2: Project implementation could result in the replacement of housing for other uses allowed within the Campus Plan. [Threshold P-2 and P-3]

Impact Analysis: The existing housing on the campus consists of four rental units on three lots along the east side of Cinco Robles Drive that are primarily rented by graduate students attending City of Hope's Irell & Manella Graduate School of Biological Sciences. Following adoption of the proposed Campus Plan, these four units would be in the Residential Medical Flex District. This RMF District is intended to allow flexibility for the existing residential uses to continue to operate as campus housing or to transition to new uses over time, such as hospitality or open space.

These residential units are not currently planned to be demolished as a part of the project, but are planned to continue to be used for graduate student housing. The Campus Plan would provide flexibility to allow for the demolition of the units if desired in the future. In addition, seven existing homes that are not owned by City of Hope but are proposed for inclusion within the Campus Plan area on the east side of Cinco Robles Drive have the potential to change in land use over time as allowed under the RMF and Transition Medical districts. These existing homes also have the option to remain residential.

Therefore, although the proposed Campus Plan does not commit to removing any of these units in the RMF or TM with R2 Overlay districts, it does maintain the flexibility to potentially establish an alternate use at some point in the future. Therefore, implementation of the proposed Campus Plan could result in the redevelopment of up to 10 households in the City of Duarte. According to the DOF, the average persons per household size in Duarte is 3.05. Using this conservative assumption, 10 households would include 31 residents.

The DOF provides housing and population estimates for all cities and counties in California. The following is a list of housing vacancy rates in Duarte, Irwindale, and surrounding cities:

- Arcadia: 4.0 percent
- Azusa: 6.0 percent
- Baldwin Park: 6.4 percent
- Bradbury: 9.5 percent
- Covina: 3.9 percent
- Duarte: 2.7 percent
- Irwindale: 6.7 percent
- Monrovia: 5.3 percent

The 2016 vacancy rates in Duarte and Irwindale were 3 and 7 percent, respectively. Should the residential units eventually be converted to other uses, such as open space or parking, the 10 displaced households would be able to find alternate housing options within the communities of Duarte or Irwindale. There is also a moderate level of housing supply in several adjacent cities. Impacts are considered less than significant.

5.11.4 Cumulative Impacts

Population, Housing and Employment

Cumulative population and housing impacts are assessed relative to the City of Duarte and Irwindale General Plan buildout assumptions and SCAG's 2016-2040 RTP/SCS population, housing, and employment projections. SCAG provides projections for net increases in population, housing, and employment in the cities of Duarte and Irwindale between 2012 and 2035 (see Table 5.11-1).

Cumulative buildout of the City of Duarte General Plan would allow up to 25,418 residents, 7,702 dwelling units, and 9,953,071 non-residential square feet (11,945 jobs) (Duarte 2016). Cumulative buildout statistics for the City of Irwindale are based on SCAG growth projections since the Irwindale General Plan does not contain buildout statistics—2,000 residents, 500 dwelling units, and 21,500 employees. Compared to each City's SCAG projections for population, housing and employment in 2035 (see Table 5.11-1), overall buildout of the two general plans would be within SCAG's projections, with the exception of Duarte's General Plan population and employment buildout which would exceed SCAG's projections (24,300 residents and 11,900 jobs) by 1,118 residents and 45 jobs. This represents a 4.6 and 0.4 percent increase above SCAG's projections for population and employment, respectively, which is a nominal increase above projected growth estimates.

The proposed Campus Plan would not directly result in an increase of population or housing, thus it also would not contribute to the cumulative increase in population or housing growth in Duarte and Irwindale.

The proposed Campus Plan would, however, create 1,841 new jobs in the project area, which is 63 percent of the 4,500 additional jobs projected in the cities of Duarte and Irwindale between 2012 and 2040. City of Hope is the largest employer in the immediate area (~19 percent of the combined employment in Duarte and Irwindale) and expansion of City of Hope's facilities is a part of the General Plan growth projections for both cities. The increase in employment resulting from the Campus Plan would not exceed growth projections in either City. Further, and as discussed previously, the employees for these new jobs would be expected to be drawn from the existing employment pool in the region and would not result in associated population growth. Therefore, cumulative impacts related to employment growth would be less than significant.

Jobs/Housing Balance

The additional employment resulting from the project would increase the ratio of jobs to homes in the cities of Duarte and Irwindale. The SCAG RTP/SCS growth forecast projects that the City of Duarte jobs/housing balance will be 1.45 in 2040. With the proposed Campus Plan, the City of Duarte would increase its jobs/housing balance to 1.62. The desirable range provided by the American Planning Association is 1.3 to 1.7. Therefore, the City of Duarte would maintain an ideal jobs/housing balance in the future with the implementation of the proposed Campus Plan. SCAG forecasts indicate that without the proposed Campus Plan the City of Irwindale would have a jobs/housing ratio of 43.00. Implementation of the proposed Campus Plan could slightly increase jobs/housing balance in Irwindale to 43.84. The increases in jobs/housing ratio for both cities based on development of the proposed Campus Plan would be minimal. Further, the increases in the jobs/housing ratio for both cities based on the Campus Plan and cumulative development would not substantially deviate from SCAG forecasts. Therefore, cumulative impacts to the jobs/housing balance would be less than significant.

5.11.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to population and housing were described in detail in Sections 5.11.1.1 of this DEIR and are listed below.

State

- California Government Code Section 65300: Housing Element Law

Regional

- SCAG's 2016-2040 RTP/SCS

5.11.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.11-1, 5.11-2.

5.11.7 Mitigation Measures

Impacts are less than significant and no mitigation measures are necessary.

5.11.8 Level of Significance After Mitigation

No significant unavoidable adverse impacts relating to population and housing would occur.

5.11.9 References

California Department of Finance (DOF). 2016, January 1. Table 2: E-5 City/County Population and Housing Estimates.

California Employment Development Department (EDD). 2016, June. Occupational Employment Statistics Survey Results, 1st Quarter 2016 Wages for the Los Angeles-Long Beach-Glendale metropolitan Statistical Area. http://www.labormarketinfo.edd.ca.gov/data/oes-employment-and-wages.html.

City of Hope. 2016, June 17. Responses to Fehr & Peers Population Data Collection Request Memorandum.

Duarte, City of. 2014, February. 2014−2021 Housing Element. http://www.hcd.ca.gov/housing-policy-development/housing-resource-center/plan/he/housing-element-documents/duarte_5th_adopted021914.pdf.

———. 2016, June. City of Duarte General Plan Final Supplemental EIR for the Town Center Specific Plan.

Irwindale, City of. 2013, September. City of Irwindale General Plan Section 3 Housing Element. http://ci.irwindale.ca.us/DocumentCenter/View/38.

Kyser Center for Economic Research. 2016, May. San Gabriel Valley Economic Forecast and Regional Overview. Prepared for Los Angeles County Economic Development Corporation. https://sgvpartnership.org/wp-content/uploads/SGV_FINAL_20160508.pdf.

Southern California Association of Governments (SCAG). 2016, April 7. Final 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): A Plan for Mobility, Accessibility, Sustainability, and a High Quality of Life. http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx.

———. 2016b, April. Demographics and Growth Forecast (2016–2040 RTP/SCS). http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS_DemographicsGrowthForecast.pdf.

US Census. 2016. 2009-2013 5-Year American Community Survey Employment Data. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

Walker Parking Consultants (Walker). 2016, June. City of Hope Campus Plan Parking Study.

Weltz, Jerry. 2003. Jobs-Housing Balance. Planning Advisory Service Report Number 516. American Planning Association.

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5.12 PUBLIC SERVICES

This section addresses public services including Fire Protection and Emergency Services, Police Protection, Schools, and Libraries. Impacts to parks are addressed in Section 5.13, *Recreation*. Public and private utilities and service systems, including water, wastewater, and solid waste services and systems; are addressed in Section 5.16, *Utilities and Service Systems*.

The information in this section is based in part on written responses to service questionnaires from Kevin Johnson, Acting Chief of the Los Angeles County Fire Department Forestry Division; and Captain Coronne Jacobs of the Los Angeles County Sheriff's Department; the responses are included in Appendix M, *Public Services Correspondence*, to this DEIR.

5.12.1 Fire Protection and Emergency Services

5.12.1.1 REGULATORY BACKGROUND

The California Fire Code (CFC) comprises Part 9 of Title 24 of the California Code of Regulations. The CFC is updated on a three-year cycle; the 2016 CFC took effect on January 1, 2017. Hospitals are classified as essential facilities in California Building Code (CBC; Title 24, California Code of Regulations, Part 2) Table 1604A. Essential facilities are defined in CBC Chapter 2 as "Buildings and other structures that are intended to remain operational in the event of extreme environmental loading from flood, wind, snow or earthquakes." The CBC is updated on the same cycle as the CFC.

The current CFC is adopted, with certain modifications, as Title 32 of the Los Angeles County Code of Ordinances; which is adopted in turn as City of Duarte Municipal Code Section 15.04.010.

5.12.1.2 ENVIRONMENTAL SETTING

Fire Stations, Equipment, and Staffing

The Los Angeles County Fire Department (LACFD) provides fire protection and emergency medical services to the cities of Duarte and Irwindale, including the City of Hope campus. The City of Hope campus is in the first-in service area of Fire Station 44 at 1105 Highland Avenue in the City of Duarte, about 1.2 miles to the northeast. The next two closest fire stations to the project site are Station 48 at 15546 Arrow Highway in the City of Irwindale, about 4.2 miles by road to the southeast; and Station 169 at 5112 Peck Road in the City of El Monte, approximately 4.0 miles by road to the southwest (Johnson 2016). Apparatus and daily staffing at the three stations are listed below in Table 5.12-1.

5. Environmental Analysis
PUBLIC SERVICES

Table 5.12-1 Fire Stations

Station Address Distance from Project Site	Apparatus	Daily Staffing
Station 44 (1105 Highland Avenue, Duarte) 1.2 miles from the City of Hope campus	2 fire engines, one patrol vehicle	7
Station 48 (15546 Arrow Highway, Irwindale) 4.2 miles from the City of Hope campus	1 fire engine	4
Station 169 (5112 Peck Road, El Monte) 4.0 miles from the City of Hope Campus	1 fire engine	3

Source: Johnson 2016

Response Times

The LACFD's response time goals in urban areas are five minutes or less for the first arriving unit for fire and emergency medical responses and eight minutes or less for the advanced life support (paramedic) unit.

During 2015, Station 44's jurisdiction had an average emergency response time of 4 minutes 49 seconds (Johnson 2016).

5.12.1.3 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

FP-1 Result in a substantial adverse physical impact associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection services.

5.12.1.4 ENVIRONMENTAL IMPACTS

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.12-1: Implementation of the Campus Plan would introduce new structures, workers, patients, and visitors into the LACFD service boundaries. The LACFD estimates that it can serve the Campus Plan buildout with existing firefighting resources in and near the project site. [Threshold FP-1]

Impact Analysis:

Construction

Construction projects under the Campus Plan are not expected to increase demand for fire protection and emergency medical services, however, the construction of projects has the potential re-route access to the site and immediately surrounding area due to street closures, closed access points, etc. Due to the nature of the project as a medical facility, it is critically important that construction activities do not block emergency access to City of Hope or surrounding neighborhoods. To address fire and emergency access needs, the traffic and circulation components of the proposed Campus Plan would be designed and constructed in accordance with all applicable Los Angeles County Fire Department (LACFD) design standards for emergency access (e.g., minimum lane width and turning radius). The Campus Plan includes a number of standards to ensure adequate emergency access. Gate access standards outlined in the Campus Plan require a minimum gate access width of 15 feet or as required by the LACFD. In addition, there are several campus access points that allow access for fire and emergency vehicles (including three on Duarte Road and one on Buena Vista Street). During the development review process the City of Hope would be required to coordinate with LACFD to ensure adequate emergency vehicle access during all phases of construction. Therefore, construction activities would not interfere with response times or service ratios and impacts would be less than significant.

Operation

Campus Plan buildout would result in a net increase of approximately 1,038,500 gross square feet of development, resulting in an increase of approximately 1,841 employees. This increase in building square footage and employees onsite is expected to generate an increase in demands for fire protection. LACFD anticipates that it can serve the project with existing firefighting stations, apparatus, and staff, and that project development would not require the LACFD to build new or expanded fire stations or obtain additional apparatus and staff (Johnson 2016). Therefore, impacts would be less than significant.

Further, future development in accordance with the Campus Plan would be required to comply with all applicable fire code and ordinances for construction, access, water mains, fire flows, and fire hydrants. Specific fire and life safety requirements for the construction phase would be addressed at the building fire plan check review stage (Johnson 2016). For example, site plans would be submitted to the Los Angeles Fire Department in order to obtain a fire flow requirement based upon the tenant type, building size, and building type. Compliance with LACFD requirements would also ensure adequate provision of resources. Demolition and replacement of outdated facilities with new facilities equipped with modern fire and life safety systems would also reduce demands for fire protection.

5.12.1.5 CUMULATIVE IMPACTS

The area considered for cumulative impacts is LACFD Battalions 16 and 10, which span much of the north-central and west-central San Gabriel Valley, respectively; Battalion 16 also serves part of the San Gabriel Mountains. Battalion 16 includes the cities of Duarte, Baldwin Park, Irwindale, Azusa, and Covina; while Battalion 10 encompasses the cities of Rosemead, El Monte, South El Monte, and San Gabriel, and some adjoining unincorporated areas. Battalion 16 is housed in eight fire stations, and Battalion 10 in nine stations

(LACFD 2012). Over the buildout period of the Campus Plan, other projects in the service areas of Battalions 10 and 16 would develop additional structures housing increased numbers of residents and workers, thus generating increased demands for fire protection and emergency medical services. Cumulative growth anticipated in the region would generate increased tax revenues to cities and Los Angeles County. Some of those revenues would be available to fund construction of new or expanded fire stations; purchase additional apparatus; and/or hire additional staff. Such additional revenue would offset some of the potentially adverse impacts of increased development. In addition, similar to the proposed project, each of the cumulative projects would be subject to Title 24 Building Code regulations and individually subject to Los Angeles Fire Department review and compliance with all applicable construction-related and operational fire safety requirements of the Los Angeles Fire Department and the Building and Fire Codes of the applicable city. In addition, in correspondence included with Appendix M, LACFD has indicated that it will be able to serve cumulative developments in addition to the proposed project. To that end, LACFD has not identified the need for additional facilities as a result of the Campus Plan and identified cumulative development. Therefore, cumulative impacts to fire services would be less than significant.

5.12.1.6 EXISTING REGULATIONS

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to fire protection and were described in detail in Sections 5.12.1.1 of this DEIR and are listed below.

State

- California Fire Code (Title 24, California Code of Regulations, Part 9)
- California Building Code (Title 24, California Code of Regulations, Part 2)

5.12.1.7 LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Upon implementation of regulatory requirements, Impact 5.12-1would be less than significant.

5.12.1.8 MITIGATION MEASURES

No mitigation measures are required.

5.12.1.9 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Impacts would be less than significant.

5.12.2 Police Protection

5.12.2.1 ENVIRONMENTAL SETTING

The Los Angeles County Sheriff's Department (LACSD) provides police protection to the City of Duarte including the project site. Service to the City of Duarte is based at the Duarte Satellite Station at 1042 Huntington Drive, which is a sub-station to LACSD Temple Station in Temple City. Twenty-three full-time deputies from the LACSD Temple Station are assigned to the Duarte Satellite Station. Staff based at the

Duarte Satellite Station cover the cities of Duarte and Bradbury on three shifts and includes two Special Assignment deputies, one school resource deputy, and one sergeant. In addition, relief personnel are dispatched from the LACSD Temple Station in Temple City.

LACSD generally prescribes to a service ratio of one patrol deputy per thousand residents. The service ratios, based on 2010 US Census data, are approximately one deputy per 972 residents (Jacob 2016). Note that police staffing is determined based on numerous factors, and a simple officer-to-population ratio is not recommended for making police staffing decisions (IACP 2015; ICMA 2013).

The Irwindale Police Department (IPD) provides police protection to the City of Irwindale. IPD is located at 5050 N. Irwindale Avenue and staffs 47 personnel, 11 patrol units, 2 motorcycles and 10 other vehicles (Irwindale 2015). In 2015, there were 20,412 calls for service (Irwindale 2015).

In addition to local police protection services, City of Hope Security provides 24-hour security service on the project site to handle routine security matters.

Response Times

LACSD response time goals for the Duarte Satellite Station's service area are 10 minutes for emergency calls, 20 minutes for priority calls, and 60 minutes for routine calls. Current average response times are 2.7 minutes for emergency calls, 8.9 minutes for priority calls, and 40.8 minutes for routine calls (Jacob 2016). IPD response times are typically less than five minutes in the City (Irwindale 2016).

5.12.2.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

PP-1 Result in a substantial adverse physical impact associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection services.

5.12.2.3 ENVIRONMENTAL IMPACTS

Impact 5.12-2: Implementation of the Campus Plan would introduce new structures, workers, patients, and visitors into the service area of the LACSD and IPD, thereby increasing the demand on police protection facilities and personnel. [Threshold PP-1]

Impact Analysis: Implementation of the Campus Plan could increase demands for police protection on the City of Hope campus. As described above, buildout would result in a net increase of approximately 1,038,500 gross square feet of development, resulting in an increase of approximately 1,841 employees. Buildout of the Campus Plan would allow an average daily population of 9,393, which includes patients, employees, physicians, and residents. Since any new housing or residents would be associated with the hospital uses and the Specific Plan would not allow new development of market-rate, for-sale housing or rental housing that is not part of campus operations, the project would have no impact on service ratios (Jacob 2016). However, City of Hope generates periodic calls for law enforcement services. Calls for service are expected to increase commensurate with the increase in growth on the project site (Jacob 2016). With the continued support of 24-hour security on the City of Hope campus it is expected that LACSD would continue to provide adequate service ratios and response times to the project site.

The large majority of proposed development under the Campus Plan would be in the City of Duarte. The largest single structure proposed in the Campus Plan in the City of Irwindale would be a parking structure near the northeast corner of the campus (see Figure 3-5, *Illustrative Site Plan*). The remaining uses proposed within the Infrastructure and Utility District do not generate a significant number of employees or result in a significant increase in demands for police service. Thus, it is not anticipated that Campus Plan buildout would require the Irwindale Police Department to build a new or expanded police facility.

In addition to police services provided by Duarte and Irwindale, City of Hope has a security department that provides safety, security, crime prevention and emergency response services for City of Hope main campus, 24 hours a day, seven days a week. The armed patrol division works closely and cooperatively with local agencies on issues of mutual concern by sharing information as needed. City of Hope patrol division will investigate reports in a timely manner and conduct impartial investigations. Any crimes will be reported to LACSD or IPD. The department is a hybrid department composed of both in-house staff members and contracted officer from G4S Solutions. City of Hope officers include 31 staff members. They provide a safe and secure campus environment by performing security, parking enforcement, traffic control and responding to calls for service. City of Hope is required to maintain security service levels established at the time of Specific Plan adoption (Section 6.5 of the City of Hope Master Plan).

Buildout of the Campus Plan with the existing security in place would not result in a significant impact to police services. Impacts are less than significant.

5.12.2.4 CUMULATIVE IMPACTS

The area considered for cumulative impacts is the service area of the Irwindale Police Department and LACSD Temple Station, which includes the cities of Duarte, Bradbury, Rosemead, South El Monte, and Temple City; and unincorporated areas of Los Angeles County near those cities. Over the buildout period of the Campus Plan, other projects in the Irwindale Police Department and Temple Station's service areas would develop additional structures housing increased numbers of residents and workers, thus generating increased demands for police services.

Buildout of the Campus Plan in combination with continued growth and intensification of land uses in the Duarte Satellite Station and Irwindale service areas would contribute to a cumulative impact on their resources and operations. Such increased demands are expected to require additional deputies, civilian personnel, and equipment, including vehicles, weaponry, communications equipment, and office furniture. Additional staff and resources would eventually require expansion of the Duarte Satellite Station (Jacob 2016). Other projects would generate increased tax revenues to cities and Los Angeles County. Some of those revenues would be available to fund construction of new or expanded Sheriff's stations; purchase additional equipment; and/or hire additional staff. Nevertheless, City of Hope has a security department that provides safety, security, crime prevention and emergency response services for the City of Hope campus, 24 hours a day, seven days a week, thus reducing demands on local law enforcement. Under the Campus Plan, City of Hope would, at a minimum, maintain its security services at current levels throughout the buildout of the project. This would ensure that the increase in development and population at the campus would not itself require expansion of LACSD facilities. Further, similar to the Campus Plan, each of the cumulative projects would be subject to review from the applicable law enforcement agency and would be required to comply with all applicable safety requirements of the law enforcement agency and the applicable city in order to adequately address police protection service demands. As a result, cumulative impacts to law enforcement services would not be cumulatively considerable and would be less than significant.

5.12.2.5 EXISTING REGULATIONS

No regulations govern law enforcement facilities.

5.12.2.6 LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Upon implementation of regulatory requirements, Impact 5.12-2 would be less than significant.

5.12.2.7 MITIGATION MEASURES

Project Design Features (PDFs)

The following project design features (PDF) would contribute to reducing impacts related to police protection services associated with the proposed project:

- City of Hope is required to maintain security service levels to that provided at the time of Specific Plan adoption (Section 6.5 of the City of Hope Master Plan).

Mitigation Measures

No mitigation measures are required.

5.12.2.8 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Impacts would be less than significant.

5.12.3 Other Services

5.12.3.1 ENVIRONMENTAL SETTING

School Services

Regulatory Background

California State Assembly Bill 2926: School Facilities Act of 1986

To assist in providing school facilities to serve students generated by new development, Assembly Bill (AB) 2926 (California Government Code Sections 66000 et seq.) was enacted in 1986 and authorizes a levy of impact fees on new residential and commercial/industrial development. The bill was expanded and revised in 1987 through the passage of AB 1600, which added Sections 66000 et seq. to the Government Code. Under this statute, payment of impact fees by developers serves as CEQA mitigation to satisfy the impact of development on school facilities.

California Senate Bill 50

Senate Bill (SB) 50 (California Government Code Section 65996), passed in 1998, provides a comprehensive school facilities financing and reform program and enables a statewide bond issue to be placed on the ballot. Under the provisions of SB 50, school districts are authorized to collect fees to offset the costs associated with increasing school capacity as a result of development and related population increases. The funding goes to acquiring school sites, constructing new school facilities, and modernizing existing school facilities. SB 50 establishes a process for determining the amount of fees developers will be charged to mitigate impacts. According to Section 65996 of the California Government Code, development fees authorized by SB 50 are deemed to be "full and complete school facilities mitigation."

Under this legislation, three levels of developer fees may be imposed upon new development by the governing school district. Level I fees are assessed based upon the proposed square footage of residential, commercial/industrial, and/or parking structure uses. Level II fees require the developer to provide one-half of the costs of accommodating students in new schools, and the state provides the remaining half. To qualify for Level II fees, the governing board of the school district must adopt a School Facilities Needs Analysis and meet other prerequisites in accordance with Section 65995.6 of the California Government Code. Level III fees apply if the state runs out of bond funds, allowing the governing school district to impose 100 percent of the cost of school facility or mitigation on the developer, minus any local dedicated school monies.

Duarte Unified School District

The Duarte Unified School District (DUSD) spans 23 square miles including the City of Duarte, the City of Bradbury, part of the City of Irwindale, some unincorporated Los Angeles County area southwest of the City of Duarte; and unincorporated Los Angeles County area in the San Gabriel Mountains north of the cities of Duarte and Bradbury. The District had population of about 27,729 counted in the 2010 US Census (US Census Bureau 2016a). DUSD operates five elementary schools, one intermediate school, one high school, one continuation high school. Districtwide enrollment in the 2015-16 school year was 3,853 (CDE 2016a).

A charter school for grades 7-12, California School of the Arts-San Gabriel Valley – a partnership between DUSD and the Orange County School of the Arts – is scheduled to open on DUSD's current Northview Intermediate School campus in the 2017-18 school year (DUSD 2016).

Library Services

Library services are provided to the project site by the Los Angeles County Public Library at the Duarte Library at 1301 Buena Vista Street, about 0.4 mile north of the project site.

5.12.3.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

PS-1 Result in a substantial adverse physical impact associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for school services.

5.12.3.3 ENVIRONMENTAL IMPACTS

Impact 5.12-3: The proposed project would not generate new residents that would impact school or library facilities or services. [Threshold PS-1]

Impact Analysis:

School Services

Buildout of the Campus Plan would allow an average daily population of 9,393, which includes patients, employees, physicians, and residents. Any new housing or residents would be associated with the hospital uses and the Specific Plan would not allow new development of market-rate, for-sale housing or rental housing that is not part of campus operations. Project impacts on school, library or other population driven public services could result in an indirect impact if employment generation due to project buildout attracted substantial numbers of new workers into the region, inducing substantial population growth. Implementation of the proposed Campus Plan would result in the creation of approximately 1,841 new long-term jobs (see Table 3-3). As described in Section 5.11, *Population and Housing*, of this DEIR, the proposed Campus Plan is not expected to induce substantial population growth. As stated, it is expected that the jobs would be filled by workers in the region. Since growth associated with the proposed project would be driven by an increase in employees, no new students would be generated and the project would not place additional demands on school facilities.

Pursuant to AB 2926 and SB 50, DUSD may charge City of Hope developer fees for projects developed under the Campus Plan based on student generation rates for commercial and industrial uses even if little or no population increase is assumed, and City of Hope would be required to pay such fees. Developer fees per

SB 50 would reduce any indirect impact on school facilities that might be caused by Campus Plan buildout, and impacts would be less than significant.

Library Services

Impacts to library services would be less than significant for the same reasons explained in the analysis of impacts on school facilities above. Many of the jobs generated by the project are expected to be taken by people who live in the region. Furthermore, people who work at City of Hope live throughout the San Gabriel Valley and people generally tend to visit libraries closer to their homes rather than those near their workplace. Thus, no substantial impact to any one library or library service provider would occur. Impacts would be less than significant.

5.12.3.4 CUMULATIVE IMPACTS

No project level impacts to school or library services would occur, therefore, the project would not combine with other projected growth in the region to cause significant cumulative impacts. No significant cumulative impacts would occur.

5.12.3.5 EXISTING REGULATIONS

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to schools and were described in detail in Sections 5.12.3.1 of this DEIR and are listed below.

State

- California State Assembly Bill 2926: School Facilities Act of 1986
- California Government Code Section 65996: Senate Bill 50
- California Government Code Sections 66000 et seq.: School Facilities Act of 1986

5.12.3.6 LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Upon implementation of regulatory requirements, Impact 5.12-3 would be less than significant.

5.12.3.7 MITIGATION MEASURES

No mitigation measures are required.

5.12.3.8 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Impacts would be less than significant.

5.12.4 References

California Department of Education (CDE). 2016b, October 17. California School Directory. http://www.cde.ca.gov/re/sd/.

California Department of Education (CDE). 2016a, October 14. Dataquest. http:// http://dq.cde.ca.gov/dataquest/.

California Department of Finance (CDF). 2016, May. E-5 Population and Housing Estimates for Cities, Counties, and the State, January 2011- 2016. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/documents/E-5_2016_InternetVersion.xls.

California State Library (CSL). 2016, October 17. California Public Library Outlets. http://www.batchgeo.com/map/capublibs.

Duarte Unified School District (DUSD). 2016, October 14. California School of the Arts-San Gabriel Valley to Open in Duarte USD. http://www.duarte.k12.ca.us/site/default.aspx?PageType=3&DomainID=4&ModuleInstanceID=251&ViewID=047E6BE3-6D87-4130-8424-D8E4E9ED6C2A&RenderLoc=0&FlexDataID=5562&PageID=1.

International Association of Chiefs of Police (IACP). 2015, October 8. Perspectives: Police Officer to Population Ratios: Bureau of Justice Statistics Data. http://www.theiacp.org/portals/0/pdfs/Officer-to-Population-Ratios.pdf.

International City/County Management Association (ICMA). 2013, November 21. An Analysis of Police Department Staffing: How Many Officers do You Really Need? http://icma.org/en/icma/knowledge_network/documents/kn/Document/305747/How_many_officers_do_you_really_need.

Irwindale, City of. 2015, June 30. Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2015, City of Irwindale, California. http://www.irwindaleca.gov/ArchiveCenter/ViewFile/Item/85.

———.2016, April. Irwindale Materials Recovery Facility and Transfer Station Project Final Environmental Impact Report (SCH No. 2013051029), City of Irwindale, Los Angeles County, California.

Jacobs, Coronne (Captain). 2016, August 25. Written response to service questionnaire. Los Angeles County Sheriff's Department.

Johnson, Kevin (Acting Chief, Forestry Division). 2016, September 9. Written response to service questionnaire. Los Angeles County Fire Department.

Los Angeles County Economic Development Corporation (LAEDC). 2016, May. San Gabriel Valley Economic Forecast and Regional Overview 2016. http://laedc.org/wp-content/uploads/2016/05/SGV_FINAL_20160508.pdf.

Reed, Spencer (Senior Transportation Engineer). 2016, October 17. Email. Fehr & Peers.

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Southern California Association of Governments (SCAG). 2016, April 7. Demographics & Growth Forecast. Appendix to 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy. http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS_DemographicsGrowthForecast.pd.

US Census Bureau (USCB). 2010, December. School District Reference Map (2010 Census): Los Angeles County, CA. Parent Sheet 6. http://www2.census.gov/geo/maps/dc10map/sch_dist/st06_ca/c06037_los_angeles/DC10SD_C06037_006.pdf.

US Census Bureau (USCB). 2016a, October 14. Table P1: Total Population: Duarte Unified School District, California. American Factfinder. http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_SF1_P1&prodType=table.

US Census Bureau (USCB). 2016b, October 14. Longitudinal Employer-Household Dynamics (LEHD). OnTheMap. http://onthemap.ces.census.gov/.

5.13 RECREATION

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for implementation of the proposed City of Hope campus to impact recreation in the City of Duarte and the City of Irwindale. The potential for adverse impacts on accessibility of recreational facilities for existing and proposed residential neighborhoods and impacts resulting from the construction of additional recreational facilities are evaluated based on current facilities and their usage.

5.13.1 Environmental Setting

5.13.1.1 REGULATORY BACKGROUND

State Regulations

Quimby Act of 1975

The Quimby Act (Government Code § 66477) gives cities and counties the authority to require developers to dedicate land as parkland, pay in-lieu fees, or both as a condition of approval for a tentative or final tract map or parcel map for a residential subdivision. Revenue generated through the Quimby Act cannot be used for operation or maintenance of existing park facilities. The Quimby Act also sets a statewide minimum standard of three acres of parkland for every 1,000 residents; if the amount of existing neighborhood and community park area exceeds that limit, the city or county may establish a higher standard. City of Duarte Development Code Section 19.82.030 establishes a standard of 2.5 acres of passive and active parks per 1,000 residents. The City of Irwindale 2020 General Plan Resource Management Element identifies a parkland standard of one acre of parkland per 2,500 residents.[1]

Local

City of Duarte Municipal Code

The municipal code identifies land use categories, development standards, and other general provisions that ensure consistency between the City's general plan and proposed projects. The following provisions from the City's municipal code focus on park and recreational facilities impacts:

- **Section 19.82.030 (Relationship of land required to population density).** This section states that the Council has found and determined that the public convenience, health, interest, safety, and welfare require that two and one-half acres of property, for each 1,000 persons residing within this City, shall be devoted to park and recreational purposes.

[1] The City of Irwindale's parkland standard is lower than those of many other jurisdictions. However, note that the 1,899-acre Santa Fe Dam Recreation Area, operated by the Los Angeles County Department of Parks and Recreation, is mostly in the City of Irwindale.

City of Irwindale General Plan Resource Management Plan

Resource Management Element Programs

- **Overview of Park Standards:** The Resource Management Plan for Irwindale promotes the protection of the environment in the City. The plan provides a Citywide approach to the utilization, conservation, and management of the City's resources. The plan consists of programs for the preservation of significant resources and standards for development in areas with identified resources. The plan also addresses parks, recreation facilities, and open space. Although the City does not have a codified parkland standard in its municipal code, the General Plan details a standard of one acre per 2,500 residents and states that the City currently exceeds the standard.
- **Parks Master Plan:** The Irwindale Park Master Plan contemplates a number of public improvements including the expansion of the library, enhancement of the learning center services, the creation of a child care facility, and expanded City Hall offices and support areas.

5.13.1.2 EXISTING CONDITIONS

City of Hope Campus

The project site contains over 10 acres of parks, landscaped gardens, and open space areas. Employees, patients, and visitors are well served by these existing amenities, including a rose garden and Japanese garden (0.5 acres), Pioneer (6.6 acres) and Heritage parks (2.9 acres), several common landscape areas, and an outdoor basketball court.

Figure 5.13-1, *Existing Parks,* shows both the existing parkland on the project site as well as the surrounding parkland in Duarte and Irwindale.

City of Duarte

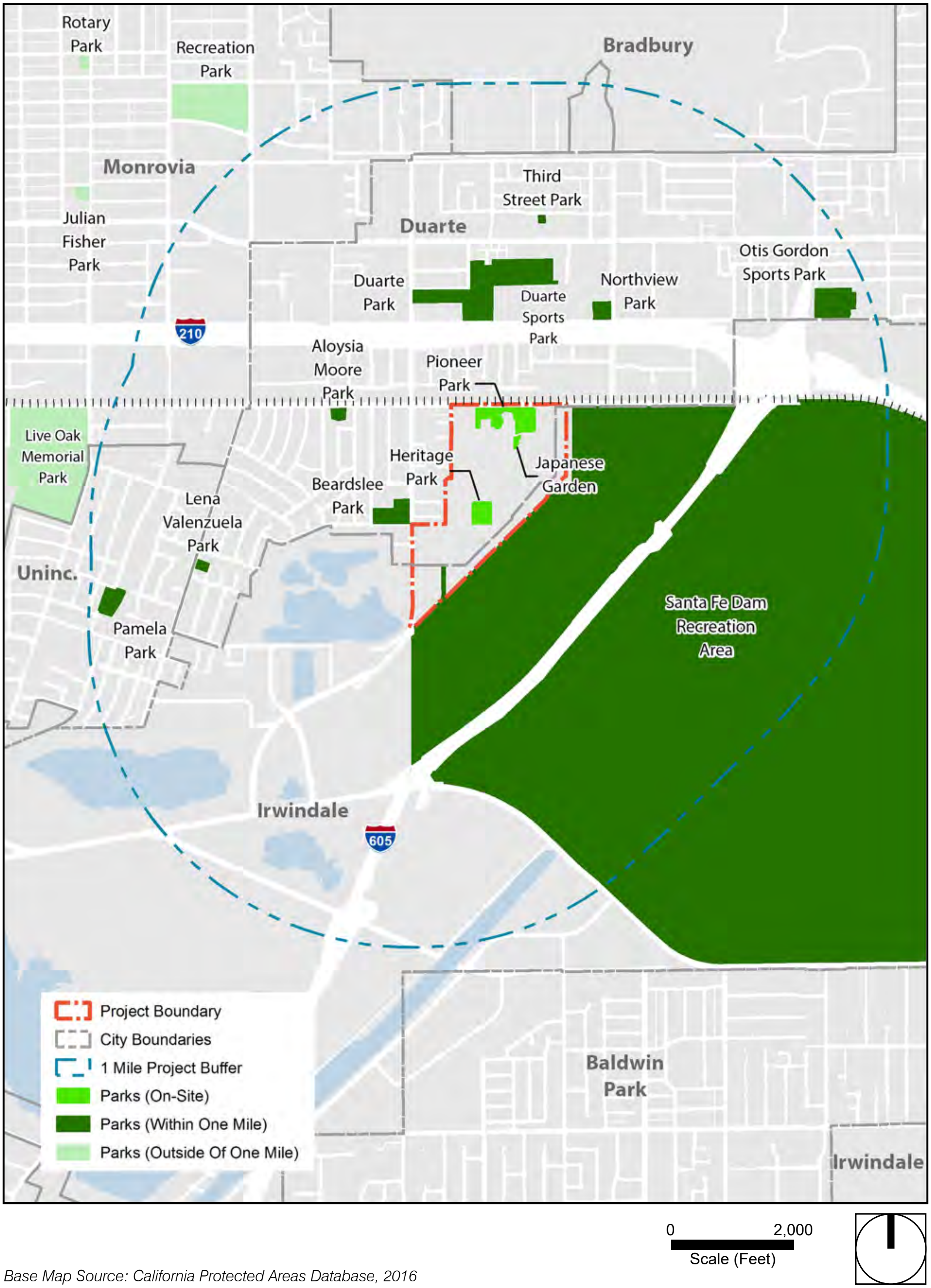
The City of Duarte owns 39.2 active park acreages and leases 26.5 acreages from the Duarte Unified School District for recreational purposes. In addition, the 18.55 acre nine-hole golf course, which is designated open space on the Duarte General Plan, is also used for recreational purposes.[2]

The City of Duarte Parks and Recreation Department is responsible for youth sports, adult sports, special events, recreation classes, senior, youth and adult excursions, cultural events, senior services and programs, the Fitness Center, teen services and programs, beautification awards, aquatics, and supervised parks. The Parks and Recreation Department is also responsible for maintenance of all City facilities. This includes repairs to buildings and park sites, custodial services, supervision of activities held in City facilities, and overseeing contractual maintenance agreements (Duarte 2007).

[2] Not included as park acreage is the 70 acres and 329 acres parcels of wilderness area owned by the City of Duarte, and the 22.7 acres dedicated to the City by Attalla Ranch (Duarte 2007).

Figure 5.13-1 - Existing Parks

5. Environmental Analysis



Base Map Source: California Protected Areas Database, 2016

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Duarte Parks

The City parks detailed in Table 5.13-1 are within a one-mile radius of the project site and could serve future employees generated by the City of Hope Campus Plan.

Table 5.13-1 City of Duarte Parks Serving the Project Site

Park and Location	Acreage	Amenities
Beardslee Park 2000 Buena Vista Street Duarte, CA 91010	4.32	Picnic area, barbecue pits, playground equipment, restrooms, soccer field, amphitheater
Aloysia Moore Park 1100 Duarte Road Duarte, CA 91010	1.01	Picnic and barbecue area, playground equipment
Duarte Park 1344 Bloomdale Street Duarte, CA 91010	2.95	Multi-purpose Classroom/Camp Building, restrooms, picnic and barbecue area, lighted basketball court, playground equipment, futsal court
Duarte Sports Park 1401 Central Avenue Duarte, CA 91010	19.92	Lighted tennis courts, softball fields, skate park, basketball courts, futsal Courts
Pamela Park 2236 Goodall Avenue Duarte, CA 91010	3.05	Picnic areas, basketball court, playground
Lena Valenzuela Park 2120 Mountain Avenue Duarte, CA 91010	0.68	Picnic and barbecue area, playground equipment
Northview Park 1433 Highland Avenue Duarte, CA 91010	1.91	Multipurpose field
Otis Gordon Sports Park 2351 Central Avenue Duarte, CA 91010	6.95	Picnic and barbecue area, playground equipment, lighted softball fields
Third Street Park 1626 Third Street Duarte, CA 91010	0.33	Picnic and barbecue area, playground equipment

Source: Duarte 2016. California Protected Areas Database 2016.

Additional recreational opportunities are provided by 70-acre and 329-acre parcels of wilderness area owned by the City of Duarte; 22.7 acres dedicated to the City by Attalla Ranch; utility and floodway easements; bike, equestrian, and hiking trails; and an 18.55-acre, nine-hole golf course (Duarte 2007). According to the California Protected Areas Database, there are currently 64.99 acres of parkland in the City of Duarte, with an additional 1,260.75 acres of the Angeles National Forest and 405.27 acres of the Duarte Wilderness preserve that fall within Duarte's city limits, for a total of 1,731.01 acres of parkland within the City of Duarte (Greeninfo Network 2016).

Duarte Parkland Standard

Based on its municipal code, the City of Duarte has a parkland standard of 2.5 acres per 1,000 residents. Duarte's current (2016) population is 22,177 persons (DOF 2016). In order to meet the City's parkland-to-population ratio, the City would need 55.4 acres of parkland. According to the General Plan, the City owns 39.2 active park acreages and leases 26.5 acreages from the Duarte Unified School District for recreational purposes, totaling 65.7 acres (Duarte 2007). Therefore, the City of Duarte is currently exceeding its parkland standard by 10.3 acres.

Irwindale Parks

According to the Irwindale General Plan, the City currently owns and maintains three parks—the 25-acre Irwindale Park, the 5-acre Jardin de Roca Park, and the 2-acre Nora Fraijo Pocket Park. In addition to these three parks, the Los Angeles County Parks and Recreation Department leases 650 acres of the Santa Fe Dam Recreation Area for public recreational uses. According to the California Protected Areas Database, there are currently 15.08 acres of parkland in Irwindale, with an additional 1,784.65 acres of the Santa Fe Dam and Recreation Area that fall within Irwindale's city limits, for a total of 1,799.73 acres of parkland in Irwindale.

As shown in Table 5.13-1, all parks within a one-mile radius of the project site are in Duarte. No parks designated by the Irwindale Recreation Department are within a one-mile radius of the project site, and thus would likely not serve new employees generated by the City of Hope Campus Plan.

Irwindale Parkland Standard

As stated above, the City of Irwindale does not have a codified parkland standard in its municipal code; however, its General Plan includes a parkland standard of one acre per 2,500 residents (Irwindale 2008). Irwindale's current (2016) population is 1,415 persons (DOF 2016). In order to meet the City's parkland-to-population ratio, the City would need 0.57 acre of parkland. According to the General Plan, the City owns 32 active park acreages and would have access to 650 acres of the Santa Fe Dam Reservoir Area leased by the Los Angeles County Parks and Recreation Department for recreational purposes. Therefore, the City of Irwindale is currently exceeding its parkland standard.

5.13.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project:

R-1 Would increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

R-2 Includes recreational facilities or requires the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant:

- Threshold R-2: The Campus Plan does not propose development of new or expanded recreational facilities.

This impact will not be addressed in the following analysis.

5.13.3 Environmental Impacts

Methodology

Generally, a project is determined to have a potentially significant impact on recreation if the project does not meet a jurisdiction's parkland standard at the project-level, either through dedication of parkland or payment of in-lieu fees.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.13-1: Implementation of Campus Plan would generate additional employees that would increase the use of existing park and recreational facilities. [Threshold R-1]

Impact Analysis: As stated above, the City of Duarte has a parkland standard of 2.5 acres per 2,500 residents and the City of Irwindale as a parkland standard of 1.0 acres per 2,500 residents. The City of Duarte is mostly built out, hindering its ability to acquire and develop additional parkland. According to the certified General Plan EIR for the 2007 City of Duarte Comprehensive General Plan 2005–2020, there is adequate parkland (55.21 acres) to meet the minimum recommendation.

Implementation of the proposed Campus Plan would result in the creation of approximately 1,841 new long-term jobs (see Table 3-3)[3]. As described in Section 5.11, *Population and Housing*, of this DEIR, the proposed Campus Plan is not expected to induce substantial population growth. Therefore, the cities of Duarte and Irwindale would continue to meet and exceed their parkland standards at Campus Plan buildout.

The City of Hope Campus Plan would not result in damage to existing parks and recreational facilities and would not result in the removal of any parkland from Duarte or Irwindale. The Campus Plan is being designed with a goal to strengthen the relationship between City of Hope and Duarte and Irwindale residents. This includes a vision to create new open spaces throughout the campus in the proposed Cultural Amenity District, creating greater connectivity to and preservation of the existing Rose Garden, Pioneer Park, Cooper Auditorium, Visitor Center, Arthur & Rosalie Kaplan Family Pavilion, and the historic La Kretz House of Hope on campus. The Campus Plan would preserve long-term open space areas and implement extensive landscaping throughout the campus. The proposed open space would be a key feature of the campus, offering employees, visitors, and local residents areas to relax, gather, and exercise. Additionally, the proposed Specific Plan's landscape guidelines would incorporate sustainable site design practices and focus on enhancing and improving landscaping features throughout the City of Hope campus. No impacts would occur.

[3] The number of existing and projected long-term jobs includes full-time and part-time employees at the campus; this does not include contractors or physicians.

5.13.4 Cumulative Impacts

To determine the cumulative public park and recreational impacts, citywide growth forecasts are considered. Based on the Southern California Association of Governments' 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy, the City of Duarte would have approximately 8,200 households in 2040, and the City of Irwindale would have approximately 500 households in 2040 (SCAG 2016). This would be an increase of approximately 863 households over 2016 conditions for the City of Duarte, and an increase of approximately 111 households over 2016 conditions for the City of Irwindale (7,337 Duarte housing units, 389 Irwindale housing units; DOF 2016). During this time, the City of Duarte population is anticipated to increase from the City's estimated 2016 population of 22,177 persons (DOF 2016) to approximately 24,300 persons in 2040 (SCAG 2016). During this same time period, the City of Irwindale population is anticipated to increase from the City's estimated 2016 population of 1,415 persons (DOF 2016) to approximately 2,000 persons in 2040 (SCAG 2016).

Based on the cities' parkland standard and the anticipated population growth through 2040, 5.3 acres of parkland would be needed in Duarte and 0.6 acres would be needed in Irwindale. Both cities currently have enough parkland to meet the need of future development in the cities. Furthermore, implementation of the Campus Plan would not result in a population increase and therefore would not contribute to any cumulative impacts to meeting the parkland standards within the City of Duarte and the City of Irwindale. The parkland already included within the City of Hope project site would not only be important for serving the project site, but also as part of the Cities' overall goal of providing sufficient park space for its residents. Therefore, cumulative impacts related to parks and recreational facilities would be less than significant.

5.13.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to recreation and were described in detail in Sections 5.13.1.1 of this DEIR and are listed below.

- Quimby Act (California Government Code Section 66477

5.13.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impact would be less than significant: 5.13-1.

5.13.7 Mitigation Measures

No mitigation measures are required.

5.13.8 Level of Significance After Mitigation

Impacts are less than significant.

5.13.9 References

Department of Finance (DOF). 2016, May. E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2016 with 2010 Census Benchmark. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/.

Duarte, City of. 2007, August 14. Open Space and Conservation Element. City of Duarte General Plan. http://www.accessduarte.com/civicax/filebank/blobdload.aspx?BlobID=22816.

———. 2016, October 25. Parks and Recreation: City Parks. http://www.accessduarte.com/dept/parks_and_recreation/parks/default.htm.

Greeninfo Network. 2016, October 25. California Protected Areas Database. http://www.calands.org/map.

Irwindale, City of. 2008, June. City of Irwindale 2020 General Plan. http://ci.irwindale.ca.us/DocumentCenter/View/38.

Southern California Association of Governments. 2016, April 7. Final 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): A Plan for Mobility, Accessibility, Sustainability, and a High Quality of Life. http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx.

———. 2016, April. Demographics and Growth Forecast (2016–2040 RTP/SCS). http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS_DemographicsGrowthForecast.pdf.

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5.14 TRANSPORTATION AND TRAFFIC

This section of the draft environmental impact report (DEIR) evaluates the potential for implementation of the City of Hope Campus Plan (proposed project) to result in transportation and traffic impacts in the Cities of Duarte and Irwindale. The study area is described in Section 5.14.1.2 below and shown in Figure 5.14-1. The methodology for determining traffic impacts is provided in Section 5.14.3.1 of this DEIR. The analysis in this section is based in part on the following technical report(s):

- Transportation Impact Study for the City of Hope, Fehr & Peers, April 2017

A complete copy of the Transportation Impact Study for the City of Hope Campus Plan is in Appendix J1 to this DEIR.

5.14.1 Environmental Setting

5.14.1.1 REGULATORY FRAMEWORK

This section summarizes state and local laws, regulations, plans, or guidelines that are potentially applicable to the proposed project.

State

Assembly Bill 1358: The California Complete Streets Act

The California Complete Streets Act (AB 1358) of 2008 was also signed into law on September 30, 2008. Beginning January 1, 2011, AB 1358 requires circulation elements to address the transportation system from a multimodal perspective. The bill states that streets, roads, and highways must "meet the needs of all users in a manner suitable to the rural, suburban, or urban context of the general plan." Essentially, this bill requires a circulation element to plan for all modes of transportation where appropriate, including walking, biking, car travel, and transit.

The Complete Streets Act also requires circulation elements to consider the multiple users of the transportation system, including children, adults, seniors, and the disabled. AB 1358 tasks the Governor's Office of Planning and Research (OPR) to release guidelines for compliance, which are so far undeveloped.

Sustainable Communities and Climate Protection Act

The Sustainable Communities and Climate Protection Act of 2008 or Senate Bill (SB) 375 was signed into law on September 30, 2008. The SB 375 regulation provides incentives for cities and developers to bring housing and jobs closer together and to improve public transit. The goal behind SB 375 is to reduce automobile commuting trips and length of automobile trips, thus helping to meet the statewide targets for reducing greenhouse gas emissions set by AB 32.

SB 375 requires each metropolitan planning organization to add a broader vision for growth, called a "Sustainable Communities Strategy" (SCS), to its transportation plan. The SCS must lay out a plan to meet

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the region's transportation, housing, economic, and environmental needs in a way that enables the area to lower greenhouse gas emissions. The SCS should integrate transportation, land-use, and housing policies to plan for achievement of the emissions target for their region. On April 7, 2016, the Southern California Association of Governments' (SCAG) Regional Council adopted the 2016-2040 Regional Transportation Plan/ Sustainable Communities Strategy (2016 RTP/SCS).

Senate Bill 743

The legislature found that with the adoption of the SB 375, the state had signaled its commitment to encourage land use and transportation planning decisions and investments that reduce vehicle miles traveled (VMT) and thereby contribute to the reduction of greenhouse gas emissions (GHG), as required by the California Global Warming Solutions Act of 2006 (Assembly Bill [AB 32]). Additionally, AB 1358, described above, requires local governments to plan for a balanced, multimodal transportation network that meets the needs of all users.

On September 27, 2013, SB 743 was signed into law. SB 743 started a process that could fundamentally change transportation impact analysis as part of CEQA compliance. These changes will include the elimination of auto delay, level of service (LOS), and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts in many parts of California (if not statewide). As part of the new CEQA Guidelines, the new criteria "shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses" (Public Resources Code Section 21099(b)(1)). In addition, a project's aesthetic and parking impacts will no longer be considered significant impacts on the environment if the project is a residential, mixed-use residential, or employment center project located on an infill site within a transit priority area.

OPR is in the process of developing alternative metrics and thresholds based on VMT. OPR has published the final draft of changes to the CEQA Guidelines, which will require certification and adoption by the California Secretary for Natural Resources before they go into effect. This may take several months depending on the input received during the review process. Once the guidelines are prepared and certified, "automobile delay, as described solely by level of service of similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment" (Public Resources Code Section 21099(b)(2)). Certification and implementation of the guidelines are expected in late 2017. Since OPR has not yet amended the CEQA Guidelines to implement this change, automobile delay is still considered a significant impact, and the Cities of Duarte and Irwindale will continue to use the established LOS criteria. The legislation does not preclude the application of local general plan policies, zoning codes, conditions of approval, or any other planning requirements. While the regulations of SB 743 regarding determination of impacts have not been finalized or adopted at this time, the analyses was provided for informational purposes and to address Caltrans' Local Development Intergovernmental Review Program Interim Guidance.

Figure 5.14-1 - Study Area Intersection Analysis Locations

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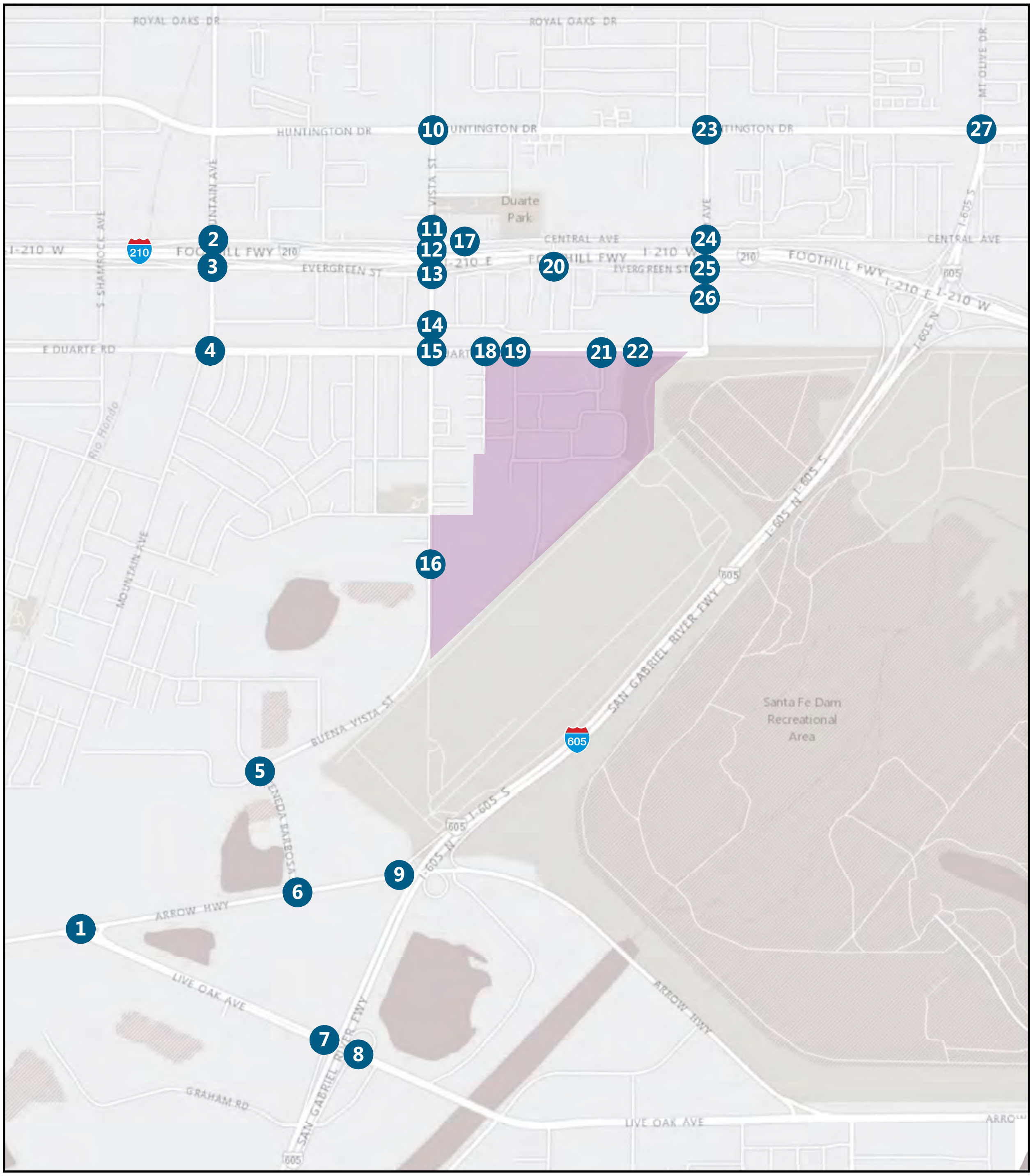

Study Intersection

Project Site

0 2,000
Scale (Feet)

Base Map Source: Fehr & Peers, 2016

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Department of Transportation

Caltrans, the California Department of Transportation, is charged with planning and maintaining state routes, highways, and freeways. Caltrans is the owner/operator for I-210, I-605, and I-10 in the study area. Caltrans has developed transportation impact analysis guidelines for use when assessing state facilities, "Guide for the Preparation of Traffic Impact Studies".

Regional and Local

SCAG's 2016 RTP/SCS

Every four years, SCAG updates the RTP for the six-county region that includes Los Angeles, San Bernardino, Riverside, Orange, Ventura, and Imperial counties. Current and recent transportation plan goals generally focus on balanced transportation and land use planning that:

- Maximize mobility and accessibility for all people and goods in the region.
- Ensure travel safety and reliability for all people and goods in the region.
- Preserve and ensure a sustainable regional transportation system.
- Maximize the productivity of our transportation system.
- Protect the environment and health of residents by improving air quality and encouraging active transportation (e.g., bicycling and walking).
- Encourage land use and growth patterns that facilitate transit and active transportation.

Los Angeles County Metropolitan Transportation Authority

Los Angeles County Metropolitan Transportation Authority (Metro) serves as transportation planner and coordinator, designer, builder, and operator for Los Angeles County. Metro funds improvements to all modes of transportation through several programs, including the Transportation Improvement Program, the Congestion Management Program, and Bicycle Transportation Strategic Plan. Metro operates rail and bus transit services throughout Los Angeles County, including the Cities of Duarte and Irwindale.

Los Angeles County Congestion Management Program

In 2010, the County of Los Angeles updated its Congestion Management Program (CMP) to assess the overall performance of the highway system, which provides quantitative input for funding improvements and programs. This is the eighth CMP adopted for Los Angeles County since the requirement became effective with the passage of Proposition 111 in 1990. The CMP covers approximately 500 miles of freeway facilities, which are divided into 81 key segment pairs (eastbound/westbound or northbound/southbound). The traffic operations at each segment are evaluated every two years by Caltrans and published in the CMP. The CMP arterial streets in Duarte consist of the intersection of Azusa Avenue & Foothill Boulevard. The CMP mainline freeway monitoring stations closest to the project site are I-210 at Highland Avenue and I-605 at Rivergrade Road.

The county's traffic congestion management policy is intended to determine appropriate transportation planning actions in response to a particular level of service (LOS). However, a particular level of service at an intersection does not necessarily preclude additional development at or around that intersection. Instead, the local agency responds with a three tiered approach that emphasizes:

1. Managing speeds and motorist behavior at intersections with high LOS.
2. Reviewing traffic growth patterns when congestion begins to appear and planning for appropriate ways to address additional congestion.
3. Taking steps to manage congestion, including moving from intersection-specific metrics to LOS for an entire corridor.

City of Duarte

The Circulation Element establishes a program that is intended to provide a balanced transportation/circulation system that will support the anticipated growth in local and regional land uses. The Circulation Element outlines the goals, objectives, and policies for meeting Duarte's existing and future transportation needs and describes the future circulation system needed to support the Land Use Element. The goals and objectives of this circulation element include the following:

- To provide a sustainable, convenient, efficient, and cost effective circulation system to serve the present and future transportation needs of the Duarte community.
- Maintain the existing transportation infrastructure in Duarte and upgrade the system when appropriate to improve traffic conditions through enhanced traffic control measures, roadway improvements, and effective planning for new development.
- To protect local residential neighborhoods from the impacts of through traffic and trucks.
- Minimize the intrusion of through traffic, commuter traffic, and/or trucks on local streets in residential neighborhoods.
- To increase the use of alternative modes of transportation for traveling to, from, or through Duarte.
- Encourage and promote the use of travel modes other than the single occupancy vehicle, such as bus transit, rail transit, carpools, vanpools, bicycling, and walking.

City of Irwindale

The City of Irwindale Infrastructure Element of the Irwindale General Plan includes the Circulation Element. This Element will guide the ongoing development of the City's roadway system in a manner that is compatible with the Community Development Element. This section of the Element considers the following:

- Regional Access - briefly describes the regional transportation systems that serve the City;
- Existing Traffic Volumes - briefly describes the daily and peak hour traffic volumes for key roadways in the City
- Characteristics of City Streets - provides a descriptive overview of those roadways that are located in the City.
- Levels of Service - indicates the operational levels of service for key roadways segments and intersections in the City
- Truck Routes, Bridges, and Public Transit - are briefly discussed in their respective sections
- Infrastructure - describes those utility and service purveyors that serve the City.

5.14.1.2 EXISTING ROADWAY NETWORK

The study area consists of roadways within the cities of Duarte, Irwindale, and Monrovia, and Caltrans facilities. Major streets serving the study area include Huntington Drive, Central Avenue, Duarte Road, and Arrow Highway in the east-west direction and Mountain Avenue, Buena Vista Street, and Highland Avenue in the north-south direction. Regional access to and from the study area is provided by the I-210 Freeway a quarter mile north and I-605 Freeway about a half mile east and south of the project site. The characteristics of analyzed streets serving the study area are listed below. The street descriptions include the existing designation under the current City of Duarte General Plan Circulation Element.

- **I-210** runs in an east-west direction north of the project site and extends from I-5 in the west to San Bernardino in the east. I-210 provides four general travel lanes and one high-occupancy vehicle (HOV) lane in each direction within the study area. A number of interchanges are provided between Mountain Avenue and Buena Vista Street in the study area.
- **I-605** runs generally in a north-south direction east and south of the project site and extends from Huntington Drive in Duarte in the north to I-405 Freeway in the south. The Freeway provides four general travel lanes in each direction within the study area. The project site may be accessed via I-605 to the south at Arrow Highway and Live Oak Avenue and to the east at the I-210/I-605 interchange. I-605 terminates at Huntington Drive in the City of Duarte.
- **Huntington Drive** is an arterial street that runs through the northern portion of the study area. Huntington Drive provides two travel lanes in each direction with a median and left-turn pockets through

the corridor. Generally, the street allows parking on both sides of the roadway with a posted speed limit of 40 miles per hour.

- **Central Avenue** is a collector street that runs parallel to and north of I-210. The street generally provides one travel lane in each direction and access to the I-210 ramps. The corridor allows parking on both sides of the roadway and the posted speed limit is 35 miles per hour.

- **Evergreen Street** is a local street that runs parallel to and south of the I-210. The street provides two travel lanes in the eastward direction with access to I-210 between Mountain Avenue and Buena Vista Street and no parking is allowed. The street provides one lane in each direction between Buena Vista Street and Highland Avenue with parking allowed on the south side of the street and limited parking on the north side of the street. The posted speed limit is 35 miles per hour.

- **Business Center Drive** is a local street that runs north of the project site. The street provides one travel lane in each direction, parking on both sides of the street, and a posted speed limit of 25 miles per hour.

- **Three Ranch Road** is a local street that runs just north of the project site through residential neighborhoods. The street provides one travel lane in each direction and allows parking on both sides of the street.

- **Duarte Road** is an arterial street that runs directly north of the project site. The street provides two travel lanes in each direction with a median and left-turn pockets throughout the corridor. Parking is generally allowed on both sides of the street, except near the project site where it is restricted to two hours and the posted speed limit is 40 miles per hour.

- **Arrow Highway** is an arterial street that runs in the southern portion of the study area. The street provides two or three travel lanes in each direction with a median and left-turn pockets. Parking is generally allowed along the corridor and the posted speed limit is 40 miles per hour.

- **Live Oak Avenue** is an arterial street that runs in the southern portion of the study area. The street provides two or three travel lanes in each direction with a median and left-turn pockets. Parking is generally prohibited and the posted speed limit is 45 miles per hour.

- **Mountain Avenue** is an arterial street that runs in the western portion of the study area. The street provides two travel lanes in each direction north of Duarte Road and one travel lane in each direction south of Duarte Road. Mountain has a center turn lane. Parking is generally allowed on both sides of the street and the posted speed limit is 40 miles per hour.

- **Buena Vista** is an arterial street that runs through the center of the study area. The street provides two travel lanes in each direction and has parking on both sides of the street south of Duarte Road and 3-hour parking limits north of I-210 on both sides of the street. The posted speed limit is 35 miles per hour.

- **Bateman Avenue/Avenida Barbosa** are local streets that run in the southern portion of the study area. Bateman provides one travel lane in each direction and allows parking on both sides of the street. Avenida Barbosa provides two travel lanes in each direction and does not allow parking.

- **Cinco Robles Drive** is a local street west of the project site. The street provides one travel lane in each direction and allows parking on both sides of the street.

- **Village Road** is a private drive that runs through the project site between Duarte Road and Buena Vista Street and provides access to many of the site's parking lots. The street provides one travel lane in each direction and no parking is allowed.

- **Duncannon Avenue** is a local street that runs north of the project site. The street provides one travel lane in each direction and parking is allowed on both sides of the street.

- **Hope Drive** is a private drive that runs through the project site between Duarte Road and Ben Horowitz Drive. The street provides access to the project parking lots with two travel lanes in the south direction and one travel lane in the north direction and no parking is allowed.

- **Circle Road** is a private driveway that provides access to the site.

- **Highland Avenue** is an arterial street that runs northeast of the project site. The street provides two travel lanes in each direction and has parking on both sides of the street. The posted speed limit is 35 miles per hour.

- **Mt. Olive Drive** is a collector street that runs north from the I-605 terminus. The street provides one travel lane is the north direction and two travel lanes in the south direction. Parking is allowed on the west side of the street and is restricted on the east of the street. The posted speed limit is 35 miles per hour.

The project site is within the Cities of Duarte and Irwindale off of Duarte Road. The study area selected for analysis extends to Mountain Avenue to the west, Huntington Drive to the north, I-605 to the east, and Live Oak Avenue to the north. The streets in the study area are under the jurisdictions of the cities of Duarte, Irwindale, and Monrovia. The study area also contains the I-210 and I-605 Freeways, which are under the jurisdiction of the Caltrans. The study area consists of major intersections along Live Oak Avenue, Mountain Avenue, Buena Vista Street, Duarte Road, and the I-210 ramps. In consultation with City staff, 27 study intersections were identified for analysis; these intersections are shown on Figure 5.14-1, *Study Area Intersection Analysis Locations*, and listed below.

1. Live Oak Avenue & Arrow Highway (City of Irwindale)
2. Mountain Avenue & Central Avenue (City of Duarte/ Monrovia)
3. Mountain Avenue & Evergreen Street (City of Duarte/ Monrovia)
4. Mountain Avenue & Duarte Road (City of Duarte/ Monrovia)

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5. Buena Vista Street & Bateman Avenue/Avenida Barbosa (City of Irwindale)
6. Avenida Barbosa & Arrow Highway (City of Irwindale)
7. I-605 Southbound On-Ramp & Live Oak Avenue (City of Irwindale/Caltrans)
8. I-605 Northbound Off-Ramp & Live Oak Avenue (City of Irwindale/Caltrans)
9. I-605 Southbound Off-Ramp & Arrow Highway (City of Irwindale/Caltrans)
10. Buena Vista Street & Huntington Drive (City of Duarte)
11. Buena Vista Street & Central Avenue (City of Duarte)
12. Buena Vista Street & I-210 Westbound On-Ramp (City of Duarte/Caltrans)
13. Buena Vista Street & Evergreen Street/I-210 Eastbound On-Ramp (City of Duarte/Caltrans)
14. Buena Vista Street & 3 Ranch Road (City of Duarte)
15. Buena Vista Street & Duarte Road (City of Duarte)
16. Buena Vista Street & Village Road (City of Duarte)
17. I-210 Eastbound Off-Ramp & Central Avenue (City of Duarte/Caltrans)
18. Cinco Robles Drive & Duarte Road (City of Duarte)
19. Village Road & Duarte Road (City of Duarte)
20. Duncannon Avenue & Evergreen Street (City of Duarte)
21. Hope Drive & Duarte Road (City of Duarte)
22. Circle Road & Duarte Road (City of Duarte)
23. Highland Avenue & Huntington Drive (City of Duarte)
24. Highland Avenue & Central Avenue (City of Duarte)
25. Highland Avenue & Evergreen Street (City of Duarte)
26. Highland Avenue & Business Center Drive (City of Duarte)
27. Mt Olive Drive/I-605 Ramps & Huntington Drive (City of Duarte/Caltrans)

5.14.1.3 EXITING TRAFFIC CONDITIONS

Existing Trip Generation

Driveway counts were conducted for a 24-hour period at the five City of Hope campus driveways on a Tuesday, Wednesday, and Thursday in November 2015 (November 17, 2016 to November 19, 2015). The AM and PM peak hours were determined for the entire site for each day counted. The AM and PM peak hours for each day were averaged to determine the AM and PM peak hour trip generation for the existing City of Hope campus.

The driveway counts indicate that the City of Hope campus generates 11,929 daily trips, 1,290 trips (1,122 inbound/168 outbound) during the AM peak hour, and 1,161 trips (186 inbound/975 outbound) during the PM peak hour. The average daily population at the time of the driveway counts (including inpatients, outpatients, full-time employees, part-time employees, contractors, physicians, and residents) was provided by City of Hope for each of the count days. The average daily population of the City of Hope campus was determined to be approximately 6,448 persons. The resulting population translates into a vehicle trip generation rate of 1.85 daily trips per person, 0.20 AM peak hour trips per person (87 percent inbound/13 percent outbound), and 0.18 PM peak hour trips per person (16 percent inbound/84 percent outbound).

The determined trip generation accounts for the existing modal split of the City of Hope campus, and all transportation demand management programs currently enacted by City of Hope. These programs include subsidized transit passes, shuttles to and from Baldwin Park, designated carpool parking spaces, incentive programs, carpool matching, subsidized vanpools, and a Guaranteed Ride Home Program for carpoolers and van poolers. Additional detail about existing and project-related trip generation is included below in Section 5.14.3.1, Methodology.

Intersection LOS

Existing morning (6:00 to 7:00 AM) and afternoon (4:00 to 6:00 PM) peak period vehicle counts at the 27 study intersections were conducted in November 2015. Peak period counts are analyzed and included in the appendix of the traffic report (Appendix J1 of this DEIR).

The methodology utilized to calculate the intersection's LOS depended on the method of control and the city in which the intersection is located. Two different intersection LOS methodologies were used when reviewing the project's existing traffic conditions depending on the requirements of the jurisdiction that the impact occurs. These methodologies include: the Intersection Capacity Utilization (ICU) and the 2010 Highway Capacity Manual (HCM). Details about these LOS methodologies are described in detail below:

Intersection Capacity Utilization

The ICU method of intersection capacity analysis determines the intersection V/C ratio and corresponding LOS for the turning movements and intersection characteristics at signalized intersections. "Capacity" represents the maximum volume of vehicles in the critical lanes that have a reasonable expectation of passing through an intersection in one hour under prevailing roadway and traffic conditions. The ICU method calculates the V/C ratio for each critical movement by dividing volume by capacity. The V/C ratios for each critical movement are summed with an added allowance for yellow clearance to determine the total intersection V/C ratio. The total intersection V/C ratio is then matched to the appropriate LOS based on the definitions in the signalized column of Table 5.14-1. This methodology was used for signalized intersections in the jurisdictions of the City of Duarte, City of Irwindale, and City of Monrovia.

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Table 5.14-1 Intersection Level of Service Criteria

LOS	Description	Signalized ICU Value (Volume/Capacity)	Unsignalized HCM Average Total Delay (seconds/vehicle)
A	**EXCELLENT.** No Vehicle waits longer than one red light and no approach phase is fully used.	0.00–0.60	≤ 10.0
B	**VERY GOOD**. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.	0.61–0.70	> 10.0 and ≤ 15.0
C	**GOOD.** Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.	0.71–0.80	> 15.0 and ≤ 25.0
D	**FAIR.** Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.	0.81–0.90	> 25.0 and ≤ 35.0
E	**POOR.** Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.	0.91–1.00	> 35.0 and ≤ 50.0
F	**FAILURE.** Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.	>1.000	> 50.0

Sources: 1. Transportation Research Circular No. 212, Interim Materials on Highway Capacity, Transportation Research Board, 1980.
2. Highway Capacity Manual, Transportation Research Board, 2010.

Highway Capacity Manual

The HCM unsignalized intersection delay was used to determine the intersection delay in seconds and corresponding LOS for the turning movements and intersection characterizes at the unsignalized intersections. The calculation of delay represents the amount of delay experienced by vehicles passing through the intersection. The unsignalized intersections were analyzed using the all-way stop method and the 2-way stop method from the HCM 2010. Delay was calculated based on the worst-case approach (in the case of one or 2-way stop-controlled intersections), or average delay (in the case of all-way stop-controlled intersections), and used to find the corresponding LOS, as presented in the unsignalized column of Table 5.14-2. This methodology was used for unsignalized intersections in the jurisdiction of the City of Duarte and City of Irwindale.

Table 5.14-2 Existing Intersection Levels of Service

ID	Jurisdiction	N/S Street Name	E/W Street Name	Time Period	Existing Conditions			
					ICU Methodology		HCM Methodology	
					V/C	LOS	Delay	LOS
1	Irwindale	Live Oak Avenue	Arrow Highway	AM PM	1.023 0.718	F C	- -	- -
2	Duarte/Monrovia	Mountain Avenue	Central Avenue	AM PM	0.722 0.692	C B	- -	- -
3	Duarte/Monrovia	Mountain Avenue	Evergreen Street	AM PMB	0.609 0.866	B D	- -	- -
4	Duarte/Monrovia	Mountain Avenue	Duarte Road	AM PM	0.500 0.497	A A	- -	- -
5	Irwindale	Buena Vista Street	Bateman Avenue/Avenida Barbosa	AM PM	0.406 0.506	A A	- -	- -
6	Irwindale	Avenida Barbosa	Arrow Highway	AM PM	0.841 0.586	D A	- -	- -
7	Irwindale/Caltrans	I-605 Southbound On-Ramp	Live Oak Avenue	AM PM	0.528 0.783	A C	- -	- -
8	Irwindale/Caltrans	I-605 Northbound Off-Ramp	Live Oak Avenue	AM PM	- -	- -	221.3 183.2	**F** **F**
9	Irwindale/Caltrans	I-605 Southbound On-Ramp	Arrow Highway	AM PM	0.880 0.507	D A	- -	- -
10	Duarte	Buena Vista Street	Huntington Drive	AM PM	0.775 0.744	C C	- -	- -
11	Duarte	Buena Vista Street	Central Avenue	AM PM	0.579 0.621	A B	- -	- -
12	Duarte/Caltrans	Buena Vista Street	I-210 Eastbound On-Ramp	AM PM	0.397 0.550	A A	- -	- -
13	Duarte/Caltrans	Buena Vista Street	Evergreen Street	AM PM	0.537 0.679	A B	- -	- -
14	Duarte	Buena Vista Street	3 Ranch Road	AM PM	- -	- -	15.1 23.1	C C
15	Duarte	Buena Vista Street	Duarte Road	AM PM	0.664 0.731	B C	- -	- -
16	Duarte	Buena Vista Street	Village Road	AM PM	- -	- -	18.3 22.3	C C
17	Duarte/Caltrans	I-210 Westbound Off-Ramp	Central Avenue	AM PM	- -	- -	194.9 105.4	**F** **F**
18	Duarte	Cinco Robles Drive	Duarte Road	AM PM	- -	- -	22.0 20.9	C C
19	Duarte	Village Road	Duarte Road	AM PM	- -	- -	37.5 46.5	**E** **E**
20	Duarte	Duncannon Avenue	Evergreen Street	AM PM	- -	- -	7.8 7.3	A A
21	Duarte	Hope Drive	Duarte Road	AM PM	0.327 0.381	A A	- -	- -
22	Duarte	Circle Road	Duarte Road	AM PM	- -	- -	14.8 20.6	B C

Table 5.14-2 Existing Intersection Levels of Service

ID	Jurisdiction	N/S Street Name	E/W Street Name	Time Period	Existing Conditions			
					ICU Methodology		HCM Methodology	
					V/C	LOS	Delay	LOS
23	Duarte	Highland Avenue	Huntington Drive	AM PM	0.694 0.647	B B	- -	- -
24	Duarte	Highland Avenue	Central Avenue	AM PM	0.713 0.750	C C	- -	- -
25	Duarte	Highland Avenue	Evergreen Street	AM PM	- -	- -	40.2 16.8	**E** C
26	Duarte	Highland Avenue	Evergreen Street	AM PM	0.353 0.364	A A	- -	- -
27	Duarte/Caltrans	Mt Olive Drive/I-605 Ramps	Huntington Drive	AM PM	0.968 1.024	**E** **F**	- -	- -

Source: Fehr & Peers 2017.
Notes: V/C = Volume / Capacity Ratio
Intersections operating below acceptable LOS are shown in bold.

Based on the V/C and delay findings, the methodologies assign a qualitative letter grade that represents the operations of the intersection—from LOS A (minimal delay) to LOS F (excessive congestion). LOS E represents at-capacity operations. Descriptions of the LOS letter grades for signalized and unsignalized intersections are provided in Table 5.14-1.

Existing traffic volumes were analyzed to determine the projected V/C ratios, delay, and LOS for each intersection. Table 5.14-2 summarizes the existing weekday peak hour LOS. Six study area intersections operate at LOS E or worse under existing conditions. Detailed LOS calculations are provided Appendix J1.

1. Live Oak Avenue & Arrow Highway (AM peak hour)

8. I-605 Northbound Off-Ramp & Live Oak Avenue (both peak hours)

17. I-210 Westbound Off-Ramp & Central Avenue (both peak hours)

19. Village Road & Duarte Road (both peak hours)

25. Highland Avenue & Evergreen Street (AM peak hour)

27. Mt. Olive Drive/I-605 Ramps & Huntington Drive (both peak hours)

Freeway LOS

Level of service was determined using the definitions from the HCM as presented in the appendix of the Caltrans "Guide for the Preparation of Traffic Impact Studies" (note that LOS F is defined as density exceeding 45 passenger cars per mile per lane and average speed below 52.2 miles per hour). Table 5.14-3 summarizes the freeway level of service criteria, based on minimum speed and freeway density.

Table 5.14-3 Freeway Mainline and Ramp Junction Section LOS Threshold

LOS	Interpretation	Minimum Speed (mph)	Density
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	65	≤11
B	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	65	> 11 to 18
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	64.6	> 18 to 26
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	59.7	> 26 to 35
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	52.2	> 35 to 45
F	Represents a breakdown in flow.	-	> 45

Source: Highway Capacity Manual (Transportation Research Board, 2010), Fehr & Peers, 2017
Notes: Density is reported in vehicles per lane per mile (vehicle per lane per mile).
1 The maximum density for ramp junctions and weaving sections under LOS E is not defined in the HCM. The maximum density for basic segments of 45 vehicle per lane per mile was assumed to apply to ramp junctions.

Freeway mainline volume and speed data was obtained from Caltrans' Performance Measurement System (PeMS) archived traffic data for the AM and PM peak periods for Tuesdays, Wednesdays, and Thursdays in November 2015 for most segments and the data was averaged across the days. Existing conditions on the mainline segments are presented in Table 5.14-4.

For the Existing scenario, during the AM peak hour, all of the westbound analyzed segments on I-210 and I-10 operate at a congested LOS F. During the PM peak hour, both the eastbound and westbound segments on I-210, the eastbound segments on I-10, and the northbound segments on I-605 operate at LOS F. Detailed LOS calculations are provided in Appendix J1.

5. Environmental Analysis
TRANSPORTATION AND TRAFFIC

Table 5.14-4 Existing Freeway Mainline Level of Service

Location	Freeway Segment Name	Direction	AM Peak Hour			PM Peak Hour		
			Volume	LOS	Density	Volume	LOS	Density
1	I-210 w/o I-605	EB	6,332	D	27.2	4,327	F	-
		WB	3,476	F	-	4,622	F	-
2	I-210 e/o I-605	EB	6,766	D	28.3	5,824	F	-
		WB	6,153	F	-	6,261	F	-
3	I-605 s/o I-210	NB	4,465	C	18.7	4,061	F	-
		SB	5,625	C	22.3	4,574	B	17.8
4	I-10 w/o I-605	EB	5,504	C	23.1	4,932	F	-
		WB	6,478	F	-	5,869	C	24.8
5	I-10 e/o I-605	EB	4,839	C	18.9	3,125	F	-
		WB	4,416	F	-	5,500	C	23.1

Source: Fehr & Peers, 2017
Note: Density is reported in vehicles per lane per mile (volume). LOS F represents over-capacity conditions on the freeway; density cannot be accurately calculated at LOS F.
Locations operating at an average speed < 52.2 mph are defined as LOS F by the Highway Capacity Manual per the Caltrans Guide for the Preparation of Traffic Impact Studies (Dec 2002).

Public Transit

The study area is serviced by multiple public transit lines, as shown on Figure 5.14-2, *Existing Transit Service*. Transit lines in the vicinity of the project site include:

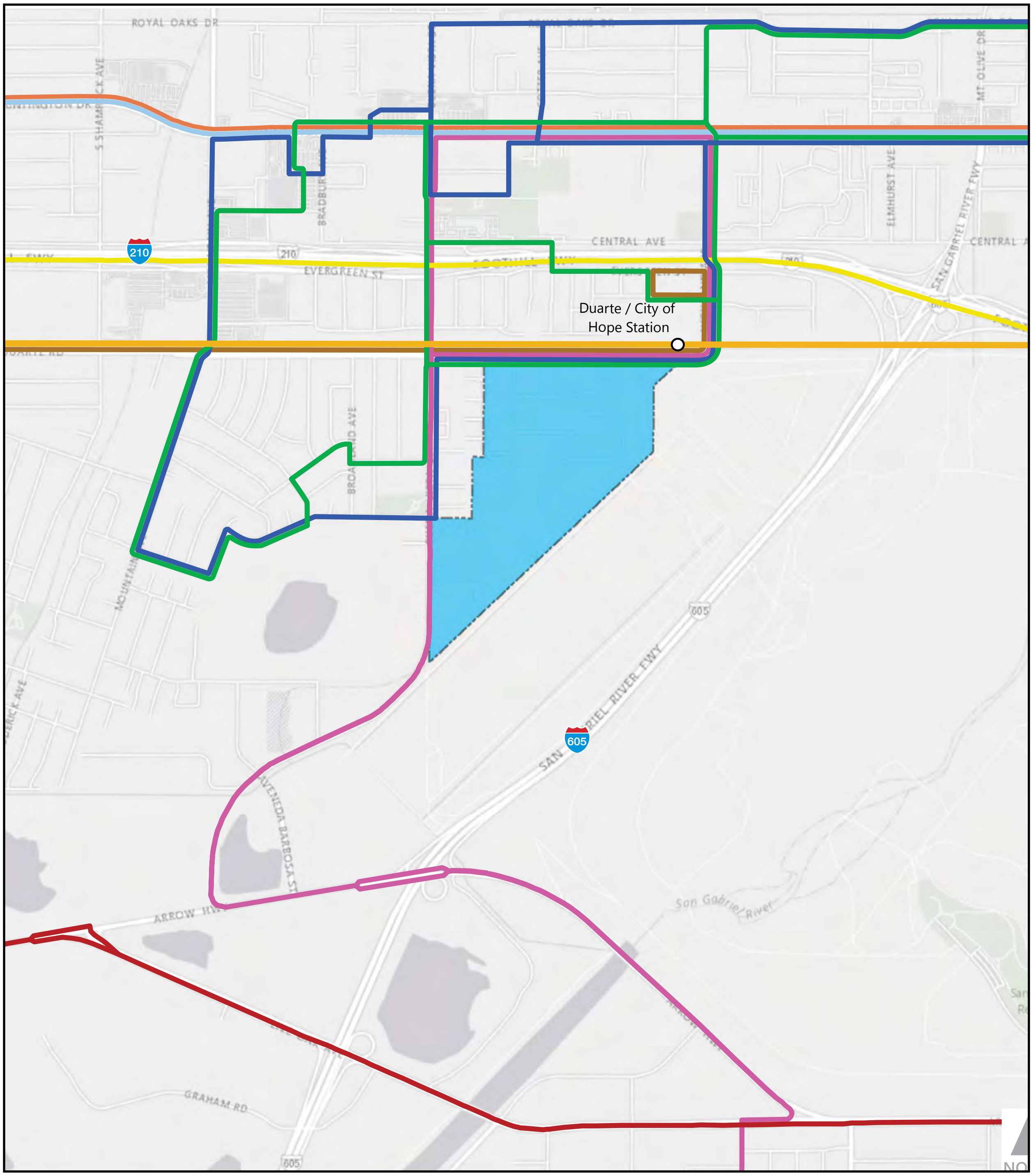
- **Metro Gold Line –** The Metro Gold Line is a light rail transit line running from East Los Angeles to Azusa via Los Angeles Union Station. The Metro Gold Line opened on March 5, 2016. The study area is served by the Duarte/City of Hope Station (directly across Duarte Road north of the project site). The Gold Line has an average headway of six minutes during the weekday AM and PM peak hours.

- **Metro Line 264 –** Metro Line 264 provides local service running between Altadena and Duarte. Line 264 has an average headway of approximately 60 minutes during the weekday AM and PM peak hours. The line runs east to west through the project site and connects to the Duarte/City of Hope Light Rail Station.

- **Foothill Transit Line 187 –** Foothill Transit Line 187 provides service between Pasadena and Montclair, through Claremont and Glendora. Line 187 has an average headway of 15 minutes during the weekday AM and PM peak hours. Line187 runs in the northern section of the study area.

- **Foothill Transit Line 272 –** Foothill Transit Line 272 provides service between Duarte and West Covina, through Irwindale and Baldwin Park. Line 272 has an average headway of 60 minutes during the weekday AM and PM peak hours. Line 272 runs directly through the northern and southern sections of the study area.

Figure 5.14-2 - Existing Transit Service



Duarte Transit

- Blue Line
- Green Line

Foothill Transit

- Line 187
- Line 272
- Line 492
- Line 494
- Line 690

Metro

- Line 264/267
- Metro Gold Line
- Metro Rail Station

Project Area

0 2,000
Scale (Feet)

Base Map Source: Fehr & Peers, 2016

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- **Foothill Transit Line 492 –** Foothill Transit Line 492 provides service between Montclair and El Monte via Arrow Highway, through El Monte, Arcadia, Baldwin Park, Irwindale, Covina, Azusa, and Claremont. Line 492 has an average headway of 30 minutes during the weekday AM and PM peak hours. Line 492 runs through south of the study area.

- **Foothill Transit Line 494 –** Foothill Transit Line 494 provides service between El Monte and San Dimas, through Monrovia, Arcadia, Duarte, Azusa, Glendora, and San Dimas. Line 494 has an average headway of 60 minutes during the weekday AM and PM peak hours. The 494 runs east to west through the northern edge of the study area.

- **Foothill Transit Line 690 –** Foothill Transit Line 690 provides service between Pasadena and Claremont through La Verne, San Dimas, Glendora, Azusa, and Pasadena. Line 690 has an average headway of 16 minutes during the weekday AM and PM peak hours. The 690 runs east to west through the northern edge of the study area.

- **Duarte Transit Blue Line –** Foothill Transit Line 690 provides service between Pasadena and Claremont through La Verne, San Dimas, Glendora, Azusa, and Pasadena. Line 690 has an average headway of 16 minutes during the weekday AM and PM peak hours. The 690 runs east to west through the northern edge of the study area.

- **Duarte Transit Green Line –** The Duarte Transit Green Line operates in a clockwise direction around the city of Duarte. The Green Line has an average headway of one hour during the weekday AM and PM peak hours. The Green Line runs in the northern part of the study area.

- **Duarte Transit Blue Line –** The Duarte Transit Blue Line operates in a counterclockwise direction around the city of Duarte. The Blue Line has an average headway of one hour during the weekday AM and PM peak hours. The Blue Line runs in the northern section of the study area.

Bicycle Facilities

Figure 5.14-3, *Existing and Proposed Bicycle Facilities*, shows existing and planned City of Duarte designated bicycles facilities in the project vicinity. Below is a description of the current Class III bicycle facility and off-street facility in the City of Duarte:

- **Royal Oaks Drive –** A Class III bike route on Royal Oaks Drive provides a bike route in the northern part of the study area, from Sierra Terrace to Buena Vista Street.

- **Duarte Bike Trail –** The Duarte Bike Trail is an off-street bicycle facility located the northern section of the study area.

In addition to the existing facilities, the City of Duarte is planning on adding other Class I, Class II, and Class III bicycle facilities in the project vicinity.

Pedestrian Facilities

There are pedestrian facilities adjacent to the project site. Along the western edge of the project site (Buena Vista Street), sidewalks between 9 and 12 feet wide are present on the western and eastern sides of Buena Vista Street.

Sidewalk connections on Duarte Road are incomplete. A 6-foot sidewalk is present on the southern side of Duarte Road between Buena Vista Street and Hope Drive, but this sidewalk on the south side of Duarte ends at Hope Drive. On the northern side of Duarte Road, an approximately 10-foot sidewalk is present between Hope Drive and Highland Avenue.

Pedestrian facilities improvements such as continuations of sidewalks, streetscape improvements, and installation of high visibility crosswalks are planned along Duarte Road. New sidewalk construction on the southern side of Duarte Road between Hope Drive and Circle Drive and on the northern side of Duarte Road between Hope Drive and Mountain Avenue is currently grant funded.

5.14.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project could:

T-1 Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

T-2 Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

T-3 Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

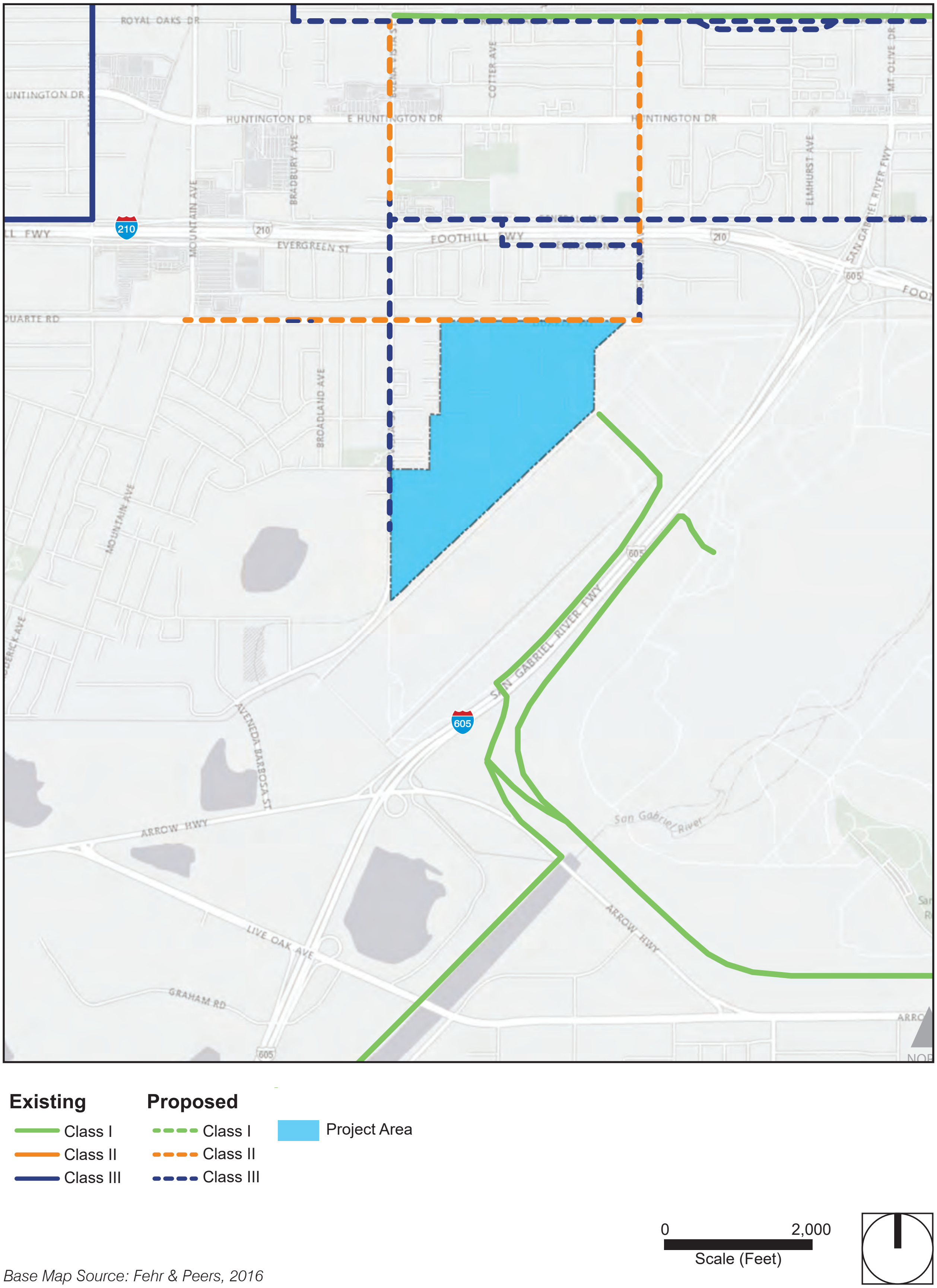
T-4 Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

T-5 Result in inadequate emergency access.

T-6 Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Figure 5.14-3 - Existing and Proposed Bicycle Facilities

5. Environmental Analysis



Base Map Source: Fehr & Peers, 2016

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The Initial Study, included as Appendix A, substantiates that impacts associated with the following thresholds would be less than significant:

- Threshold T-3: Implementation of the project would not cause any changes in traffic pattern that would lead to safety risks at the San Gabriel Valley Airport.

This impact will not be addressed in the following analysis.

Intersection Significance Criteria

City of Duarte

Signalized Intersections

The following thresholds of significance for the incremental increase in the V/C ratio was used to assess significant transportation impacts at the signalized intersections located fully or partially within the City of Duarte. The project's incremental increase in V/C ratio results in a significant impact if the following three criteria are met:

- LOS E or F
- Final V/C Ratio > 0.901
- Project Related Increase in V/C ≥ 0.020

Unsignalized Intersections

The following factors were used to assess significant transportation impacts at the unsignalized intersections in the City of Duarte. The results represent the HCM unsignalized LOS:

- Intersection is projected to decline to LOS E or F from LOS D or better with the addition of traffic volumes associated with the proposed project; and

- The intersection meets signal warrants either caused by project volumes, or project volumes are added at an intersection that meets signal warrants in the baseline scenario(s).

Signal warrants are volume based thresholds to determine whether a signal would be recommended, as determined in the California Manual on Uniform Traffic Control Devices, also known as MUTCD 2014 (Caltrans, 2014). The peak hour signal warrant test was used for the analysis. The warrant for a traffic signal is met if a plotted point representing the vehicles per hour on the major street (for both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for one hour lies above the applicable curve in Figure 4C-3 in MUTCD 2014 for the combination of approach lanes. If the combined volume of the major approaches and the corresponding conflicting volumes are greater than the threshold determined by the intersection configuration, then a traffic signal could be warranted.

5. Environmental Analysis
TRANSPORTATION AND TRAFFIC

City of Irwindale

Signalized Intersections

The City of Irwindale utilizes the following criteria threshold to assess significant transportation impacts at signalized intersections in Irwindale (LOS consistent with ICU criteria shown in Table 5.14-1):

- When a signalized intersection operates at a LOS D or better ($V/C \leq 0.900$) under the existing or future baseline conditions and the addition of the project trips worsens the intersection operations to LOS E or F ($V/C > 0.900$).
- When a signalized intersection operates at a LOS E or better ($V/C \leq 1.000$) under the existing or future baseline conditions and the addition of the project trips worsens the intersection operations to LOS F ($V/C > 1.000$) or increases the V/C ratio by 0.02 or greater
- When a signalized intersection operates at a LOS F ($V/C > 1.000$) under the existing or future baseline conditions and the addition of more than 50 peak-hour project trips increase the V/C ratio by 0.02 or greater

Unsignalized Intersections

The following thresholds of significance for the incremental increase in delay was used to assess significant transportation impacts at the unsignalized intersections in the City of Irwindale. The significance of the project's incremental increase in delay is dependent upon the underlying LOS value (consistent with delay values from HCM criteria shown in Table 5.14-1) for that specific peak hour based on the following threshold:

- When the minor stop-controlled approach operates at LOS F and does not have acceptable operation in terms of total control delay, and the addition of project trips increases the total control delay to more than 4.0 seconds per vehicle for a single lane approach or 5.0 seconds per vehicle for a multilane approaches.
- When the minor stop-controlled approach operates at LOS F and does not have acceptable operation in terms of total control delay, and the addition of more than 50 peak hour project trips contributes to the operational failure at the minor approach.

City of Monrovia

Signalized Intersections

The following Los Angeles County thresholds of significance for the incremental increase in the V/C ratio (Table 5.14-5) was used to assess significant transportation impacts at the signalized intersections located fully or partially within the City of Monrovia. The significance of the project's incremental increase in the V/C ratio is dependent upon the underlying LOS value for that specific peak hour based on the following thresholds:

Table 5.14-5 Los Angeles County Incremental Increase Criteria

Pre-Project		
LOS	Final V/C Ratio	Project Related Increase in V/C
C	0.71 to 0.80	> 0.04
D	0.81 to 0.90	> 0.02
E or F	> 0.91	> 0.01

Source: Fehr & Peers, 2017

Caltrans

Freeway Significance Criteria

The analysis of intersections under Caltrans's jurisdiction is consistent with the Caltrans "Guide for the Preparation of Traffic Impact Studies" (2002). Caltrans was consulted in in-person on September 6, 2016 to determine the analysis methodologies to be used; the analysis is consistent with the direction given by Caltrans. An impact is considered if the off-ramp queue extends beyond 85 percent of the length of the ramp during AM or PM peak hours.

For mainline facilities, Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities pursuant to the Guide for the Preparation of Traffic Impact Studies (Caltrans, 2002). However, Caltrans acknowledges that this may not always be feasible. If an existing State highway facility is operating at less than the appropriate target LOS, the existing measure of effectiveness (MOE) should be maintained (Caltrans TIS Guide, page 1). This latter criterion does not allow for determination of effect if the segment is operating at LOS F under baseline conditions. Freeway segments operating at LOS F under base conditions were identified if the project traffic added to these segments is estimated to represent 2 percent or more of the total traffic on the segment.

Level of service was determined using the following definitions from the HCM as presented in Appendix C of the Caltrans TIS Guide (note that LOS F is defined as density exceeding 45 passenger cars per mile per lane and average speed below 52.2 miles per hour, as shown in Table 5.14-6).

Table 5.14-6 LOS Definitions for Basic Freeway Segments @ 65 Miles/Hour

Level of Service	Maximum Density (pc/mi/ln)	Minimum Speed (mph)
A	11	65
B	18	65
C	26	64.6
D	35	59.7
E	45	52.2

CMP Significance Criteria

The CMP traffic impact analysis guidelines establish that a significant project impact occurs when project increases traffic demand on a CMP facility by 2 percent of capacity (V/C ≥ 0.02), causing LOS F (V/C > 1.00). If the facility is already at LOS F, a significant impact occurs when the proposed project increases traffic demand on a CMP facility by 2 percent of capacity (V/C ≥ 0.02).

5.14.3 Environmental Impacts

5.14.3.1 METHODOLOGY

The potential traffic impacts resulting from the proposed project within study area are addressed below. As part of the TIA, and consistent with Los Angeles County CMP Guidelines, the following scenarios were analyzed in addition to existing conditions:

- **Existing With Project Conditions:** Existing traffic volumes plus project traffic.
- **Future Year (2035) Without Project Conditions:** Annual growth rate factor applied through Year 2035.
- **Future Year (2035) With Project Conditions:** Future Year traffic volumes plus project traffic.

Project Mobility Improvements

The project includes improvements to the roadway, bicycle, and pedestrian network (see Chapter 3, *Project Description*, of this DEIR).

- **Duarte Station.** Encourage connectivity to and use of the Metro Gold Line and Duarte's public transit system.
- **Accessibility.** Ensure that all campus facilities and pathways are accessible to all users.
- **Multimodal Access.** Improve connectivity by walkability, bicycle access, and other features to encourage multimodal transportation use.
- **Transportation Facilities.** Locate transportation facilities—parking, transit stops, and vehicle and pedestrian amenities—in strategic locations throughout the campus.
- **Facility Integration.** Integrate interrelated facilities in a single site to optimize campus operations.
- **Wayfinding.** Improve wayfinding for vehicles and pedestrians at campus entrances and within the campus.
- **Parking Capacity.** Expand parking capacity for future demand.

- **Bicycle Infrastructure.** Explore the integration of bicycle facilities to the campus, such as bike parking and bike lanes, to promote healthy, active living and provide stronger connections to buildings and transit facilities.

- **Pedestrian Improvements.** Prioritize pedestrian and sidewalk improvements throughout the campus.

Future Traffic Conditions

Background or Ambient Growth

Ambient growth for the study area was developed based on growth factors from the Congestion Management Program for Los Angeles County (CMP) (Metro, 2010). The State of California requires that a congestion management program be developed, adopted, and updated biennially for every county that includes an urbanized area and shall include every city and the county government within that county. Metro is designated as the Congestion Management Agency for Los Angeles County and is responsible for the implementation of the CMP. The CMP was approved in October 2010 and serves as a resource for future growth factors within the 21 Regional Statistical Areas (RSA) of Los Angeles County. The growth rate factors for the RSA area of Duarte was used to determine yearly growth rates of the future traffic. Growth rates of 0.52 percent per year for the Duarte RSA were used for the development of the future year scenario.

Future traffic forecasts also include the effects of "related projects," expected to be implemented in the vicinity of the project site prior to the buildout date of the proposed project. The list of related projects was prepared based on data from the City of Duarte, City of Monrovia, City of Irwindale, City of Bradbury, City of Azusa, and County of Los Angeles. A total of 13 cumulative projects were identified in the study area (see Table 4-4, Figure 4-4, and Table 6 of Appendix J1 of this DEIR). Trip generation estimates for the related projects were calculated using a combination of previous study findings, publicly available environmental documentation, and trip generation rates contained in the Institute of Transportation Engineers' trip generation manual. These projections are conservative in that they do not in every case account for either the existing uses to be removed or the possible use of non-motorized travel modes (transit, walking, etc.).

Trip Generation

As part of the expansion, the project is expected to increase the hospital population (including inpatients, outpatients, full-time employees, part-time employees, contractors, physicians, and residents). According to the details included in the Transportation Impact Study by Fehr & Peers (2017), the existing average daily population is expected to increase from approximately 6,448 persons to approximately 9,393 persons (total increase of 2,945 persons).

The trip generation rate of the existing City of Hope campus was utilized to determine the net new trips generated by the full build-out of the proposed project. As mentioned above, the future daily population of the City of Hope Campus at full build-out of the project is estimated to be 9,393 persons. It was assumed that the existing modal splits and transportation demand programs will be similar for the proposed project. However, it is assumed that City of Hope could expect an increase in public transit ridership in the future due to an increase in connectivity with a larger service area in the future.

The driveway counts used to establish the existing trip generation were conducted prior to the opening of the Gold Line Extension from Pasadena to Azusa on March 5, 2016. The Duarte/City of Hope Gold Line Station is located approximately 300 feet from the City of Hope campus. The opening of the Gold Line Extension and subsequent Exposition Line Extension to Santa Monica has increased the Los Angeles Metro service area as compared to what was being served prior.

A 4 percent transit credit was applied to the project trip generation to account for increased transit usage over current public transportation use at City of Hope. The 4 percent estimate is based on the percentage of employees who live in a zip code within one mile of a Metro rail station. No other credits were applied to the project as any applicable credits were already accounted for in the development of the existing trip generation rate.

The City of Hope campus population is estimated to increase by 2,945 persons at the full build-out of the project. The project is expected to increase trip generation over the 20-year full buildout by approximately 4,753 daily trips, including 514 trips (448 inbound/66 outbound) during the AM peak hour and 462 trips (74 inbound/388 outbound) during the PM peak hour. Table 5.14-7 below describes the data used to calculate trip generation for this project.

Table 5.14-7 Trip Generation Estimate

		Trip Generation Rate			Estimated Trip Generation		
Land Use	**Average Daily Population**	**Daily Trips**	**AM Peak Hour**	**PM Peak Hour**	**Daily Trips**	**AM Peak Hour**	**PM Peak Hour**
Existing Year	6,448	1.85 * Average Daily Pop.	0.2	0.18	11,929	1,290	1,161
Future Buildout	9,393	1.85 * Average Daily Pop.	0.2	0.18	17,377	1,879	1,691
Future – Transit Credit (4% of estimate)	-	(1- 0.04) * Estimated Trip Value			16,682	1,804	1,623
Net Increase	2,945	-	-	-	**4,753**	**514**	**462**

Source: Fehr & Peers, 2017.

Project Traffic Distribution

The geographic distribution of trips generated by the proposed project is dependent on characteristics of the street system serving the project site, the level of accessibility of routes to and from the proposed project site, and the locations residential areas to which population of the project would be drawn.

Trip distribution estimates were based on anonymous cell phone data from the existing City of Hope campus for one year from July 2014 to June 2015. The anonymous cell phone data estimates and aggregates the home zip code data into probability distributions. These distributions are used to develop the distribution of project traffic to the City of Hope campus. Although the data included cell phone records for trip origins and destinations on weekdays and weekend days throughout the southern California (and beyond), this effort focused specifically on trip origins and destinations for weekdays.

Trip distribution estimates to the freeways included approximately 30 percent via I-605, 15 percent via I-210 to/from the east, and 25 percent via I-210 to/from the west. The ramp distribution estimates include approximately 16 percent at Live Oak Avenue, approximately 9 percent at Huntington Drive, approximately 20 percent at Central Avenue, and approximately 25 percent at Evergreen Street.

Construction Traffic Conditions

Construction of the project is expected to be completed in four phases from 2018 to 2035. Each phase of construction is anticipated to involve five key aspects: (1) Demolition, (2) Site Preparation, (3) Grading, (4) Building Construction, and (5) Architectural Coating. The number of worker, trucks, and trips generated in each aspect of each phase is dependent on what is being construction and what is being demolished. The proposed project would provide adequate staging either on the project site for trucks throughout the construction period.

Peak hauling activity is anticipated to occur during the phase 1 grading. Approximately 26 haul trucks are expected on peak days of activity. The hauling activity is likely to use double belly dump haul trucks. For access to the I-605 freeway to/from the south, the primary anticipated truck route will be via Duarte Road, Buena Vista Street, Avenida Barbosa, Arrow Highway, and Live Oak Avenue for inbound and outbound trucks. For access to the I-605 freeway to/from the north, the primary anticipated truck route will be via Duarte Road, Buena Vista Street, Avenida Barbosa, and Arrow Highway for inbound and outbound trucks. These trucks could impact the adjacent roadway network since the major roadways anticipated to be used as a truck route for the project already experience congestion during peak traffic periods.

In addition to haul trucks, the site is also expected to generate equipment and delivery trucks during each phase of construction. One example would be concrete delivery, which would be required for the building foundations. Other materials could include plumbing supplies, electrical fixtures, and items used in furnishing the project. These materials would be delivered to the site and stored on-site. These deliveries are expected to occur in variety of vehicles, including small delivery trucks to cement mixer trucks and 18-wheel trucks. Additionally, construction equipment would also have to be delivered to the site. This equipment could include cranes, bulldozers, excavators, and other large items of machinery. Most of the heavy equipment is expected to be transported to the site on large trucks such as 18-wheelers or other similar vehicles.

The number of construction workers would vary throughout the construction period. The maximum number of workers expected to be generated on a peak worker trip day would occur during the phase 1 building construction and architectural coating stages and phase 2 demolition overlap, when it is expected that up to 355 workers could be on site on a single day. Parking for all construction workers would be provided either on the project site or at an off-site parking location and shuttled to the project site.

Construction Period Trip Generation

Based on the aforementioned information, a construction period trip generation analysis was conducted to estimate daily, morning and evening peak hour passenger car equivalent (PCE) trips. It was determined that the phase 1 building construction and architectural coating and phase 2 demolition overlap would generate the single day with the highest number of trips with 355 workers vehicles, 8 haul trucks, and 124 vendor trucks. Construction workers often travel to and from a worksite outside of the typical peak commute hours. For the purpose of the analysis, it was assumed that up to 40 percent of the construction workers would arrive during the peak morning commute hour and up to 40 percent would depart during the peak evening commute hour. Haul and delivery/equipment trucks were assumed to occur evenly throughout the 8-hour construction day. A PCE factor of 2.5 was assumed for double belly dump trucks and concrete truck types, while a PCE factor of 2.0 was assumed for vendor or delivery trucks, based on the 2010 Highway Capacity Manual.

On a peak construction activity day, a total of up to 1,245 daily PCE trips are expected to occur, of which 212 PCE trips would occur during the morning peak hour and 150 PCE trips during the evening peak hour.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.14-1: Project-related trip generation would impact levels of service for the existing area roadway system. [Threshold T-1]

Impact Analysis: The traffic impact analysis compares the projected LOS at each study intersection under the existing plus project conditions and under the future and future plus project conditions to estimate the incremental increase in the V/C ratio or delay caused by the proposed project. This provides the information needed to assess the potential impact of the project using significance criteria established by the City of Duarte and City of Irwindale. Significance criteria for freeway facilities are presented below in the Caltrans Freeway Mainline Analysis.

Existing With Project Conditions

Existing Plus Project Traffic Level of Service

Existing plus project traffic volumes were analyzed to determine the projected V/C ratio or delay, and LOS for each study intersection. Table 5.14-8 summarizes the existing plus project LOS. The following seven study intersections analyzed operate at LOS E or worse during one or both peak hours under existing conditions and existing plus project scenarios:

1. Live Oak Avenue & Arrow Highway (AM peak hour, City of Irwindale)

8. I-605 Northbound Off-Ramp & Live Oak Avenue (both peak hours, City of Irwindale/Caltrans)

14. Buena Vista Street & 3 Ranch Road (PM peak hour, City of Duarte)

17. I-210 Westbound Off-Ramp & Central Avenue (both peak hours, City of Duarte/Caltrans)

19. Village Road & Duarte Road (both peak hours, City of Duarte)

25. Highland Avenue & Evergreen Street (AM peak hour, City of Duarte)

27. Mt. Olive Drive/I-605 Ramps & Huntington Drive (both peak hours, City of Duarte/Caltrans)

Table 5.14-8 Existing Plus Project Intersection Levels of Service

					ICU Methodology (signalized)						HCM Methodology (unsignalized)					
					Existing Conditions		Existing Plus Project		Change in	Significant	Existing Conditions		Existing Plus Project		Change in	Significant
ID	N/S Street Name	E/W Street Name	Jurisdiction	Time Period	V/C	LOS	V/C	LOS	V/C	Impact	Delay	LOS	Delay	LOS	V/C	Impact
1	Live Oak Avenue	Arrow Highway	Irwindale	AM	1.023	**F**	1.023	**F**	0.000	NO	-	-	-	-	-	-
				PM	0.718	C	0.741	C	0.023	NO	-	-	-	-	-	-
2	Mountain Avenue	Central Avenue	Duarte, Monrovia	AM	0.722	C	0.728	C	0.006	NO	-	-	-	-	-	-
				PM	0.692	B	0.692	B	0.000	NO	-	-	-	-	-	-
3	Mountain Avenue	Evergreen Street	Duarte, Monrovia	AM	0.609	B	0.610	B	0.001	NO	-	-	-	-	-	-
				PMB	0.866	D	0.871	D	0.005	NO	-	-	-	-	-	-
4	Mountain Avenue	Duarte Road	Duarte, Monrovia	AM	0.500	A	0.513	A	0.013	NO	-	-	-	-	-	-
				PM	0.497	A	0.503	A	0.006	NO	-	-	-	-	-	-
5	Buena Vista Street	Bateman Avenue/Avenida Barbosa	Irwindale	AM	0.406	A	0.412	A	0.006	NO	-	-	-	-	-	-
				PM	0.506	A	0.541	A	0.035	NO	-	-	-	-	-	-
6	Avenida Barbosa	Arrow Highway	Irwindale	AM	0.841	D	0.894	D	0.053	NO	-	-	-	-	-	-
				PM	0.586	A	0.608	B	0.022	NO	-	-	-	-	-	-
7	I-605 Southbound On-Ramp	Live Oak Avenue	Irwindale, Caltrans	AM	0.528	A	0.528	A	0.000	NO	-	-	-	-	-	-
				PM	0.783	C	0.783	C	0.000	NO	-	-	-	-	-	-
8	I-605 Northbound Off-Ramp	Live Oak Avenue	Irwindale, Caltrans	AM	-	-	-	-	-		221.3	**F**	307.9	**F**	86.6	**YES**
				PM	-	-	-	-	-		183.2	**F**	183.2	**F**	0.0	NO
9	I-605 Southbound On-Ramp	Arrow Highway	Irwindale, Caltrans	AM	0.880	D	0.890	D	0.010	NO	-	-	-	-	-	-
				PM	0.507	A	0.513	A	0.006	NO	-	-	-	-	-	-
10	Buena Vista Street	Huntington Drive	Duarte	AM	0.775	C	0.779	C	0.004	NO	-	-	-	-	-	-
				PM	0.744	C	0.758	C	0.014	NO	-	-	-	-	-	-
11	Buena Vista Street	Central Avenue	Duarte	AM	0.579	A	0.626	B	0.047	NO	-	-	-	-	-	-
				PM	0.621	B	0.638	B	0.017	NO	-	-	-	-	-	-
12	Buena Vista Street	I-210 Eastbound On-Ramp	Duarte, Caltrans	AM	0.397	A	0.444	A	0.047	NO	-	-	-	-	-	-
				PM	0.550	A	0.618	B	0.068	NO	-	-	-	-	-	-

Table 5.14-8 Existing Plus Project Intersection Levels of Service

					ICU Methodology (signalized)						HCM Methodology (unsignalized)					
					Existing Conditions		Existing Plus Project		Change in V/C	Significant Impact	Existing Conditions		Existing Plus Project		Change in V/C	Significant Impact
ID	N/S Street Name	E/W Street Name	Jurisdiction	Time Period	V/C	LOS	V/C	LOS			Delay	LOS	Delay	LOS		
13	Buena Vista Street	Evergreen Street	Duarte	AM PM	0.537 0.679	A B	0.613 0.739	B C	0.076 0.060	NO NO	- -	- -	- -	- -	- -	- -
14	Buena Vista Street	3 Ranch Road	Duarte	AM PM	- -	- -	- -	- -	- -		15.1 23.1	C C	19.5 35.1	C D	4.4 12.0	NO NO
15	Buena Vista Street	Duarte Road	Duarte	AM PM	0.664 0.731	B C	0.738 0.852	C D	0.119 0.121	NO NO	- -	- -	- -	- -	- -	- -
16	Buena Vista Street	Village Road	Duarte	AM PM	- -	- -	- -	- -	- -		18.3 22.3	C C	33.3 33.8	D D	15.0 11.5	NO NO
17	I-210 Westbound Off-Ramp	Central Avenue	Duarte, Caltrans	AM PM	- -	- -	- -	- -	- -		194.9 105.4	**F** **F**	330.3 118.5	**F** **F**	135.4 13.1	NO NO
18	Cinco Robles Drive	Duarte Road	Duarte	AM PM	- -	- -	- -	- -	- -		22.0 20.9	C C	32.9 25.9	D D	10.9 5.0	NO NO
19	Village Road	Duarte Road	Duarte	AM PM	- -	- -	- -	- -	- -		37.5 46.5	**E** **E**	130.8 252.1	**F** **F**	93.3 205.6	**YES** **YES**
20	Duncannon Avenue	Evergreen Street	Duarte	AM PM	- -	- -	- -	- -	- -		7.8 7.3	A A	7.8 7.3	A A	0.0 0.0	NO NO
21	Hope Drive	Duarte Road	Duarte	AM PM	0.327 0.381	A A	0.386 0.445	A A	0.059 0.064	NO NO	- -	- -	- -	- -	- -	- -
22	Circle Road	Duarte Road	Duarte	AM PM	- -	- -	- -	- -	- -		14.8 20.6	B C	18.7 29.6	C D	3.9 9.0	NO NO
23	Highland Avenue	Huntington Drive	Duarte	AM PM	0.694 0.647	B B	0.697 0.674	B B	0.003 0.027	NO NO	- -	- -	- -	- -	- -	- -
24	Highland Avenue	Central Avenue	Duarte	AM PM	0.713 0.750	C C	0.723 0.756	C C	0.010 0.006	NO NO	- -	- -	- -	- -	- -	- -
25	Highland Avenue	Evergreen Street	Duarte	AM PM	- -	- -	- -	- -	- -		40.2 16.8	**E** C	49.8 17.7	E C	9.6 0.9	NO NO

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Table 5.14-8 Existing Plus Project Intersection Levels of Service

ID	N/S Street Name	E/W Street Name	Jurisdiction	Time Period	ICU Methodology (signalized)						HCM Methodology (unsignalized)					
					Existing Conditions		Existing Plus Project		Change in V/C	Significant Impact	Existing Conditions		Existing Plus Project		Change in V/C	Significant Impact
					V/C	LOS	V/C	LOS			Delay	LOS	Delay	LOS		
26	Highland Avenue	Evergreen Street	Duarte	AM	0.353	A	0.373	A	0.020	NO	-	-	-	-	-	-
				PM	0.364	A	0.378	A	0.014	NO	-	-	-	-	-	-
27	Mt Olive Drive/I-605 Ramps	Huntington Drive	Duarte, Caltrans	AM	0.968	**E**	0.987	E	0.019	NO	-	-	-	-	-	-
				PM	1.024	**F**	1.040	F	0.016	NO	-	-	-	-	-	-

Source: Fehr & Peers 2017.
Notes: V/C = Volume / Capacity Ratio
Intersections operating below acceptable LOS are shown in bold.

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Existing Plus Project Intersection Impacts

As shown in Table 5.14-8, after applying the aforementioned significant impact criteria, it was determined that the proposed project would significantly impact traffic at the following two study intersections under the existing plus project scenario:

8. I-605 Northbound Off-Ramp & Live Oak Avenue (AM peak hour, City of Irwindale/Caltrans)

19. Village Road & Duarte Road (both peak hours, City of Duarte)

Future Year (2035) Conditions

Future Year (2035) Traffic Level of Service

The year 2035 future peak hour traffic volumes were analyzed to determine the projected V/C ratio or delay, and LOS for each study intersection. The following 17 study intersections analyzed operate at LOS E or worse during one or both peak hours under future baseline conditions and future plus project conditions:

1. Live Oak Avenue & Arrow Highway (AM peak hour, City of Irwindale)
3. Mountain Avenue & Evergreen Street (PM peak hour, City of Duarte/Monrovia)
6. Avenida Barbosa & Arrow Highway (AM peak hour, City of Irwindale)
7. I-605 Southbound On-Ramp & Live Oak Avenue (PM peak hour, City of Irwindale/Caltrans)
8. I-605 Northbound Off-Ramp & Live Oak Avenue (both peak hours, City of Irwindale/Caltrans)
9. I-605 Southbound Off-Ramp & Arrow Highway (AM peak hour, City of Irwindale/Caltrans)
10. Buena Vista Street & Huntington Drive (PM peak hour, City of Duarte)
13. Buena Vista Street & Evergreen Street/I-210 Eastbound On-Ramp (PM peak hour, City of Duarte/Caltrans)
14. Buena Vista Street & Three Ranch Road (both peak hours, City of Duarte)
15. Buena Vista Street & Duarte Road (both peak hours, City of Duarte)
16. Buena Vista Street & Village Road (PM peak hour, City of Duarte)
17. I-210 Westbound Off-Ramp & Central Avenue (both peak hours, City of Duarte/Caltrans)
18. Cinco Robles Drive & Duarte Road (both peak hours, City of Duarte)
19. Village Road & Duarte Road (both peak hours, City of Duarte)
22. Circle Road & Duarte Road (both peak hours, City of Duarte)
25. Highland Avenue & Evergreen Street (AM peak hour, City of Duarte)
27. Mt. Olive Drive/I-605 Ramps & Huntington Drive (both peak hours, City of Duarte/Caltrans)

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Future Plus Project Intersection Impacts

As presented in Table 5.14-9, after applying the aforementioned significant impact criteria, it was determined that the proposed project would significantly impact traffic at the following nine study intersections under the future plus project scenario:

1. Live Oak Avenue & Arrow Highway (PM peak hour, City of Irwindale)

6. Avenida Barbosa & Arrow Highway (AM peak hour, City of Irwindale)

8. I-605 Northbound Off-Ramp & Live Oak Avenue (both peak hours, City of Irwindale)

13. Buena Vista Street & Evergreen Street (PM peak hour, City of Duarte)

15. Buena Vista Street & Duarte Road (both peak hours, City of Duarte)

16. Buena Vista Street & Village Road (PM peak hour, City of Duarte)

17. I-210 Westbound Off-Ramp & Central Avenue (both peak hours, City of Duarte)

19. Village Road & Duarte Road (both peak hours, City of Duarte)

22. Circle Road & Duarte Road (both peak hours, City of Duarte)

Freeway Ramp Analysis

A queueing assessment was completed for the freeway ramps in the study area to ensure that traffic does not back up onto mainline freeway lanes. Ramps evaluated as part of the queueing assessment include:

8. I-605 Northbound Off-Ramp & Live Oak Avenue

9. I-605 Southbound Off-Ramp & Arrow Highway

13. Buena Vista Street & Evergreen Street

17. I-210 Westbound Off-Ramp & Central Avenue

27. Mount Olive Drive/I-605 Northbound Off-Ramp & Huntington Drive

As demonstrated in Tables 12 and 13 of the traffic impact analysis (Appendix J1 of this DEIR), one ramp would exceed the 85 percent storage length in the AM peak hour in the future condition, I-210 Westbound Off-Ramp & Central Avenue (#17). The freeway ramp queues would not extend beyond 85 percent of the length of the under for all other ramps under both the existing plus project and future plus project scenario.

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Table 5.14-9 Future Plus Project Intersection Levels of Service

					ICU Methodology (signalized)						HCM Methodology (unsignalized)					
					Future Conditions		Future Plus Project		Change in	Significant	Existing Conditions		Existing Plus Project		Change in	Significant
ID	N/S Street Name	E/W Street Name	Juris-diction	Time Period	V/C	LOS	V/C	LOS	V/C	Impact	Delay	LOS	Delay	LOS	V/C	Impact
1	Live Oak Avenue	Arrow Highway	Irwindale	AM PM	1.158 0.900	**F** D	1.158 0.923	**F** **E**	0.000 0.023	NO **YES**	- -	- -	- -	- -	- -	- -
2	Mountain Avenue	Central Avenue	Duarte, Monrovia	AM PM	0.796 0.757	C C	0.801 0.758	D C	0.005 0.001	NO NO	- -	- -	- -	- -	- -	- -
3	Mountain Avenue	Evergreen Street	Duarte, Monrovia	AM PMB	0.666 0.973	B **E**	0.667 0.978	B **E**	0.001 0.005	NO NO	- -	- -	- -	- -	- -	- -
4	Mountain Avenue	Duarte Road	Duarte, Monrovia	AM PM	0.735 0.728	C C	0.754 0.734	C C	0.019 0.006	NO NO	- -	- -	- -	- -	- -	- -
5	Buena Vista Street	Bateman Avenue/Avenida Barbosa	Irwindale	AM PM	0.482 0.602	A B	0.488 0.637	A B	0.006 0.035	NO NO	- -	- -	- -	- -	- -	- -
6	Avenida Barbosa	Arrow Highway	Irwindale	AM PM	1.064 0.823	**F** D	1.118 0.842	**F** D	0.054 0.019	**YES** NO	- -	- -	- -	- -	- -	- -
7	I-605 Southbound On-Ramp	Live Oak Avenue	Irwindale, Caltrans	AM PM	0.630 0.932	B **E**	0.630 0.932	B **E**	0.000 0.000	NO NO	- -	- -	- -	- -	- -	- -
8	I-605 Northbound Off-Ramp	Live Oak Avenue	Irwindale, Caltrans	AM PM	- -	- -	- -	- -	- -		695.4 473.2	**F** **F**	807.2 487.3	**F** **F**	111.8 14.1	**YES** **YES**
9	I-605 Southbound On-Ramp	Arrow Highway	Irwindale, Caltrans	AM PM	1.101 0.744	**F** C	1.110 0.750	**F** C	0.009 0.006	NO NO	- -	- -	- -	- -	- -	- -
10	Buena Vista Street	Huntington Drive	Duarte	AM PM	0.867 1.019	D **F**	0.871 1.023	D **F**	0.004 0.004	NO NO	- -	- -	- -	- -	- -	- -
11	Buena Vista Street	Central Avenue	Duarte	AM PM	0.646 0.754	B C	0.694 0.771	B C	0.048 0.017	NO NO	- -	- -	- -	- -	- -	- -
12	Buena Vista Street	I-210 Eastbound On-Ramp	Duarte, Caltrans	AM PM	0.506 0.717	A C	0.553 0.786	A C	0.047 0.069	NO NO	- -	- -	- -	- -	- -	- -
13	Buena Vista Street	Evergreen Street	Duarte	AM PM	0.728 0.910	C **E**	0.808 0.970	D **E**	0.080 0.060	NO **YES**	- -	- -	- -	- -	- -	- -

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Table 5.14-9 Future Plus Project Intersection Levels of Service

					ICU Methodology (signalized)						HCM Methodology (unsignalized)					
					Future Conditions		Future Plus Project		Change in	Significant	Existing Conditions		Existing Plus Project		Change in	Significant
ID	N/S Street Name	E/W Street Name	Juris-diction	Time Period	V/C	LOS	V/C	LOS	V/C	Impact	Delay	LOS	Delay	LOS	V/C	Impact
14	Buena Vista Street	3 Ranch Road	Duarte	AM	-	-	-	-	-	-	25.1	D	37.6	E	12.5	NO
				PM	-	-	-	-	-	-	38.6	E	217.6	F	179.0	NO
15	Buena Vista Street	Duarte Road	Duarte	AM	1.168	F	1.345	F	0.177	YES	-	-	-	-	-	-
				PM	1.435	F	1.615	F	0.180	YES	-	-	-	-	-	-
16	Buena Vista Street	Village Road	Duarte	AM	-	-	-	-	-	-	23.2	C	47.7	E	24.5	NO
				PM	-	-	-	-	-	-	41.7	E	89.1	F	47.4	YES
17	I-210 Westbound Off-Ramp	Central Avenue	Duarte, Caltrans	AM	-	-	-	-	-	-	410.5	F	584.9	F	174.4	YES
				PM	-	-	-	-	-	-	366.2	F	388.4	F	22.2	YES
18	Cinco Robles Drive	Duarte Road	Duarte	AM	-	-	-	-	-	-	56.1	F	106.5	F	50.4	NO
				PM	-	-	-	-	-	-	45.6	E	61.3	F	15.7	NO
19	Village Road	Duarte Road	Duarte	AM	-	-	-	-	-	-	220.9	F	1054.9	F	834	YES
				PM	-	-	-	-	-	-	461.3	F	1149.5	F	688.2	YES
20	Duncannon Avenue	Evergreen Street	Duarte	AM	-	-	-	-	-	-	8.0	A	8.0	A	0	NO
				PM	-	-	-	-	-	-	7.7	A	7.7	A	0	NO
21	Hope Drive	Duarte Road	Duarte	AM	0.450	A	0.509	A	0.059	NO	-	-	-	-	-	-
				PM	0.480	A	0.544	A	0.064	NO	-	-	-	-	-	-
22	Circle Road	Duarte Road	Duarte	AM	-	-	-	-	-		30	D	46.3	E	16.3	YES
				PM	-	-	-	-	-		104.6	F	225.4	F	120.9	YES
23	Highland Avenue	Huntington Drive	Duarte	AM	0.819	D	0.824	D	0.005	NO	-	-	-	-	-	-
				PM	0.834	D	0.861	D	0.027	NO	-	-	-	-	-	-
24	Highland Avenue	Central Avenue	Duarte	AM	0.847	D	0.856	D	0.009	NO	-	-	-	-	-	-
				PM	0.837	D	0.878	D	0.005	NO	-	-	-	-	-	-
25	Highland Avenue	Evergreen Street	Duarte	AM	-	-	-	-	-		534.1	F	801.4	F	267.3	NO
				PM	-	-	-	-	-		22.3	C	23.8	C	1.5	NO
26	Highland Avenue	Evergreen Street	Duarte	AM	0.763	C	0.784	C	0.021	NO	-	-	-	-	-	-
				PM	0.599	A	0.600	A	0.001	NO	-	-	-	-	-	-

Table 5.14-9 Future Plus Project Intersection Levels of Service

ID	N/S Street Name	E/W Street Name	Juris-diction	Time Period	ICU Methodology (signalized)						HCM Methodology (unsignalized)					
					Future Conditions		Future Plus Project		Change in V/C	Significant Impact	Existing Conditions		Existing Plus Project		Change in V/C	Significant Impact
					V/C	LOS	V/C	LOS			Delay	LOS	Delay	LOS		
27	Mt Olive Drive/I-605 Ramps	Huntington Drive	Duarte, Caltrans	AM PM	1.133 1.187	**F** **F**	1.151 1.203	**F** **F**	0.018 0.016	NO NO	- -	- -	- -	- -	- -	- -

Source: Fehr & Peers 2017.
Notes: V/C = Volume / Capacity Ratio
Intersections operating below acceptable LOS are shown in bold.

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Freeway Mainline Analysis

Mainline freeway segment analyses were conducted using the HCM operational analysis methodology as implemented by the Highway Capacity Software (HCS) software package for the following five segments along the I-210, I-605, and I-10 freeways in both directions:

- I-210 east of I-605
- I-210 west of I-605
- I-605 south of I-210
- I-10 east of I-605
- I-10 west of I-605

Existing Plus Project Mainline Level of Service

Freeway mainline volume and speed data was obtained from Caltrans' Performance Measurement System (PeMS) archived traffic data for the AM and PM peak periods for Tuesdays, Wednesdays, and Thursdays in November 2015 for most segments and the data was averaged across the days. Existing and existing plus project conditions on the mainline segments are presented in Table 5.14-10. Detailed LOS calculations are provided in the Traffic Impact Study (Appendix J1 of this DEIR).

Table 5.14-10 Existing Freeway Mainline Level of Service

Location	FWY Segment Name	AM/PM	Direction	Existing			Project Volume	Existing Plus Project			Project % of Total	Project Change in MOE
				Volume	LOS	Density		Volume	LOS	Density		
1	I-210 w/o I-605	AM	EB	6,332	D	27.2	112	6,444	D	27.8	1.7	No
			WB	3,476	F	-	18	3,494	F	-	0.5	No
		PM	EB	4,327	F	-	19	4,346	F	-	0.4	No
			WB	4,622	F	-	100	4,722	F	-	2.1	Yes
2	I-210 e/o I-605	AM	EB	6,766	D	28.3	11	6,777	D	28.4	0.2	No
			WB	6,153	F	-	67	6,220	F	-	1.1	No
		PM	EB	5,824	F	-	60	5,884	F	-	1.0	No
			WB	6,261	F	-	11	6,272	F	-	0.2	No
3	I-605 s/o I-210	AM	EB	4,465	C	18.7	135	4,600	C	19.3	2.9	No
			WB	5,625	C	22.3	21	5,646	C	22.4	0.4	No
		PM	EB	4,061	F	-	22	4,083	F	-	0.5	No
			WB	4,574	B	17.8	120	4,694	C	18.3	2.6	Yes
4	I-10 w/o I-605	AM	EB	5,504	C	23.1	68	5,572	C	23.4	1.2	No
			WB	6,478	F	-	11	6,489	F	-	0.2	No
		PM	EB	4,932	F	-	11	4,943	F	-	0.2	No
			WB	5,869	C	24.8	60	5,929	C	25.1	1.0	No

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Table 5.14-10 Existing Freeway Mainline Level of Service

Location	FWY Segment Name	AM/PM	Direction	Existing			Project Volume	Existing Plus Project			Project % of Total	Project Change in MOE
				Volume	LOS	Density		Volume	LOS	Density		
5	I-10 e/o I-605	AM	EB	4,839	C	18.9	45	4,884	C	19.1	0.9	No
			WB	4,416	F	-	7	4,423	F	-	0.2	No
		PM	EB	3,125	F	-	7	3,123	F	-	0.2	No
			WB	5,500	C	23.1	40	5,540	C	23.3	0.7	No

Note: Locations operating at an average speed < 52.2 mph are defined as LOS F by the Highway Capacity Manual per the Caltrans Guide for the Preparation of Traffic Impact Studies (Dec 2002).
Density is not provided at LOS F locations as density results are not reflective of operations at location.

For both the existing and existing plus project scenarios, during the AM peak hour, all of the westbound analyzed segments on I-210 and I-10 operate at a congested LOS F. During the PM peak hour, both the eastbound and westbound segments on I-210, the eastbound segments on I-10, and the northbound segments on I-605 operate at LOS F.

With the project, all of the segments during the AM peak hour would continue to operate at the same LOS as under existing conditions. The project represents between 0.2 and 2.9 percent of the existing plus project traffic volumes on the segments depending on location and direction. Segments where the project accounts for more than 2 percent of the existing plus project traffic volumes would operate at LOS C or better during the AM peak hour. The project is projected to have no change in the MOE during the AM peak hour under the existing plus project scenario.

With the project, one of the segments during the PM peak hour would operate at a worse LOS when compared to the existing condition. The project represents between 0.2 and 2.6 percent of the existing plus project traffic volumes on the segments depending on location and direction. One segment where the project accounts for more than 2 percent of the existing plus project traffic volumes would operate at LOS F during the PM peak hour. The project is projected to have a change in the MOE at two segments during the PM peak hour under the existing plus project scenario: 1) westbound I-210 west of I-605 and 2) southbound I-605 south of I-210.

Future and Future plus Project Mainline Level of Service

Per the Caltrans TIS Guide, future conditions analyzed in conjunction with a project entitlement process should be evaluated for the future year in which the project is anticipated to complete construction (Caltrans TIS Guide, page 3). As described above under "Methodology," future volumes were thus projected for the future traffic condition (Year 2035) taking into account projected changes in traffic over existing conditions from two primary sources: 1) ambient growth in the existing traffic volumes due to the effects of overall regional growth and development outside the study area, and 2) traffic generated by specific development projects in, or in the vicinity of, the study area.

Table 5.12-11 presents the future freeway mainline segment analysis. For both the future and future plus project scenarios, during the AM peak hour, all of the westbound analyzed segments on I-210 and I-10 operate at a congested LOS F. During the PM peak hour, both the eastbound and westbound segments on I-210, the eastbound segments on I-10, and the northbound segments on I-605 operate at LOS F.

Table 5.14-11 Future Freeway Mainline Level of Service

Location	FWY Segment Name	AM/PM	Direction	Future			Project Volume	Future Plus Project			Project % of Total	Project Change in MOE
				Volume	LOS	Density		Volume	LOS	Density		
1	I-210 w/o I-605	AM	EB	7,562	E	35.0+	112	7,674	E	35.9	1.5	No
			WB	4,325	F	-	18	4,343	E	-	0.4	No
		PM	EB	5,449	F	-	19	5,468	F	-	0.3	No
			WB	5,716	F	-	100	5,816	F	-	1.7	No
2	I-210 e/o I-605	AM	EB	7,836	E	35.7	11	7,847	E	35.8	0.1	No
			WB	7,272	F	-	67	7,339	F	-	0.9	No
		PM	EB	6,969	F	-	60	7,029	F	-	0.9	No
			WB	7,415	F	-	11	7,426	F	-	0.1	No
3	I-605 s/o I-210	AM	EB	5,294	C	22.2	135	5,429	C	22.8	2.5	No
			WB	6,456	D	26.5	21	6,477	D	26.6	0.3	No
		PM	EB	4,926	F	-	22	4,948	F	-	0.4	No
			WB	5,549	C	22.0	120	5,669	C	22.5	2.1	No
4	I-10 w/o I-605	AM	EB	6,262	D	26.8	68	6,330	D	27.2	1.1	No
			WB	7,278	F	-	11	7,289	F	-	0.2	No
		PM	EB	5,669	F	-	11	5,680	F	-	0.2	No
			WB	6,732	D	29.4	60	6,792	D	29.8	0.9	No
5	I-10 e/o I-605	AM	EB	5,466	C	21.6	45	5,511	C	21.8	0.8	No
			WB	4,959	F	-	7	4,966	F	-	0.1	No
		PM	EB	3,599	F	-	7	3,606	F	-	0.2	No
			WB	6,241	D	26.7	40	6,281	D	26.9	0.6	No

Note: Locations operating at an average speed < 52.2 mph are defined as LOS F by the Highway Capacity Manual per the Caltrans Guide for the Preparation of Traffic Impact Studies (Dec 2002).
Density is not provided at LOS F locations as density results are not reflective of operations at location.

With the project, all of the segments during the AM peak hour would continue to operate at the same LOS as under future conditions. The project represents between 0.1 and 2.5 percent of the future plus project traffic volumes on the segments depending on location and direction. Segments where the project accounts for more than 2 percent of the future plus project traffic volumes would operate at LOS C or better during the AM peak hour. The project is projected to have no change in the MOE during the AM peak hour under the future plus project scenario.

With the project, all of the segments during the PM peak hour would continue to operate at the same LOS as under future conditions. The project represents between 0.2 and 2.1 percent of the future plus project traffic volumes on the segments depending on location and direction. Segments where the project accounts for more than 2 percent of the future plus project traffic volumes would operate at LOS C or better during the AM peak hour. The project is projected to have no change in the MOE during the PM peak hour under the future plus project scenario.

Construction

As stated, a total of up to 1,245 daily PCE trips are expected to occur on a peak construction activity day, of which 212 PCE trips would occur during the morning peak hour and 150 PCE trips during the evening peak hour.

The peak construction activity would generate fewer daily and peak hour trips than are projected for the full build-out of the proposed project (4,753 daily trips, 514 AM peak hour trips, and 462 PM peak hour trips). The trip generation of the construction would have less of an impact on the traffic operations at the study intersections than the project. Nonetheless, the influx of this material and equipment could create impacts on the adjacent roadway network. For example, there may be intermittent periods when large numbers of material deliveries are required, such as when concrete trucks would be needed for the parking garages and the buildings. Some of the materials and equipment could require the use of large trucks (18-wheelers), which could create additional congestion on the adjacent roadways. Delivery vehicles may need to park temporarily on adjacent roadways such as Duarte Road or Buena Vista Street as they deliver their items. Based on past experience, it is not uncommon for these types of deliveries to result in temporary lane closures. Such delays and potential conflicts would be temporary, but impacts would remain potentially significant and require mitigation.

Impact 5.14-2: Project-related trip generation in combination with existing and proposed cumulative development would not result in designated road and/or highways exceeding county congestion management agency service standards. [Threshold T-2]

Impact Analysis: This section presents an analysis of potential impacts on the regional transportation system. This analysis was conducted in accordance with the procedures outlined in Congestion Management Program for Los Angeles County (CMP) (Metro, 2010). The CMP requires that, when an environmental impact report is prepared for a project, traffic and public transit impact analyses be conducted for select regional facilities based on the quantity of project traffic expected to use those facilities.

CMP Regional Traffic Impact Analysis

The CMP guidelines require that the first issue to be addressed is the determination of the geographic scope of the study area. The criteria for determining the study area for CMP arterial monitoring intersections and for freeway monitoring locations are:

- All CMP arterial monitoring intersections where the proposed project will add 50 or more trips during either the AM or PM peak hours of adjacent street traffic.
- All CMP mainline freeway monitoring locations where the proposed project will add 150 or more trips, in either direction, during either the AM or PM peak hours.

Significant Traffic Impact Criteria

The CMP traffic impact analysis guidelines establish that a significant project impact occurs when the following threshold is exceeded:

- The proposed project increases traffic demand on a CMP facility by 2% of capacity ($V/C \geq 0.02$), causing LOS F ($V/C > 1.00$)

If the facility is already at LOS F, a significant impact occurs when the proposed project increases traffic demand on a CMP facility by 2% of capacity ($V/C \geq 0.02$).

Arterial Monitoring Stations

The closest CMP arterial monitoring station, the intersection of Azusa Avenue & Foothill Boulevard, is approximately 4.3 miles from the project site. The project is not expected to add 50 or more vehicle trips during the AM or PM peak hours in the eastbound and westbound directions at any of the study intersections in the northeastern boundary of the study area, much closer to the project site. Therefore, the project would not add more than 50 trips to the intersection of Azusa Avenue & Foothill Boulevard farther east and no further arterial review using CMP criteria is required.

Freeways

The CMP mainline freeway monitoring stations closest to the project site are I-210 at Highland Avenue and I-605 at Rivergrade Road. According to the trip generation estimates, the project is projected to result in an increase of fewer than 150 trips in each direction for both the AM and PM peak hours at both of these locations. No further analysis of the freeway segments is required for CMP purposes.

Impact 5.14-3: Project circulation improvements would not create hazardous conditions (sharp curves, etc.), potential conflicting uses, and emergency access. [Threshold T-4]

Impact Analysis: The Campus Plan does not anticipate fundamental changes to the campus' internal circulation network from what exists today see Figure 3-6, *Proposed Vehicular Circulation and Access System*. The Campus Plan includes several project design features to facilitate improved vehicular and pedestrian circulation within the campus and enhance wayfinding for inpatient and outpatient arrivals, drop-offs, and departures. In addition, connectivity throughout and around the campus is improved with the introduction of an internal roadway system which safely accommodates bicycling, as well as improved bike and pedestrian connections to the Duarte/City of Hope Metro Gold. These improvements included in the City of Hope Campus Plan would not introduce incompatible uses to area roadways, nor would it create hazardous conditions. Therefore, impacts are less than significant.

Impact 5.14-4: The proposed project would not result in inadequate emergency access. [Threshold T-5]

Impact Analysis: The vehicular circulation and access system defines a proposed roadway network through the Campus Plan area to support a variety of potential development scenarios. This includes a secondary network of service roads, alleys, and multi-modal pathways, which will provide both service and fire access for the entirety of the campus.

To address fire and emergency access needs, the traffic and circulation components of the proposed Campus Plan would be designed and constructed in accordance with all applicable Los Angeles County Fire Department (LACFD) design standards for emergency access (e.g., minimum lane width and turning radius). For example, new site access driveways and drives aisles would be designed to meet the minimum width requirements of LACFD to allow the passing of emergency vehicles. Future development projects under the proposed Campus Plan would also be required to incorporate all applicable design and safety requirements in the most current adopted fire codes, building codes, and nationally recognized fire and life safety standards of the Cities of Duarte and Irwindale, such as the 2013 California Fire Code. Compliance with these codes and standards is ensured through the Cities' and LACFD's development review and building permit process.

The Campus Plan includes a number of standards to ensure adequate emergency access. Gate access standards outlined in the Campus Plan require a minimum gate access width of 15 feet or as required by the LACFD. In addition to gate access standards, building orientation shall consider site design factors that allow access for fire and emergency vehicles. In addition to the four primary campus access points that are maintained (including three on Duarte Road and one on Buena Vista Street), three additional points of access will be provided for emergency and maintenance vehicle access only–one at the southeastern end of Cinco Robles Drive cul-de-sac and the other two along Buena Vista Street, north and south of the Village Road access.

During the building plan check and development review process, the City of Hope would be required to coordinate with LACFD to ensure that the necessary fire prevention and emergency response features are incorporated into the proposed project and that adequate circulation and access (e.g., adequate turning radii for fire trucks) is provided within the traffic and circulation components of the proposed project. All site and building improvements proposed under the Campus Plan would be subject to review and approval by the applicable City and LACFD prior to building permit and certificate of occupancy issuance. Therefore, impacts on emergency access would be less than significant.

Impact 5.14-5: The proposed project complies with adopted policies, plans, and programs for alternative transportation. [Threshold T-6]

Impact Analysis: The mobility and streetscape plan for the proposed Specific Plan is guided by the Cities of Duarte and Irwindale's mobility elements and incorporates several complete street concepts to promote bicycle and pedestrian travel. The Campus Plan would provide an equitable method of vehicular, public transit, pedestrian, and bicycle access for development of the area. Section 3.5.1, *Description of the Project*, of the DEIR discusses the improvements to the Campus Plan area to accommodate transit, pedestrians, bicycles, and autos, which would create an efficient, balanced, multimodal mobility network by integrating autos, transit, bicycles, and pedestrians into a complete street.

Transit

The proposed Campus Plan is currently served by the Duarte Transit, Foothill Transit, and Metro Public Transit service. Buildout of the Campus Plan is expected to generate an estimated net external 4,753 daily trips, including 514 trips (448 inbound/66 outbound) during the AM peak hour and 462 trips (74 inbound/388 outbound) during the PM peak hour.

The number of transit trips generated by the Campus Plan buildout was estimated by multiplying the peak hour trip generation (514 AM peak hour trips) by 1.4 to convert auto trips to person trips (720 person trips), and assuming that up to 4 percent of those trips could be transit trips. This results in the potential of 29 AM peak hour transit trips generated by the project. With 10 transit routes serving the study area, this would equate to about 3 riders per route. At an estimated increase of 3 riders per transit vehicle, the performance or safety of transit will not decrease. Impacts to transit are less than significant.

Pedestrian

Buildout of the Campus Plan would enhance pedestrian facilities throughout the Campus Plan area by providing continuations of sidewalks, streetscape improvements, and installation of high visibility crosswalks along Duarte Road, which would also enhance pedestrian safety. Additionally, the Specific Plan provides a combination of landscape design elements, improved signage, lighting, and wayfinding, and the provision of safe, accessible, and well-marked pathways to all building entrances. The circulation design guidelines and standards in the Specific Plan contain regulations that aim to create a welcoming and accessible pedestrian environment throughout campus. This environment is to be achieved through connections between the main campus entrances and public streets, and through internal pathways that provide pedestrian linkages between buildings and uses. Therefore, the project would have a beneficial impact to pedestrian facilities. Impacts are less than significant.

Bicycle

The study area currently has a Class III bike route on Royal Oaks Drive that provides a bike route in the northern part of the study area, and an off-site bike trail also located in the northern section of the study area. In addition to the existing facilities, the City of Duarte is planning on adding other Class I, Class II, and Class III bicycle facilities in the project vicinity. The proposed bicycle facilities will improve overall access to the project site and the Campus Plan would provide greater access to these facilities through internal circulation improvements.

Many hospital employees and visitors currently ride their bikes alongside cars in the roadway or alongside pedestrians on the sidewalk through and around campus. Improving bicycle safety, circulation, and access are important objectives of the City of Hope Specific Plan. Figure 17 of the Specific Plan illustrates proposed bike improvements and the internal roadways which will accommodate those upgrades. These improvements include:

- Shared lane treatments
- Bike parking facilities

- Connections to the Emerald Necklace Recreational Trail System (with an access point immediately east of campus)
- Bike lanes/sharrows along Duarte Road and Buena Vista Street

These improvements would have a beneficial impact to bicycle facilities. Impacts are less than significant.

Conclusion

In summary, the proposed Campus Plan would improve bicycle and pedestrian facilities and infrastructure throughout the project area to promote active and alternative modes of transportation. Additionally, it would not create a substantial increase in transit ridership that could decrease the performance or safety of the system.

Consistency with the Mobility Element

The City of Hope Campus Plan is guided by the City of Duarte's Circulation Element, and the city of Irwindale's Infrastructure Element. The Campus Plan is consistent with several policies to promote complete streets and alternative transportation modes:

City of Duarte

- **Obj. 1.1:** Maintain the existing transportation infrastructure in Duarte and upgrade the system when appropriate to improve traffic conditions through enhanced traffic control measures, roadway improvements, and effective planning for new development.
- **Obj. 3.1:** Encourage and promote the use of travel modes other than the single occupancy vehicle, such as bus transit, rail transit, carpools, vanpools, bicycling, and walking.

City of Irwindale

- **Policy 3:** The City of Irwindale will continue to develop and enhance the existing streets and intersections in the City.
- **Policy 5:** The City of Irwindale will continue to support the development and expansion of the region's public and mass transit system.

City of Monrovia

- **Goal 1:** Minimize traffic congestion on arterial and collector streets during peak hours in order to ensure a safe and efficient movement of people and goods within the City.
- **Goal 2:** Provide a system of streets and alleys that meets the needs of current and future residents, local and commuter traffic demands and ensures the safe and efficient movement of vehicles, people and goods throughout the City. Improve streets and alleys to their full design standards.

Furthermore, the City of Hope Campus Plan would help the City implement AB 1358, the California Complete Streets Act. AB 1358, described in Section 5.14.1.1, Regulatory Setting, requires local governments to plan for a balanced, multimodal transportation network that meets the needs of all users. By incorporating multi-modal transportation components into the City of Hope Campus Plan, the City would increase the number of trips made by alternative modes of travel, reducing the number of vehicle trips. An increase in transit trips, bicycling, and walking would thus help the City meet the transportation needs of all residents, workers, and visitors while reducing traffic congestion. Therefore, no impacts to adopted policies, plans, and programs for alternative transportation are anticipated to occur.

Consistency with SB 743

As stated in Section 5.14.1.1, Regulatory Setting, SB 743 started a process that could fundamentally change transportation impact analysis as part of CEQA compliance. These changes in many parts of California (if not statewide) will include the elimination of auto delay, LOS, and similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts. As part of the new CEQA Guidelines, the new criteria "shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses" (Public Resources Code Section 21099(b)(1)). Certification of the new guidelines are expected in late 2017. However, since OPR has not yet amended the CEQA Guidelines to implement this change, automobile delay is still considered a significant impact, and the Cities of Duarte and Irwindale will continue to use the established LOS criteria.

For informational purposes, Fehr & Peers prepared a technical memorandum (included in Appendix J1) to quantify the VMT for the project under existing and proposed conditions. To evaluate total VMT for the project, the analysis considered two methods for determining trip distance. The first method utilized trip distances as determined by the Southern California Association of Government's (SCAG) travel demand model, and the second method utilized the anonymous cell phone data from the existing City of Hope campus on weekdays for one year from July 2014 to June 2015. Detailed methodology used to calculate VMT and VMT reductions are provided in the Appendix J1 of this DEIR.

Vehicle Miles Traveled (VMT) Analysis

To evaluate total VMT for the project, the VMT analysis considered two methods for determining trip distance. The first method utilized trip distances as determined by the Southern California Association of Government's (SCAG) travel demand model, and the second method utilized the anonymous cell phone data from the existing City of Hope campus on weekdays for one year from July 2014 to June 2015.

SCAG Travel Demand Model Trip Distances

The vehicle trip length for the Duarte transportation analysis zone (TAZ) was obtained from the SCAG 2012 Regional Transportation Plan (RTP) Travel Demand Model The SCAG travel demand model identifies trip distances as either Home-Based Work (HBW), Home-Based Other (HBO), or Non Home-Based (NHB). The HBW and HBO trip distances were selected as the HBW trip distance represents the average distance traveled by people who work at the City of Hope while the HBO trip distance represents the average distance traveled by people who visit the City of Hope. The Duarte TAZ in the 2008 SCAG travel demand model identifies the HBW distance as 16.1 miles and the HBO distance as 8.6 miles.

Cell Phone Data Distances

Although the anonymous cell phone data included cell phone records for trip origins and destinations on weekdays throughout southern California (and beyond), this effort focused specifically on trip origins and destinations in the counties of Kern County, Ventura County, Los Angeles County, Orange County, San Bernardino County, Riverside County, and San Diego County. The cell phone data captures the trip distances of a sample of anyone who was working or visiting the City of Hope from July 2014 to June 2015. The anonymous cell phone data estimates and aggregates the home zip code data into probability distributions. These distributions are used to develop the distribution of project traffic to the City of Hope campus. The weighted average trip distance was determined to be 14.3 miles.

VMT Estimate

SCAG Travel Demand Model VMT

To calculate the daily VMT, the total daily trips were multiplied by the associated SCAG travel demand model trip distances. Based on the City of Hope future estimated trip generation of 12,793 daily worker trips and 3,890 daily visitor trips, the future VMT is estimated to be approximately 239,421 daily VMT. Based on the City of Hope existing trip generation of 9,920 daily worker trips and 2,009 daily visitor trips, existing VMT is estimated to be approximately 176,989 daily VMT. The net new VMT for buildout of the Campus Plan is estimated to be approximately 62,432 daily VMT.

Cell Phone Data VMT

To calculate the daily VMT, the total daily trips were multiplied weighted average trip distance. Based on the City of Hope future estimated trip generation of 16,682 daily trips, the future VMT is estimated to be approximately 238,553 daily VMT. Based on the City of Hope existing trip generation of 11,929 daily trips, existing VMT is estimated to be approximately 170,585 daily VMT. The net new VMT for buildout of the Campus Plan is estimated to be approximately 67,968 daily VMT.

VMT Per Capita Estimate

SCAG Travel Demand Model VMT Per Capita

To calculate the VMT per capita, the daily VMT was divided by the service population. The service population includes including full-time employees, part-time employees, contractors, and physicians. For the existing City of Hope campus, the 176,989 daily VMT was divided by the service population of 5,362 persons to result in an estimated 33.0 VMT per capita. For the future City of Hope campus, the 239,421daily VMT was divided by the service population of 7,203 persons to result in an estimated 33.2 VMT per capita. The net new VMT per capita for buildout of the Campus Plan is an estimated 33.9 VMT per capita.

Cell Phone Data VMT Per Capita

To calculate the VMT per capita, the daily VMT was divided by the service population. For the existing City of Hope campus, the 170,585 daily VMT was divided by the service population of 5,362 persons to result in an estimated 31.8 VMT per capita. For the future City of Hope campus, the 238,553 daily VMT was divided by the service population of 7,203 persons to result in an estimated 33.1 VMT per capita. The net new VMT per capita for buildout of the Campus Plan is an estimated 36.9 VMT per capita.

5.14.4 Cumulative Impacts

Cumulative traffic impacts are created when the proposed project—combined with other future development projects accommodated by the Cities' General Plans—contribute to the overall traffic impacts, requiring additional improvements to maintain acceptable level of service operations with or without the proposed project. Cumulative future traffic conditions include annual ambient traffic growth as well as the traffic effects of the 13 related projects expected to be implemented in the vicinity of the project site prior to full buildout of the Campus Plan. A significant cumulative impact is identified when a facility is projected to operate below the level of service standards due to cumulative future traffic in combination with project-related traffic increases. Cumulative traffic impacts were addressed in Impacts 5.14-1, 5.14-2, and 5.14-5 in Section 5.14.3, above. Trip generation estimates for the related projects were calculated using a combination of previous study findings, publicly available environmental documentation, and trip generation rates contained in the Institute of Transportation Engineers' trip generation manual. These projections are conservative in that they do not in every case account for either traffic generated by the existing uses to be removed or the possible use of non-motorized travel modes (transit, walking, etc.). Impacts and mitigation measures are discussed in Sections 5.14.6 and 5.14.7, respectively. As discussed in these sections, the proposed project's incremental effect on congested intersections would be significant at nine study area intersections prior to the implementation of mitigation. As further detailed in this section, while the implementation of mitigation would reduce impacts at six study area intersections below the applicable threshold of significance cumulative traffic impacts at intersections in the Cities of Duarte and Irwindale and impacts at Caltrans intersections and freeway facilities would be significant and unavoidable.

5.14.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to transportation and traffic and were described in detail in Section 5.14.1.1 of this DEIR and are listed below.

State and Regional

- The California Complete Streets Act (AB 1358)
- Sustainable Communities and Climate Protection Act (SB 375)
- SB 743
- SCAG 2016 Regional Transportation Plan/Sustainable Communities Strategy
- Los Angeles County Congestion Management Program

5.14.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.14-2, 5.14-3, 5.14-4 and 5.14-5.

Without mitigation, the following impacts would be **potentially significant**:

- **Impact 5.14-1:** Project-related traffic would result in a significant impact at 2 intersections during the existing plus project condition, 9 intersections during the future year plus project condition, including one freeway ramp, and two freeway mainline segments. The project would result in temporary construction traffic impacts.

5.14.7 Mitigation Measures

5.14.7.1 PROJECT DESIGN FEATURES

The following Project Design Features (PDF) would be incorporated into the project to reduce transportation and traffic related impacts:

PDF-1 **Circulation and Access:** In order to ensure sufficient and convenient parking, access, and internal circulation through each phase of campus development, interim parking and circulation improvements are required prior to building permit issuance. (see Figure 15 of the Specific Plan). Improvements include:

- Improve connectivity throughout and around the campus with the introduction of an internal roadway system which safely accommodates bicycling, as well as improved bike and pedestrian connections to the Duarte/City of Hope Metro Gold Line station.
- In addition to the four primary campus access points that are maintained (including three on Duarte Road and one on Buena Vista Street) three additional points of access will be provided for emergency and maintenance vehicle access only. One at the southeastern end of Cinco Robles Drive cul-de-sac and the other two along Buena Vista Street, north and south of the Village Road access.
- Currently unsignalized access points at Circle Road and Village Road (one access point on Duarte Road and the other on Buena Vista St.) will be signalized.

PDF-2 **Internal Roadway System:** Roadways will be improved and widened as new development is built and phased in over time. The goal of improving the internal roadway system is to create landscaped, complete streets accommodating pedestrians, bicyclists, automobiles, and a campus shuttle. Parking structures and new asphalt paved parking areas will be constructed with enhanced access, circulation, and streetscape improvements. Refer to Chapter 4 of the City of Hope Specific Plan regarding the proposed improvements to Village Road, Circle Road, Hope Drive, Mannie Fineman Road, Isadore Familian Way, and Center Drive.

PDF-3 **Bicycle Network:** Many hospital employees and visitors currently ride their bikes alongside cars in the roadway or alongside pedestrians on the sidewalk through and around campus. Improving bicycle safety, circulation, and access are important objectives of the City of Hope Specific Plan. Figure 17 of the Specific Plan illustrates proposed bike improvements and the internal roadways which will accommodate those upgrades. These improvements include:

- Shared lane treatments
- Bike parking facilities
- Connections to the Emerald Necklace Recreational Trail System (with an access point immediately east of campus)
- Bike lanes/sharrows along Duarte Road and Buena Vista Street.

PDF-4 **Pedestrian Connectivity:** The Specific Plan strives to enhance the pedestrian experience throughout campus with a combination of landscape design elements, improved signage, lighting, and wayfinding, and the provision of safe, accessible, and well-marked pathways to all building entrances. The circulation design guidelines and standards in the Specific Plan contain regulations and guidelines that aim to create a welcoming and accessible pedestrian environment throughout campus. This environment is to be achieved through connections between the main campus entrances and public streets, and through internal pathways that provide pedestrian linkages between buildings and uses.

5.14.7.2 MITIGATION MEASURES

Impact 5.14-1

TRAF-1 Prior to the issuance of the first certificate of occupancy for a new building constructed pursuant to the City of Hope Campus Plan, the project applicant shall install signals for the intersections listed below or prepare a signal warrant study pursuant to Caltrans' California Manual on Uniform Traffic Control Devices. If a signal warrant study prepared in coordination with the responsible agency, shows that signalization is warranted, the project applicant shall install the required signal(s). If signalization is not warranted, an updated signal warrant study for each of the unsignalized intersections identified below shall be prepared every five years until project buildout. Signal installation and/or signal warrant analyses shall be conducted for the following intersections[1]:

- 8. I-605 Northbound Off-Ramp & Live Oak Avenue
- 16. Buena Vista Street & Village Road

[1] Intersections # 16, 17, 19, and 22 meet peak hour signal warrant criteria under the future baseline scenario; intersection #8 meets warrant criteria at a 43 percent net increase in population.

- 17. I-210 Westbound Off-Ramp & Central Avenue
- 19. Village Road & Duarte Road
- 22. Circle Road & Duarte Road

TRAF-2 Prior to the issuance of building permits, the project applicant shall make fair-share payments to the City of Irwindale toward the construction of traffic improvements to Avenida Barbosa at Arrow Highway (#6) as follows:

- Modify the eastbound approach on Arrow Highway to provide a second eastbound left-turn lane within the existing roadway width.
- Restriping the approach to change from one left-turn lane and two through lanes into two left-turn lanes and two through lanes.

TRAF-3 Prior to issuance of permits for any construction activity, the project applicant shall prepare a construction management plan. The Construction Management Plan shall be approved by the Cities of Duarte and Irwindale Public Works Department. The construction management plan shall identify construction hours, truck routes, travel patterns for haul routes, staging and parking areas, staggered worker arrival times, and safety procedures for pedestrians and bicyclists. The construction management plan shall prohibit the use of heavy construction vehicles during peak hours; establish requirements for the loading, unloading, and storage of materials on the project site; and establish requirements for the temporary removal of parking spaces, time limits for the reduction of travel lanes, and closing or diversion of pedestrian facilities to ensure the safety of pedestrian and access to local businesses. The plan shall also require the construction contractor to implement the following measures during construction activities, which shall be discussed at the pre-grading conference/meeting:

- A flagman shall be placed at the truck entry and exit from the project site onto Duarte Road and Buena Vista Street to control the flow of exiting trucks.
- The preferred haul route to and from the project site shall be Duarte Road, Buena Vista Street (south of Village Road), Avenida Barbosa, and Arrow Highway for inbound and outbound trucks to north I-605. Trucks shall not be permitted to travel along local residential streets.
- Deliveries and pick-ups of construction materials shall be scheduled during non-peak travel periods and coordinated to reduce the potential of trucks waiting to load or unload for protracted periods of time.
- Access shall remain unobstructed for land uses in proximity to the project site during construction.

- In the event of a lane or sidewalk closure, a worksite traffic control plan, shall be implemented to route traffic or pedestrians around any such lane or sidewalk closures.
- Coordinate with the Cities and emergency service providers to ensure adequate access is maintained to the project site and neighboring businesses.
- Schedule vehicle movements to minimize vehicles waiting off-site and impeding public traffic flow on the surrounding streets.

Mitigation Measures Considered and Rejected

Provided below is a discussion of physical measures that were explored but due to physical constraints, safety concerns, and/or potential secondary impacts, these mitigation measures have been determined to be infeasible.

- **1. Live Oak Avenue & Arrow Highway.** A mitigation measure was analyzed involving a modification to the northbound approach on Live Oak Avenue to change the dedicated free-flow right-turn into a shared left/right-turn. The mitigation would require the removal of the free-flow right-turn and the reduction or removal of the pedestrian refuge island to create the shared left/right-turn lane. The mitigation would reduce the intersection operations to a less than significant level. The mitigation is not recommended due to the reduction or removal of the pedestrian refuge island.

- **13. Buena Vista Street & Evergreen Street.** A mitigation measure was analyzed involving a modification to the northbound approach on Buena Vista to change one northbound through lane into a northbound shared through/right lane. The mitigation would require restriping the approach to change from two through lanes and one right-turn lane into one through lane, one shared through/right-turn lane, and one right-turn lane. The mitigation would reduce the intersection operations to a less than significant level. However, the mitigation is not recommended due to potential limited line of sight and pedestrian conflicts with the northbound multiple right-turn lanes.

- **15. Buena Vista Street & Duarte Road.** A mitigation measure was analyzed involving the installation of a right-turn overlap phase in the westbound direction. The intersection was determined to have an existing de facto operational right turn lane based on the measurements of the westbound shared through/right-turn lane and the operations of the lane during the AM and PM peak hours. The mitigation was determined to be infeasible due to the lack of a dedicated westbound right-turn lane at the intersection.

5.14.8 Level of Significance After Mitigation

Impact 5.14-1

With implementation of Mitigation Measure TRAF-1 and TRAF-2, traffic operations would be improved to acceptable levels of service and impacts would be less than significant, with the exception of three intersections in the future condition (see Tables 10 and 11 in Appendix J1 of this DEIR). For the reasons stated above, improvements to: Live Oak Avenue & Arrow Highway (#1; Irwindale), Buena Vista Street & Evergreen Street (#13; Duarte), and Buena Vista Street & Duarte Road (#15; Duarte) are not recommended for safety reasons. Impacts to these intersections would remain ***significant and unavoidable***.

The freeway ramp queues would extend beyond the 85 percent length of the ramp at I-605 Northbound Off-Ramp & Live Oak Avenue (#8) and I-210 Westbound Off-Ramp & Central Avenue (#17). Signalization of these ramp intersections as required under TRAF-1 would reduce the storage length by approximately half during both peak periods, ensuring that the queue would not extent beyond the 85 percent length (see Table 14 of Appendix J1 of this DEIR). This would mitigate the ramps to less than significant. However, the improvement is within the responsibility of Caltrans and not controlled by the Cities. Therefore, the Cities cannot guarantee implementation of the improvement and impacts to freeway ramps would be ***significant and unavoidable***.

The required improvements to Avenida Barbosa & Arrow Highway (#6; Irwindale) are not currently included in any traffic fee program; therefore, project impacts to this intersection would be ***significant and unavoidable.***

Two freeway segments will operate at an unacceptable level, and the project adds traffic to these facilities. Therefore, there are project-level impacts to the freeway system near the project site. To mitigate the impacts at the identified locations, freeway mainline widening would be required. However, this type of infrastructure is extremely costly and is typically infeasible for one development project to undertake. The City cannot assure the construction of improvements to freeway facilities that may be needed to improve traffic flow. Furthermore, Caltrans does not have any funding mechanism in place to allow development projects to contribute a fair-share payment to future improvements and off-set traffic impacts caused by regional transportation. The facility is not controlled by the Cities, which could not guarantee implementation of the mitigation measures. Therefore, the identified impacts to the freeway system are considered ***significant and unavoidable***.

Note this project-level impact assumes that buildout of the project would occur at one time without consideration for regional improvements. In the future condition, impacts to the two freeway segments– westbound I-210 west of I-605 and 2) southbound I-605 south of I-210– would not occur.

Improvements to state highway facilities are planned, funded, and constructed by the State of California through a legislative and political process involving the state legislature; the California Transportation Commission (CTC); the California Business, Transportation, and Housing Agency; Caltrans; and the Regional Transportation Planning Agency (RTPA). Although potential impacts to the freeway mainline segments and ramps have been evaluated, implementation of the transportation improvements to Caltrans facilities listed above is the primary responsibility of Caltrans. Caltrans has recognized that private development has a role to play in funding fair share improvements to impacts on these facilities, but neither Caltrans nor the state has adopted a program that can ensure that locally contributed impact fees will be tied to improvements to freeway mainlines, and only Caltrans has jurisdiction over mainline improvements. Because Caltrans has exclusive control over state highway improvements, ensuring that developer fair share contributions to mainline improvements are actually part of a program tied to implementation of mitigation is within the jurisdiction of Caltrans. However, a number of programs are in place in Los Angeles County to improve and upgrade the regional transportation system. These include the State Transportation Improvement Program (STIP), Regional Transportation Improvement Program (RTIP), Interregional Improvement Program (IIP), and Caltrans Traffic Operations Strategies, State Highway Operation and Protection Program (SHOPP). State and federal fuel taxes generate most of the funds used to pay for these improvements. Funds expected to be available for transportation improvements are identified through a fund estimate prepared by Caltrans and adopted by the CTC. These funds, along with other fund sources, are deposited in the state highway account to be programmed and allocated to specific project improvements in both the STIP and SHOPP by the CTC. However, if these programs are not implemented by the agencies with the responsibility to do so, the project's freeway mainline impacts would remain ***significant and unavoidable***.

Mitigation Measure TRAF-3 would ensure that a construction management plan is in place to eliminate the potential for conflicts related to construction equipment, haul trips, and worker trips. Temporary construction related traffic impacts would be less than significant.

5.14.9 References

California Department of Transportation (Caltrans). 2002, December. "Guide for the Preparation of Traffic Impact Studies." http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf.

Fehr and Peers. 2017, April. Transportation Impact Study for the City of Hope.

Governor's Office of Planning and Research (OPR). 2010. Update to the General Plan Guidelines: Complete Streets and the Circulation Element. State of California. http://opr.ca.gov/docs/Update_GP_Guidelines_Complete_Streets.pdf.

Institute of Transportation Engineers (ITE). 2010. Trip Generation, 9th Edition.

Los Angeles County Metropolitan Transportation Authority (Metro). 2010, October 28. 2010 Congestion Management Program for Los Angeles County. http://media.metro.net/docs/cmp_final_2010.pdf.

Walker Parking Consultants. 2016, June. City of Hope Campus Plan Parking Study.

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5.15 TRIBAL CULTURAL RESOURCES

Tribal cultural resources include landscapes, sacred places, or objects with cultural value to a California Native American tribe. This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for implementation of the City of Hope Campus Plan (Campus Plan) to impact tribal cultural resources in the City of Duarte and the City of Irwindale. Other potential impacts to cultural resources (i.e., prehistoric, historic, paleontological, and disturbance of human remains) are evaluated in Section 5.4, *Cultural Resources*. The analysis in this section is based in part on the following report:

- *Cultural Resources Technical Report for the City of Hope Specific Plan, City of Duarte, Los Angeles County, California*, SWCA Environmental Consultants, July 2017.

A complete copy of this study is included in Appendix E1 of this DEIR.

5.15.1 Environmental Setting

5.15.1.1 REGULATORY BACKGROUND

Federal

Archaeological Resources Protection Act

The Archaeological Resources Protection Act of 1979 regulates the protection of archaeological resources and sites which are on Federal lands and Indian lands.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (NAGPRA) is a federal law passed in 1990 that provides a process for museums and Federal agencies to return certain Native American cultural items, such as human remains, funerary objects, sacred objects, or objects of cultural patrimony, to lineal descendants, and culturally affiliated Indian tribes.

State

Public Resources Code

Archaeological resources are protected pursuant to a wide variety of state policies and regulations enumerated under the California Public Resources Code. In addition, cultural resources are recognized as a non-renewable resource and therefore receive protection under the California Public Resources Code and CEQA.

- **California Public Resources Code 5097.9–5097.991** provides protection to Native American historical and cultural resources, and sacred sites and identifies the powers and duties of the Native American Heritage Commission (NAHC). It also requires notification to descendants of discoveries of Native American human remains and provides for treatment and disposition of human remains and associated grave goods.

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- **California Public Resources Code 5097.9** states that no public agency or private party on public property shall "interfere with the free expression or exercise of Native American Religion." The code further states that:

  > No such agency or party [shall] cause severe or irreparable damage to any Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine… except on a clear and convincing showing that the public interest and necessity so require. County and city lands are exempt from this provision, except for parklands larger than 100 acres.

Health and Safety Code

The discovery of human remains is regulated per California Health and Safety Code Section 7050.5, which states that:

> In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation…until the coroner…has determined…that the remains are not subject to…provisions of law concerning investigation of the circumstances, manner and cause of any death, and the recommendations concerning the treatment and disposition of the human remains have been made to the person responsible…. The coroner shall make his or her determination within two working days from the time the person responsible for the excavation, or his or her authorized representative, notifies the coroner of the discovery or recognition of the human remains. If the coroner determines that the remains are not subject to his or her authority and…has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission.

Senate Bill 18

Prior to the enactment of Senate Bill 18 (SB 18; California Government Code Sections 65352.3 et seq.) related to traditional tribal cultural places (TTCP) in 2004, state law provided limited protection for Native American prehistoric, archaeological, cultural, spiritual, and ceremonial places. These places may include sanctified cemeteries, religious, ceremonial sites, shrines, burial grounds, prehistoric ruins, archaeological or historic sites, Native American rock art inscriptions, or features of Native American historic, cultural, and sacred sites.

SB 18 placed new requirements upon local governments for developments within or near TTCP. SB 18requires local jurisdictions to provide opportunities for involvement of California Native Americans tribes in the land planning process for the purpose of preserving traditional tribal cultural places. The Final Tribal Guidelines recommends that the NAHC provide written information as soon as possible but no later than 30 days to inform the lead agency if the proposed project is determined to be in proximity to a TTCP and another 90 days for tribes to respond to if they want to consult with the local government to determine whether the project would have an adverse impact on the TTCP. There is no statutory limit on the consultation duration. Forty-five days before the action is publicly considered by the local government council, the local government refers action to agencies, following the CEQA public review time frame. The

CEQA public distribution list may include tribes listed by the NAHC who have requested consultation or it may not. If the NAHC, the tribe, and interested parties agree upon the mitigation measures necessary for the proposed project, it would be included in the project's EIR. If both the lead agency and the tribe agree that adequate mitigation or preservation measures cannot be taken, then neither party is obligated to take action.

SB 18 requires a city or county to consult with the NAHC and any appropriate Native American tribe prior to the adoption, revision, amendment, or update of a city's or county's general plan. While SB 18 does not specifically mention consultation or notice requirements for adoption or amendment of specific plans, the Final Tribal Guidelines advises that SB 18 requirements extend to specific plans as well, because state planning law requires local governments to use the same process for amendment or adoption of specific plans as general plans (defined in Government Code § 65453). In addition, SB 18 provides a new definition of TTCP that requires a traditional association of the site with Native American traditional beliefs, cultural practices, or ceremonies or the site must be shown to actually have been used for activities related to traditional beliefs, cultural practices, or ceremonies. Previously, the site was defined to require only an association with traditional beliefs, practices, lifeways, and ceremonial activities. In addition, SB 18 law amended Civil Code § 815.3 and added California Native American tribes to the list of entities that can acquire and hold conservation easements for the purpose of protecting their cultural places.

Assembly Bill 52

The Native American Historic Resource Protection Act (AB 52) took effect July 1, 2015, and incorporates tribal consultation and analysis of impacts to tribal cultural resources (TCR) into the CEQA process. It requires TCRs to be analyzed like any other CEQA topic and establishes a consultation process for lead agencies and California tribes. Projects that require a Notice of Preparation of an EIR or Notice of Intent to adopt a ND or MND on or after July 1st are subject to AB 52. A significant impact on a TCR is considered a significant environmental impact, requiring feasible mitigation measures.

TCRs must have certain characteristics:

1) Sites, features, places, cultural landscapes (must be geographically defined), sacred places, and objects with cultural value to a California Native American tribe that are either included or determined to be eligible for inclusion in the California Register of Historic Resources or included in a local register of historical resources. (PRC § 21074(a)(1))

2) The lead agency, supported by substantial evidence, chooses to treat the resource as a TCR. (PRC § 21074(a)(2))

The first category requires that the TCR qualify as a historical resource according to PRC Section 5024.1. The second category gives the lead agency discretion to qualify that resource—under the conditions that it support its determination with substantial evidence and consider the resource's significance to a California tribe. The following is a brief outline of the process (PRC §§ 21080.3.1–3.3).

1) A California Native American tribe asks agencies in the geographic area with which it is traditionally and culturally affiliated to be notified about projects. Tribes must ask in writing.

2) Within 14 days of deciding to undertake a project or determining that a project application is complete, the lead agency must provide formal written notification to all tribes who have requested it.

3) A tribe must respond within 30 days of receiving the notification if it wishes to engage in consultation.

4) The lead agency must initiate consultation within 30 days of receiving the request from the tribe.

5) Consultation concludes when both parties have agreed on measures to mitigate or avoid a significant effect to a TCR, OR a party, after a reasonable effort in good faith, decides that mutual agreement cannot be reached.

6) Regardless of the outcome of consultation, the CEQA document must disclose significant impacts on TCRs and discuss feasible alternatives or mitigation that avoid or lessen the impact.

5.15.1.2 EXISTING CONDITIONS

The project site is heavily urbanized and developed with medical and research buildings ranging from 46 to 81 years old, surface parking lots, parks and open space. No tribal cultural resources onsite were identified during field survey or in responses to inquiries by Native American tribal representatives, both conducted as part of the cultural resources investigation for the Campus Plan; or in a Sacred Lands File search conducted by the Native American Heritage Commission (NAHC) referenced in a letter by the NAHC dated February 17, 2016 (SWCA 2017).

5.15.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

TCR-1 Cause a substantial adverse change in the significance of a Tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:

- Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

5.15.3 Environmental Impacts

Methodology

In order to identify tribal cultural resources and analyze any potentially significant adverse impacts, SWCA conduced records searches, site inspections, intensive-level surveys, background research, and Native American consultation per SB 18 and AB 52 requirements. The National Register of Historic Places and CRHR criteria were also used and a sacred lands file search from NAHC was conducted. Please refer to Appendix E1 "Methods" for specific details on methodology.

The following impact analysis addresses thresholds of significance that may be potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.15-1: Grading activities associated with implementation of the Campus Plan have the potential to encounter tribal cultural resources. [Threshold TCR-1]

Impact Analysis: Conducting consultation early in the CEQA process allows tribal governments, public lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. The intent of the consultations is to provide an opportunity for interested Native American contacts to work together with the City during the project planning process to identify and protect tribal cultural resources.

Sacred Lands File Search and Consultation

As stated in Section 5.4, *Cultural Resources*, and Appendix E1 of this DEIR, no prehistoric sites have been recorded on the project site or within a quarter-mile radius of the site (SWCA 2017). On February 17, 2016, a Sacred Lands File search was conducted by NAHC to determine if any sacred lands or traditional cultural properties had been identified near the project site (SWCA 2017). The NAHC response did not identify any properties deemed significant by local Native American groups in the vicinity of the project. The NAHC also provided a list of five Native American groups and individuals who may have knowledge of cultural resources in the project area. SWCA sent letters to each of the contacts, identifying the project location and requesting input, via U.S. mail on February 26, 2016. SWCA conducted one follow-up telephone call with each contact on March 5, 2016. Four tribes responded to SWCA:

- ***Gabrielino/Tongva San Gabriel Band of Mission Indians.*** Chairperson Anthony Morales stated via telephone on February 26, 2016, that he considered the area to be sensitive for prehistoric and historic archaeological resources and recommended Gabrieleño/Tongva San Gabriel Band of Mission Indians tribal monitors be present during ground-disturbing activities. No follow-up communication has been received from the tribe as of the date of this DEIR.

- ***Gabrielino Tongva Indians of California Tribal Council***: Tribal Chair Robert Dorame stated via telephone on February 26, 2016, that he was not aware of any cultural resources within the project area, but planned on speaking with local residents with direct knowledge of the area and would call SWCA should he have any additional concerns

- ***Gabrieleño Band of Mission Indians - Kizh Nation***: Chairperson Salas responded via email that the project is located within the ancestral and traditional territories of the Kizh (Kitc) Gabrieleño villages and that their tribal monitors should be on-site during any ground-disturbing activities.

- ***Soboba Band of Mission Indians***: Cultural Resources Program Director Joseph Ontiveros sent SWCA a letter via U.S. mail indicating no specific concerns regarding known cultural resources in the specified project area.

Representatives from the Gabrielino/Tongva San Gabriel Band of Mission Indians and Gabrieleño Band of Mission Indians – Kizh Nation identified that there are tribal cultural resources in the vicinity of the project site, and that there is a potential to encounter buried prehistoric deposits on the project site. Buried or obscured archaeological resources may be encountered during construction. Therefore, there remains a possibility that the development of the project site through grading and excavation activities could impact previously undisturbed prehistoric archaeological resources. Thus, impacts to tribal cultural resources are potentially significant.

AB 52 and SB 18 Consultation

In accordance with AB 52 and SB 18 requirements, NAHC provided a list of tribal representatives who may have knowledge of tribal cultural resources in the project area. The City sent invitation letters to representatives of the Native American contacts provided by the NAHC on January 4, 2016, formally inviting tribes to consult with the City on the City of Hope Campus Plan. The intent of the consultations was to provide an opportunity for interested Native American contacts to work together with the City during the project planning process to identify and protect tribal cultural resources. Letters were sent to the following Tribes:

AB 52

- Andrew Salas, Chairman, Gabrieleño Band of Mission Indians – Kizh Nation
- Joseph Ontiveros, Cultural Resource Director, Soboba Band of Luiseño Indians

SB 18

- John Tommy Rosas, Tribal Admin, Tongva Ancestral Territorial Tribal Nation
- Ron Andrade, Director, LA City/County Native American Indian Community

- Anthony Morales, Chairperson, Gabrieleno/Tongva San Gabriel Band of Mission Indians
- Sandonne Goad, Chairperson, Gabrielino/Tonga Nation
- Robert F. Dorame, Tribal Chair/Cultural Resources, Gabrielino Tongva Indians of California Tribal Council
- Bernie Acuna, Co-Chairperson, Gabrielino-Tongva Tribe
- Linda Candelaria, Co-Chairperson, Gabrielino-Tongva Tribe
- Andrew Salas, Chairman, Gabrieleño Band of Mission Indians – Kizh Nation
- Conrad Acuna, Gabrielino-Tongva Tribe
- Sam Dunlap, Cultural Resources Director, Gabrielino/Tongva Nation

Response letters were received from two tribal representatives Andrew Salas of Gabrieleño Band of Mission Indians - Kizh Nation and John Tommy Roasas, Tongva Ancestral Territorial Tribal Nation.

- ***Gabrieleño Band of Mission Indians - Kizh Nation***: Chairman Andrew Salas notes that the entire City of Duarte lies on top of a Gabrieleño Prehistoric Village, which later became known as Rancho De Duarte. States that due to concerns related to potential impacts to cultural resources, that they would like to request one of their tribal monitors to be onsite at the project site during all ground disturbance.

- ***Tongva Ancestral Territorial Tribal Nation:*** Confirmed receipt of the City's consultation letter and provided a list of billing rates.

In response to the letter received from the Gabrieleño Band of Mission Indians - Kizh Nation, the City of Duarte sent a follow up letter on September 22, 2016, providing the tribe with cultural resources results and requesting additional documentation related to the cultural significance attributed to the project site and surrounding area (see Appendix E1). The letter requested an in-person or telephone consultation to go over this additional data to confirm the need for a Native American monitor to be present during all ground disturbances. As of the date of this DEIR, no response has been received from the tribe. Nevertheless, tribal cultural resources could be present in soils under the Campus Plan site, and project ground-disturbing activities could damage such resources. This impact would be potentially significant. Implementation of Mitigation Measure CUL-2 set forth in Section 5.4, Cultural Resources, of this DEIR and reproduced below has been incorporated into the project.

5.15.4 Cumulative Impacts

Cumulative impacts to cultural resources would occur when the impacts of the Campus Plan, in conjunction with other projects and development in the region, result in multiple and/or cumulative impacts to tribal cultural resources in the area. No prehistoric sites have been recorded on the project site or within a quarter-mile radius of the site, and no sacred sites are documented within or adjacent to the project area. However, it is possible that buried prehistoric artifacts or tribal cultural resources could be present within the area. Each future project considered for approval by the Cities of Duarte and Irwindale would be required to include mitigation measures to protect these resources if they are uncovered during grading activities. The proposed

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project also includes mitigation measures to ensure proper identification, treatment, and preservation of cultural resources. Implementation of these measures would reduce the potential for adverse impacts on tribal cultural resources both individually and cumulatively. Therefore, cumulative impacts to cultural resources would be less than significant.

5.15.5 Existing Regulations

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to tribal cultural resources and were described in detail in Sections 5.15.1.1 of this DEIR and are listed below.

Federal

- Archaeological Resources Protection Act
- Native American Graves Protection and Repatriation Act

State

- California Public Resources Code Sections 5079–5079.65
- California Senate Bill 18
- Assembly Bill 52

5.15.6 Level of Significance Before Mitigation

Without mitigation, the following impacts would be **potentially significant:**

- **Impact 5.15-1** Tribal cultural resources could be adversely impacted by grading activities associated with the Campus Plan.

5.15.7 Mitigation Measures

Impact 5.15-1

Mitigation Measure CUL-2 in Section 5.4, *Cultural Resources*, of this DEIR applies and is reproduced below.

CUL-2 Prior to issuance of any permits allowing ground-disturbing activities within the Campus Plan area, the City of Duarte and/or City of Irwindale, as appropriate, shall ensure that an archeologist who meets the Secretary of the Interior's Standards for professional archaeology has been retained for the project and will be on call during all grading and other significant ground-disturbing activities. The Qualified Archaeologist shall ensure that the following measures are followed for the project:

- Prior to any ground disturbance, the Qualified Archaeologist, or their designee, shall provide Worker Environmental Awareness Protection (WEAP) training to construction personnel regarding regulatory requirements for the protection of cultural (prehistoric and historic) resources. As part of this training, construction personnel shall be briefed on proper procedures to follow should unanticipated cultural resources be made during construction. Workers will be provided contact information and protocols to follow in the event that inadvertent discoveries are made. The WEAP training can be in the form of a video or PowerPoint presentation. Printed literature (handouts) can accompany the training and can also be given to new workers and contractors to avoid the necessity of continuous training over the course of the project.

- In the event that unanticipated cultural material is encountered during any phase of project construction, all construction work within 50 feet (15 meters) of the find shall cease and the Qualified Archaeologist shall assess the find for importance. Construction activities may continue in other areas. If, in consultation with the appropriate City, the discovery is determined to not be important, work will be permitted to continue in the area.
  - If a find is determined to be important, additional work may be warranted, or the find can be preserved in place and construction allowed to proceed.
  - Additional work can include scientific recording and excavation of that portion of the find making the find important.
  - If excavation of a find occurs, the Qualified Archaeologist shall draft a report within 60 days of conclusion of excavation that identifies the find and summarizes the analysis conducted. The completed report shall be approved by the City and filed with the County and with the South Central Coastal Information Center at California State University, Fullerton.
  - Excavated finds shall be curated at a repository determined by the Qualified Archaeologist and approved by the City.

5.15.8 Level of Significance After Mitigation

Impact 5.15-1

Implementation of Mitigation Measure CUL-2 would ensure the project applicant and construction contractors are cognizant of potential tribal cultural resources onsite and have specified procedures to implement to ensure these potentially uncovered resources are not damaged during grading and construction activities. The mitigation measure requires that any archaeological resources encountered during project ground-disturbing activities be recovered, evaluated and curated, if necessary, by a qualified archaeologist, thus reducing potential impacts associated with tribal cultural resources to a level that is less than significant. Therefore, no significant unavoidable adverse impacts relating to tribal cultural resources have been identified.

5.15.9 References

GPA Consulting (GPA). 2016, March. Historical Resource Report: City of Hope Specific Plan.

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SWCA Environmental Consultants (SWCA). 2016, March 16. Summary of Cultural Resources Identification Efforts and Preliminary Results for the City of Hope Specific Plan and Environmental Impact Report, Cities of Duarte and Irwindale, Los Angeles County, California.

———. 2017, July. Cultural Resources Technical Report for the City of Hope Specific Plan, City of Duarte, Los Angeles County, California.

5.16 UTILITIES AND SERVICE SYSTEMS

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for implementation of the proposed Campus Plan to impact utilities and services systems. Utilities and services systems include water supply, treatment, and distribution systems; wastewater (sewage) conveyance and treatment; solid waste collection and disposal; and other public utilities. Impacts to hydrology (e.g., flooding), storm drainage systems, and water quality can be found in Section 5.8, *Hydrology and Water Quality*.

The analysis in this section is based, in part, on following technical reports:

- Revised Wastewater Analysis for the City of Hope Specific Plan, KPFF Consulting Engineers, August 16, 2016. (Appendix K1)
- Revised Water Infrastructure and Demand Analysis for the City of Hope Specific Plan, KPFF Consulting Engineers, August 16, 2016. (Appendix K2)
- Final Water Supply Assessment for the City of Hope Specific Plan, Water Systems Consulting, Inc., September 22, 2017. (Appendix L)

Complete copies of these technical studies are included in Appendices K1, K2, and L, as indicated, to this DEIR.

5.16.1 Wastewater Treatment and Collection

5.16.1.1 ENVIRONMENTAL SETTING

Regulatory Framework

Federal

Treating wastewater before effluent is discharged to Waters of the United States is required by the federal Clean Water Act, United States Code, Title 33, Sections 1251 et seq. The federal Clean Water Act is described in further detail in Section 5.8, *Hydrology and Water Quality*, of this DEIR.

Sanitation Districts of Los Angeles County

Capital improvements to the Los Angeles County Sanitation District's (LACSD) water reclamation plants are funded from connection fees charged to new developments, redevelopments, and expansions of existing land uses. The connection fee is a capital facilities fee used to provide additional conveyance, treatment, and disposal facilities (capital facilities) required by new users connecting to the LACSD's sewerage system or by existing users who significantly increase the quantity or strength of their wastewater discharge. The Connection Fee Program ensures that all users pay their fair share for any necessary expansion of the system. Estimated wastewater generation factors used in determining connection fees in LACSD's 22 member districts are set forth in the Connection Fee Ordinance for each respective district available on LACSD's website. The project site is in District 22 of the LACSD.

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Los Angeles Regional Water Quality Control Board

Discharge limits for effluent from LACSD's San Jose Creek Water Reclamation Plant are set forth in Los Angeles Regional Water Quality Control Board Order No. R4-2015-0070 issued in 2015.

Existing Conditions

Wastewater Conveyance

Sanitary sewer services within the cities of Duarte and Irwindale are provided by the Los Angeles County Department of Public Works (LACDPW). The LACDPW operates and maintains Duarte's local wastewater conveyance infrastructure, which connects to LACSD regional trunk sewer lines. Existing sewer pipelines adjacent to the project site are shown in Figure 5.16-1, *Existing Sanitary Sewer System*, and described below.

- **Duarte Road.** A County-owned 12-inch trunk sewer runs at a 1.208 percent slope east to west from Highland Avenue to Buena Vista Street. It then continues south to the 15-inch trunk sewer along Buena Vista Street with a grade of 0.736 percent.

- **Cinco Robles Drive.** An 8-inch vitrified clay pipe (VCP) runs north to south along Cinco Robles Drive, five feet west of centerline. At the end of the cul-de-sac, the pipe continues to the west, crossing underneath the Duarte Flood Control Channel and connects to a manhole in Buena Vista Street.

- **Buena Vista Street.** A County-owned 15-inch trunk sewer runs at 0.736 percent sloped north to south from Three Ranch Road to Galen Street and then continues to the west. Wastewater from the project site directly discharges at this intersection between Buena Vista Street and Galen Street at the manhole, as designated "LACSD's Joint Outfall B Unit 8G Trunk Sewer," with a 15-inch VCP sewer line from the campus.

As shown in Table 5.16-1, the project site is estimated to generate approximately 412,152 gallons per day (gpd) of wastewater under existing conditions. The wastewater generation rates used in KPFF's Wastewater Analysis are from Los Angeles County Sanitation District No 22.

Table 5.16-1 Existing Wastewater Generation

Building Use	User Category[1]	Unit of Measure	Unit Flow (gpd)	Square Feet (sf)/Units	Wastewater (gpd)
Outpatient (Clinic)	Medical/Clinic Building	1,000 SF	300	304,322	91,297
Inpatient (Hospital)[2]	Medical/Clinic Building	1,000 SF	300	425,722	127,717
Research	Medical/Clinic Building	1,000 SF	300	457,936	137,381
Office	Office Building	1,000 SF	200	186,296	37,259
Hospitality[3]	Hotel	Room	125	40	5,000
Assembly	Club & Lodge Halls	1,000 SF	125	69,295	8,662
Warehouse	Warehousing	1,000 SF	25	59,244	1,481
Industrial	Light Manufacturing	1,000 SF	25	73,909	1,848
Housing[4]	Single Family Home	Dwelling Unit	260	4	1,040
	Multi-Unit Home	Dwelling Unit	156	3	468
Total	—	—	—	**1,576,724 sf/ 47 units**	**412,152**

Source: KPFF 2016.
SF = square feet
1. These are LACSD No. 22 user categories. LACSD's comment letter on the project's Notice of Preparation for this DEIR recommended the use of District-wide loading factors to calculate project wastewater generation. The LACSD No. 22 loading table is consistent with the District-wide loading factors and includes additional uses not listed in the District-wide tables.
2. Hospital uses is not listed on the LACSD No. 22 loading table and is assumed to be equal to that of a Medical, Dental, Veterinary Clinic or Building category.
3. COH's current hospitality uses consist of forty (40) rooms in 10 buildings (four units per building). Two (2) of those buildings would be demolished in Phase 2 of the Project, and the remaining eight (8) would be demolished in Phase 3. The proposed hospitality uses under the Project, which would consist of 75,000 square feet of floor area, would contain eighty (80) rooms.
4. COH owns four (4) single family homes and one (1) apartment containing 3 dwelling units.

Wastewater Treatment

The wastewater generated by the project site is conveyed through the aforementioned trunk sewer pipelines and treated at the San Jose Creek Water Reclamation Plant (SJCWRP) located at 1965 Workman Mill Road in unincorporated Los Angeles County adjacent to the City of Industry. The design capacity of the SJCWRP is 100 million gallons per day (mgd) and the facility currently processes an average flow of 69.4 mgd, resulting in a remaining capacity of about 30.6 mgd.

5.16.1.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project:

U-1 Would exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

U-2 Would require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

U-5 Would result in a determination by the wastewater treatment provider which serves or may serve the project that is has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

5.16.1.3 ENVIRONMENTAL IMPACTS

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.16-1: Wastewater generated by buildout of the proposed Campus Plan would be adequately conveyed by existing infrastructure and adequately treated by the wastewater service provider for the project site. [Thresholds U-1, U-2 (part related to wastewater facilities), and U-5]

Impact Analysis: As described in Chapter 3, *Project Description*, of this DEIR, buildout of the proposed Campus Plan would involve construction of new facilities (including medical buildings and parking structures) and replacement of existing outdated and obsolete buildings with modern facilities. At buildout, the project site would contain approximately 2.64 million gross square feet of building space, which represents an overall increase of 1.04 million square feet.

Wastewater Conveyance

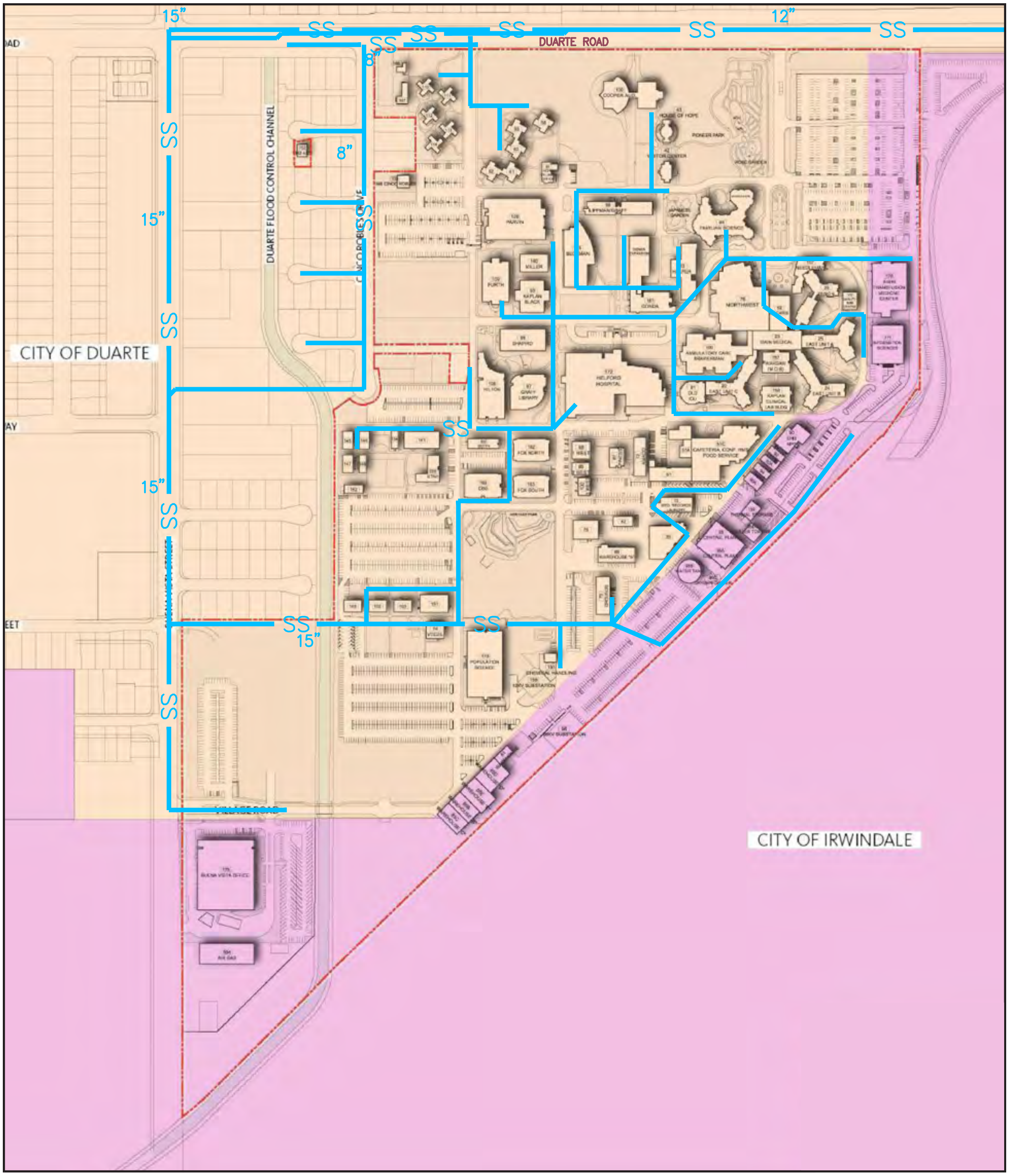
As shown in Table 5.16-2, buildout of the proposed Campus Plan is estimated to generate a total wastewater flow of 701,277 gpd, resulting in a net increase of 289,125 gpd (KPFF 2016).

Table 5.16-2 Projected Wastewater Generation – Campus Plan Buildout

Building Use	User Category	Estimated Wastewater Generation (gpd)			
		Unit of Measure	Unit Flow (gpd)	Square Feet (sf)/Units	Campus Plan Buildout
Outpatient (Clinic)	Medical/Clinic Building	1,000 SF	300	734,322	220,297
Inpatient (Hospital)	Medical/Clinic Building	1,000 SF	300	565,222	169,567
Research	Medical/Clinic Building	1,000 SF	300	758,936	227,681
Office	Office Building	1,000 SF	200	318,296	63,659
Hospitality	Hotel	Room	125	80	10,000
Assembly	Club & Lodge Halls	1,000 SF	125	40,295	5,037
Warehouse	Warehousing	1,000 SF	25	10,744	269
Industrial	Light Manufacturing	1,000 SF	25	130,409	3,260
Housing	Single Family Home	Dwelling Unit	260	4	1,040
	Multi-Unit Home	Dwelling Unit	156	3	468
Total Wastewater Generation					**701,277**
Existing Wastewater Generation (Table 5.16-1)					**412,152**
Net increase in wastewater generation					**289,125**

Source: KPFF 2016.
SF = square feet
[1] Some land uses would increase under the proposed Campus Plan, while some would decrease.

Figure 5.16-1 - Existing Sanitary Sewer System



Project Boundary

SS Existing Sanitary Sewer

0 600
Scale (Feet)

Source: KPFF Engineers, 2016

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UTILITIES AND SERVICE SYSTEMS

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Figure 5.16-2, *Proposed Sanitary Sewer System*, shows the proposed phasing and installation of wastewater pipes on the project site. The majority of the wastewater generated from the project site would continue to be conveyed to a 15-inch VCP at 0.56 percent slope at the end of the campus's sewer conveyance system. The flow capacity of this pipe is estimated to be approximately 4.83 cubic feet per second (cfs), which is greater than the anticipated wastewater flow at buildout of 701,277 gpd, equivalent to 1.09 cfs (KPFF 2016). Therefore, the existing 15-inch pipe is adequate to accommodate the proposed development and impacts are less than significant.

Additionally, LACSD's Joint Outfall B Unit 8G Trunk Sewer located in Galen Street at Buena Vista Street has a design capacity of 3.5 million gallons per day (mgd) and "conveyed a peak flow of 0.9 mgd when last measured in 2014" (KPFF 2016). The average daily increase in wastewater flow estimated for the proposed Campus Plan—289,125 gpd—is 8.3 percent of the design capacity of the 15-inch trunk sewer and 11.1 percent of its remaining flow capacity. Therefore, project flows are well within the design capacity of the existing sewer system. Additionally, LACSD has a system in place to effectively monitor and account for proposed sewer demand changes related to general plans, specific plans, and individual projects. Potential impacts to LACSD facilities are less than significant.

Buildout of the Campus Plan would require upgrades and extensions of on-site pipes and fixtures to tie into off-site connections. In particular, the existing onsite sewer system does not extend to portions of the southwest corner of the project site where City of Hope may construct new buildings. If new buildings or structures requiring sewer lines are constructed at this location, a new sewer main will be required to run along the future fire access/roadway adjacent to the buildings and connect to an existing 15-inch sewer to the north. Furthermore, new buildings and other improvements on the project site may require relocation of wastewater pipelines. For example, a major utilities corridor exists under a proposed new 280,000 square foot outpatient building, which is planned for phase 1 of the project on the eastern peroration of the campus. These existing utilities may need to rerouted around the proposed building footprint or a bridge many need to be constructed or existing utilities so that they may remain in place. The exact location, type, and scale of proposed buildings are unknown at this time. The cities of Duarte and Irwindale and LACSD, during the engineering/plan check process for each project, would assess the infrastructure needs of such improvements to ensure that adequate wastewater infrastructure is available to serve new land uses. Impacts related to wastewater conveyance would be less than significant. No additional impacts would occur beyond the impacts identified throughout Chapter 5 of the DEIR

Wastewater Treatment

As discussed under Subsection 5.16.1.1, above, the wastewater generated by the project site is treated at the SJCWRP, which has a design capacity of 100 mgd and currently processes an average flow of 69.4 mgd. Approximately 42 million gallons per day of reclaimed water (tertiary treatment) is reused for groundwater recharge, irrigation of parks, schools, and greenbelts with the remainder discharged to the San Gabriel River. SJCWRP has a remaining capacity of about 30.6 mgd. The projected average peak daily wastewater flow generated by buildout of the proposed Campus Plan—823,908 gpd—would only represent 0.8 percent of the facility's design capacity and 2.7 percent of its remaining capacity. When compared to the SJCWRP's overall treatment capacity, buildout of the proposed Campus Plan would not have a significant impact on the

SJCWRP's ability to treat wastewater in the area. Impacts related to wastewater treatment would be less than significant.

Wastewater Treatment Requirements

Wastewater treatment requirements for discharges to municipal storm drainage systems (MS4s) are contained in the General Construction Permit, Order No. 2012-0006-DWQ, issued by the State Water Resources Control Board in 2012, National Pollutant Discharge Elimination System Permit No. CAS004001, and the Los Angeles County MS4 Permit (Order No. R4-2012-0175), as amended by Order WQ 2015-0075. Wastewater flows from the project site would not interfere with the ability of the wastewater treatment plant to continue to meet the discharge limitations for the NPDES permit, because the chemical composition of wastewater flows would not change and the provided wastewater flows is well within the design capacity of SJCWRP's treatment plant. Additionally, plans for water quality protection that would be required for projects developed pursuant to the proposed Campus Plan—Stormwater Pollution Prevention Plans for construction projects and Water Quality Management Plans for design and operation of projects—are discussed in Section 5.8, *Hydrology and Water Quality*, as are Best Management Practices that would be specified in such plans for implementation in those projects. Impacts would be less than significant.

5.16.1.4 CUMULATIVE IMPACTS

The proposed project in combination with cumulative projects would result in an increased demand for wastewater conveyance and treatment. The area considered for cumulative impacts to wastewater collection is the service area of the LACSD District 22, which includes the cities of Arcadia, Azusa, Baldwin Park, Bradbury, Covina, Duarte, Glendora, Irwindale, La Verne, Monrovia, San Dimas, Walnut, and West Covina, as well as Los Angeles County. Growth within these service areas would increase wastewater generation. As stated previously the SJCWRP treatment plan has a residual capacity of about 46 mgd. The population in the San Gabriel Valley is expected to increase by 12.3 percent from 2012 to 2040 (see Table 5.11-1). A proportional 12.3 percent increase in wastewater discharge would result in a cumulative net increase of approximately 6.5 mgd of wastewater, which is within the remaining residual capacity of SJCWRP—representing 14 percent of the residual capacity. Since there is sufficient residual capacity at the wastewater treatment facility serving District 22, cumulative impacts related to treatment capacity would be less than significant.

Cumulative impacts related to wastewater conveyance depends on the location and size of the project as well as phasing. All future development within the Cities of Duarte and Irwindale and the LACSD service area would be reviewed on a project-by-project basis to verify that existing capacity exists to convey the wastewater generated with the new development. In addition, development projects would be subject to payment of fees prior to connecting to the Cities or LACSD's facilities. The other major cumulative projects identified in the immediate vicinity of the project site would not utilize the same sewer trunk line as the proposed project. Therefore, sewer impacts of the proposed project would not combine with impacts of other cumulative development and cumulative impacts related to wastewater conveyance would be less than significant.

Figure 5.16-2 - Proposed Sanitary Sewer System

Source: KPFF Engineers, 2016

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Impacts of buildout under the proposed project to sewers would be limited to sewers in and near the project area. Therefore, impacts of the proposed project would not combine with impacts of other cumulative development projects in the Cities of Duarte and Irwindale, or other development projects in other areas of the LACSD's service area but outside the City, to result in significant cumulative impacts.

5.16.1.5 EXISTING REGULATIONS

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to wastewater conveyance and treatment were described in detail in Section 5.16.1.1 of this DEIR and are listed below.

Federal

- United States Code, Title 33, Sections 1251 et seq.: Clean Water Act

Regional

- LACSD District 22, Connection Fee Ordinance
- Los Angeles Regional Water Quality Control Board: Oder No. R4-2015-0070

5.16.1.6 LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Upon implementation of regulatory requirements, Impact 5.16-1 would be less than significant.

5.16.1.7 MITIGATION MEASURES

No mitigation measures are required.

5.16.1.8 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Impacts would be less than significant.

5.16.2 Water Supply and Distribution Systems

5.16.2.1 ENVIRONMENTAL SETTING

Regulatory Framework

Federal

Clean Water Act

The Federal Clean Water Act (CWA) establishes regulatory requirements for potable water supplies including raw and treated water quality criteria. The water provider serving the project site is required to monitor water quality and conform to the regulatory requirements of the CWA.

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Safe Drinking Water Act

The Federal Safe Drinking Water Act (SDWA) is enforced by the United States Environmental Protection Agency and sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. SDWA requires many actions to protect drinking water and its sources including rivers, lakes, and groundwater.

State

Urban Water Management Planning Act

The Urban Water Management Planning Act of 1983, California Water Code Sections 10610 et seq., requires preparation of a plan that:

- Plans for water supply and assesses reliability of each source of water over a 20-year period in 5-year increments.
- Identifies and quantifies adequate water supplies, including recycled or non-potable water, for existing and future demands in normal, single-dry, and multiple-dry years.
- Implements conservation and the efficient use of urban water supplies. Significant new requirements for quantified demand reductions were added by the Water Conservation Act of 2009 (Senate Bill 7 of Special Extended Session 7 (SBX7-7)), which amends the act and adds new water conservation provisions to the Water Code.

20x2020 Water Conservation Plan

The 20x2020 Water Conservation Plan, issued by the California Department of Water Resources in 2010 pursuant to SBX7-7, established a water conservation target of 20 percent reduction in water use by 2020 compared to 2005 baseline use.

Senate Bills 610 and 221

To assist water suppliers, cities, and counties in integrating water and land use planning, the state passed Senate Bill (SB) 610 (Chapter 643, Statutes of 2001) and SB 221 (Chapter 642, Statutes of 2001), effective January 1, 2002. SB 610 and SB 221 improve the link between information of water supply availability and certain land use decisions made by cities and counties. They are companion measures that promote more collaborative planning between local water suppliers and cities and counties. Both statutes require detailed information regarding water availability to be provided to city and county decision makers prior to approval of specified large development projects. This detailed information must be included in the administrative record as the evidentiary basis for an approval action by the city or county on such projects. The statutes recognize local control and decision making regarding the availability of water for projects and the approval of projects. Under SB 610, water supply assessments (WSA) must be furnished to local governments for inclusion in any environmental documentation for certain projects subject to CEQA, as defined in Water Code Section 10912(a). Under SB 221, approval by a city or county of certain residential subdivisions requires an affirmative verification of sufficient water supply. SB 221 is intended as a fail-safe to ensure collaboration on finding the needed water supplies to serve a new large subdivision before construction begins.

A WSA was prepared for the proposed Campus Plan and is discussed in this Section and included as Appendix L to this DEIR.

The Urban Water Management Planning Act states that every urban water supplier that provides water to 3,000 or more customers or provides over 3,000 acre-feet (af) of water annually should make every effort to ensure the appropriate level of reliability in its water service to meet the needs of its various categories of customers during normal, dry, and multiple dry years. Both SB 610 and SB 221 identify the Urban Water Management Plan (UWMP) as a planning document that can be used by a water supplier to meet the standards in both statutes. Thorough and complete UWMPs are foundations for water suppliers to fulfill the specific requirements of these two statutes, and they are important source documents for cities and counties as they update their general plans. Conversely, general plans are source documents as water suppliers update the UWMPs. These planning documents are linked, and their accuracy and usefulness are interdependent (DWR 2011).

AB 3030, California Groundwater Management Act

The Groundwater Management Act of the California Water Code (Sections 10750 et seq.; AB 3030) provides guidance for applicable local agencies to develop a voluntary Groundwater Management Plan in state-designated groundwater basins.

Governor Brown's Executive Order B-29-15

The year 2013 marked the driest year recorded in state history and has led Governor Edmund G. Brown Jr. to proclaim a state of emergency regarding the dry conditions throughout California. This proclamation, announced on January 17, 2014, urged Californians to reduce their water use by 20 percent and directed state officials to take all necessary actions to prepare for these drought conditions by assisting farmers and communities that are economically impacted by dry conditions and directed state agencies to use less water and hire more firefighters. Governor Brown also gave state water officials more flexibility to manage supply throughout California under drought conditions.

In particular for local water agencies, the declaration orders that local urban water suppliers and municipalities implement their local water shortage contingency plans immediately in order to avoid or forestall outright restrictions that could become necessary later in the drought. Local water agencies should also update their legally required urban and agricultural water management plans, which help plan for extended drought conditions. The Department of Water Resources will make the status of these updates publicly available.[1] (Brown 2014).

On April 1, 2015, Governor Brown issued Executive Order B-29-15, finding that, among other things, "…conditions of extreme peril to the safety of persons and property continue to exist in California due to water shortage and drought conditions…" and ordering that, among other things, the "State Water Resources

[1] Office of Governor Edmund G. Brown Jr. 2014, January 17. Governor Brown Declares Drought State of Emergency. http://gov.ca.gov/news.php?id=18368.

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Control Board shall impose restrictions to achieve a statewide 25 percent reduction in potable urban water usage through February 28, 2016.

"These restrictions will require water suppliers to California's cities and towns to reduce usage as compared to the amount used in 2013. These restrictions should consider the relative per capita water usage of each water suppliers' service area, and require that those areas with high per capita use achieve proportionally greater reductions than those with low use." (Brown 2015).

On April 18, 2015, the State Water Resources Control Board released a draft of the water-use-reduction target they intend to impose on each individual urban water supplier; the final order was issued on July 15, 2015.

Local

The following provisions from the Cities' Municipal Code focus on water supply impacts and water conservation.

Duarte Municipal Code

- **Chapter 16.04 (Green Building Standards Code).** Adopts by reference the most current (2013) California Green Building Standards Code (CALGreen).
- **Chapter 6.15 (Low Impact Development Standards).** Requires the use of low impact development (LID) standards in planning and construction of development projects. These standards help to control and maintain water flow rate using site design and best management practices.
- **Chapter 19.40 (Landscaping Standards), Sections 19.40.090, 19.40.100, 19.40.110**. Landscape and Irrigation design requirements for water efficient landscaping.
- **Chapter 19.52 (Sustainable Development Practices), Section 19.52.050 (Water Conservation).** Includes standards to conserve water.
- **Landscaping Ordinance.** New landscapes are required to be designed to conserve water and adhere to an annual water budget, also known as the maximum applied water allowance or MAWA (in gallons per year).

Existing Conditions

Water Supplies

Four levels of water agencies are involved in obtaining and conveying water supplies to the project site:

- The Department of Water Resources operates the State Water Project (SWP) that imports water from northern California.

- The Metropolitan Water District of Southern California (MWD) distributes imported water from northern California to its member agencies, and imports water from the Colorado River via the Colorado River Aqueduct.

- The Upper San Gabriel Valley Municipal Water District (Upper District), an MWD member agency which serves much of the east and central San Gabriel Valley, wholesales imported water from the MWD to retail water purveyors in its service area. Upper District has never produced groundwater and currently does not have facilities to do so. However, Upper District's sub-agencies produce water from the Main San Gabriel Basin (MSGB). Additionally, Upper District purchases supplemental water for groundwater replenishment purposes (Upper District 2016).

- The California American Water Company Duarte Service Area (CAW) is the retail water purveyor for most of the City of Duarte, including the project site; as well as parts of the cities of Irwindale, Bradbury, Monrovia, and Azusa, and the unincorporated community of South Monrovia (see Figure 2-1, Project Vicinity Map, in the Water Supply Assessment included as Appendix L of this DEIR.

CAW's water supplies consist of groundwater from the MSGB, surface water, and imported water from the northern California via the State Water Project and from the Colorado River. Groundwater is the primary source of supply. The amount of demand that is not met by groundwater allocations is met by surface water used to recharge the MSGB, and by purchasing replacement water (also known as supplemental water) for indirect offset of over pumping groundwater in MSGB.

Groundwater

Groundwater is the primary source of supply for the Duarte service area. Projected groundwater supplies are determined by CAW's stipulated allocation as defined in the Judgment of the MSGB as well as CAW's ability to pump beyond their allocation in the MSGB.

Main San Gabriel Basin

The Duarte service area overlies the MSGB. The MSGB is an unconfined aquifer which provides up to 90 billion gallons of groundwater annually to San Gabriel Valley's 1.4 million residents. The total surface area of the MSGB is 167 square miles and contains about 2.8 trillion gallons of groundwater. The San Gabriel Mountains border the north with smaller hills including San Jose, Puente, Merced, and Repetto forming the east, south, and southwest borders. Figure 5.8-3 shows the MSGB boundary.

The MSGB is an adjudicated basin that is subject to an entry of judgment through the Upper San Gabriel Valley Municipal Water District v. City of Alhambra, et al., Los Angeles County Case No. 924128, Judgment entered January 4, 1973 (MSGB Judgment). The MSGB Judgment states that "in each and every calendar year commencing with 1953, the Basin has been and is in Overdraft" (12). CAW's Duarte service area has an adjudicated right to 1.84634% of the annually determined Operating Safe Yield (OSY) for the MSGB as defined by the MSGB Judgment (see Appendix L).[2]

The amount of water parties of the MSGB Judgment may extract from the MSGB is not restricted, but the MSGB Judgment provides a means for replacing all annual extractions in excess of a Party's annual right with Supplemental Water. If a producer extracts water in excess of its portion of the annual operating safe yield, it must pay a Replacement Water assessment, which will be used by the MSGB Watermaster to purchase Supplemental Water through three Responsible Agencies: Upper District, San Gabriel Valley Municipal Water District, and Three Valleys Municipal Water District.

The MSGB Watermaster's Five-Year Water Quality and Supply Plan 2015-2016 to 2019-2020 serves as the groundwater management plan for the MSGB. For the purposes of supply projection, it is assumed that CAW's MSGB groundwater allocation will be equal to 1.84634% of the annually adopted operating safe yield, which is set each year based on the hydrologic conditions of the MSGB. The operating safe yield for Fiscal Year (FY) 2015/16-2019/20 has been adopted by the MSGB Watermaster and is 150,000 acre-feet per year (afy) in FY 2015/16 and 130,000 afy from FY 2016/17 to 2019/20. For the purposes of supply projection, the 10-year average OSY (FY 2010/11 to 2019/20) of 158,000 afy is used for all subsequent years and as the average year. In 2015, the volume of ground water pumped was 5,002 afy, which is projected to be 7,240 afy in 2035.

Surface Water

The Duarte service area, CAW is classified as an "Integrated Producer" in the MSGB Judgement that provides for two types of water allocation rights including a diversion component and a pumping component. CAW has surface water diversion rights from the San Gabriel River, which is a fixed annual allocation of 1,672 afy. Historically, the surface water has been diverted from the San Gabriel River located in the San Gabriel watershed. Surface water that is released from the San Gabriel Reservoir is delivered through a weir located adjacent to the City of Pasadena power plant and water from Morris Reservoir is diverted directly from the San Gabriel River. Water from both sources is intercepted by CAW's infrastructure and flows by gravity to the Woodlyn Lane and Lemon Irrigation reservoirs to supply Duarte's irrigation system. The remainder is either applied to the Fish Canyon spreading grounds or returned to the San Gabriel River and spread further downstream. The spreading functions recharge the aquifers which supply Duarte's wells. The reservoir and spreading activity is managed by the Los Angeles County Department of Public Works (LACDPW) in conjunction with water purveyors with surface water diversion rights.

The use of surface water for non-potable irrigation is expected to be discontinued by 2020. The fixed surface water diversion right not used for irrigation is transferred to the Los Angeles County spreading basins for groundwater recharge. It is assumed that once the irrigation system is retired, full allocation of 1,672 afy will be applied to the spreading grounds. The surface water rights are recovered through additional pumping rights within the MSGB.

[2] The Operating Safe Yield (OSY) is the amount of groundwater that can be pumped from the Main San Gabriel Basin without required assessments for purchase of replacement water.

Wholesale Water

CAW obtains wholesale water from Upper District, which is a member agency of MWD. MWD acquires water from the Colorado River Aqueduct and the California State Water Project and distributes treated and untreated water to its member agencies. Untreated water from Upper District is used indirectly for groundwater replacement in the MSGB. The total current water supply from Upper District is 1,148 afy as of 2015 and the projected supply is 2,651 afy in 2035. The existing and projected supply is equal to the difference in projected demand and groundwater plus surface water allocations.

Water Reliability

Several factors affect the supply reliability of the Duarte system. The legal factors affecting supply include groundwater adjudications, and Replacement Water purchases for excess pumping. Environmental factors related to wholesale supply reliability are reduced deliveries of SWP due to reduced pumping in the Sacramento Delta. The MWD UWMP states that the "listing of several fish species as threatened or endangered under the federal or California Endangered Species Acts (ESAs) have adversely impacted operations and limited the flexibility of the SWP." Water quality factors influence groundwater production capacity and efficiency in the MSGB and Raymond Basin. All of the supplies are subject to reduction as a result of climatic factors. Groundwater production amounts and wholesale supplies could change in the future depending on OSY reductions and availability of wholesale supplies.

Wholesale Water Reliability

The Duarte water system relies on wholesale supplies for indirect groundwater replacement. Upper District's UWMP indicates a surplus supply for the UWMPs' planning horizon. Additionally, the MSGB Watermaster and Upper District have multiple ongoing initiatives designed to manage and enhance supply reliability to continue to provide sufficient supply even in dry years. Based on the 2015 UWMP and the MSGB Watermaster Water Management Actions (see Section 7.1.1.1 of the WSA; Appendix L of this DEIR), it is anticipated that MSGB Replacement Water will be available from Upper District to meet CAW's total projected demands.

Future Water Projects

There are currently no planned future projects to bring in new supply sources to the Duarte system. However, The Upper District, in coordination with MWD, is working to expand its existing recycled water program by developing the Indirect Reuse Replenishment Project (IRRP). The IRRP will replenish the Main San Gabriel Groundwater Basin with up to 10,000 acre feet annually with highly treated recycled water. The projected completion date for this project is 2018. It is anticipated that the IRRP will help Upper District improve supply reliability within the MSGB.

Summary of Water Supplies and Demands

CAW's historical and projected water supplies and demands are shown below in Table 5.16-3. Water demand generated at buildout of the Campus Plan was taken into account in developing projected future water demands in CAW's service area and is therefore included in the water forecasts shown in Table 5.16-3.

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Methods for forecasting water supplies are described in Sections 6.1.1 and 6.1.3 of the WSA included as Appendix L of this DEIR.

Table 5.16-3 Summary of CAW Existing and Forecast Water Supplies and Demands, afy

	2015	2020	2025	2030	2035
Water Supplies					
MSGB Groundwater	2,609	2,917	2,917	2,917	2,917
Surface Water Recharged to MSGB	1,246	1,672	1,672	1,672	1,672
Surface Water for Irrigation	426	0	0	0	0
Upper District Replacement Water	1,148	2,241	2,375	2,512	2,651
Total	**5,429**	**6,830**	**6,964**	**7,101**	**7,240**
Demands					
Water Consumption	4,775	5,884	5,999	6,117	6,237
Non-revenue Water[1]	654	946	965	984	1,003
Total	**5,429**	**6,830**	**6,964**	**7,101**	**7,240**

Source: Table 6-6 of the WSA; Appendix L of this DEIR.
[1] Non-revenue water is water not paid for by customers; for example, leaks from CAW's distribution system.

Project Area Water Demand and Distribution

Water Conveyance

The water purveyor for the project site is CAW. The project site and cities of Duarte and Irwindale is served entirely by groundwater sources from the Main San Gabriel Basin. Existing water service infrastructure is installed throughout and surrounding the project site. There are two existing 8-inch laterals and meters servicing the campus; one is located at the northwest corner of the property, east of Village Road, which connects to a 12-inch ductile iron pipe water main on Duarte Road and the other is located at the southeast corner of intersection between Buena Vista Street and Galen Street, about half-way along the west property line. Existing water pipelines adjacent to the project site are shown in Figure 5.16-3, *Existing Water System*, and described below.

- **Duarte Road.** A 12" ductile iron pipe water main was recently installed as part of the Foothill Transit Authority Metro Gold Line, IP-0550-1775 project. It runs east-west, 14 feet north of the south right-of-way for the length of project frontage and jogs to 40 feet north of south right-of-way to the west of Cinco Robles Drive. It provides water service via an 8-inch lateral to the City of Hope site and connects to a 16-inch water main at Buena Vista Street

- **Cinco Robles Drive.** An 8-inch asbestos cement pipe water main runs south to north, 16 feet west of the east right-of-way, connected to the 12-inch ductile iron pipe water main at Duarte Road.

- **Buena Vista Street.** The southernmost corner of the project site borders with Buena Vista Street, where an 80-inch water pipe with different material along its length, runs south to north, 5 feet west of the east right-of-way. This main also provides an 8-inch service lateral and meter to the City of Hope campus.

Figure 5.16-3 - Existing Water System

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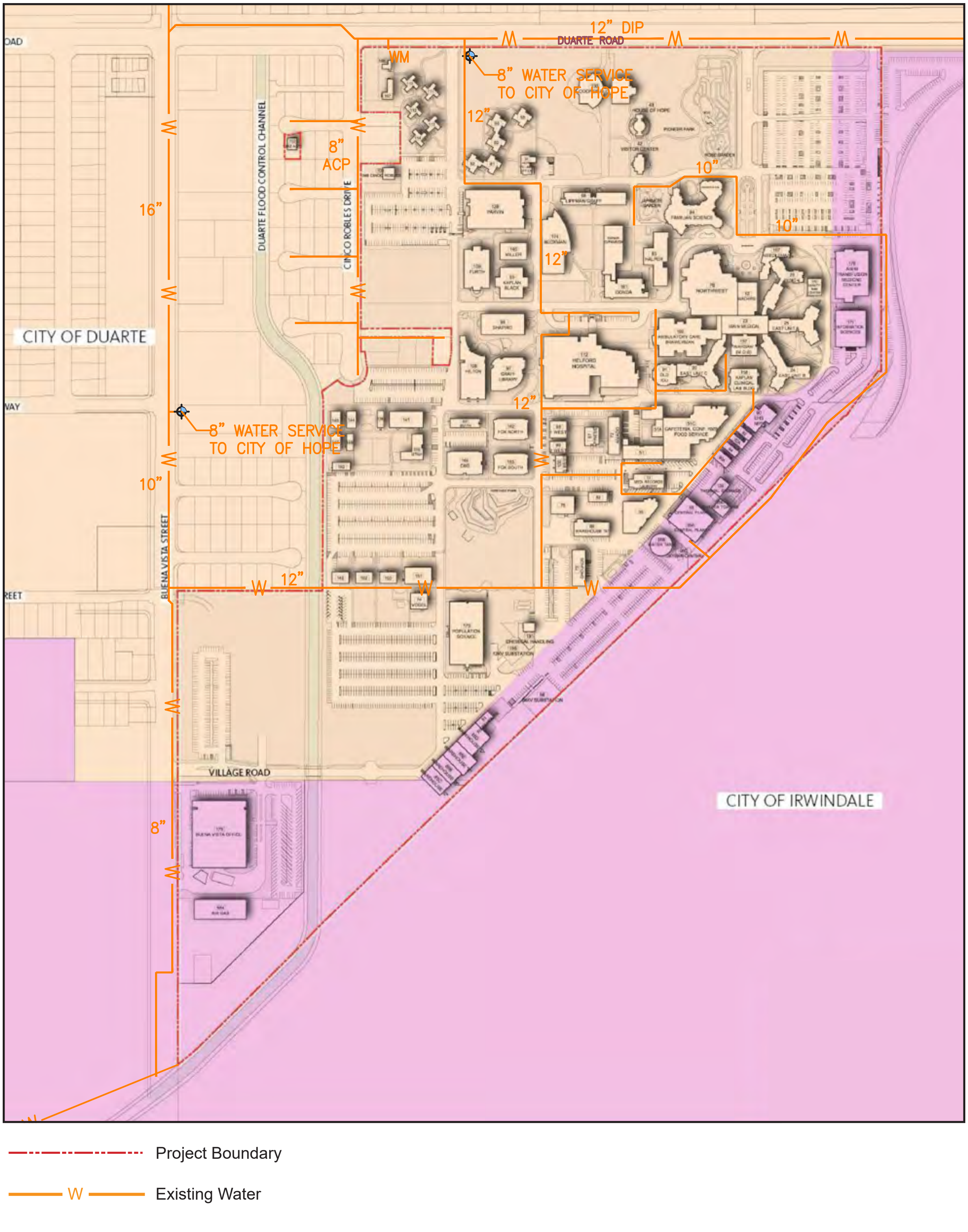

Source: KPFF Engineers, 2016

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Water Demand

As shown in Table 5.16-4, the project site is estimated to generate approximately 457,551 gpd of water demand under existing conditions.

Table 5.16-4 Existing Water Demand

Building Use	User Category	Unit of Measure	Unit Flow (gpd)	Square Feet (sf)/Units	Water (gpd)
Outpatient (Clinic)	Medical/Clinic Building	1,000 SF	333	304,322	101,339
Inpatient (Hospital)	Medical/Clinic Building	1,000 SF	333	425,722	141,765
Research	Medical/Clinic Building	1,000 SF	333	457,936	152,493
Office	Office Building	1,000 SF	222	186,296	41,358
Hospitality	Hotel	Room	139	40	5,560
Assembly	Club & Lodge Halls	1,000 SF	139	69,295	9,632
Warehouse	Warehousing	1,000 SF	28	59,244	1,659
Industrial	Light Manufacturing	1,000 SF	28	73,909	2,070
Housing	Single Family Home	Dwelling Unit	289	4	1,156
	Multi-Unit Home	Dwelling Unit	173	3	519
Total	—	—	—	**1,576,724 sf/ 47 units**	**457,551**

Source: KPFF 2016.
SF = square feet

5.16.2.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project:

U-2 Would require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

U-4 Would not have sufficient water supplies available to serve the project from existing entitlements and resources, and new and/or expanded entitlements would be needed.

5.16.2.3 ENVIRONMENTAL IMPACTS

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.16-2: Adequate water supply is available to meet water demands of the proposed project; however additional water infrastructure is required to increase groundwater production capacity. [Thresholds U-2 (part relating to water facilities) and U-4]

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Impact Analysis:

Water Demand

As shown in Table 5.16-5, buildout of the proposed Campus Plan is estimated consume a total water flow of 778,484 gpd, resulting in a net increase of 320,933 gpd (KPFF 2016). The water infrastructure study (Appendix K2) calculates water demand by using the LACSD No. 22 wastewater loading factors divided by 0.9, which assumes that wastewater generation is 90 percent of water demand. This includes water use based on building square footage only and does not account for landscaping, irrigation, and fire service demand.

Table 5.16-5 Projected Water Generation – Campus Plan Buildout

Building Use	User Category	Estimated Water Demand (gpd)			
		Unit of Measure	Unit Flow (gpd)	Square Feet (sf)/Units	Campus Plan Buildout
Outpatient (Clinic)	Medical/Clinic Building	1,000 SF	333	734,322	244,529
Inpatient (Hospital)	Medical/Clinic Building	1,000 SF	333	565,222	188,219
Research	Medical/Clinic Building	1,000 SF	333	758,936	252,726
Office	Office Building	1,000 SF	222	318,296	70,662
Hospitality	Hotel	Room	139	80	11,120
Assembly	Club & Lodge Halls	1,000 SF	139	40,295	5,601
Warehouse	Warehousing	1,000 SF	28	10,744	301
Industrial	Light Manufacturing	1,000 SF	28	130,409	3,652
Housing	Single Family Home	Dwelling Unit	289	4	1,156
	Multi-Unit Home	Dwelling Unit	173	3	519
Total Water Generation					**778,484**
Existing Water Generation (Table 5.16-4)					**457,551**
Net increase in water generation					**320,933**

Source: KPFF 2016.
SF = square feet
1 Some land uses would increase under the proposed Campus Plan, while some would decrease.

CAW bases its future water demand and supply needs on Southern California Association of Governments' (SCAG) growth projections, which includes buildout of the City of Hope campus. CAW forecasts that it will have sufficient water supplies to meet estimated water demands from buildout of the Campus Plan. This finding is based on CAW's rights to a reliable supply of groundwater and ability to purchase water to replace water pumped in excess of CAW's MSGB allocation (see Appendix L).

Additionally, Section 5.4 of the Specific Plan requires landscape plans to include sustainable design practices–the use of native and drought-tolerant plants, preservation of the natural ecosystem, replenishment of groundwater, and reduction of water. Additionally, all new landscape planting within the entire Campus Plan area shall be designed to meet City of Duarte landscaping ordinance requirements. Measures include the following:

- Irrigation systems should use water-conserving methods and water-efficient technologies such as drip emitters, evapotranspiration controllers, and moisture sensors.

- Irrigation systems shall be operated automatically using an electric controller and low-voltage remote control valves and rain sensors.

- Drainage should be directed to subterranean retention systems, permeable areas, or small bioswales to minimize discharge to the storm drain system.

- Vegetation and other improvements capable of carrying, retaining, infiltrating, and treating runoff should be used in a safe manner to the extent feasible

Future development that would be accommodated by the proposed Campus Plan would also be required to comply with the provisions of the most current (2013) California Green Building Standards Code (CALGreen; adopted by reference in Chapter 18.47 [Green Building Standards Code] of the City's Municipal Code), which contains requirements for indoor water use reduction and site irrigation conservation.

Water Conveyance

Figure 5.16-4, *Proposed Water System*, shows the proposed water system by phase. The proposed water system would require new lines to connect to the existing infrastructure and re-routing of existing lines to accommodate proposed buildings. For example, a major utilities corridor, including water lines existing under a proposed new 280,000 square foot outpatient (clinic) building in the eastern part of the campus planned for phase 1. These utilities would require re-routing around the proposed building footprint or a buildings design that incorporates a bridge so that the existing utilities could remain in place. Additionally, the existing on-site water system does not extend to portions of the southwest corner of the campus. If new buildings or structures requiring water lines are constructed in this location, a new water main pipe will be required to run along the future fire access roadway adjacent to the buildings and connect to an existing 12-inch water line to the north. Proposed infrastructure would be designed and analyzed on as buildings are proposed during the preparation of engineering plans prior to construction. The impacts of construction and re-routing of water mains and laterals would be part of the impacts of construction of the affected projects. No additional impacts would occur beyond the impacts identified throughout Chapter 5 of this DEIR.

Well Infrastructure

Based on the WSA prepared for the project site (Appendix L), CAW has indicated that it has available water supply but would need additional infrastructure to increase production capacity in the MSGB, due to an existing well capacity deficit. The following facility improvements are anticipated:

- Drilling and equipping of one (1) new well to produce additional water supply from the MSGB. The size is anticipated to be at least 430 gpm to meet the projected buildout maximum day demand of the project.

- Property for the new well. This could be located on the COH campus or at another location for which property would need to be acquired.

- Water main extension. Depending on the location of the new well, a water main extension from the new well to existing CAW distribution system may be needed.

In accordance with CAW's Rule No. 15, which describes CAW's effective rules regarding services as approved by the California Public Utilities Commission, the applicant would be required to enter into a main extension agreement with CAW, identifying water system improvements required to serve the proposed customers and the estimated construction costs. Details on construction costs and reimbursement procedures are provided in section 9.1 of the WSA (Appendix L). As detailed in Section 9.1.3, Phased Implementation, of the WSA, the project applicant may implement water reductions measures on the campus to offset water demand caused by new development so that the campus would remain at least "net water neutral" until the new well is operating.

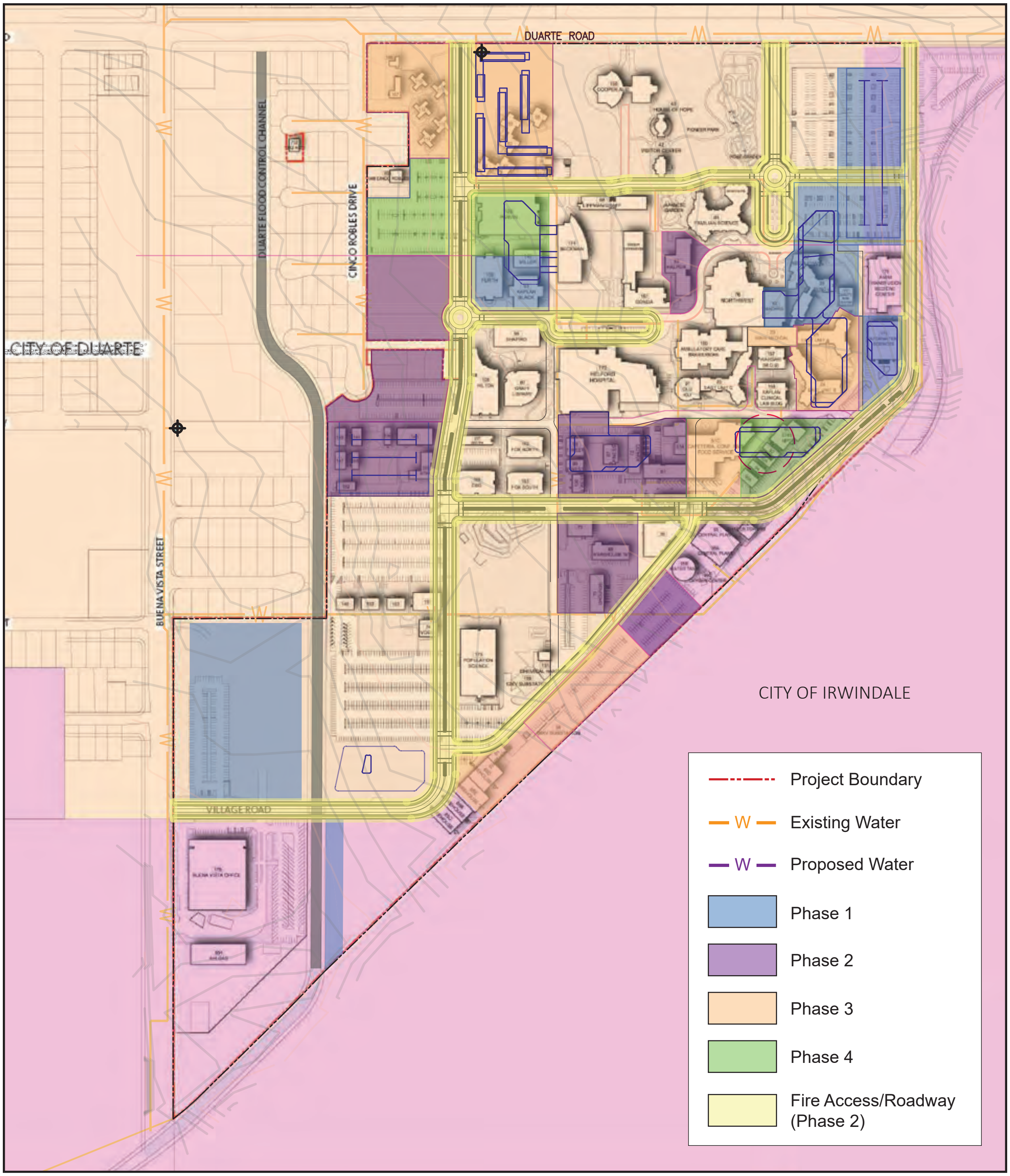
Because Campus Plan buildout would exceed the current well capacity, impacts to water supply infrastructure are potentially significant. Construction of a new well would require separate environmental review and would be subject to the requirements of the Upper District's IRRP "Zone of Control" (see Figure 9-1 of the WSA, Appendix L of this DEIR). Environmental review of a new well is not included in this EIR because the location and size of such a well are presently unknown, making any such analysis speculative. It could not be located in the Zone of Control but may be located in the Secondary Boundary, subject to restrictions. Portions of the southwest corner of the project site lie outside of the IRRP Zone of Control and some areas are outside of the Secondary boundary (meaning there would be no restrictions). However, all well sites are subject to review and approval by the MSGB Watermaster and State Water Resources Control Board – Division of Drinking Water. Water supply infrastructure impacts would be significant due to the existing well capacity deficit.

5.16.2.4 CUMULATIVE IMPACTS

Water Demand and Supply

Water supplies and demands for CAW's service area are addressed above under Existing Conditions. Future water-use projections were developed using the WSA with input from CAW and SCAG growth forecasts; CAW's expectations for additional water conservation; and the 20x2020 Water Conservation Plan urban water use target. The 2015 UWMP found that forecast water supplies would meet demands in normal, single-dry-year, and multiple-dry-year conditions. The WSA concluded that CAW would have sufficient water supplies to meet water demands of the CAW's service area in combination with the proposed project. Therefore, cumulative impacts on water supply would be less than significant.

Figure 5.16-4 - Proposed Water System
5. Environmental Analysis



Source: KPFF Engineers, 2016

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Water Conveyance

Impacts to water mains due to buildout of the proposed project would be limited to mains in and near the project site. Therefore, project-related impacts would not combine with impacts of other cumulative development projects within the Cities of Duarte and Irwindale to result in significant cumulative impacts. With respect to water infrastructure, however, as discussed above the WSA concluded that Campus Plan buildout would exceed CAW's current well capacity, and so the applicant would be required to enter into a main extension agreement with CAW to implement facility improvements that would ultimately result in a new production well and connection to the existing CAW distribution system. Because the new improvements are specific to the proposed project's water demand, it is not expected that cumulative development would need to contribute to the facility improvements required by CAW. Therefore, cumulative impacts on water conveyance would be less than significant.

5.16.2.5 EXISTING REGULATIONS

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to water supplies and conveyance were described in detail in Section 5.16.2.1 of this DEIR and are listed below.

Federal

- United States Code, Title 33, Sections 1251 et seq.: Clean Water Act

State

- California Water Code Sections 10610 et seq.: Urban Water Management Planning Act
- Senate Bill X7-7 (2009): Water Conservation Act of 2009
- Senate Bill (SB) 610 (Chapter 643, Statutes of 2001) and SB 221 (Chapter 642, Statutes of 2001): Water Supply Assessments
- California Water Code Sections 10750 et seq.: California Groundwater Management Act
- Executive Order B-29-15

Local

- Duarte Municipal Code, Chapter 16.04 (Green Building Standards Code). Adopts by reference the most current (2013) California Green Building Standards Code (CALGreen).
- Duarte Municipal Code, Chapter 6.15 (Low Impact Development Standards). Requires the use of low impact development (LID) standards in planning and construction of development projects. These standards help to control and maintain water flow rate using site design and best management practices.

- Duarte Municipal Code, Chapter 19.40 (Landscaping Standards), Sections 19.40.090, 19.40.100, 19.40.110. Landscape and Irrigation design requirements for water efficient landscaping.
- Duarte Municipal Code, Chapter 19.52 (Sustainable Development Practices), Section 19.52.050 (Water Conservation). Includes standards to conserve water.

5.16.2.6 LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Without mitigation, the following impact would be **potentially significant**:

- **Impact 5.16-2:** Adequate water supply available to meet water demands of the proposed project; however additional water infrastructure is required to increase groundwater production capacity.

5.16.2.7 MITIGATION MEASURES

Impact 5.16-2

USS-1 Prior to issuance of building permits for a new building that increases water demand in the project area, the project applicant shall provide a conditional "will serve" letter from the water provider to the City of Duarte and City of Irwindale, as applicable, evidencing that upon compliance with all rules and regulations of the California Public Utilities Commission (CPUC), and all applicable water provider tariffs on file with the CPUC there will be adequate water supply and/or well capacity to serve the demands of that building. Prior to the issuance of a certificate of occupancy for such a new building, the project applicant shall provide a final "will serve" letter from the water provider to the City of Duarte and/or City of Irwindale, as applicable, confirming that all conditions set forth in the conditional "will serve" letter have been satisfied.

5.16.2.8 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Although buildout of the project would require drilling of a new well, a main extension agreement with CAW, and approval by the MSGB Watermaster and State Water Resources Control Board – Division of Drinking Water., implementation of the Campus Plan could continue to occur by demonstrating that the new development is net water neutral per the WSA, Section 9.1.3, until the new well is operating. Additionally, Mitigation Measure USS-1 identified above would require the applicant to demonstrate the availability of water supply and well capacity prior to issuance of a certificate of occupancy. This would reduce potential impacts associated with water supply infrastructure to less than significant.

5.16.3 Storm Drainage Systems

Impacts to storm drainage systems are analyzed in Section 5.8, *Hydrology and Water Quality*, and are not analyzed further in this section.

5.16.4 Solid Waste

5.16.4.1 ENVIRONMENTAL SETTING

Regulatory Background

Federal

The Resource Conservation and Recovery Act of 1976 (RCRA) (Title 40 of the Code of Federal Regulations), Part 258, contains regulations for municipal solid waste landfills and requires states to implement their own permitting programs incorporating the federal landfill criteria. The federal regulations address the location, operation, design (liners, leachate collection, run-off control, etc.), groundwater monitoring, and closure of landfills.

State

Assembly Bills 939, 341, and 1826

Assembly Bill 939 (Integrated Solid Waste Management Act of 1989; Public Resources Code 40050 et seq.) established an integrated waste-management system that focused on source reduction, recycling, composting, and land disposal of waste. AB 939 required every California city and county to divert 50 percent of its waste from landfills by the year 2000. Compliance with AB 939 is measured in part by comparing solid waste disposal rates for a jurisdiction with target disposal rates. Actual rates at or below target rates are consistent with AB 939. AB 939 also requires California counties to show 15 years of disposal capacity for all jurisdictions in the county or show a plan to transform or divert its waste.

Assembly Bill 341 (Chapter 476, Statutes of 2011) increased the statewide solid waste diversion goal to 75 percent by 2020. The law also mandates recycling for commercial and multifamily residential land uses as well as schools and school districts.

Assembly Bill 1826 (California Public Resources Code Sections 42649.8 et seq.) requires recycling of organic matter by businesses, and multifamily residences of five of more units, generating such wastes in amounts over certain thresholds. The law took effect in April 2016.

California Green Building Standards Code

Section 5.408 (Construction Waste Reduction, Disposal, and Recycling) of the 2013 California Green Building Standards Code (CAlGreen; Title 24, California Code of Regulations, Part 11) requires that at least 50 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse.

Local

Los Angeles Countywide Siting Element

In 1997, the County of Los Angeles prepared a Countywide Siting Element (Siting Element) that estimates the amount of solid wastes generated in Los Angeles County and proposes various diversion and alternate disposal options. The Siting Element is a long-term planning document that describes how the County and the cities within the County plan to manage the disposal of their solid waste for a 15-year planning period. The Siting Element identifies the Los Angeles County Department of Public Works (DPW) as the responsible agency to develop plans and strategies to manage and coordinate the solid waste generated in the unincorporated areas and to address the disposal needs of Los Angeles County. In addition, the Siting Element contains goals and policies on a variety of solid waste management issues. The county will continue to meet its disposal capacity needs by implementing enhanced waste reduction and diversion programs and greater resource recovery efforts.

City of Duarte

Solid waste collection and disposal in the City of Duarte is addressed in Chapters 6.08 (Garbage and Rubbish Disposal), 6.09 (Collection of Recyclable Materials), 6.10 (Diversion of Construction and Demolition Waste), and 6.14 (Solid Waste Disposal) of the Duarte Municipal Code. Chapter 6.10 establishes requirements for the preparation of waste diversion reports by project applicants. Chapter 6.14 adopts by reference the County of Los Angeles's solid waste ordinance.

City of Irwindale

Chapters 8.20 (Solid Waste Collection and Salvage of Recyclable Materials) and 7.24 (Waste or Refuse Disposal Sites) of the Irwindale Municipal Code addressed solid waste in Irwindale.

Existing Conditions

Medical waste generated on campus is handled by Medical Waste Services and is separate from general solid waste services. The following discussion and analysis is related to general solid waste services.

Solid Waste Collection

General solid waste collection service in Duarte is provided by Burrtec Waste Services. In Irwindale, solid waste services are provided by Athens Services. Solid waste is collected from two places on campus: waste from the Helford Hospital in the central part of the campus is collected from the hospital by Burrtec Waste Industries; waste from the remainder of the campus is collected from a storage area on the southeast site boundary in the City of Irwindale by Athens Services. In 2016, Burrtec collected 475 tons of solid waste from Helford Hospital and Athens Services collected 938 tons from the storage area on the southeast site boundary.

Solid Waste Recycling and Disposal

In 2015, about 94 percent of the solid waste landfilled from the City of Irwindale, and the great majority of the waste from the City of Duarte, was landfilled at five facilities described in Table 5.16-6 below.[3]

[3] Disposal data by landfill is not available for the City of Duarte, data for which are reported as part a much larger agency. Therefore, disposal by landfill from Duarte was assumed to be similar to three nearby cities for which data are available – Azusa, Monrovia, and El Monte. In 2015 about 85 percent of the total solid waste landfilled from those three cities went to the five landfills in Table 5.16-6 above.

Table 5.16-6 Landfills Serving Duarte and Irwindale

Landfill and Location	Current Remaining Capacity (Cubic Yards)	Estimated Close Date	Maximum Daily Load (tons)	Average Daily Disposal, 2015 (tons)[1]	Residual Daily Disposal Capacity (tons)
Azusa Land Reclamation Co. Landfill Azusa, Los Angeles County	51,512,201	2045	8,000	1,054	6,946
Olinda Alpha Sanitary Landfill, Brea, Orange County	34,200,000	2021	8,000	6,916	1,084
San Timoteo Sanitary Landfill, Redlands, San Bernardino County	13,605,488	2043	2,000	871	1,129
Mid-Valley Sanitary Landfill, Rialto, San Bernardino County	67,520,000	2033	7,500	2,987	4,513
El Sobrante Landfill near Corona, Riverside County	145,530,000	2045	16,054	6,793	9,261
Total	**312,367,689**	Not applicable	**41,554**	**18,621**	**22,933**

Sources: CalRecycle 2017a, CalRecycle 2017b, CalRecycle 2017c, CalRecycle 2017d, CalRecycle 2017e, CalRecycle 2017f, and CalRecycle 2017g.
[1] Average daily disposal is calculated from annual disposal based on 300 operating days per year; each of the five landfills is open six days per week, Monday through Saturday, except for certain holidays.

5.16.4.2 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project:

U-6 Would be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs.

U-7 Would not comply with federal, state, and local statutes and regulations related to solid waste.

5.16.4.3 ENVIRONMENTAL IMPACTS

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.16-3: Existing and proposed facilities would accommodate project-generated solid waste and comply with related solid waste regulations. [Thresholds U-6 and U-7]

Impact Analysis:

Landfill Capacity

Campus Plan buildout is estimated to generate a net increase of about 39,006 pounds (19.5 tons) of solid waste per day, as shown below in Table 5.16-7.

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UTILITIES AND SERVICE SYSTEMS

Table 5.16-7 Projected Solid Waste Generation

Land Use District	Land Use	Proposed Net New Development (GSF)	Solid Waste Generation (pounds per day)	
			Per square foot[2]	Total
Core Medical (CM)	Patient care (outpatient and inpatient)	569,500	0.059	33,601
	Research	301,000	0.0132	3,913
	Office	132,000	0.006	792
	Hospitality	57,000	0.018	1,026
	Assembly	(29,000)	0.0132	-383
	Subtotal	**1,030,500**	**—**	**38,949**
Transition Medical (TM) with R2 Overlay[1]	—	—	—	—
Cultural Amenity (CA) [1]	—	—	—	—
Infrastructure and Utility (IU)	Industrial	56,500	0.0132	746
	Warehouse	-48,500	0.0142	-689
	Subtotal	**8,000**	**—**	**57**
Residential Medical Flex (RMF)[1]	—	0	—	—
Total	**—**	**1,038,050**	**—**	**39,006 (19.5 tons)**

Notes: GSF = Gross Square Feet
1 No net new development is planned for the Transition Medical (TM), Cultural Amenity (CA), and Residential Medical Flex (RMF) districts.
2 Solid waste generation rates were obtained by identifying the median of CalRecycle's estimated solid waste generation rates for each land use. The proposed land uses correspond to the following more general land use description provided by CalRecycle (https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates):
Patient Care = Hospital
Research = Industrial
Office = Office
Hospitality = Restaurants
Assembly = Industrial/Manufacturing
Industrial = Industrial/Manufacturing
Warehouse = Warehouse and Manufacturing/Warehouse

The proposed net new development of 1,038,050 gross square feet includes up to 409,000 square feet of demolition required prior to construction of the proposed buildings. The demolition debris would contribute towards the proposed project's overall solid waste generation.

As shown on Table 5.16-6, there is 22,933 tons per day of residual capacity for the landfills serving the project site. There is sufficient landfill capacity in the region for project-generated solid waste, and impacts would be less than significant.

Regulatory Compliance

Compliance with regulations governing medical waste is addressed in Section 5.7, *Hazards and Hazardous Materials*, of this DEIR.

Development projects under the Campus Plan would include storage areas for recyclable materials per AB 341, including areas for storing organic matter per AB 1826. At least 50 percent of construction and demolition debris from such projects would be recycled and/or salvaged for reuse per CALGreen Section 5.408. Campus Plan implementation would comply with regulations governing solid waste disposal and diversion, and impacts would be less than significant.

Cumulative Impacts

The area for which cumulative solid waste disposal impacts are considered is Los Angeles County. The estimated Countywide increase in solid waste disposal between 2016 and 2040 is shown in Table 5.16-8, based on the California Department of Finance 2016 households estimate; US Census Bureau 2014 employment estimate; SCAG projections for 2040 based on County general plan development projections; and solid waste generation rates from the California Department of Resource Recovery and Recycling.

Table 5.16-8 Estimated Net Increase in Solid Waste Generation, County of Los Angeles

				Solid Waste Generation in Pounds per Day	
	2016 [2014]	2040	Net Increase, 2016-2040	Per unit	Net Total, 2016-2040
Households	3,308,022	3,946,600	705,396	7.7 pound/unit/day[1]	5,431,549
Employment	[3,868,109]	5,226,000	1,357,891	6.1 pound/employee/day[2]	8,283,135
				Total	**13,714,684**

Sources: SCAG 2016; US Census 2016, CalRecycle 2017h.
[1] The waste generation factor used here is the average of the rates for single-family and multi-family units (10 pounds/unit/day and 5.3 pounds/unit/day, respectively).
[2] The generation factor is for general commercial use; and is the median of three generation factors for general commercial use listed on the California Department of Resource Recycling and Recovery's website.

As shown in Table 5.16-8, in consideration of population growth through 2040 the estimated net increase in solid waste disposal from the County of Los Angeles is approximately 13.7 million pounds per day, or about 6,857 tons per day. As shown in Table 5.16-6, the five landfills accepting the vast majority of the solid waste from the cities of Duarte, Irwindale, Azusa, Monrovia, and El Monte have a combined residual capacity of nearly 23,000 tons per day. Solid waste from Los Angeles County is also disposed of at numerous other landfills. Therefore, the estimated net increase in solid waste generation over the buildout period for the Campus Plan would not require the construction of new or expanded landfills. Campus Plan buildout is anticipated to generate 39,006 pounds (19.5 tons) of solid waste per day, which is approximately 0.3 percent of the total projected net increase in solid waste disposal in the County of Los Angeles. In addition, cumulative development would be required to comply with state laws and local ordinances governing recycling and waste diversion that would reduce the amount of solid waste landfilled. Therefore, cumulative impacts related to solid waste would be less than significant.

Existing Regulations

State

- California Public Resources Code 40050 et seq.: Integrated Solid Waste Management Act of 1989
- Assembly Bill 341 (Chapter 476, Statutes of 2011)
- Title 24, California Code of Regulations, Part 11 (California Green Building Standards Code), Section 5.408 (Construction Waste Reduction, Disposal, and Recycling)

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Local

- City of Duarte Municipal Code, Chapters 6.08 (Garbage and Rubbish Disposal), 6.09 (Collection of Recyclable Materials), 6.10 (Diversion of Construction and Demolition Waste), and 6.14 (Solid Waste Disposal)
- City of Irwindale Municipal Code, Chapters 8.20 (Solid Waste Collection and Salvage of Recyclable Materials) and 7.24 (Waste or Refuse Disposal Sites)

Level of Significance Before Mitigation

Upon implementation of regulatory requirements, Impact 5.16-4 would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance After Mitigation

Impacts would be less than significant.

5.16.5 References

California Department of Resources Recycling and Recovery (CalRecycle). 2017a, April 26. Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility. http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx.

———. 2017a, April 26. Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility. http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx.

———. 2017b, April 26. Facility/Site Summary Details: Azusa Land Reclamation Co. Landfill. http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AA-0013/Detail/.

———. 2017c, April 26. Facility/Site Summary Details: Olinda Alpha Sanitary Landfill. http://www.calrecycle.ca.gov/SWFacilities/Directory/30-AB-0035/Detail/.

———. 2017d, April 26. Facility/Site Summary Details: San Timoteo Sanitary Landfill. http://www.calrecycle.ca.gov/SWFacilities/Directory/36-AA-0087/Detail/.

———. 2017e, April 26. Facility/Site Summary Details: Mid-Valley Sanitary Landfill. http://www.calrecycle.ca.gov/SWFacilities/Directory/36-AA-0055/Detail/.

———. 2017f, April 26. Facility/Site Summary Details: El Sobrante Landfill. http://www.calrecycle.ca.gov/SWFacilities/Directory/33-AA-0217/Detail/.

———. 2017g, April 26. Landfill Tonnage Reports. http://www.calrecycle.ca.gov/SWFacilities/Landfills/tonnages/.

———. 2017h, April 26. Estimated Solid Waste Generation Rates. https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates.

California Department of Water Resources (DWR). 2011, March 11. SB610/SB221 Guidebook and FAQs. http://www.water.ca.gov/urbanwatermanagement/SB610_SB221/.

———. 2014a, February 5. Hydrologic Conditions in California (01/01/2014). California Data Exchange Center. http://cdec.water.ca.gov/cgi-progs/reports/EXECSUM.

———. 2014b, January 31. *DWR Drops State Water Project Allocation to Zero, Seeks to Preserve Remaining Supplies*. http://www.water.ca.gov/news/newsreleases/2014/013114pressrelease.pdf.

KPFF Consulting Engineers (KPFF). 2016, August 16 (revised). Revised Water Infrastructure and Demand Analysis for the City of Hope Campus Plan.

———. 2016, August 16 (revised). Wastewater Analysis for the City of Hope Specific Plan.

Southern California Association of Governments (SCAG). 2016, April 7. 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy. http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx.

Upper San Gabriel Valley Municipal Water District (Upper District). 2016, June. Upper San Gabriel Valley Municipal Water District 2015 Urban Water Management Plan. http://upperdistrict.org/wp-content/uploads/2012/11/Final_2015_Upper_District_UWMP.pdf.

US Census. 2016, November 16. Longitudinal Employer-Household Dynamics (LEHD). OnTheMap. http://onthemap.ces.census.gov/.

Water Systems Consulting, Inc. (WSC). 2017, September 22. Final Water Supply Assessment for the City of Hope Specific Plan.

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5.17 ENERGY

This section evaluates the potential for energy-related impacts associated with the project and ways in which the project would reduce unnecessary energy consumption, consistent with the suggestions contained in Appendix F of the CEQA Guidelines. Energy service providers to the site include Southern California Edison (SCE) for electrical service and Southern California Gas Company (SCG) for natural gas.

5.17.1 Environmental Setting

Regulatory Background

Federal

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 (Public Law 110-140) seeks to provide the nation with greater energy independence and security by increasing the production of clean renewable fuels; improving vehicle fuel economy; and increasing the efficiency of products, buildings, and vehicles. It also seeks to improve the energy performance of the federal government. The Act sets increased Corporate Average Fuel Economy Standards; the Renewable Fuel Standard; appliance energy efficiency standards; building energy efficiency standards; and accelerated research and development tasks on renewable energy sources (e.g., solar energy, geothermal energy, and marine and hydrokinetic renewable energy technologies), carbon capture, and sequestration.

State

Renewables Portfolio Standard

The California Renewables Portfolio Standard (RPS) was established in 2002 under Senate Bill (SB) 1078 and was amended in 2006 and 2011. The RPS program requires investor-owned utilities, electric service providers, and community choice aggregators to increase the use of eligible renewable energy resources to 33 percent of total procurement by 2020. The California Public Utilities Commission is required to provide quarterly progress reports on progress toward RPS goals. This has accelerated the development of renewable energy projects throughout the State. Based on the 3rd quarter 2014 report, the three largest retail energy utilities provided an average of 20.9 percent of its supplies from renewable energy sources. Since 2003, 8,248 megawatts (MW) of renewable energy projects have started operations (CPUC 2014). Senate Bill 350 (de Leon), was signed into law September 2015 and establishes tiered increases to the RPS—40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 also set a new goal to double the energy-efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

State Alternative Fuels Plan

Assembly Bill (AB) 1007 requires the California Energy Commission (CEC) to prepare a plan to increase the use of alternative fuels in California. The State Alternative Fuels Plan was prepared by the CEC with CARB and in consultation with other federal, State, and local agencies to reduce petroleum consumption; increase use of alternative fuels (e.g., ethanol, natural gas, liquefied petroleum gas, electricity, and hydrogen); reduce greenhouse gas (GHG) emissions; and increase in-state production of biofuels. The State Alternative Fuels Plan recommends a strategy that combines private capital investment, financial incentives, and advanced technology that will increase the use of alternative fuels; result in significant improvements in the energy efficiency of vehicles; and reduce trips and vehicle miles traveled through changes in travel habits and land management policies. The Alternative Fuels and Vehicle Technologies Funding Program legislation (AB 118, Statutes of 2007) proactively implements this plan (CEC 2007).

Appliance Efficiency Regulations

The 2006 Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608) were adopted by the California Energy Commission on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally and non–federally regulated appliances. California's Appliance Efficiency Regulations (California Code of Regulations [CCR], Title 20, Parts 1600–1608) contain energy performance, energy design, water performance, and water design standards for appliances (including refrigerators, ice makers, vending machines, freezers, water heaters, fans, boilers, washing machines, dryers, air conditioners, pool equipment, and plumbing fittings) that are sold or offered for sale in California. These standards are updated regularly to allow consideration of new energy efficiency technologies and methods.

Energy Efficiency Standards (CCR Title 24, Part 6)

The Energy Efficiency Standards for Residential and Nonresidential Buildings (24 California Code of Regulations [CCR]] Part 6) were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The California Energy Commission (CEC) adopted the 2008 changes to the Building Energy Efficiency Standards in order to (1) "Provide California with an adequate, reasonably-priced, and environmentally-sound supply of energy" and (2) "Respond to Assembly Bill 32, the Global Warming Solutions Act of 2006, which mandates that California must reduce its greenhouse gas emissions to 1990 levels by 2020". Title 24 Part 6 of the 2013 California Building Standards Code, the 2013 California Energy Code, went into effect on July 1, 2014, and includes energy efficiency updates (CBSC 2015).

Most recently, the CEC adopted the 2016 Building and Energy Efficiency Standards. The 2016 Standards will continue to improve upon the current 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. These standards went into effect on January 1, 2017. Under the 2016 Standards, residential buildings are 28 percent more energy efficient than the 2013 Standards, and nonresidential buildings are 5 percent more energy efficient than the 2013 Standards (CEC 2015a). Buildings that are constructed in accordance with the 2013 Building Energy Efficiency Standards are 25 percent (residential) to 30 percent (nonresidential) more energy efficient than the prior 2008 standards as a result of better windows, insulation, lighting, ventilation systems, and other features. While the 2016 standards do not achieve zero net energy, they do get very close to the state's goal and make important steps toward changing residential building practices in California. The 2019 standards will take the final step to achieve zero net energy for newly constructed residential buildings throughout California (CEC 2015b).

Title 24, Part 11, Green Building Standards

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11, Title 24, known as CALGreen; adopted by reference in Chapter 18.47 [Green Building Standards Code] of the City's Municipal Code) was adopted as part of the California Building Standards Code (Title 24, California Code of Regulations). CALGreen established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants. The mandatory provisions of CALGreen became effective January 1, 2011. The 2016 CALGreen took effect on January 1, 2017. The CALGreen Code is intended to (1) reduce greenhouse gas emissions from buildings; (2) promote environmentally responsible, cost-effective, healthier places to live and work; (3) reduce energy and water consumption; and (4) respond to the directives by the Governor. In short, the code is established to reduce construction waste, make buildings more efficient in the use of materials and energy, and reduce environmental impact during and after construction. The CALGreen Code contains requirements for construction site selection; storm water control during construction; construction waste reduction; indoor water use reduction; material selection; natural resource conservation; site irrigation conservation; and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for verifying that all building systems (e.g., heating and cooling equipment and lighting systems) are functioning at their maximum efficiency (CBSC 2015).

Assembly Bill 1493

California vehicle GHG emission standards were enacted under AB 1493 (Pavley I). Pavley I is a clean-car standard that reduces GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016 and is anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. California implements the Pavley I standards through a waiver granted to California by the EPA. In 2012, the EPA issued a Final Rulemaking that sets even more stringent fuel economy and GHG emissions standards for model year 2017 through 2025 light-duty vehicles (see also the discussion on the update to the Corporate Average Fuel Economy standards under *Federal Laws*, above). In January 2012, CARB approved the Pavley Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards. Under California's Advanced Clean Car program, by 2025, new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

Executive Order B-18-12

Executive Order B-18-12 called for new or renovated state buildings larger than 10,000 square feet to achieve the U.S. Green Building Council's Leadership in Energy Efficiency and Design (LEED) "Silver" certification.

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Local

City of Duarte

The City of Duarte's sustainable development practices in the City's development code are summarized below. Per the Alfred E. Alquist Hospital Facilities Seismic Safety Act of 1983, the Office of Statewide Health Planning and Development (OSHPD) is the enforcement agency for hospital buildings, acute psychiatric hospitals, skilled nursing facilities, and intermediate care facilities—as defined in Section 129725 of the Health and Safety Code—with regard to the applicable Title 24 building standards, preempting the local jurisdiction. However, the City of Duarte would have jurisdiction over parts of the proposed Campus Plan that are not under OSHPD's jurisdiction—such as surface parking, landscaping, parking structure, and other buildings not subject to OSHPD.

City of Duarte Sustainable Development Practices

The City of Duarte Sustainable Development Practices is codified in Chapter 19.52, Article 3, of the City's development code. This chapter includes guidelines and standards for conservation of natural resources, increased energy efficiency, and transit (e.g., transportation demand management, active transit design). Specific sustainable design requirements for energy efficiency, water conservation, transit and pedestrian access, and construction debris recycling depend on the level of development based on size (e.g., number of dwelling units, amount of nonresidential square footage), per Section 19.52.020(B). There are four levels of development, Level 1 to Level 4. Level 1 has the fewest requirements and Level 4 the most. In addition to these requirements, Chapter 19.52 includes optional measures that may be incorporated into an individual project.

City of Irwindale

The City of Irwindale has adopted the Los Angeles County Green Building Standards Code, which incorporates the California Green Building Standards Code. As with the City of Duarte, OSHPD is the enforcement agency for Title 24 building standards compliance. However, the City of Irwindale would have jurisdiction over components and facilities of the proposed Campus Plan that are not subject to OSHPD's jurisdiction.

Existing Conditions

Electricity

Supplies and Demands

The project site is in Southern California Edison (SCE)'s service area, which spans much of southern California from Orange and Riverside counties on the south to Santa Barbara County on the west to Mono County on the north (CEC 2011). Total electricity consumption in SCE's service area in gigawatt-hours is forecasted to be 102,218 GWh in 2016 and increase to 113,612 GWh in 2025 for the mid-demand scenario (CEC 2014); one GWh is equivalent to one million kilowatt-hours. Sources of electricity sold by SCE in 2014, the latest year for which data are available, were:

- 24 percent renewable, consisting mostly of geothermal and wind
- 3 percent large hydroelectric
- 27 percent natural gas
- 6 percent nuclear
- 40 percent unspecified sources – that is, not traceable to specific sources (SCE 2015)[1]

Existing electricity demands from existing development within the project site are estimated to be approximately 30.3 million kilowatt-hours annually, as shown in Table 5.17-1.

Table 5.17-1 Existing Estimated Electricity Demands

Land Use	CalEEMod Land Use Category	Unit	Quantity	Electricity Demands in kWh per Year	
				Per unit	Total
Inpatient/Outpatient	Hospital	SF	730,044	24.8	18,112,300
Office	Medical Office Building	SF	186,296	15.2	2,839,020
Research	Research & Development	SF	457,936	12.5	5,742,380
Assembly	General Office Building	SF	69,295	15.2	1,055,920
Data Center	General Heavy Industrial	SF	N/A	0.0	N/A
Industrial	General Light Industry	SF	73,909	12.5	926,686
Warehouse	Unrefrigerated Warehouse-No Rail	SF	59,244	4.6	270,612
Housing	Apartments Low Rise	units	6	3,727.6	22,233
Hospitality	Hotel	SF	18,168	9.1	164,469
Surface Parking	Parking Lot	SF	1,392,800	N/A	1,225,530
Parking structure	Enclosed Parking with Elevator	SF	None	N/A	N/A
Total	Not applicable	N/A	N/A	N/A	**30,359,150**

Notes: Electricity demand factors used in estimating the demands shown above are from the California Emissions Estimator Model Version 2016.3.1 by California Air Pollution Control Officer's Association (CAPCOA) 2016.

Facilities

An electrical substation is located near the middle of the project site's southern boundary. Currently Hopeful Substation is served by two 66/12 kV 12.5 Mega Volt Ampere (MVA) transformers (a volt-ampere is a measure of the apparent power in an electrical circuit; one MVA is one million volt-amperes). Based on historical data from January 2015 to October 2016, the maximum electrical load at the substation was 13.3 MVA. The load exceeds a single transformer's capacity, and therefore, redundancy has been lost during peak conditions. Existing subtransmission lines are adequate to serve existing electricity demands in the area (Reyes 2016).

[1] The electricity sources listed above reflect changes after the 2013 closure of the San Onofre Nuclear Generating Station, which is owned by SCE.

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Natural Gas

Supplies and Demands

The Southern California Gas Company (SCGC) provides natural gas to the Plan Area. SCGC's service area spans much of the southern half of California, from Imperial County on the southeast to San Luis Obispo County on the northwest to part of Fresno County on the north to Riverside County and most of San Bernardino County on the east (CEC 2015). Total natural gas supplies available to SCGC are forecast to remain constant at 3.875 billion cubic feet per day (bcfd) from 2015 through 2035. Total natural gas consumption in SoCalGas's service area is forecast to be 2.681 bcfd in 2016 and 2.382 bcfd in 2035 (CGEU 2016). Estimated existing natural gas demand from existing development within the project site is approximately 66.5 million kBTU[2] annually, as shown in Table 5.17-2.

Table 5.17-2 Existing Estimated Natural Gas Demands

Land Use	CalEEMod Land Use Category	Unit	Quantity	Natural Gas Demands in kBTU per Year	
				Per unit	Total
Inpatient/Outpatient	Hospital	SF	730,044	71.4	52,139,700
Office	Medical Office Building	SF	186,296	12.4	2,317,520
Research	Research & Development	SF	457,936	19.8	9,067,130
Assembly	General Office Building	SF	69,295	12.4	862,030
Data Center	General Heavy Industrial	SF	N/A	N/A	N/A
Industrial	General Light Industry	SF	73,909	19.8	1,463,400
Warehouse	Unrefrigerated Warehouse-No Rail	SF	59,244	1.0	61,614
Housing	Apartments Low Rise	units	6	15,105.6	90,634
Hospitality	Hotel	SF	18,168	25.9	469,643
Surface Parking	Parking Lot	SF	1,392,800	N/A	N/A
Parking structure	Enclosed Parking with Elevator	SF	None	N/A	N/A
Total	Not applicable	N/A	N/A	N/A	**66,471,671**

Notes: Natural gas demand factors used in estimating the demands shown above are from the California Emissions Estimator Model Version 2016.3.1 by California Air Pollution Control Officer's Association (CAPCOA) 2016.

Facilities

A distribution pipeline extends east-west in Duarte Road along the project site's northern boundary. East of the site, the pipeline continues northward in Highland Avenue (Chuang 2016).

Central Utilities Plant

Energy for the project is generated by the Central Utilities Plant located on the project site. The Central Utilities Plan is composed of boilers, chillers, and a cooling water system with a cooling tower. Natural gas is

[2] kBTU = thousand British thermal units; 1,000 BTU.

used in the broilers and electricity is used by the billers, cooling water system, boiler feed pumps, and other ancillary equipment.

5.17.2 Thresholds of Significance

Section 21100(b)(3) of the California Environmental Quality Act (CEQA) requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing any inefficient, wasteful, and unnecessary consumption of energy. Although not specifically in Appendix G of the CEQA Guidelines, Appendix F of the CEQA Guidelines states that the goal of conserving energy implies the wise and efficient use of energy and the means of achieving this goal include 1) decreasing overall per capita energy consumption; 2) decreasing reliance on fossil fuels such as coal, natural gas and oil; and 3) increasing reliance on renewable energy sources. Appendix F of the CEQA Guidelines states that potential environmental impacts considered in the EIR concerning energy may include the following:

- The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials maybe discussed.
- The effects of the project on local and regional energy supplies and on requirements for additional capacity.
- The effects of the project on peak and base period demands for electricity and other forms of energy.
- The degree to which the project complies with existing energy standards.
- The effects of the project on energy resources.

Therefore, the following additional thresholds are also addressed in the impact analysis: a project would normally have a significant effect on the environment if the project:

ENG-1 Would the project substantially increase demand on energy or require the construction of new or the expansion of existing facilities, the construction of which could cause significant environmental effect.

ENG-2 Would result in an inefficient, wasteful and unnecessary consumption of energy.

5.17.3 Project Design Features

The following project design features would address reducing energy consumption associated with the proposed project:

Energy Efficiency and Conservation

- Exceeding local and state energy-efficiency building requirements is encouraged.

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- Energy-efficient design and natural lighting and ventilation should be used wherever possible.
- The use of materials that reduce heat transfer into and out of buildings (such as light-colored roofing materials) is encouraged.
- Whenever possible, building articulation and form should be expressive of and driven by environmental and site conditions, such as solar orientation, views, noise, prevailing winds, and local climate. South- and west-facing windows should either be tinted or shaded with an overhang, deciduous trees, or awnings to reduce summer exposure.
- Buildings are encouraged to integrate sustainable design features such as photovoltaic panels (especially on top of parking decks), renewable materials with proven longevity, and storm water treatment where feasible.
- Green roofs may be considered as alternatives to active spaces and to help reduce the urban heat island effect.
- Planting of trees along southern and western building walls is encouraged to reduce the urban heating effect.
- Large specimen trees should be incorporated near major new buildings to provide a signature landscape element and to help increase the building's energy efficiency through additional shading.
- Lighting design should consider the use of control systems that reduce light levels during low-usage times whole not sacrificing uniformity or safety.

Healthy Design

- Recreational amenities should be incorporated on campus, including community gardens, gathering spaces, campus walking paths/routes, and areas for physical activity.
- Buildings should provide visibility and access to active/recreational areas.
- Bicycle storage and infrastructure should be secure, easily accessible and identifiable, and near building entrances.
- To facilitate pedestrian movement, a continuous, unobstructed path of travel must be maintained in any pathway.
- Pedestrian pathways can be used to connect less active outdoor spaces with more active uses.

Water Conservation

- Irrigation systems should use water-conserving methods and water-efficient technologies such as drip emitters, evapotranspiration controllers, and moisture sensors.
- Irrigation systems shall be operated automatically using an electric controller and low-voltage remove control valves.
- Plant material should incorporate native and low-water-use species consistent with the plant palettes recommended by the City of Duarte and City of Irwindale landscape regulations.
- Landscaping areas should use plants that require minimal water resources. Drought-tolerant grasses should be used for lawn areas where possible.

5.17.4 Environmental Impacts

Methodology

Based on CEQA Guidelines Appendix F, Energy Conservation, of the State CEQA Guidelines, in order to ensure energy implications are considered in project decisions, CEQA identifies that EIRs include a discussion of the potential impacts of proposed projects, with particular emphasis on avoiding or reducing wasteful, unnecessary, or inefficient use of energy resources as applicable. Environmental effects may include the project's energy requirements and its energy use efficiencies by amount and fuel type during construction, operation and decommissioning; the effects of the project on local and regional energy supplies; the effects of the project on peak and base period demands for electricity and other forms of energy; the degree to which the project complies with existing energy standards; the effects of the project on energy resources; and the project's projected transportation energy use requirements and its overall use of efficient transportation alternatives, if applicable. This discussion is provided below.

The following impact analysis addresses the thresholds of significance identified above. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.17-1: Existing and planned electricity and natural gas facilities would be able to accommodate utility demands generated by buildout of the proposed project. [Threshold ENG-1]

Impact Analysis:

Short-Term Construction Impacts

Construction of the project would create temporary increased demands for electricity and vehicle fuels compared to existing conditions and would result in short-term transportation energy use.

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Electrical Energy

The project site is already developed and consumes an average annual electricity demand of 30,359,150 kilowatt hour (kWh) (California Emissions Estimator Model Version 2016.3.1 by California Air Pollution Control Officer's Association [CAPCOA] 2016). Construction of the proposed project would require electricity use to power the construction-related equipment. The electricity use during construction would vary during different phases of construction, where the majority of construction equipment during demolition and grading would be gas-powered or diesel-powered, and the later construction phases would require electricity-powered, such as interior construction and architectural coatings. Since the project site is already served by onsite electrical infrastructure, adequate infrastructure capacity is available to accommodate the electricity demand during construction would not require additional or expanded electrical infrastructure.

The construction contractors are anticipated to minimize idling of construction equipment during construction and reduce construction and demolition waste by recycling. Such required practices would limit wasteful and unnecessary electrical energy consumption. Thus, impacts from energy use during short-term construction activities would be less than significant.

Gas Energy

The project site already being served by SCG and such demands would be eliminated once construction operations are completed. The construction-related equipment would not be powered by natural gas and no natural gas demand is anticipated during construction. No new or expanded natural gas facilities or supply are anticipated. Impacts related to gas energy use during short-term construction activities would be less than significant.

Transportation Energy

Transportation energy use depends on the type and number of trips, vehicle miles traveled, fuel efficiency of vehicles, and travel mode. Transportation energy use during construction would come from the transport and use of construction equipment, delivery vehicles and haul trucks, and construction employee vehicles that would use diesel fuel and/or gasoline. The use of energy resources by these vehicles would fluctuate according to the phase of construction and would be temporary. The majority of construction equipment during demolition and grading would be gas-powered or diesel-powered, and the later construction phases would require electricity-powered. Impacts related to transportation energy use during construction would be temporary and would not require expanded energy supplies or the construction of new infrastructure. Additionally, implementation of Mitigation Measure AQ-2 would require the construction contractor to utilize Level 3 Diesel Particulate Filters for all construction equipment of 50 horsepower or more and ensure that all non-essential idling of construction equipment is restricted to five minutes or less in compliance with California Air Resources Board Rule 2449, thus reducing transportation energy consumption. Impacts would not be significant.

Long-Term Operational Impacts

Operation of the project would create additional demands for electricity and natural gas compared to existing conditions, and would result in increased transportation energy use. Operational use of energy would include heating, cooling, and ventilation of buildings; water heating; operation of electrical systems, security and control center functions, use of on-site equipment and appliances; and indoor, outdoor, perimeter, and parking lot lighting.

Electrical Energy

Buildout under the proposed Campus Plan would create a net increase in electricity demand of approximately 48.1 million kilowatt hour annually compared to existing conditions, as shown in Table 5.17-3. This net increase is well within SCE's systemwide net increase in electricity supplies of approximately 13,400 GWh annually over the 2012-2024 period. Therefore, there are sufficient planned electricity supplies in the region for the estimated net increase in electricity demands, and buildout under the Campus Plan would not require expanded electricity supplies. Installation of one new 28 MVA transformer at the Hopeful Substation would be required to meet estimated electricity demands from Campus Plan buildout. Two 28 MVA transformers could be installed, if desired, to provide redundancy; both transformers could be installed within the existing substation fence (Reyes 2016).

Table 5.17-3 Forecast Electricity Demands from Project Buildout

					Electricity Demands in kWh per Year		
			Quantity		Per unit		
Land Use	CalEEMod Land Use Category	Unit	Existing Remaining	New Proposed	Existing Remaining	New Proposed	Total[1]
Inpatient/Outpatient	Hospital	SF	629,544	670,000	24.8	22.9	18,112,300
Office	Medical Office Building	SF	68,296	250,000	15.2	13.1	2,839,020
Research	Research & Development	SF	387,936	371,000	12.5	11.2	5,742,380
Assembly	General Office Building	SF	40,295		15.2	0.0	1,055,920
Data Center	General Heavy Industrial	SF		30,000	0.0	769.0	23,070,000
Industrial	General Light Industry	SF	70,409	30,000	12.5	11.2	926,686
Warehouse	Unrefrigerated Warehouse-No Rail	SF	10,744		4.6	0.0	270,612
Housing	Apartments Low Rise	units	6	0	3,727.6	N/A	22,233
Hospitality	Hotel	SF	168	75,000	9.1	7.6	164,469
Surface Parking	Parking Lot	SF	359,600	575,800	0.9	0.9	841,860
Parking structure	Enclosed Parking with Elevator	SF		1,200,000	N/A	6.5	7,800,000
Total	Not applicable		N/A	N/A	**N/A**		**78,516,687**
Existing Demands (from Table 5.17-1)							**30,359,150**
Net Increase							**48,157,537**

Notes: electricity demand factors used in estimating the demands shown above are from the California Emissions Estimator Model Version 2016.3.1 by California Air Pollution Control Officer's Association (CAPCOA) 2016.
[1] Total electricity demand at buildout is
[(existing remaining square footage) x (electricity demand per square foot for existing remaining uses)] **+**
[(new proposed square footage) x (electricity demand per square foot for new proposed uses)]

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Additionally, plans submitted for building permits of development projects in the Campus Plan area would be required to include verification demonstrating compliance with the 2016 Building and Energy Efficiency Standards and are also required to be reviewed. Future projects would also be required adhere to the provisions of CALGreen, which established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants.

Furthermore, the Specific Plan outlines a number of provisions that would ensure that individual development projects in within the project site are designed with energy conservation in mind, including;

- **Goal 4. Sustainable Development and Design:** Sustainable practices in building design, construction, and maintenance help to minimize the campus's impact on surrounding infrastructure and facilities.
    - **Green Building Standards.** Maximize energy efficiency, indoor air quality, energy-efficient lighting, building orientation, and shading through local and state standards and/or through implementation of LEED principles.
    - **Water Efficiency.** Incorporate water-efficient design features and practices such as xeriscaping, permeable surfaces, collection devices, biofiltration devices, green rooftops, cisterns, berms and swales, and green roofs.
    - **Building Systems.** Replace older buildings and infrastructure that require high maintenance with more efficient, lower-maintenance, and environmentally sensitive systems.
    - **Adaptive Reuse of Buildings.** Reuse or continue to use structurally compliant and technologically up-to-date facilities.
    - **Energy Generation.** Consider building layout, siting, and design so as not to preclude on-site alternative energy production.
    - **Sustainable Infrastructure.** Incorporate sustainable infrastructure practices in an efficient and cost-effective manner.

Impacts would be less than significant after implementation of the foregoing Specific Plan provisions.

The proposed project would be required to comply with the current Building Energy Efficiency Standards and to implement Countywide energy and environmental policy to achieve silver rating or better Leadership in Energy and Environmental Design (LEED) certification. The proposed project would be consistent with the requirements of these energy-related regulations, and would not result in wasteful or unnecessary electricity demands. Therefore, the proposed project would not result in a significant impact related to electricity.

Gas Energy

Buildout of the Campus Plan would generate a net increase in natural gas demands of approximately 42.5 million kBTU annually – or about 113,000 cubic feet per day – as shown in Table 5.17-4. New developments under the Campus Plan would use less natural gas per square foot as would existing land uses; note the lower natural gas demands per square foot for new development in Table 5.17-4. Total natural gas demands onsite at Campus Plan buildout would be about 109 million kBTU annually, or about 289,860 cubic feet per day. Total natural gas supplies available to SCGC are forecast to remain constant at 3.875 billion cubic feet per day (bcfd) from 2015 through 2035 (CGEU 2016). Total natural gas demands in SoCalGas's service area are forecast to decrease by 0.299 bcfd by 2035 to 2.382 bcfd due to intense energy efficiency efforts. The forecast net increase in natural gas demands due to buildout under the Campus Plan are will within SoCalGas's forecasts of natural gas supplies, and therefore, would not require new or expanded natural gas supplies. Impacts would be less than significant.

Table 5.17-4 Forecast Natural Gas Demands from Project Buildout

Land Use	CalEEMod Land Use Category	Unit	Quantity		Natural Gas Demands in kBTU per Year		
					Per unit		
			Existing Remaining	New Proposed	Existing Remaining	New Proposed	Total[1]
Inpatient/Outpatient	Hospital	SF	629,544	670,000	71.4	62.3	86,688,900
Office	Medical Office Building	SF	68,296	250,000	12.4	10.0	3,338,732
Research	Research & Development	SF	387,936	371,000	19.8	17.5	14,164,170
Assembly	General Office Building	SF	40,295		12.4		501,270
Data Center	General Heavy Industrial	SF		30,000	N/A	17.5	524,235
Industrial	General Light Industry	SF	70,409	30,000	19.8	17.5	1,918,335
Warehouse	Unrefrigerated Warehouse-No Rail	SF	10,744		1.0	N/A	11,174
Housing	Apartments Low Rise	units	6		15,105.6	N/A	90,634
Hospitality	Hotel	SF	168	75,000	25.9	23.1	1,735,263
Surface Parking	Parking Lot	SF	359,600	575,800	0	0	0
Parking structure	Enclosed Parking with Elevator	SF		1,200,000	0	0	0
Total	N/A	N/A	N/A	N/A	N/A	N/A	**108,972,712**
Existing Demands (from Table 5.17-2)							**66,471,671**
Net Increase							**42,501,042**

Notes: Natural gas demand factors used in estimating the demands shown above are from the California Emissions Estimator Model Version 2016.3.1 by California Air Pollution Control Officer's Association (CAPCOA) 2016.
[1] Total natural gas demand at buildout is
[(existing remaining square footage) x (natural gas demand per square foot for existing remaining uses)] **+**
[(new proposed square footage) x (natural gas demand per square foot for new proposed uses)]

Development pursuant to the proposed project would result in a net increase in the natural gas demands. The project site is already served by SCG, and the increased development intensities in the area may require upgrades to the existing system. Gas service would be added to the existing system by SCG as necessary to meet the requirements. There is extensive and reliable gas services in the area, and the improvements would occur in accordance with the SCG's policies and extension rules on file with the Public Utilities Commission

(PUC) when the contractual agreements are made. The availability of natural gas service is based on present gas supply and regulatory policies. As a public utility, SCG is under the auspices of the PUC and federal regulatory agencies. Should these agencies take any action that affects gas supply or the conditions under which service is available, gas service would be provided in accordance with revised conditions. Although the project implementation would create additional demands on natural gas supplies and distribution infrastructure, the increased demands are projected to be within the service capabilities of SCG.

Further, the proposed project will demolish older buildings that employ less-efficient natural gas systems, and newly constructed buildings will employ lower-maintenance and high-efficiency gas systems. Several project design features would also reduce overall natural gas consumption by implementing energy-efficient design (e.g., building orientation); enhancing natural lighting and ventilation; utilizing building materials that reduce heat transfer in and out of buildings (e.g., light-colored roofing and green roofs); installing photovoltaic panels; planting trees along building perimeters to reduce urban heating effect and providing additional shading; and exceeding local and state energy-efficiency building requirements. No significant impacts are anticipated.

Transportation Energy

The proposed project would consume transportation energy during operations from the use of motor vehicles. Transportation energy is based on vehicle miles traveled (VMT) data provided by Fehr and Peers for the proposed project in addition to VMT and fuel consumption data for the County of Los Angeles as obtained using EMFAC2014, Version 1.0.7., and vehicle fleet mix based on CalEEMod, Version 2016.3.2.1, and California Department of Transportation data.

The vehicle trip length analysis focused specifically on trip origins and destinations in the counties of Kern County, Ventura County, Los Angeles County, Orange County, San Bernardino County, Riverside County, and San Diego County. The cell phone data is used to estimate VMT by capturing a sample of trip distances of anyone who was working or visiting the City of Hope from July 2014 to June 2015.

The total daily VMT for the existing City of Hope facility is 170,585, which is based on the existing trip generation of 11,929 daily trips (Fehr & Peers 2017). Under the current condition, the transportation energy demand is estimated at 8,973 gallons per day, and 3,113,725 gallons per year[3] of gasoline and diesel fuel.

The proposed project would increase total daily VMT by 67,968 to 238,553, a 39.8 percent increase from existing conditions. At buildout, the proposed project would consume an estimated 7,852 gallons per day, and 2,724,522 gallons per year[4] of gasoline and diesel fuel. Compared to existing conditions, this results in a net decrease in fuel consumption of 1,121 gallons per day, and 389,203 gallons per year of gasoline and diesel fuel. The primary reason for this decrease is an increase in the average corporate fuel economy of vehicles as a result of state and federal laws, as well as vehicle turn over, that improves the overall fuel economy of California's vehicle fleets.

[3] Based on CARB's EMFAC 2014 fleet efficiency for year 2016 based on the fleet mix included in the traffic study, as modeled in CalEEMod.

[4] Based on CARB's EMFAC 2014 fleet efficiency for year 2035 based on the fleet mix included in traffic study, as modeled in CalEEMod.

The City of Duarte and its surrounding area are highly urbanized with numerous gasoline fuel facilities and infrastructure. Consequently, the proposed project would not result in a substantial demand for energy that would require expanded supplies or the construction of other infrastructure or expansion of existing facilities.

Other Considerations

In addition the evaluation above, recent case law suggests that other considerations related to energy be evaluated including whether a building should be constructed at all, how large it should be, where it should be located, whether it should incorporate renewable energy resources. These considerations are discussed below:

Project Need: The project site is developed with 1,600,850 gross square feet of total development (including the following land uses: Core Medical, Transition Medical, and Infrastructure and Utility). The Statement of Objectives included in the Project Description (Section 3.2) projects an increase in regional demand for outpatient services through 2035. The existing facility will not fulfill the minimum future requirements of future outpatient services, and therefore, enhancement and development of the existing City of Hope campus facility is necessary.

Building Size: The City proposes to increase development on the existing City of Hope campus. The proposed net new development (proposed new – proposed demolition) is 1,038,500 gross square feet, resulting in a total buildout development (existing + net new) of 2,639,350 gross square feet. As noted above, increasing the area of development for the City of Hope campus is necessary to the project's core objectives. In addition, the proposed project will demolish up to 387,500 gross square feet of building area, which includes buildings that require high maintenance and do not incorporate sustainable design elements. The proposed project includes up to 1,426,000 gross square feet of new development, which would incorporate lower-maintenance and environmentally sensitive systems, as well as sustainable design elements. The proposed size of the project is based on the required demand of services, and will therefore increase the size of the total development. However, the proposed project's sustainable design elements will increase energy efficiency to the extent possible.

Project Location: The proposed project includes development and enhancement of an existing facility in the City of Duarte and Irwindale. All project developments will be located on the existing City of Hope Campus, and therefore, the location of the proposed project will not affect the existing vehicle miles travelled (VMT) and associated gasoline consumption (project-related VMT and associated gasoline consumption is discussed in detail above, in Transportation Energy. The location of the proposed project will not affect potential energy consumption.

Incorporation of Renewable Energy: One of the goals of the City of Hope Master Plan would enforce sustainable practices in site development, building design, construction practices, and maintenance help to minimize the Campus's impact on surrounding infrastructure, facilities, and the natural environment. Sustainable design elements include compliance with Green Building Standards, Water Efficiency Practices, Low-Maintenance and Environmentally Sensitive Building Systems, Adaptive Reuse of Buildings, Consideration of Energy Generation and Construction Waste, Off-Site Impacts, and Sustainable Infrastructure. The proposed project does not specifically incorporate the use of renewables into the Master

Plan. However, it should be noted that SCE, which provides electricity to the project site, recently developed the Tehachapi Renewable Transmission Project that will increase the amount of energy that the project site and surrounding area generates from renewable power. The Tehachapi Renewable Transmission Project will enhance electric service reliability in the region, and will help meet California's renewable energy goals.

Based on the analysis above, Impact 5.17-1 would be less than significant.

Furthermore, as required by Mitigation Measure GHG-1, the City of Hope would be required to implement sustainable development features, such as future alternative energy production (photovoltaic systems), energy efficient appliances, and LEED certification, which will further encourage renewable energy.

Impact 5.17-2: The proposed project would not result in inefficient, wasteful and unnecessary consumption of energy. [Threshold ENG-2]

Impact Analysis:

Short-Term Construction Impacts

The proposed project would not result wasteful, inefficient, or unnecessary use of energy during construction. It is anticipated that the construction equipment would be well maintained and meet the appropriate Tier ratings per CALGreen or EPA emissions standards, such that adequate energy efficiency level is achieved. Construction trip would not result in unnecessary use of energy since the project site is centrally located and is served by numerous regional freeway system (e.g., I-605, I-210) that provides most direct and shortest routes from various areas of the region. Electrical energy would be available for use during construction from existing power lines and connection, avoiding the use of generators that are less efficient than tying into existing SCE infrastructure. Thus, energy use during construction of the project would not be considered inefficient, wasteful, or unnecessary. Impacts would be less than significant and no mitigation is required.

Long-Term Operational Impacts

The proposed project would not result in inefficient, wasteful and unnecessary consumption of energy. The proposed project would reduce wasteful energy consumption at the existing City of Hope Campus by ensuring that new buildings implement improved electrical, natural gas, water, and wastewater systems that comply with the current California Building Energy and Efficiency Standards (Title 24, Part 6) and California Green Building Standards Code (CALGreen) (Title 24, Part 11). The 2016 Building and Energy Efficiency Standards are effective starting on January 1, 2017. The Building Energy and Efficiency Standards and CALGreen are updated tri-annually with a goal to achieve net zero energy for residential buildings by 2020 and non-residential buildings by 2030. The proposed project would not result in a significant inefficient, wasteful and unnecessary consumption of energy. Based on the analysis above, Impact 5.17-2 would be less than significant.

5.17.5 Cumulative Impacts

Electrical Energy

The geographic area for electricity service is SCE boundaries and for natural gas service is SCG boundaries. The proposed project would result in an increased services demand in electricity and natural gas. Although the proposed project would result in a net increase in electricity, this increase would not require SCE to expand or construct infrastructure to that could cause substantial environmental impacts. As discussed previously, the total annual electricity consumption in SCE's service area in gigawatt-hours is forecast to increase by 11,394 million kilowatt hours (11,394 GWh) between 2016 and 2025 for the mid-demand scenario. While this forecast represents a very large increase in electricity consumption, the project's percent of cumulative consumption would be approximately 0.42 percent. The project, in combination with cumulative development, is well within SCE's systemwide net increase in electricity supplies annually over the 2012 to 2024 period, and there are sufficient planned electricity supplies in the region for estimated net increases in energy demands. As such, cumulative impacts would be less than significant.

Gas Energy

Similarly, additional natural gas infrastructure is not anticipated due to cumulative development. Total natural gas consumption in SCG's service area is forecast to decrease by 0.299 bcfd between 2016 and 2035 due to intense energy efficiency efforts, while total natural gas supplies are forecast to remain constant at 3.875 bcfd. Therefore, it is anticipated that SCG would be able to meet the natural gas demand of the cumulative projects without additional facilities. In addition, both SCE and SCG's demand forecasts include the growth contemplated by the project and the other cumulative projects. SCE and SCG plan to continue to provide reliable service to its customers and upgrade their distribution systems as necessary to meet future demand.

Transportation Energy

Transportation energy use would also increase; however, this transportation energy use would not represent a major amount of energy use when compared to the amount of existing development and to total number of vehicle trips and vehicle miles travelled throughout the county and the region. The proposed project and other cumulative projects are required to comply with various federal and state government legislation to improve energy efficiency in buildings, equipment, and appliances and reduce vehicle miles travelled. Increased energy efficiency to comply with building energy efficiency standards will reduce energy consumption on a per square foot basis. In addition, utility companies are required to increase their renewable energy sources to meet the RPS mandate of 50 percent renewable supplies by 2030. Further, compliance with the existing regulatory requirements and project design features would ensure that proposed project does not result in an inefficient, wasteful and unnecessary consumption of energy. Therefore, cumulative impacts to energy resources would be less than significant.

5. Environmental Analysis
ENERGY

5.17.5.1 EXISTING REGULATIONS

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to electricity and natural gas supplies were described in detail in Section 5.16.6.1 of this DEIR and are listed below.

- California Green Building Standards Code (Part 11, Title 24)
- California Code of Regulations, Title 20: Appliance Efficiency Regulations
- California Code of Regulations, Title 24: Building Energy Efficiency Standards

5.17.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.17-1 and 5.17-2.

5.17.7 Mitigation Measures

No mitigation measures are required, however Mitigation Measure GHG-1 in Section 5.6 of this DEIR would reduce energy consumption.

5.17.8 Level of Significance After Mitigation

No significant impacts related to energy resources have been identified. No significant and unavoidable impacts are anticipated.

5.17.9 References

California Department of Water Resources (DWR). 2011, March 11. SB610/SB221 Guidebook and FAQs. http://www.water.ca.gov/urbanwatermanagement/SB610_SB221/.

———. 2014a, February 5. Hydrologic Conditions in California (01/01/2014). California Data Exchange Center. http://cdec.water.ca.gov/cgi-progs/reports/EXECSUM.

———. 2014b, January 31. *DWR Drops State Water Project Allocation to Zero, Seeks to Preserve Remaining Supplies*. http://www.water.ca.gov/news/newsreleases/2014/013114pressrelease.pdf.

———. 2014c, December. 2014 Power Integrated Resource Plan. https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-integratedresourceplanning/a-p-irp-documents?_afrLoop=35026438123104&_afrWindowMode=0&_afrWindowId=u672oou3z_1#%40%3F_afrWindowId%3Du672oou3z_1%26_afrLoop%3D35026438123104%26_afrWindowMode%3D0%26_adf.ctrl-state%3Dqkixd73h_4.

California Energy Commission (CEC). 2011, October 25. California Energy Utility Service Areas. http://www.energy.ca.gov/maps/serviceareas/Electric_Service_Areas_Detail.pdf.

———. 2012. California Natural Gas Detailed Utility Service Areas. http://www.energy.ca.gov/maps/serviceareas/natural_gas_detailed_service_areas.pdf.

———. 2014, December. California Energy Demand Updated Forecast, 2015-2025. http://www.energy.ca.gov/2014publications/CEC-200-2014-009/CEC-200-2014-009-SF-REV.pdf.

———. 2015a. 2016 Building Energy Efficiency Standards, Adoption Hearing Presentation. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/ June 10.

———. 2015b. 2016 Building Energy and Efficiency Standards Frequently Asked Questions. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf.

California Gas and Electric Utilities (CGEU). 2014, July. 2014 California Gas Report. http://www.socalgas.com/regulatory/documents/cgr/2014-cgr.pdf.

———. 2016, June 29. 2016 California Gas Report. http://www.pge.com/pipeline_resources/pdf/library/regulatory/downloads/cgr16.pdf.

Chuang, James (Senior Environmental Specialist/Land Planner). 2016, October 13. Email response to service questionnaire. Southern California Gas Company.

Los Angeles, County of. 2015a. Electric Consumption & Revenue Detail: Multiple Years. Excel Data from January 2009 to August 2013 (Meter Nos: PMYG02025–00000274, APMYVL02025–00000360, 1APMYD00219–00033740, M00022–00001883, and M00009–00925579). Department of Public Works.

———. 2015b. Renewable Energy. Department of Regional Planning. http://planning.lacounty.gov/energy.

Oak Ridge National Laboratory (ORNL). 2015, September 30 (released). *Transportation Energy Data Book*. Edition 34. http://cta.ornl.gov/data/download34.shtml.

Reyes, Jose (Project Manager). 2016, October 19. Written questionnaire response. Southern California Edison.

Southern California Edison (SCE). 2015, November 18. Power Content Label: 2014. http://www.energy.ca.gov/sb1305/labels/2013_labels/IOUs/Southern_California_Edison_2013.pdf.

Southern California Gas Company (SCGC). 2015. Pipeline Safety, Pipeline Maps, Los Angeles County. http://www.socalgas.com/safety/pipeline-maps/LA.shtml.

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6. Significant Unavoidable Adverse Impacts

At the end of Chapter 1, *Executive Summary*, is a table that summarizes the impacts, mitigation measures, and levels of significance before and after mitigation. Mitigation measures would reduce the level of impact, but the following impacts would remain significant, unavoidable, and adverse after mitigation measures are applied.

6.1 GREENHOUSE GAS EMISSIONS

Impact 5.6-1

Implementation of Mitigation Measures GHG-1 and GHG-2 would ensure that GHG emissions generated from implementation of the City of Hope Specific Plan would be minimized to the extent feasible. However, additional federal and state measures would be necessary to reduce GHG emissions to meet the midterm GHG reduction target of SB 32 and the long-term GHG reduction goal of Executive Order and S-03-05, which are, respectively, 40 percent of 1990 levels by 2030 and 80 percent of 1990 levels by 2050. Although the 2017 Scoping Plan Update is being prepared by CARB with a planned adoption in December of 2017, there is currently no adopted statewide plan past 2020 that achieves the midterm GHG reduction target of SB 32 or the long-term GHG reduction goal of S-03-05. Furthermore, at this time, the state cannot meet the 2050 goal without major advancements in technology (CCST 2012). Since no additional federal or state measures are currently available that would ensure that the City of Hope Specific Plan project could achieve the post-2020 targets, Impact 5.6-1 would remain ***significant and unavoidable***.

6.2 NOISE

Impact 5.10-1

With implementation of Mitigation Measure N-1, construction noise impacts due to construction activities would be reduced to the extent feasible. There are no definitive, bright-line sound level thresholds for construction noise. Given the expected noise levels and, in particular, the extended length of the construction activities (three to four years for each of the four phases), significant construction noise impacts would remain. Impact 5.10-1 would remain ***significant and unavoidable***.

6.3 TRANSPORTATION AND TRAFFIC

Impact 5.14-1

With implementation of Mitigation Measure TRAF-1 and TRAF-2, traffic operations would be improved to acceptable levels of service and impacts would be less than significant, with the exception of three intersections in the future condition (see Tables 10 and 11 in Appendix J1 of this DEIR). For the reasons

6. Significant Unavoidable Adverse Impacts

stated above, improvements to: Live Oak Avenue & Arrow Highway (#1; Irwindale), Buena Vista Street & Evergreen Street (#13; Duarte), and Buena Vista Street & Duarte Road (#15; Duarte) are not recommended for safety reasons. Impacts to these intersections would remain ***significant and unavoidable***.

The freeway ramp queues would extend beyond the 85 percent length of the ramp at I-605 Northbound Off-Ramp & Live Oak Avenue (#8) and I-210 Westbound Off-Ramp & Central Avenue (#17). Signalization of these ramp intersections as required under TRAF-1 would reduce the storage length by approximately half during both peak periods, ensuring that the queue would not extent beyond the 85 percent length (see Table 14 of Appendix J1 of this DEIR). This would mitigate the ramp to less than significant. However, the improvement is within the responsibility of Caltrans and not controlled by the Cities. Therefore, the Cities cannot guarantee implementation of the improvement and impacts to freeway ramps would remain ***significant and unavoidable***.

The required improvements to Avenida Barbosa & Arrow Highway (#6; Irwindale) are not currently included in any traffic fee program; therefore, project impacts to this intersection would be ***significant and unavoidable.***

Two freeway segments will operate at an unacceptable level, and the project adds traffic to these facilities. Therefore, there are project-level impacts to the freeway system near the project site. To mitigate the impacts at the identified locations, freeway mainline widening would be required. However, this type of infrastructure is extremely costly and is typically infeasible for one development project to undertake. The City cannot assure the construction of improvements to freeway facilities that may be needed to improve traffic flow. Furthermore, Caltrans does not have any funding mechanism in place to allow development projects to contribute a fair-share payment to future improvements and off-set traffic impacts caused by regional transportation. The facility is not controlled by the Cities, which could not guarantee implementation of the mitigation measures. Therefore, the identified impacts to the freeway system are considered ***significant and unavoidable.***

Note this project-level impact assumes that buildout of the project would occur at one time without consideration for regional improvements. In the future condition, impacts to the two freeway segments– westbound I-210 west of I-605 and 2) southbound I-605 south of I-210– would not occur.

Improvements to state highway facilities are planned, funded, and constructed by the State of California through a legislative and political process involving the state legislature; the California Transportation Commission (CTC); the California Business, Transportation, and Housing Agency; Caltrans; and the Regional Transportation Planning Agency (RTPA). Although potential impacts to the freeway mainline segments and ramps have been evaluated, implementation of the transportation improvements to Caltrans facilities listed above is the primary responsibility of Caltrans. Caltrans has recognized that private development has a role to play in funding fair share improvements to impacts on these facilities, but neither Caltrans nor the state has adopted a program that can ensure that locally contributed impact fees will be tied to improvements to freeway mainlines, and only Caltrans has jurisdiction over mainline improvements. Because Caltrans has exclusive control over state highway improvements, ensuring that developer fair share contributions to mainline improvements are actually part of a program tied to implementation of mitigation is within the jurisdiction of Caltrans. However, a number of programs are in place in Los Angeles County to improve and upgrade the regional transportation system. These include the State Transportation Improvement Program (STIP), Regional Transportation Improvement Program (RTIP), Interregional Improvement Program (IIP), and Caltrans Traffic Operations Strategies, State Highway Operation and Protection Program (SHOPP). State and federal fuel taxes generate most of the funds used to pay for these improvements. Funds expected to be available for transportation improvements are identified through a fund estimate prepared by Caltrans and adopted by the CTC. These funds, along with other fund sources, are deposited in the state highway account to be programmed and allocated to specific project improvements in both the STIP and SHOPP by the CTC. However, if these programs are not implemented by the agencies with the responsibility to do so, the project's freeway mainline impacts would remain ***significant and unavoidable.***

6. Significant Unavoidable Adverse Impacts

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7. Alternatives to the Proposed Project

7.1 INTRODUCTION

7.1.1 Purpose and Scope

The California Environmental Quality Act (CEQA) requires that an Environmental Impact Report (EIR) include a discussion of reasonable project alternatives that would "feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any significant effects of the project, and evaluate the comparative merits of the alternatives" (CEQA Guidelines Section 15126.6). This chapter identifies potential alternatives to the proposed project and evaluates them, as required by CEQA.

Key provisions of the CEQA Guidelines on alternatives (Section 15126.6[a] through [f]) are summarized below to explain the foundation and legal requirements for the alternatives analysis in the EIR.

- "The discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly" (15126.6[b]).

- "The specific alternative of 'no project' shall also be evaluated along with its impact" (15126.6[e][1]).

- "The no project analysis shall discuss the existing conditions at the time the Notice of Preparation (NOP) is published, and at the time the environmental analysis is commenced, as well as what would reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives" (15126.6[e][2]).

- "The range of alternatives required in an EIR is governed by a 'rule of reason' that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project" (15126.6[f]).

- "Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent)" (15126.6[f][1]).

- "For alternative locations, "only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR" (15126.6[f][2][A]).
- "An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative" (15126.6[f][3]).

For each development alternative, this analysis:

- Describes the alterative,
- Analyzes the impact of the alternative as compared to the proposed project,
- Identifies the impacts of the project that would be avoided or lessened by the alternative,
- Assesses whether the alternative would meet most of the basic project objectives, and
- Evaluates the comparative merits of the alternative and the project.

Per the CEQA Guidelines Section 15126.6(d), additional significant effects of the alternatives are discussed in less detail than the significant effects of the project as proposed.

7.1.2 Project Objectives

As described in Section 3.2, the following goals and objectives for the City of Hope Campus Plan project will aid decision makers in their review of potential associated environmental impacts:

1. Allow for the flexible, long-term development and enhancement of the entire City of Hope campus in order to augment hospital, outpatient services, research uses, office space and support services and meet the evolving needs of the community, while minimally disrupting the surrounding neighborhood.
2. Facilitate the replacement and/or enhancement of existing medical buildings and support facilities in order to accommodate the projected increase in regional demand for outpatient services through 2035.
3. Maximize the creation of construction jobs and new permanent jobs in the Cities of Duarte and Irwindale and the surrounding community through the long-term expansion and enhancement of the campus, such that at full project buildout there is a jobs-housing balance in the City of Duarte at the top end of the desirable range of jobs to housing (between 1.3:1 and 1.7:1) recommended by the American Planning Association so that Duarte remains a regional employment center with a multitude of jobs in the health care industry that reinforces Duarte's brand as the "City of Health."
4. Develop enhanced and expanded open space on the campus to serve the needs of City of Hope patients, employees and visitors, while concentrating development footprints.
5. Provide a modern, cohesive and contemporary design complemented by landscaping and public art, to create a dynamic relationship between existing and new buildings.
6. Modernize or replace obsolete or outdated buildings and facilities with more efficient development that meets the needs of City of Hope patients, physicians, researchers and other employees.

7. Reinforce public investment in and encourage use of public transit, and maximize employee density in proximity to public transit, including the Gold Line station at Duarte/City of Hope and regional bus lines.
8. Improve and streamline multimodal transportation and access throughout the campus, including by foot, bicycle, car, and shuttle.
9. Maximize employee density in proximity to public transit while reducing or mitigating all net new greenhouse gas emissions from construction and operation to zero.
10. Incorporate sustainable design elements to the maximum extent possible throughout the campus, including compliance with green building standards, water and energy efficient design elements, electricity generation, adaptive reuse of buildings, and minimization of solid waste generation.
11. Support proximate parking for patients, visitors and employees, between parking structures and surface lots, and the variety of buildings intended to serve campus populations.
12. Upgrade and expand utilities and infrastructure necessary to support campus growth, while minimizing impacts to the greater community.
13. Augment site improvements, signage and wayfinding to foster a more accessible campus for all populations.

7.2 SIGNIFICANT AND UNAVOIDABLE IMPACTS

Pursuant to CEQA Guidelines Section 15126.6[b], alternatives to the proposed project include those that are capable of avoiding or substantially lessen any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. Therefore, based on the analysis contained in Chapter 5, *Environmental Analysis*, the proposed Campus Plan would result in significant environmental effects prior to mitigation on the topics of air quality, biological resources, cultural resources, hazards and hazardous materials, tribal cultural resources, and utilities and service systems. Following mitigation, however, impacts to these three topical areas would be avoided or reduced to less than significant levels. Even with mitigation measures, however, the proposed Campus Plan would have significant and unavoidable environmental impacts related to greenhouse gas (GHG) emissions, noise (construction), and transportation and traffic.

7.3 ALTERNATIVES CONSIDERED AND REJECTED DURING THE SCOPING/PROJECT PLANNING PROCESS

The following is a discussion of the land use alternatives considered during the scoping and planning process and the reasons why they were not selected for detailed analysis in this Draft EIR.

7.3.1 Alternative Development Areas

CEQA requires that the discussion of alternatives focus on alternatives to the project or its location that are capable of avoiding or substantially lessening any significant effects of the project. The key question and first step in the analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR (Guidelines Sec. 15126[5][B][1]). In general, any development of the size and type proposed by the project would have substantially the same impacts on air quality, noise, transportation and traffic, and utilities and service systems. Without a site-specific analysis, impacts on aesthetics, biological resources, cultural resources, hazards and hazardous materials, and hydrology/water quality cannot be evaluated. The proposed Campus Plan area is already developed; infill development and redevelopment on the project site would result in fewer impacts than development on an alternate undeveloped vacant property. Furthermore, the site contains adequate infrastructure for future development to connect to; therefore an alternative site is not likely to reduce impacts related to hydrology, public services, and utilities.

Furthermore, City of Hope does not own other properties similar to the size of the City of Hope campus and cannot likely be expected to acquire, control, or have access to another site that could accommodate the campus plan. The general area that would be conducive to the type and intensity of institutional uses proposed by the project is either developed or planned to be developed in near future, and thus not available. Due to lack of viable and comparable sites in the general area that would allow for development of the project in a manner that would avoid or substantially lessen the project's potentially significant impacts, development of the project on an alternative site has been eliminated from consideration.

7.4 ALTERNATIVES SELECTED FOR FURTHER ANALYSIS

Based on the criteria listed above, the following three alternatives have been determined to represent a reasonable range of alternatives which have the potential to feasibly attain most of the basic objectives of the project but which may avoid or substantially lessen any of the significant effects of the project. These alternatives are analyzed in detail in the following sections.

- No Project/No Development
- No Project/Existing General Plan Alternative
- Reduced Intensity Alternative

An EIR must identify an "environmentally superior" alternative, and where the No Project Alternative is identified as environmentally superior, the EIR is then required to identify as environmentally superior an alternative from among the others evaluated. Each alternative's environmental impacts are compared to the proposed project and determined to be environmentally superior, neutral, or inferior. However, only impacts found significant and unavoidable are used in making the final determination of whether an alternative is environmentally superior or inferior to the proposed project. Only the impacts involving GHG emissions, noise, and traffic were found to be significant and unavoidable. Section 7.8 identifies the environmentally superior alternative.

Table 7-1 provides a summary of square footage and employment buildout figures for each of the three alternatives and the proposed project. This table was developed as a tool to better understand the differences between the proposed project and the alternatives.

Table 7-1 Alternatives Comparison

	Proposed Campus Plan	No Project/No Development Alternative	No Project/Existing General Plan Alternative[1]	Reduced Intensity Alternative
Square Footage	2,639,350	1,600,850	2,944,670	2,243,448
Employment	6,474	3,633	7,223	5,559
Population[2]	9,393	6,448	10,479	8,374

1. Buildout of the existing general plan was calculated based on the assumption that: 1) For Duarte: 1.5 FAR is allowed with a height limit of 75 feet; 50 percent of the site is developable; and the FAR excludes parking structures (2,874,960 sf); 2) For Irwindale, assumed the existing square footage (69,709 sf); and 3) employees prorated based on square feet.
2. Population includes all persons traveling to the project site: employees, patients, visitors, contractors, physicians, and residents.

7.5 NO PROJECT/NO DEVELOPMENT ALTERNATIVE

This alternative evaluates what would occur if the project is not approved, and is based upon existing conditions and available infrastructure. The project site is developed with 1,600,850 square feet of medical and research facilities, landscaped gardens, open spaces, two-lane roadways, drive aisles, and associated parking. Under this alternative, City of Hope would make minor fixes and modification to its aging buildings and support facilities, including repairing outdated utility and service systems over time. Many of the City of Hope buildings are more than 50 years old and reaching the end of their expected life span for this type of construction and use. The electrical, mechanical, and plumbing systems have surpassed a reasonably expected 30-year life span and are costly and difficult to maintain. Under this alternative, no demolition of existing buildings or construction of new medical and research facilities would occur. Compared to the project, this alternative would result in a reduction of 1,038,500 square feet of medical and research uses and 2,841 employees.

7.5.1 Aesthetics

Under the No Project/No Development Alternative, no new development would occur within in the project site. Therefore, the existing visual character and resources would remain as is. However, the various visual improvements that would be introduced throughout the project site under the proposed Campus Plan (e.g., landscaping, building form and architectural design, and public art) would not occur under this alternative. Additionally, the proposed project's aesthetic and visual resource impacts were determined to be less than significant. No favorable impact to aesthetics would occur under this alternative, and impacts under this alternative would be greater compared to the proposed project but remain less than significant.

7.5.2 Air Quality

Under this alternative, no new development would occur, and no new construction or demolition activities would occur. Therefore, the proposed project's potentially significant construction-related emissions impact requiring mitigation would be eliminated under this alternative.

Since the No Project/No Development Alternative would not increase traffic, associated air emissions would remain as is (that is, no impact would occur) and less than the proposed project. Although the proposed project would not result in any significant and unavoidable air quality impacts, air quality impacts under this alternative would be reduced compared to the proposed project and be less than significant.

7.5.3 Biological Impacts

The No Project/No Development Alternative would not result in any new development, and indirect construction-noise impacts to biological resources would be eliminated. No impact would occur under this alternative, and impacts would be reduced compared to the proposed project.

7.5.4 Cultural Resources

Under the No Project/No Development Alternative, no new development would occur within the project site; this alternative would not result in the potential to impact historical resources or encounter paleontological and archaeological during grading activities. Since no development would occur, there would be no potential to damage cultural resources, and impacts would be reduced compared to the proposed project.

7.5.5 Geology and Soils

No new construction activities, including demolition and grading, would occur under the No Project/No Development Alternative. Therefore, there would be no potential for additional workers, buildings, and structures to experience seismic ground shaking, or other geologic hazard. However, the proposed project's impacts to geology and soils were determined to be less than significant provided that existing regulations and standard conditions are implemented prior to and during building construction.

Although seismic risks to older buildings that were constructed under older and less conservative building code requirements would not be corrected under this alternative, it also would not involve any major grading or excavation that could cause unstable subsurface geologic conditions or significant erosion impact. Therefore, impacts to geology and soils would be reduced compared to the proposed project.

7.5.6 Greenhouse Gas Emissions

The No Project/No Development Alternative assumes the project area is completely built out and no new development would occur. The proposed project would replace older buildings with energy-efficient building designs. This alternative would generate 48,080 metric tons of CO_2 equivalent per year ($MTCO_2e$/year) or 7.4 $MTCO_2e$ per service population (SP) per year compared to the proposed project, which would generate 67,078 $MTCO_2e$/year or 7.1 $MTCO_2e$ per service population. This alternative would result in a reduction of GHG emissions; however the recent long-term GHG reductions goals under Executive Orders S-3-05 and B-30-15 would still not be met without major advancements in technology. Therefore, impacts under this alternative would be reduced compared to the proposed project and less than significant since no new development would occur. This alternative would eliminate a significant unavoidable impact.

7.5.7 Hazards and Hazardous Materials

Under this alternative, the project site is assumed to be completely built out, and no new development would occur. The potential for asbestos-containing materials and lead-based paint to be released during the demolition of buildings and structures under the proposed project would not occur, since no development would occur under this alternative. Furthermore, existing hazardous emissions or uses would remain as is and would be required to continue complying with existing state and local regulations. Therefore, impacts of this alternative would be less than significant and would be reduced compared to the proposed project.

7.5.8 Hydrology and Water Quality

Existing water quality conditions, groundwater supplies, drainage patterns, and runoff amounts would remain as is under this alternative since no new development would occur. This alternative would not introduce new sources of water pollutants to the project area (from either construction or operations phases of development projects). Additionally, this alternative would not require the water supply infrastructure improvements that would be required under the proposed project. However, this alternative would not include the development of new low-impact development, source control, site design, and treatment control best management practices (BMPs) to minimize runoff and water pollution. These BMPs are required measures that would occur under the proposed project and have a beneficial impact on stormwater quality. Overall, hydrology and water quality impacts would be slightly greater under this alternative and less than significant.

7.5.9 Land Use and Planning

Given that the proposed Specific Plan would not be adopted, this alternative would not require a general plan amendment and zone change. The existing zoning designations on the project site would remain (H: Hospital in Duarte and A-1: Agricultural, M-1: Light Manufacturing, and C-2: Heavy Commercial in Irwindale). However, this alternative would not allow new development to enhance the campus, establish a sense of place, or provide community amenities. New development standards and design guidelines to enhance the character, mobility, and connectivity of the project site would also not be implemented. Additionally, the proposed project's impacts to land use and planning were determined to be less than significant. Overall, land use impacts of the No Project/No Development Alternative would be less than significant and similar to those of the proposed project.

7.5.10 Noise

Under this alternative, no new development would occur. Therefore, this alternative would eliminate the proposed project's significant and unavoidable noise impacts related to construction activities. Additionally, no new operational noises would be generated because no new development would occur; however, no significant operational noise impacts were identified with the project. Therefore, no impact would occur under this alternative and impacts would be reduced as compared to the proposed project.

7.5.11 Population and Housing

Employment growth would not occur under the No Project/No Development Alternative because no new businesses, roads, or other infrastructure would be constructed. Population (employees, patients, visitors) on the project site would remain as is under this alternative, resulting in no impact to population and housing. However, the proposed project was determined to be within the growth projections for the area, and impacts to population and housing were determined to be less than significant. Therefore, population and housing impacts would be similar, and less than significant, under this alternative compared to the proposed project.

7.5.12 Public Services

The Los Angeles County Fire Department (LACFD) currently provides fire protection services to the project site. Although there would be less building area under this alternative compared to the proposed project, the new buildings would be constructed to meet the latest building and fire codes and equipped with better fire sprinkler and hydrant systems than the current aging structures. Therefore, impacts to fire services would not change significantly under this alternative compared to the proposed project. The onsite police protection services are provided by the Los Angeles County Sherriff Department (LACSD) and the Irwindale Police Department. LACSD indicated that they may need to expand their police facilities to accommodate buildout of the proposed project; therefore, the reduction in building square footage and on site population would reduce impacts to LACSD. There are no direct demands for school or library services by the City of Hope campus, and the indirect public services demands from the existing staffing would not change at the project site. Overall, impacts related to fire, police, school, and library services would be similar to the proposed project. As under the proposed project, public service impacts were determined to the less than significant.

7.5.13 Recreation

Under the No Project/No Development Alternative, no new employees would be introduced to the project area, which would slightly reduce impacts resulting from additional demand on parks and recreational facilities in the Cities of Duarte and Irwindale. However, the proposed project's impacts on parks and recreational facilities were determined to be less than significant. Overall, impacts to parks and recreational facilities would be similar under this alternative compared to the proposed project, and less than significant.

7.5.14 Transportation and Traffic

The proposed project would result in significant impacts to two freeway segments: 1) westbound I-210 west of I-605 and 2) southbound I-605 south of I-210 as well as six intersections after implementation of mitigation measures, as follows:

- 1. Live Oak Avenue & Arrow Highway (AM peak hour)
- 6. Avenida Barbosa & Arrow Highway (AM peak hour)
- 8. I-605 Northbound Off-Ramp & Live Oak Avenue (both peak hours)
- 13. Buena Vista Street & Evergreen Street (PM peak hour)

- 15. Buena Vista Street & Duarte Road (both peak hours)
- 17. I-210 Westbound Off-Ramp & Central Avenue (both peak hours)

Under the No Project/No Development Alternative, no new building square footage or employees would be introduced on to the project site. Existing daily trips would remain similar to current conditions, and all roadway segments and intersections would maintain existing levels of service. This alternative would not generate 4,753 additional daily trips associated with the proposed project, and no impact would occur.

As detailed in Table 8 of the Transportation Impact Study in Appendix J1 of this DEIR, 17 intersections operate at a deficient LOS during one or more peak hours under future no project conditions.

- 1. Live Oak Avenue & Arrow Highway (AM peak hour)
- 3. Mountain Avenue & Evergreen Street (PM peak hour)
- 6. Avenida Barbosa & Arrow Highway (AM peak hour)
- 7. I-605 Southbound On-Ramp & Live Oak Avenue (PM peak hour)
- 8. I-605 Northbound Off-Ramp & Live Oak Avenue (both peak hours)
- 9. I-605 Southbound Off-Ramp & Arrow Highway (AM peak hour)
- 10. Buena Vista Street & Huntington Drive (PM peak hour)
- 13. Buena Vista Street & Evergreen Street (PM peak hour)
- 14. Buena Vista Street & Three Ranch Road (PM peak hour)
- 15. Buena Vista Street & Duarte Road (both peak hours)
- 16. Buena Vista Street & Village Road (PM peak hour)
- 17. I-210 Westbound Off-Ramp & Central Avenue (both peak hours)
- 18. Cinco Robles Drive & Duarte Road (both peak hours)
- 19. Village Road & Duarte Road (both peak hours)
- 22. Circle Road & Duarte Road (PM peak hour)
- 25. Highland Avenue & Evergreen Street (AM peak hour)
- 27. Mt. Olive Drive/I-605 Ramps & Huntington Drive (both peak hours

As shown in Table 16 of Appendix J1, during the AM peak hour, all of the westbound analyzed segments on I-210 and I-10 operate at a congested LOS F. During the PM peak hour, both the eastbound and westbound segments on I-210, the eastbound segments on I-10, and the northbound segments on I-605 operate at LOS F. Since this alternative would not add any new trips to the site, it would eliminate the proposed project's significant and unavoidable traffic impacts, including all six intersections and two freeway mainline traffic impacts of the project, identified above.

7.5.15 Tribal Cultural Resources

Under this alternative no ground disturbances would occur. Therefore, no tribal cultural resources impacts would occur. Tribal cultural resources impacts of this alternative would be reduced compared to the proposed project. However, tribal cultural resources are not a significant and unavoidable impact of the proposed project.

7.5.16 Utilities and Service Systems

The existing campus is served by existing infrastructure and existing utilities and service systems are expected to continue to operate adequately. Due to the increase in land use intensity onsite under the proposed project, it would require improvements and upgrades to existing utilities and service systems, such as establishing a new well for additional water supply source, and upgrading/extending water, wastewater and storm drain pipes and fixtures to tie into off-site connections. The proposed project would also increase demand for natural gas and electricity given the substantial increase in nonresidential development. Therefore, this alternative would reduce impacts to all utility services, including water, wastewater, storm drains, solid waste compared to the proposed project.

7.5.17 Energy

Under this alternative, no demolition of existing buildings or construction of new medical and research facilities would occur. Therefore, energy demand for electricity and natural gas would remain as is. Compared to the proposed project, impacts on energy would be reduced and remain less than significant.

7.5.18 Conclusion

Ability to Reduce Environmental Impacts

As summarized in Table 7-2, *Summary of No Project/No Development Alternative Impacts*, the No Project Alternative would lessen environmental impacts in the areas of air quality, biological resources, cultural resources, geology and soils, GHG emissions, hazards, noise, public services, transportation and traffic, tribal cultural resources, and energy; have greater environmental impacts related to aesthetics, hydrology and water quality,; and have similar impact in the area of land use/planning, population and housing, public services, and recreation. Additionally, this alternative would eliminate the proposed project's significant and unavoidable impacts to GHG emissions, construction noise, and traffic. Therefore, overall this alternative is considered environmentally superior when compared to the proposed project.

Table 7-2 Summary of No Project/No Development Alternative Impacts

Environmental Issue	Potential Significance of Proposed Project's Impact	Potential Significance of Alternative's Impact	Comparison
Aesthetics	Less Than Significant	Less Than Significant	Greater than project
Air Quality	Less Than Significant with Mitigation Measures	Less Than Significant	Less than project
Biological Resources	Less Than Significant with Mitigation Measures	Less Than Significant	Less than project
Cultural Resources	Less Than Significant with Mitigation Measures	Less Than Significant	Less than project
Geology and Soils	Less Than Significant	Less Than Significant	Less than project
Greenhouse Gas Emissions	**Significant and Unavoidable**	Less Than Significant*	Less than project
Hazards and Hazardous Materials	Less Than Significant with Mitigation Measures	Less Than Significant	Less than project
Hydrology and Water Quality	Less Than Significant	Less Than Significant	Greater than project
Land Use and Planning	Less Than Significant	Less Than Significant	Similar to project
Noise	**Significant and Unavoidable**	Less Than Significant*	Less than project
Population and Housing	Less Than Significant	Less Than Significant	Similar to project
Public Services	Less Than Significant	Less Than Significant	Less than project
Recreation	Less Than Significant	Less Than Significant	Similar to project
Transportation and Traffic	**Significant and Unavoidable**	Less Than Significant*	Less than project
Tribal Cultural Resources	Less Than Significant with Mitigation Measures	Less Than Significant	Less than project
Utilities and Service Systems	Less Than Significant with Mitigation Measures	Less Than Significant	Less than project
Energy	Less Than Significant	Less Than Significant	Less than project

* Indicates elimination of a significant and unavoidable impact.

Ability to Achieve Project Objectives

Implementation of the No Project/No Development Alternative would ultimately stop any new development from occurring within in the project site beyond what is already on the ground. Therefore, none of the project objectives would be achieved under this alternative.

The No Project/No Development Alternative would not provide any of the project benefits that would occur with adoption of the Specific Plan, including enhancement of character and design, improved mobility and connectivity, water quality enhancement, creation of place, sustainable development and design, and economic revitalization.

7.6 NO PROJECT/EXISTING GENERAL PLAN ALTERNATIVE

Section 15126.6(e) of the CEQA Guidelines requires that an EIR evaluate and analyze the impacts of the "No-Project" Alternative. When the project is the revision of an existing land use or regulatory plan, policy, or ongoing operation, the no-project alternative is the continuation of the plan, policy, or operation into the future. Therefore, under the No Project/Existing General Plan Alternative, the current general plan land uses and zoning would remain in effect. All proposed changes to land uses and boundaries in the Campus Plan area would not occur. Development in accordance with the existing zoning would continue to occur, allowing for a total of 2,944,670 square feet of hospital uses and 7,223 employees. This represents an increase of 305,320 total nonresidential square feet and 749 employees compared to the proposed project. Buildout of the existing general plan was calculated based on the assumption that: 1) For Duarte: 1.5 FAR is allowed with a height limit of 75 feet; 50 percent of the site is developable; and the FAR excludes parking structures (2,874,960 sf); 2) For Irwindale, assumed the existing square footage (69,709 sf); and 3) employees prorated based on square feet (see Table 7-1 footnote).

The area of the project site within Duarte (89.5 acres) is designated as Hospital (encompasses the majority of the project site), Single-Family Residential, Medium-Density Residential, High-Density Residential, Research and Development, and Public Facilities in the general plan and zoned H (Hospital), R-1 (One-Family Residential), R-2 (Two-Family Residential), R-4 (Multiple Family Residential High Density), and O (Open Space). The area of the project site within Irwindale (26.5 acres) is designated as Industrial/Business Park (IBP), Open Space/Easements (OSE), and Commercial in the general plan and zoned A-1 (Agricultural), M-1 (Light Manufacturing), and C-2 (Heavy Commercial).

7.6.1 Aesthetics

This alternative would not implement the development standards and design guidelines included in the proposed Specific Plan that are intended to develop an established identity and sense of place and a cohesive and contemporary design character for the campus–including protections for several existing visual resources on the campus, and guidelines requiring installation of public art (see Section 5.1, *Aesthetics*, of this DEIR for further description). This alternative would not include a Cultural Amenity District including the two significant historical structures on campus, the Visitors Center and the House of Hope. Thus, aesthetics impacts of this alternative would be greater than those of the proposed project; impacts would be less than significant in both scenarios.

7.6.2 Air Quality

This alternative would permit development of up to about 305,000 square feet and 749 employees more than the Campus Plan would. Therefore, air quality impacts would be increased in this alternative both from construction and from operation (from transportation; area sources such as consumer products, cleaning supplies, and paints; and natural gas use). Impacts would be less than significant after mitigation for both scenarios.

7.6.3 Biological Impacts

The campus is nearly built out; vacant land onsite—comprising about 10 percent of the site—consists of disturbed area that is periodically cleared and 1.9 acre of ruderal vegetation at the south end of the site. Construction under the existing general plans could occur anywhere on the campus. Biological resources impacts of the proposed project would be less than significant after implementation of one mitigation measure protecting nesting migratory birds. Direct onsite impacts of this alternative would also be less than significant after implementation of such mitigation measure, and would be similar to those of the proposed project.

Potential indirect impacts of this alternative to the Santa Fe Flood Control Basin would be generally similar to those of the proposed project, and less than significant, as permitted development intensity under this alternative would be about 10 percent greater than that of the proposed project. Overall, impacts would be similar to those of the proposed project.

7.6.4 Cultural Resources

Development under this alternative could alter the historical significance of two buildings on campus that were identified as significant historical resources—the Visitors Center and House of Hope buildings, both in the north-central part of the campus. Under the proposed project no construction is proposed on or near the sites of either building. Thus, historical resources impacts of this alternative could be greater than those of the proposed project.

This alternative would permit development anywhere on the campus; the proposed project would permit development on the whole campus except for the Cultural Amenity District in the north-central part of the site containing the two above-mentioned historical buildings. Thus, potential impacts of this alternative to buried archaeological and paleontological resources would be similar to those of the proposed project, that is, less than significant after mitigation.

7.6.5 Geology and Soils

This alternative would permit development on the entire campus at maximum intensity about 10 percent greater than the proposed project. The proposed project would permit development on nearly the entire campus. Thus, geology and soils impacts of this alternative would be similar to the proposed project and less than significant for both scenarios.

7.6.6 Greenhouse Gas Emissions

GHG emissions impacts of this alternative would be increased compared to those of the proposed project due to the increased permitted development intensity in this alternative, which would result in increased construction emissions and increased operational emissions from both stationary and mobile sources. The three sectors, respecting both the proposed project and this alternative, generating the largest GHG emissions are building energy use, on-road transportation, and solid waste disposal. Therefore, impacts under GHG emissions impacts would be increased in this alternative and significant and unavoidable.

7.6.7 Hazards and Hazardous Materials

The amounts of hazardous materials that could be used and hazardous wastes generated would be slightly increased in this alternative compared to the proposed project due to the increased development intensity.

The types and severities of hazards involved (chemical hazards, biohazards, and radiological hazards) would be similar in both scenarios. Overall, hazards and hazardous materials would be slightly greater for this alternative and would be less than significant after mitigation for both scenarios.

7.6.8 Hydrology and Water Quality

Hydrology and water quality impacts would be greater for this alternative compared to the proposed project. While the development footprints and types of water contaminants would be similar, the proposed project would implement a comprehensive stormwater runoff program. In comparison, this alternative may implement piecemeal stormwater improvements on a project-by-project basis. Thus, impacts would be greater under this scenario, but would remain less than significant by complying with Los Angeles County Department of Public Works and stormwater pollution prevent plan (SWPPP) requirements.

7.6.9 Land Use and Planning

Land use impacts of this alternative would be greater than those of the proposed project. In this alternative, development onsite would conform with the general plans and zoning codes of the cities of Duarte and Irwindale and would not require any general plan amendments and zone changes. However, development restrictions imposed on City of Hope under the proposed project provide a substantially greater amount of regulation on the campus than under existing zoning. Thus, impacts would be greater than the proposed project although remain less than significant.

7.6.10 Noise

Noise impacts of this alternative would be slightly greater than those of the proposed project due to the increases in permitted building intensity and workers. Thus, construction noise; operational noise from stationary sources such as HVAC systems, loading docks, parking lot activities; and operational vehicle noise would all be increased somewhat by this alternative. Construction noise impacts would be significant and unavoidable in both scenarios. Operational noise impacts would be less than significant in both scenarios.

7.6.11 Population and Housing

The proposed increase in employment onsite under the proposed project would not be an adverse impact, as the jobs-housing ratios for the City of Duarte and the San Gabriel Valley are currently balanced—that is, between 1.3 and 1.7—and would remain so under proposed project buildout. The net increase in employment onsite under this alternative compared to the proposed project—749 workers—would not cause an adverse impact. The proposed project could displace up to 10 residences; there are sufficient vacant residences in the project region to absorb any displaced residents. The residences onsite are in an area designated for residential uses in the City of Duarte General Plan; thus, no displacement of onsite housing would be required under this alternative for General Plan conformance. The proposed project does not propose development of new residences. This analysis assumes that land use onsite under this alternative would continue to be focused on health care and research. Overall, population and housing impacts would be similar and less than significant under the two scenarios.

7.6.12 Public Services

This alternative could generate slightly increased demands fire and police services compared to the proposed project due to the increases in permitted development intensity and workers. This alternative would not affect demands for schools, parks, and libraries, as demands for those facilities are generated by the populations in the facilities' service areas, and this alternative is not expected to increase population onsite. Public services impacts would be slightly increased by this alternative and would be less than significant in both scenarios.

7.6.13 Recreation

This alternative would not affect demands for parkland compared to the proposed project, as this alternative would not increase population onsite or in the project region. Recreation impacts would be similar, and less than significant, in both scenarios.

7.6.14 Transportation and Traffic

Transportation impacts of this alternative would be increased compared to the proposed project due to the increase of 749 workers, or about 26 percent of the net increase of approximately 2,841 jobs that would be generated by the proposed project; and by the increased numbers of patients and visitors generated by the increase of about 305,000 square feet in this alternative compared to the proposed project. This alternative would exacerbate significant and unavoidable traffic impacts, including 3 intersection impacts and two freeway mainlines. Impacts would be significant and unavoidable for the proposed project and this alternative.

7.6.15 Tribal Cultural Resources

Impacts to tribal cultural resources would be similar for this alternative as for the proposed project, as the development footprint would be similar—and less than significant—for the two scenarios.

7.6.16 Utilities and Service Systems

Utility demands onsite are proportional to the service population, that is, the combined numbers of workers, patients, and visitors. Utilities and service system impacts would increase under this alternative due to the increases in building area and workers compared to the proposed project.

7.6.17 Energy

This alternative would allow approximately 305,320 additional square feet of medical and research use and increase population and employment by 1,086 and 749, respectively. This would increase energy demand for electricity and natural gas during construction and operational activities. Although impacts would remain less than significant, impacts would be greater under this alternative compared to that of the proposed project.

7. Alternatives to the Proposed Project

7.6.18 Conclusion

Ability to Reduce Environmental Impacts

As summarized in Table 7-3, *Summary of No Project/Existing General Plan Alternative Impacts*, the No Project Alternative would have greater environmental impacts related to aesthetics, air quality, GHG emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, public services, transportation and traffic, utilities and service systems, and energy; and have similar impact in the areas of biological resources, cultural resources, geology and soils, population and housing, recreation, and tribal cultural resources. Notably, this alternative would result in a new significant and unavoidable impact to GHG emissions and would still have significant and unavoidable impacts to construction noise, traffic and water supply. Therefore, overall this alternative is considered environmentally inferior when compared to the proposed project.

Table 7-3 Summary of No Project/Existing General Plan Alternative Impacts

Environmental Issue	Potential Significance of Proposed Project's Impact	Potential Significance of Alternative's Impact	Comparison
Aesthetics	Less Than Significant	Less than Significant	Greater than project
Air Quality	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Greater than project
Biological Resources	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Similar to project
Cultural Resources	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Similar to project
Geology and Soils	Less Than Significant	Less than Significant	Similar to project
Greenhouse Gas Emissions	**Significant and Unavoidable**	**Significant and Unavoidable**	Greater than project
Hazards and Hazardous Materials	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Greater than project
Hydrology and Water Quality	Less Than Significant	Less than Significant	Greater than project
Land Use and Planning	Less Than Significant	Less than Significant	Greater than project
Noise	**Significant and Unavoidable**	**Significant and Unavoidable**	Greater than project
Population and Housing	Less Than Significant	Less than Significant	Similar to project
Public Services	Less Than Significant	Less than Significant	Greater than project
Recreation	Less Than Significant	Less than Significant	Similar to project
Transportation and Traffic	**Significant and Unavoidable**	**Significant and Unavoidable**	Greater than project
Tribal Cultural Resources	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Similar to project
Utilities and Service Systems	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Greater than project
Energy	Less Than Significant	Less Than Significant	Greater than project

Ability to Achieve Project Objectives

Implementation of this alternative would not achieve objective 5 (a modern, cohesive and contemporary design complemented by landscaping and public art), 11 (proximate parking), and 13 (wayfinding). Implementation of the No Project/Existing General Plan Alternative would achieve project objectives 1 through 3 involving campus development, outpatient health care capacity, employment generation, and city revenues (see Section 7.6). Implementation of this alternative would partially or wholly achieve objectives 4 (open space), 6 (modernize/replace buildings), 7 and 8 (public transit and active transportation on and off campus), 9 and 10 (sustainability regarding GHG emissions, water- and energy-efficient designs, and minimizing solid waste generation), and 12 (expansion of infrastructure). Objectives 5, 7, 8, 9, 10, and 11 are all consistent with the existing City of Duarte General Plan, as described in Section 5.9, Land Use, of this DEIR.

7.7 REDUCED INTENSITY ALTERNATIVE

This Reduced Intensity Alternative was selected to avoid or substantially lessen significant unavoidable impacts related to GHG emissions, noise (construction), and traffic. In order to eliminate a significant and unavoidable transportation impact an approximate 25 percent reduction in daily trips would be required, a net increase of 3,565 trips. Based on the trip generation rates established in the traffic analysis (see Appendix J1), the campus population generates 1.85 daily trips per person, which translates to an allowable net increase of 1,926 population (an approximate 35 percent reduction in population compared to the proposed project) (see Table 7-1). This reduction in trips and population would result in a proportional decrease in building square footage of 15 to 25 percent, which would occur proportionally across the campus. This reduction in building square footage and overall intensity would also reduce impacts related to GHG emissions and noise. Implementation of the Specific Plan provisions would still apply.

7.7.1 Aesthetics

Impacts associated with the Reduced Intensity Alternative would be similar to the proposed project because it would result in a similar development area and would require compliance with the provisions of the proposed Campus Plan. Although buildout intensity would be reduced, heights, setbacks, building forms, and other development standards and design guidelines would still apply. Therefore, impacts would be less than significant, similar to the proposed project.

7.7.2 Air Quality

The Reduced Intensity Alternative would reduce regional air quality impacts by approximately 15 to 25 percent. With approximately 395,902 fewer square feet of building area, this alternative would reduce regional construction emissions by approximately 15 to 25 percent, although it was determined that the project's daily construction emissions did not exceed SCAQMD's thresholds and mitigation would reduce construction-related $PM_{2.5}$ impacts to less than significant.

The maximum daily operational phase regional emissions would also be reduced by approximately 15 to 25 percent, due to the 25 percent reduction in vehicle trips and associated vehicle miles traveled. However, project operational impacts would not exceed SCAQMD's threshold levels. This alternative would slightly reduce the air quality impacts which would be less than significant after mitigation in each scenario.

7.7.3 Biological Impacts

The Reduced Intensity Alternative would result in similar impacts to biological resources as the proposed project (less than significant after mitigation) since the development area would be the same. The reduction in development intensity would reduce indirect noise impacts to potential sensitive resources in areas surrounding the project site. Indirect impacts would be slightly reduced, although indirect impacts would be mitigated to less than significant under the proposed project.

7.7.4 Cultural Resources

Similar to the proposed project, implementation of the Reduced Intensity Alternative would cover the same development area and could uncover cultural resources during grading activities or result in impacts to historical resources. Thus, impacts would be the same as the proposed project and be reduced to less than significant upon implementation of mitigation measures.

7.7.5 Geology and Soils

Under this alternative, like the proposed project, existing buildings would be removed and graded and required to comply with the most recent building and seismic codes and regulations. Geology and soils impacts of this alternative would be less than significant, similar to the proposed project.

7.7.6 Greenhouse Gas Emissions

The Reduced Intensity Alternative would result in a reduction of nonresidential square footage and would decrease vehicle trips compared to the proposed project. Therefore, this alternative would result in a reduction in construction and operational GHG emissions. As with the proposed project, Mitigation Measures GHG-1 and GHG-2 would reduce GHG emissions. However, impacts related to GHG emissions would remain significant and unavoidable, since additional statewide measures would be necessary to reduce GHG emissions to meet the long-term GHG reduction goals under Executive Order S-03-05 (80 percent of 1990 levels by 2050) and Executive Order B-30-15 (identify goal to reduce GHG emissions for 2030). Currently, there is no plan past 2020 that achieves the long-term GHG reduction goal established under Executive Order S-03-05 or the new Executive Order B-30-15. As identified by the California Council on Science and Technology, the state cannot meet the 2050 goal without major advancements in technology (CCST 2012). Since no additional statewide measures are currently available, impacts would remain significant and unavoidable.

7.7.7 Hazards and Hazardous Materials

Similar to the proposed project, buildout of the Reduced Intensity Alternative would involve the use of hazardous materials during construction and could expose construction workers to hazardous materials during demolition from asbestos-containing materials or grading from contaminated soils. However, construction materials such as fuels, paints, and solvents would be used in limited quantities and would not pose a significant safety hazard. Any remediation and or demolition would be required to comply with the appropriate state standards, guidelines, and responsible agencies.

Similar to the proposed project, new development would increase patient care and research land uses and increase the amount of hazardous materials that would be used at City of Hope. Similar to the proposed project, this alternative would be required to comply with City of Hope plans, policies, and procedures governing the use, storage, and disposal of hazardous wastes and hazardous materials, including emergency operations plan, safe handling of hazardous medications and waste, spill management assistance response team, receiving and handling radioactive materials, and the radiation safety manual. City of Hope operations under this alternative would still be subject to the regulations and guidelines of federal, state, and local agencies for the use, handling, storage, and transport of hazardous materials. Impacts would be less than significant after mitigation for this alternative and for the proposed project.

7.7.8 Hydrology and Water Quality

The project site is already developed and runoff is conveyed by surface streets or local storm drains to regional storm drainage facilities. Like the proposed project, this alternative is anticipated to reduce peak flow rates by implementing low-impact development features and providing a treatment/infiltration system that reduces runoff volumes conveyed to the drainage system. Therefore, it is anticipated that this alternative and the proposed project would have a beneficial impact on area hydrology and water quality at completion. Similar to the proposed project, implementation of this alternative would result in compliance with the National Pollutant Discharge Elimination System Construction General Permit requirements and implementation of various BMPs to reduce water quality impacts. Therefore, hydrology and water quality impacts of this alternative would be similar to the proposed project and would not be significant.

7.7.9 Land Use and Planning

The Reduced Intensity Alternative would allow for a similar mix of land uses with less development intensity than the proposed project. This alternative would require amendments to the general plans and zoning codes of Duarte and Irwindale. Similar to the proposed project, this alternative would be consistent with the goals and policies of the cities' general plan and the Southern California Association of Governments' (SCAG's) 2016-2040 Regional Transportation Plan / Sustainable Communities Strategy (RTP/SCS) and result in similar less than significant impacts as the proposed project.

7.7.10 Noise

Reduction in building development intensity would slightly reduce the length of project-related construction noise impacts, but not peak construction noise volumes. Construction would also occur over an extended length of time (several years). Due to the peak construction noise volumes and length of construction activities this alternative would be less than the proposed project, but remain significant and unavoidable.

The reduction in vehicle trips would slightly reduce the operational traffic-related noise impacts. However, no significant operational-related noise impacts were identified for the proposed project. Noise impacts of this alternative would be reduced compared to the proposed project and less than significant.

7.7.11 Population and Housing

Under the Reduced Intensity Alternative, buildout would result in an approximate 35 percent reduction in population on site, including visitors, employees, and patients. Under this alternative, the population, housing, and employment at buildout would be consistent with the cities' growth projections identified in SCAG's RTP/SCS. However, growth associated with the proposed project was also within growth projections. The Reduced Intensity Alternative would provide fewer regional employment opportunities and activity center in a high quality transit area. Overall, impacts to population and housing would remain less than significant with this alternative and similar to the proposed project.

7.7.12 Public Services

Like the proposed project, this alternative would comply with the California Fire Code, and implementation of existing regulations and standard conditions would ensure that impacts related to fire service are not substantially different from that of the proposed project. As part of the proposed project, public service providers were contacted to determine whether development of the proposed Campus Plan would adversely impact existing and future planned levels of service and resources. Police, fire, school and library service providers determined the project would not result in any adverse impacts to their services and resources. As with the proposed project, public service impacts would be less than significant.

7.7.13 Recreation

Under the Reduced Intensity Alternative, the demands on existing recreational facilities would be slighting reduced due to the reduction in overall population (i.e. employees, patients, and visitors). However, the proposed project's impacts on parks and recreational facilities were determined to be less than significant. Overall, impacts to parks and recreational facilities would be similarly less than significant under this alternative compared to the proposed project.

7.7.14 Transportation and Traffic

Under this alternative, vehicle trips would be reduced by 25 percent as compared to the proposed project. This would reduce the project's traffic impact at two intersections under the existing plus project scenario, nine intersections under the future plus project scenario, and two freeway mainline segments. The proposed project would result in a significant and unavoidable impact at Buena Vista Street and Evergreen Street (#13) with a 77 percent increase in net population, which would be eliminated under this alternative. Therefore, operational traffic impacts would be less under this alternative compared to the proposed project; however, significant and unavoidable traffic impacts would remain.

7.7.15 Tribal Cultural Resources

Similar to the proposed project, this alternative would replace existing buildings with new buildings and result in ground disturbances due to grading. Therefore, potential tribal cultural resources impacts would be similar to the proposed project, that is, less than significant after mitigation

7.7.16 Utilities and Service Systems

Under this alternative, building square footage would be reduced by 15 percent and there would be approximately 35 percent fewer employees under this alternative compared to the proposed project. Therefore, this alternative would generate less wastewater and consume less water. The solid waste, electricity, and gas demands would also be reduced. Utilities and service systems impacts of this impact would be reduced compared to the proposed project and less than significant after mitigation.

7.7.17 Energy

Under this alternative, allowable building square footage would be reduced and the associated energy demand would also be reduced. Construction and operational activities associated with this alternative would have reduced energy demand. Impacts would remain less than significant.

7.7.18 Conclusion

Ability to Reduce Environmental Impacts

As summarized in Table 7-4, *Summary of Reduced Intensity Alternative Impacts*, the Reduced Intensity Alternative would lessen environmental impacts in the areas of air quality, biological resources, GHG emissions, noise, transportation and traffic, utilities and service systems, and energy; and have similar impacts in the area of aesthetics, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, population and housing, public services, recreation, and tribal cultural resources. One significant and unavoidable traffic impact would be eliminated. However, significant and unavoidable impacts to GHG emissions, construction noise, and traffic would remain. Overall, this alternative is considered environmentally superior when compared to the proposed project.

7. Alternatives to the Proposed Project

Table 7-4 Summary of Reduced Intensity Alternative Impacts

Environmental Issue	Potential Significance of Proposed Project's Impact	Potential Significance of Alternative's Impact	Comparison
Aesthetics	Less Than Significant	Less Than Significant	Similar to the project
Air Quality	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Less than project
Biological Resources	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Less than project
Cultural Resources	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Similar to the project
Geology and Soils	Less Than Significant	Less Than Significant	Similar to the project
Greenhouse Gas Emissions	**Significant and Unavoidable**	**Significant and Unavoidable**	Less than project
Hazards and Hazardous Materials	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Similar to the project
Hydrology and Water Quality	Less Than Significant	Less Than Significant	Similar to the project
Land Use and Planning	Less Than Significant	Less Than Significant	Similar to the project
Noise	**Significant and Unavoidable**	**Significant and Unavoidable**	Less than project
Population and Housing	Less Than Significant	Less Than Significant	Similar to the project
Public Services	Less Than Significant	Less Than Significant	Similar to the project
Recreation	Less Than Significant	Less Than Significant	Similar to the project
Transportation and Traffic	**Significant and Unavoidable**	**Significant and Unavoidable***	Less than project
Tribal Cultural Resources	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Similar to the project
Utilities and Service Systems	Less Than Significant with Mitigation Measures	Less Than Significant with Mitigation Measures	Less than project
Energy	Less Than Significant	Less Than Significant	Less than project

* Indicates elimination of one significant and unavoidable impact; Buena Vista Street and Evergreen Street (#13).

Ability to Achieve Project Objectives

Under the Reduced Intensity Alternative, most of the proposed project's objectives would be achieved but to a lesser extent as compared to the proposed project. For example, this alternative would allow for the flexible, long-term development and enhancement of the City of Hope campus; facilitate the replacement/enhancement of existing buildings and support facilities; develop enhanced and expanded open space on the campus; provide a modern, cohesive and contemporary design; modernize/replace outdated buildings; reinforce public investment in and encourage use of public transit; improve and streamline multimodal transportation and access throughout the campus; and incorporate sustainable design elements to the maximum extent possible throughout the campus (objectives 1, 2, 5, 6, 7, 8, 9 and 11). However, these objectives would be achieved to a lesser extent given the 15-25 percent reduction in development intensity and 35 percent reduction in employees and population on site. For example, this alternative would not maximize the creation of construction jobs (objective 3) or replace/enhance as many existing building and facilities that may need renovations due to aging infrastructure (objective 6). The reduced development potential may also limit the streamlining efforts for multimodal transportation and access to the campus and may not encourage as much public transit use with less development on the campus (objective 8). The reduced development would not incorporate as much sustainable design (objective 10).

Additionally, with the reduction in development intensity, this alternative would not be able to maximize the creation of construction and new permanent jobs; or accommodate the projected increase in regional demand for outpatient services through 2035 (objectives 3, 4 and 10) to the proposed project's extent.

7.8 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires a lead agency to identify the "environmentally superior alternative" and, in cases where the "No Project" Alternative is environmentally superior to the proposed project, the environmentally superior development alternative must be identified. Table 7-5 summarizes the impacts for the alternatives and how they compare to the proposed project. The No Project/No Development Alternative is environmentally superior to the proposed project because it results in the elimination of three significant unavoidable adverse impacts: GHG emissions, Noise (Construction), and Traffic.

Since the environmentally superior alternative is the No Project/No Development Alternative, a development alternative was selected, as required by CEQA. The Reduced Intensity Alternative is environmentally superior to the proposed project because it results in the greatest reductions to the significant and unavoidable project impacts.

In summary, the Reduced Intensity Alternative would lessen environmental impacts in the areas of air quality, biological resources, GHG emissions, noise, transportation and traffic, and utilities and service systems; and have similar impacts in the area of aesthetics, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, population and housing, public services, recreation, and tribal cultural resources. Although significant and unavoidable impacts to GHG emissions, construction noise, and traffic, this alternative overall is considered environmentally superior when compared to the proposed project.

Under the Reduced Intensity Alternative, most of the proposed project's objectives would be achieved but to a lesser extent as compared to the proposed project. For example, this alternative would allow for the flexible, long-term development and enhancement of the City of Hope campus; facilitate the replacement/enhancement of existing buildings and support facilities; develop enhanced and expanded open space on the campus; provide a modern, cohesive and contemporary design; modernize/replace outdated buildings; reinforce public investment in and encourage use of public transit; improve and streamline multimodal transportation and access throughout the campus; and incorporate sustainable design elements to the maximum extent possible throughout the campus (objectives 1, 2, 5, 6, 7, 8, 9 and 11). However, these objectives would be achieved to a lesser extent given the 15-25 percent reduction in development intensity and 35 percent reduction in employees and population on site. For example, this alternative would not maximize the creation of construction jobs (objective 3) or replace/enhance as many existing building and facilities that may need renovations due to aging infrastructure (objective 6). The reduced development potential may also limit the streamlining efforts for multimodal transportation and access to the campus and may not encourage as much public transit use with less development on the campus (objective 8). The reduced development would not incorporate as much sustainable design (objective 10).

Additionally, with the reduction in development intensity, this alternative would not be able to maximize the creation of construction and new permanent jobs; or accommodate the projected increase in regional demand for outpatient services through 2035 (objectives 3, 4 and 10) to the proposed project's extent.

Table 7-5 Summary of Impacts of Alternatives Compared to the Proposed Project

Topic	Proposed Project	No Project/No Development Alternative	No Project/Existing General Plan Alternative	Reduced Intensity Alternative
Aesthetics	LTS	Greater than project LTS	Greater than project LTS	Similar to the project LTS
Air Quality	LTS/M	Less than project LTS	Greater than project LTS/M	Less than project LTS/M
Biological Resources	LTS/M	Less than project LTS	Similar to project LTS/M	Less than project LTS/M
Cultural Resources	LTS/M	Less than project LTS	Similar to project LTS/M	Similar to the project LTS/M
Geology and Soils	LTS	Less than project LTS	Similar to project LTS	Similar to the project LTS
Greenhouse Gas Emissions	**SU**	Less than project* LTS	Greater than project **SU**	Less than project **SU**
Hazards and Hazardous Materials	LTS/M	Less than project LTS	Greater than project LTS/M	Similar to the project LTS/M
Hydrology and Water Quality	LTS	Greater than project LTS	Greater than project LTS	Similar to the project LTS
Land Use and Planning	LTS	Similar to project LTS	Greater than project LTS	Similar to the project LTS
Noise	**SU**	Less than project* LTS	Greater than project **SU**	Less than project **SU**
Population and Housing	LTS	Similar to project LTS	Similar to project LTS	Similar to the project LTS
Public Services	LTS	Less than project LTS	Greater than project LTS	Similar to the project LTS
Recreation	LTS	Similar to project LTS	Similar to project LTS	Similar to the project LTS
Transportation and Traffic	**SU**	Less than project* LTS	Greater than project **SU**	Less than project** **SU**
Tribal Cultural Resources	LTS/M	Less than project LTS	Similar to project LTS/M	Similar to the project LTS/M
Utilities and Service Systems	LTS/M	Less than project LTS	Greater than project LTS/M	Less than project LTS/M
Energy	LTS	Less than project LTS	Greater than project LTS	Less than project LTS

Notes: LTS: Less than Significant; LTS/M: Less than Significant with Mitigation Incorporated; SU: Significant and Unavoidable
* Indicates elimination of a significant and unavoidable impact.
** Indicates elimination of one significant and unavoidable traffic impact; Buena Vista Street and Evergreen Street (#13).

8. Impacts Found Not to Be Significant

California Public Resources Code Section 21003 (f) states: "…it is the policy of the state that…[a]ll persons and public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical, and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment." This policy is reflected in the State California Environmental Quality Act (CEQA) Guidelines (Guidelines) Section 15126.2(a), which states that "[a]n EIR [Environmental Impact Report] shall identify and focus on the significant environmental impacts of the proposed project" and Section 15143, which states that "[t]he EIR shall focus on the significant effects on the environment." The Guidelines allow use of an Initial Study to document project effects that are less than significant (Guidelines Section 15063[a]). Guidelines Section 15128 requires that an EIR contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant, and were therefore not discussed in detail in the Draft EIR.

8.1 ASSESSMENT IN THE INITIAL STUDY

The Initial Study prepared for the proposed project in October 2015 determined that impacts listed below would be less than significant. Consequently, they have not been further analyzed in this Draft EIR (DEIR). Please refer to Appendix A for explanation of the basis of these conclusions. Impact categories and questions below are summarized directly from the CEQA Environmental Checklist, as contained in the Initial Study.

Table 8-1 Impacts Found Not to Be Significant

Environmental Issues		Initial Study Determination
I. AESTHETICS. Would the project:		
a)	Have a substantial adverse effect on a scenic vista?	Less Than Significant Impact
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	No Impact
II. AGRICULTURE AND FOREST RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:		
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	No Impact

8. Impacts Found Not to Be Significant

Table 8-1 Impacts Found Not to Be Significant

Environmental Issues		Initial Study Determination
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	No Impact
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	No Impact
d)	Result in the loss of forest land or conversion of forest land to non-forest use?	No Impact
e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	No Impact
III. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:		
e)	Create objectionable odors affecting a substantial number of people?	Less Than Significant Impact
IV. BIOLOGICAL RESOURCES. Would the project:		
d)	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?	Less Than Significant Impact
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	No Impact
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	No Impact
V. CULTURAL RESOURCES. Would the project:		
d)	Disturb any human remains, including those interred outside of formal cemeteries?	Less Than Significant Impact
VI. GEOLOGY AND SOILS. Would the project:		
a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	
	i) 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? Refer to Division of Mines and Geology Special Publication 42.	Less Than Significant Impact
	iii) Seismic-related ground failure, including liquefaction?	No Impact
	iv) Landslides?	No Impact
b)	Result in substantial soil erosion or the loss of topsoil?	Less Than Significant Impact
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS. Would the project:		
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	No Impact
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	No Impact
IX. HYDROLOGY AND WATER QUALITY. Would the project:		
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in a substantial erosion or siltation on- or off-site	Less Than Significant Impact

8. Impacts Found Not to Be Significant

Table 8-1 Impacts Found Not to Be Significant

Environmental Issues		Initial Study Determination
g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	No Impact
h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	No Impact
i)	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 Impact
j)	Inundation by seiche, tsunami, or mudflow?	No Impact
X. LAND USE AND PLANNING. Would the project:		
a)	Physically divide an established community?	No Impact
c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?	No Impact
XI. MINERAL RESOURCES. Would the project:		
a)	Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	No Impact
b)	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	No Impact
XII. NOISE. Would the project result in:		
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	No Impact
f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	No Impact
XV. RECREATION.		
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	No Impact
XVI. TRANSPORTATION/TRAFFIC. Would the project:		
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	No Impact

8. Impacts Found Not to Be Significant

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9. Significant Irreversible Changes Due to the Proposed Project

Section 15126.2(c) of the CEQA Guidelines requires that an Environmental Impact Report (EIR) describe any significant irreversible environmental changes that would be caused by the proposed project should it be implemented. Specifically, the CEQA Guidelines state:

> Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highways improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

In the case of the proposed City of Hope Campus Plan, its implementation would involve a land use, development, and implementation framework to support approximately 1,038,500 gross square feet of net new development on the project site—964,340 square feet within the City of Duarte and 74,160 square feet within the City of Irwindale. Significant irreversible changes that would be caused by implementation of the Campus Plan would be:

- Construction activities that would entail the commitment of nonrenewable and/or slowly renewable energy resources; human resources; and natural resources such as lumber and other forest products, sand and gravel, asphalt, steel, copper, lead, other metals, water, and fossil fuels. Operation that would require the use of natural gas and electricity, petroleum-based fuels, fossil fuels, and water. The commitment of resources required for the construction and operation of the project would limit the availability of such resources for future generations or for other uses during the life of the project.

- An increased commitment of social services and public maintenance services (e.g., police, fire, sewer, and water services) would also be required. The energy and social service commitments would be long-term obligations in view of the low likelihood of returning the land to its original condition once it has been developed.

- Employment growth related to project implementation would increase vehicle trips over the long term. Emissions associated with such vehicle trips would continue to contribute to the South Coast Air Basin's nonattainment designations for ozone, particulate matter (PM_{10} and $PM_{2.5}$), and lead (Los Angeles County only) under the California and National Ambient Air Quality Standards (AAQS), and nonattainment for nitrogen dioxide (NO_2) under the California AAQS.

9. Significant Irreversible Changes Due to the Proposed Project

- Long-term irreversible commitment of vacant parcels of land or redevelopment of existing developed land in the cities of Duarte and Irwindale.

Given the low likelihood that the land would revert to lower intensity uses or to its current form, the proposed project would generally commit future generations to these environmental changes. However, the Specific Plan area is already developed; therefore, the use of existing infrastructure is possible with some upgrades and improvements, and environmental impacts can be minimized. Additional development intensities can be more readily accommodated with minimal physical impact, relieving development pressure from other areas where more intensive use of nonrenewable resources would be necessary. The commitment of resources to the proposed project is not unusual or inconsistent with projects of this type and scope. However, once these commitments are made, it is improbable that the Specific Plan area would revert back to its current condition. Thus, the proposed project would result in significant irreversible changes to the environment throughout the lifespan of the structures.

10. Growth-Inducing Impacts of the Proposed Project

Pursuant to Sections 15126(d) and 15126.2(d) of the CEQA Guidelines, this section is provided to examine ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Also required is an assessment of other projects that would foster other activities which could affect the environment, individually or cumulatively. To address this issue, potential growth-inducing effects will be examined through analysis of the following questions:

- Would this project remove obstacles to growth, e.g., through the construction or extension of major infrastructure facilities that do not presently exist in the project area, or through changes in existing regulations pertaining to land development?

- Would this project result in the need to expand one or more public services to maintain desired levels of service?

- Would this project encourage or facilitate economic effects that could result in other activities that could significantly affect the environment?

- Would approval of this project involve some precedent-setting action that could encourage and facilitate other activities that could significantly affect the environment?

Please note that growth-inducing effects are not to be construed as necessarily beneficial, detrimental, or of little significance to the environment. This issue is presented to provide additional information on ways in which this project could contribute to significant changes in the environment, beyond the direct consequences of developing the land use concept examined in the preceding sections of this EIR.

Would this project remove obstacles to growth, e.g., through the construction or extension of major infrastructure facilities that do not presently exist in the project area, or through changes in existing regulations pertaining to land development?

The proposed Campus Plan would direct growth towards areas that are almost entirely built out with urban land uses. These areas are currently well served by infrastructures and roadways. The Campus Plan does not plan the construction or extension of major infrastructure facilities that are not currently present in the project area, with the exception of the potential need for additional water supply infrastructure due to an existing well capacity deficit. Mitigation Measure USS-1 would ensure the project applicant provides evidence to the City of Duarte and City of Irwindale, as applicable, that it has obtained adequate water to serve the

10. Growth-Inducing Impacts of the Proposed Project

demands of the project site. Anticipated water facility improvements include drilling and equipping one new well to produce additional water supply from the Main San Gabriel Basin; purchasing the property for the new well if located offsite; and installing a water main extension from the new well to existing California American Water Company Duarte Service Area distribution systems. Because the new improvements are specific to the proposed project's water demand and there is adequate water supply to service the CAWs service area, it is not expected that the new infrastructure would induce growth in the area. Some extensions or improvements of utility facilities from surrounding roadways, including water and sewer lines, would be required for future development. However, as discussed in Section 5.16, *Utilities and Service Systems*, implementation of the proposed Campus Plan can generally be accommodated by the existing storm drain, water, and sewer infrastructure.

Would this project result in the need to expand one or more public services to maintain desired levels of service?

As described in Chapter 5.12, *Public Services*, public service agencies were consulted during preparation of this DEIR, including Los Angeles County Fire Department, Los Angeles County Sheriff's Department, and Duarte Unified School District. None of the service providers indicated that buildout of the City of Hope Campus Plan would necessitate the immediate expansion of their service and facilities in order to maintain adequate and desired levels of service. There is no housing proposed as part of the Campus Plan, and therefore no new residents would added to the Campus Plan area as a result of Campus Plan buildout. Therefore, there is unlikely to be any direct impacts to school and library services in the area, and impacts related to schools and library services are expected to be less than significant. However, school impact fees per Senate Bill 50 (Government Code § 65995[h]) would offset any potential increase in public service demands related to schools in the Campus Plan area associated with buildout the proposed Campus Plan. Therefore, no future expansion of public services would be required to maintain existing levels of service.

Would this project encourage or facilitate economic effects that could result in other activities that could significantly affect the environment?

Implementation of the Campus Plan would create varying levels of temporary construction employment opportunities as the project area builds out. This would be an indirect economic effect of this project that would not significantly affect the environment. Implementation of the proposed Campus Plan would generate short-term design, engineering, and construction jobs during project construction. Construction related jobs would not result in a significant population increase because they would be filled by workers in the region. Construction would occur intermittently over a period of 20 years. Construction would not result in a significant increase in population because the construction phase would be temporary and buildings would be developed as the market demands.

The proposed Campus Plan would result in the creation of 2,841 new long-term jobs. As the number of employees in the Campus Plan area grows, these employees would seek shopping, entertainment, auto maintenance, and other economic opportunities in the surrounding area. This would facilitate economic goods and services and could, therefore, encourage the creation of new businesses and/or the expansion of existing businesses to address these economic needs. Actual growth would depend on future market demand, site constraints, and property owners' willingness to take advantage of new development regulations. However, new commercial uses developed to serve the shopping needs of future employees would likely generate additional employment opportunities. Therefore, implementation of the Campus Plan would have both direct and indirect economic effects that could significantly affect the environment. The impacts from this effect would be analyzed and any appropriate mitigation imposed on a project-by-project basis.

Would approval of this project involve some precedent-setting action that could encourage and facilitate other activities that could significantly affect the environment?

The City of Hope Campus Plan would require the approval of discretionary actions; however, the project would not set a precedent for future projects with similar characteristics. The project would require the following approvals and adoptions:

From the Duarte City Council:

- Approval of a General Plan Amendment from Hospital, Medium-Density Residential, High-Density Residential, and Research and Development to Specific Plan.
- Approval of a Zone Change from H (Hospital), R-2 (Two-Family Residential), and R-4 (Multiple Family Residential High Density) to Specific Plan.

From the Irwindale City Council:

- Approval of a General Plan Amendment from Industrial/Business Park, Open Space/Easements, and Commercial to Specific Plan.
- Approval of a Zone Change from A-1 (Agricultural), M-1 (Light Manufacturing), and C-2 (Heavy Commercial) to Specific Plan.

The approval of these actions would limit growth and place additional restrictions on development currently allowed in the City of Duarte and Irwindale General Plans and Zoning Codes. As demonstrated in Table 7-1, the Campus Plan area has an existing buildout projection of approximately 300,000 square feet over what the proposed Specific Plan would allow. Additionally, future projects would need to complete applicable environmental review. Therefore, the proposed Campus Plan would not set a precedent that would make it more likely for other projects in the region to gain approval of similar applications.

Moreover, no changes to any of the City of Duarte or Irwindale's building safety standards (i.e., building, grading, plumbing, mechanical, electrical, fire codes) are proposed or required to implement the proposed project. Therefore, the proposed project would not involve a precedent-setting action that would encourage and/or facilitate other activities that could significantly affect the environment.

10. Growth-Inducing Impacts of the Proposed Project

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13. Bibliography

Airgas. 2016, February 11. Safety Data Sheet: Nitrous Oxide. https://www.airgas.com/msds/001042.pdf.

ASTM International. 2013. ASTM E-1527-13: Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. https://www.astm.org/Standards/E1527.htm.

Bay Area Air Quality Management District (BAAQMD). 2011 (revised). California Environmental Quality Act Air Quality Guidelines.

Beranek, Leo. 1988. Noise and Vibration Control. Revised edition. Washington, D.C.: Institute of Noise Control Engineering.

Bies, David A. and Colin H. Hansen. 2009. Engineering Noise Control: Theory and Practice. 4th edition. New York: Spon Press.

Bolt, Beranek & Newman. 1987. Noise Control for Buildings and Manufacturing Plants.

Cadre Environmental. 2016, June. Biological Resources Technical Report, City of Hope Campus Plan, City of Duarte.

California Air Pollution Control Officers Association (CAPCOA). 2016. California Emissions Estimator Model (CalEEMod). Version 2016.3.1. Prepared by: Trinity Consultants and the California Air Districts.

California Air Resources Board (CARB). 1998, April 22. The Report on Diesel Exhaust. http://www.arb.ca.gov/toxics/dieseltac/de-fnds.htm.

———. 1999. Final Staff Report: Update to the Toxic Air Contaminant List.

———. 2008, October. Climate Change Proposed Scoping Plan: A Framework for Change.

———. 2010, August. Proposed Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375. Staff Report.

———. 2014, March 24. California Greenhouse Gas Inventory for 2000–2012: By Category as Defined by the Scoping Plan, http://www.arb.ca.gov/cc/inventory/data/data.htm.

———. 2014, May 15. First Update to the Climate Change Scoping Plan: Building on the Framework. http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm.

13. Bibliography

———. 2015, September 15. ARB Process and Schedule for SB 375 Target Update. http://www.arb.ca.gov/cc/sb375/sb375.htm.

———. 2015, December. Area Designations Maps: State and National. http://www.arb.ca.gov/desig/adm/adm.htm.

———. 2016, May 4. Ambient Air Quality Standards. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

———. 2016, June. 2016 Edition California Greenhouse Gas Inventory for 2000-2014: By Category as Defined in the 2008 Scoping Plan. https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_00-14_20160509.xlsx.

———. 2016. Greenhouse Gas Emission Inventory: Query Tool for Years 1990. 1st edition. https://www.arb.ca.gov/app/ghg/1990_1990/ghg_sector.php.

———. 2016. Air Pollution Data Monitoring Cards (2011, 2012, 2013, 2014, and 2015). Accessed July 22, 2016. http://www.arb.ca.gov/adam/topfour/topfour1.php.

———. 2017, January 20. The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target. https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf.

———. 2017, March 14. Final Proposed Short-Lived Climate Pollutant Reduction Strategy. https://www.arb.ca.gov/cc/shortlived/shortlived.htm.

California American Water Company (CAWC). 2015. 2015 Annual Water Quality Report.

———. 2016, June 30. Final 2015 Urban Water Management Plan for the Southern Division – Los Angeles County District. Prepared by Water Systems Consulting, Inc.

California Climate Action Team (CAT). 2006, March. Climate Action Team Report to Governor Schwarzenegger and the Legislature.

California Climate Change Center (CCCC). 2012, July. Our Changing Climate 2012: Vulnerability and Adaptation to the Increasing Risks from Climate Change in California.

California Department of Finance (DOF). 2016, January 1. Table 2: E-5 City/County Population and Housing Estimates.

———. 2016, May. E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2016 with 2010 Census Benchmark. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/.

———. 2016. Report P-2: State and County Population Projections by Race/Ethnicity and Age (5-year groups). http://www.dof.ca.gov/Forecasting/Demographics/projections/documents/P-2_Age5yr_CAProj_2010-2060.xls.

13. Bibliography

California Department of Fish and Wildlife (CDFW). 2016. Sensitive Element Record Search for the Baldwin Park and Azusa Quadrangles. Natural Diversity Data Base (CNDDB). Sacramento, California. Accessed February 2016.

California Department of Forestry and Fire Prevention (CAL FIRE). 2012, May. Very High Fire Hazard Severity Zones in LRA: Los Angeles County. http://www.fire.ca.gov/fire_prevention/fhsz_maps_losangeles.php.

California Department of Public Health (CDPH). 2016, November 1. Registered Medical Waste Transfer Stations and Treatment Facilities. https://www.cdph.ca.gov/certlic/medicalwaste/Documents/MedicalWaste/2013/Treatment%20Facilities%20Transfer%20Stations.pdf.

California Department of Resources Recycling and Recovery (CalRecycle). 2017a, April 26. Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility. http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx.

———. 2017, April 26. Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility. http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx.

———. 2017, April 26. Facility/Site Summary Details: Azusa Land Reclamation Co. Landfill. http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AA-0013/Detail/.

———. 2017, April 26. Facility/Site Summary Details: Olinda Alpha Sanitary Landfill. http://www.calrecycle.ca.gov/SWFacilities/Directory/30-AB-0035/Detail/.

———. 2017, April 26. Facility/Site Summary Details: San Timoteo Sanitary Landfill. http://www.calrecycle.ca.gov/SWFacilities/Directory/36-AA-0087/Detail/.

———. 2017, April 26. Facility/Site Summary Details: Mid-Valley Sanitary Landfill. http://www.calrecycle.ca.gov/SWFacilities/Directory/36-AA-0055/Detail/.

———. 2017, April 26. Facility/Site Summary Details: El Sobrante Landfill. http://www.calrecycle.ca.gov/SWFacilities/Directory/33-AA-0217/Detail/.

———. 2017, April 26. Landfill Tonnage Reports. http://www.calrecycle.ca.gov/SWFacilities/Landfills/tonnages/.

———. 2017, April 26. Estimated Solid Waste Generation Rates. https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates.

California Department of Transportation (Caltrans). 2002, December. "Guide for the Preparation of Traffic Impact Studies." http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf.

———. 2006. Traffic Noise Analysis Protocol.

13. Bibliography

———. 2009, November. Technical Noise Supplement ("TeNS"). Prepared by ICF International.

———. 2011. California Scenic Highway Mapping System. http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm.

———. 2016. Traffic Census Program: Traffic Counts, Year 2014. Annual Average Daily Traffic. Accessed October 18, 2016. http://traffic-counts.dot.ca.gov/.

———. 2016. Long-Term Socio-economic Forecasts by County. http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic.html.

California Department of Transportation (Caltrans), Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office. 2004, June. Transportation- and Construction-Induced Vibration Guidance Manual. Prepared by ICF International. Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office.

California Department of Transportation (Caltrans), Division of Environmental Analysis. 2002, February. Transportation Related Earthborne Vibration (Caltrans Experiences). Technical Advisory, Vibration. TAV-02-01-R9601. Prepared by Rudy Hendricks.

California Department of Water Resources (DWR), 2003. California's Groundwater. Bulletin 118. State of California.

———. 2011, March 11. SB610/SB221 Guidebook and FAQs. http://www.water.ca.gov/urbanwatermanagement/SB610_SB221/.

———. 2014, February 5. Hydrologic Conditions in California (01/01/2014). California Data Exchange Center. http://cdec.water.ca.gov/cgi-progs/reports/EXECSUM.

———. 2014, January 31. DWR Drops State Water Project Allocation to Zero, Seeks to Preserve Remaining Supplies. http://www.water.ca.gov/news/newsreleases/2014/013114pressrelease.pdf.

———. 2014, December. 2014 Power Integrated Resource Plan. https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-integratedresourceplanning/a-p-irp-documents?_afrLoop=35026438123104&_afrWindowMode=0&_afrWindowId=u672oou3z_1#%40%3F_afrWindowId%3Du672oou3z_1%26_afrLoop%3D35026438123104%26_afrWindowMode%3D0%26_adf.ctrl-state%3Dqkixd73h_4.

California Division of Occupational Safety and Health (Cal/OSHA). 2001. "Exposure Control Plan for Bloodborne Pathogens." Developed by the Education Unit, Cal/OSHA Consultation Service, California Department of Industrial Relations. http://www.dir.ca.gov/dosh/dosh_publications/expplan2.pdf.

13. Bibliography

———. 2001. "A Best Practices Approach for Reducing Bloodborne Pathogen Exposure." Developed by the Education Unit, Cal/OSHA Consultation Service, California Department of Industrial Relations. http://www.dir.ca.gov/dosh/dosh_publications/BBPBest1.pdf.

California Emergency Management Agency (CalEMA). 2013. State of California Multi-Hazard Mitigation Plan.

California Employment Development Department (EDD). 2016, June. Occupational Employment Statistics Survey Results, 1st Quarter 2016 Wages for the Los Angeles-Long Beach-Glendale metropolitan Statistical Area. http://www.labormarketinfo.edd.ca.gov/data/oes-employment-and-wages.html.

California Energy Commission (CEC). 2006. Our Changing Climate: Assessing the Risks to California. 2006 Biennial Report, California Climate Change Center. CEC-500-2006-077.

———. 2009, May. The Future Is Now: An Update on Climate Change Science, Impacts, and Response Options for California. CEC-500-2008-0077.

———. 2011, October 25. California Energy Utility Service Areas. http://www.energy.ca.gov/maps/serviceareas/Electric_Service_Areas_Detail.pdf.

———. 2012. California Natural Gas Detailed Utility Service Areas. http://www.energy.ca.gov/maps/serviceareas/natural_gas_detailed_service_areas.pdf.

———. 2014, December. California Energy Demand Updated Forecast, 2015-2025. http://www.energy.ca.gov/2014publications/CEC-200-2014-009/CEC-200-2014-009-SF-REV.pdf.

———. 2015. 2016 Building Energy Efficiency Standards, Adoption Hearing Presentation. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/ June 10.

———. 2015. 2016 Building Energy and Efficiency Standards Frequently Asked Questions. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf.

California Gas and Electric Utilities (CGEU). 2014, July. 2014 California Gas Report. http://www.socalgas.com/regulatory/documents/cgr/2014-cgr.pdf.

———. 2016, June 29. 2016 California Gas Report. http://www.pge.com/pipeline_resources/pdf/library/regulatory/downloads/cgr16.pdf.

California Geological Survey (CGS). 2016, August 23. Fault Activity Map of California (2010). http://maps.conservation.ca.gov/cgs/fam/.

———. 2016b, August 23. Ground Motion Interpolator. http://www.quake.ca.gov/gmaps/PSHA/psha_interpolator.html.

13. Bibliography

California Natural Resources Agency (CNRA). 2014, July. Safeguarding California: Reducing Climate Risk, An Update to the 2009 California Climate Adaptation Strategy.

California Office of Emergency Services (CalOES). 2016. Dam Inundation Registered Images and Boundary Files in Shape File Format, San Gabriel Dam, Morris Dam, and Sawpit Dam.

California Stormwater Quality Association (CASQA). 2003, January. Stormwater Best Management Practice Handbook: New Development and Redevelopment.

Campbell, R. H., T. H. McCulloh, and J. G. Vedder. 2009. The Miocene Topanga Group of Southern California: A 100-year History of Changes in Stratigraphic Nomenclature. Open-File Report 2007–1385. U.S. Geological Survey.

Chuang, James (Senior Environmental Specialist/Land Planner). 2016, October 13. Email response to service questionnaire. Southern California Gas Company.

City of Hope. 2008. Radiation Safety Manual.

———. 2014, July. Safe Handling of Hazardous Medications and Waste.

———. 2014, October. Emergency Operations Plan.

———. 2014, October. Radioactive Materials, Receiving and Handling.

———. 2015, July. Spill Management Assistance Response Team (S.M.A.R.T.).

———. 2016, June 17. Responses to Fehr & Peers Population Data Collection Request Memorandum.

Crook, R., C. R. Allen, B. Kamb, C. M. Payne, and R. J. Proctor. 1987. Recent Reverse Faulting in the Transverse Ranges, California. Professional Paper 1339. U.S. Geological Survey.

Department of Toxic Substances Control (DTSC). 2016, December 15. Glossary of Environmental Terms. http://www.dtsc.ca.gov/InformationResources/Glossary_of_Environmental_Terms.cfm.

Division of Mines and Geology (DMG). 1998. Seismic Hazard Zone Report for the Azusa 7.5-Minute Quadrangle, Los Angeles County, California. Department of Conservation.

Duarte, City of. 2007, August 14. City of Duarte General Plan. http://www.accessduarte.com/dept/cd/planning/general_plan.htm.

———. 2012. 2012 Hazard Mitigation Plan.

———. 2012, November. Duarte Energy Action Plan.

———. 2014, February. 2014−2021 Housing Element. http://www.hcd.ca.gov/housing-policy-development/housing-resource-center/plan/he/housing-element-documents/duarte_5th_adopted021914.pdf.

13. Bibliography

———. 2015. Duarte Municipal Code and Code of Ordinances. https://www.municode.com/library/CA/duarte/codes/code_of_ordinances.

———. 2016, June. City of Duarte General Plan Final Supplemental EIR for the Town Center Specific Plan.

———. 2016, October 25. Parks and Recreation: City Parks. http://www.accessduarte.com/dept/parks_and_recreation/parks/default.htm.

Environmental Data Resources (EDR). 2016, February 29. Radius Map Report, City of Hope, 1500 E. Duarte Road, Duarte, CA 91010.

Federal Emergency Management Agency (FEMA). 2008, September 26. Flood Insurance Rate Maps (FIRMs) Nos. 06037C1415F and 06037C1700F.

Federal Highway Administration (FHWA). 1978, December. Federal Highway Traffic Noise Prediction Model. United States Department of Transportation Report No. FHWA-RD77-108.

Federal Transit Administration (FTA). 2006, May. Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. US Department of Transportation.

Fehr & Peers. 2017, April. Transportation Impact Study for the City of Hope.

Galvin Preservation Associates. 2016, March. City of Hope Specific Plan, Duarte, California, Historical Resource Report.

Geosyntec Consultants. 2016, May 27. 2015 Annual Performance Evaluation Report. Volume 1: Baldwin Park Operable Unit of the San Gabriel Valley Superfund Sites, Los Angeles County, California. https://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/f8d651c17285544f88257ffb005e941c/$FILE/Final%202015%20BPOU%20Annual%20PE%20Report%20Vol%201_text%20&%20tables_052716.pdf.

Governor's Office of Planning and Research (OPR). 2003, October. State of California General Plan Guidelines.

———. 2008, June. CEQA and Climate Change: Addressing Climate Change through CEQA Review. Technical Advisory. http://www.opr.ca.gov/ceqa/pdfs/june08-ceqa.pdf.

———. 2010. Update to the General Plan Guidelines: Complete Streets and the Circulation Element. State of California. http://opr.ca.gov/docs/Update_GP_Guidelines_Complete_Streets.pdf.

Galvin Preservation Associates (GPA) Consulting. 2016, March. Historical Resource Report: City of Hope Specific Plan

Greeninfo Network. 2016, October 25. California Protected Areas Database. http://www.calands.org/map.

13. Bibliography

Griffith, Glenn et al. 2016, February 24. Ecoregions of California (poster). Open-File Report 2016–1021. U.S. Geological Survey. http://pubs.usgs.gov/of/2016/1021/ofr20161021_sheet2.pdf.

Harris, Cyril M. 1998. Handbook of Acoustical Measurements and Noise Control. 3rd edition. Woodbury, NY: Acoustical Society of America.

Healthcare Environmental Resource Center (hercenter.org). 2016, November 2. Types of Regulated Medical Waste (RMW). http://www.hercenter.org/rmw/rmwtypes.cfm.

———. 2016, November 2. Common Hazardous Materials in Healthcare Facilities. http://www.hercenter.org/hazmat/hazcommon.cfm.

Institute of Transportation Engineers (ITE). 2010. Trip Generation, 9th Edition.

Intergovernmental Panel on Climate Change (IPCC). 1995. Second Assessment Report: Climate Change 1995.

———. 2001. Third Assessment Report: Climate Change 2001. New York: Cambridge University Press.

———. 2007. Fourth Assessment Report: Climate Change 2007. New York: Cambridge University Press.

———. 2013. Fifth Assessment Report: Climate Change 2013. New York: Cambridge University Press.

Irwindale, City of. 2008, June. City of Irwindale 2020 General Plan. http://ci.irwindale.ca.us/DocumentCenter/View/38.

———. 2009. City of Irwindale Commercial and Industrial Design Guidelines. http://www.ci.irwindale.ca.us/DocumentCenter/View/39.

———. 2012. City of Irwindale Energy Action Plan.

———. 2013, September. City of Irwindale General Plan Section 3 Housing Element. http://ci.irwindale.ca.us/DocumentCenter/View/38.

———. 2015. Irwindale Municipal Code. https://www.municode.com/library/ca/irwindale/codes/code_of_ordinances.

———.2016, April. Irwindale Materials Recovery Facility and Transfer Station Project Final Environmental Impact Report (SCH No. 2013051029), City of Irwindale, Los Angeles County, California.

Johnson, Kevin (Acting Chief). 2016, September 9. Written response to service questionnaire. Los Angeles County Fire Department Forestry Division.

KPFF Consulting Engineers (KPFF). 2016, August 16 (revised). Low Impact Development (LID) Study.

———. 2016, August 16 (revised). Hydrology Report for City of Hope Campus Plan.

13. Bibliography

———. 2016, August 16 (revised). Revised Water Infrastructure and Demand Analysis for the City of Hope Campus Plan.

———. 2016, August 16 (revised). Wastewater Analysis for the City of Hope Specific Plan.

Kyser Center for Economic Research. 2015, February 20. 2014 San Gabriel Valley Economic Forecast and Regional Overview. Los Angeles County Economic Development Corporation. http://laedc.org/wp-content/uploads/2012/04/SGV-Report-2014_Final.pdf.

———. 2016, May. San Gabriel Valley Economic Forecast and Regional Overview. Prepared for Los Angeles County Economic Development Corporation. https://sgvpartnership.org/wp-content/uploads/SGV_FINAL_20160508.pdf.

LGC Geotechnical Inc. 2016, February 29.Geotechnical Summary Regarding the City of Hope Specific Plan, Located in the Cities of Duarte and Irwindale, California.

Los Angeles, County of. 2014. Low Impact Development Standards Manual.

———. 2015. Electric Consumption & Revenue Detail: Multiple Years. Excel Data from January 2009 to August 2013 (Meter Nos: PMYG02025–00000274, APMYVL02025–00000360, 1APMYD00219–00033740, M00022–00001883, and M00009–00925579). Department of Public Works.

———. 2015. Renewable Energy. Department of Regional Planning. http://planning.lacounty.gov/energy.

———. 2016. HydroCalc Calculator. http://dpw.lacounty.gov/wmd/dsp_LowImpactDevelopment.cfm.

Los Angeles County Department of Public Works (DPW). 2016. Los Angeles County Storm Drain System. Los Angeles County. http://dpw.lacounty.gov/fcd/stormdrain/index.cfm.

Los Angeles County Metropolitan Transportation Authority (Metro). 2010, October 28. 2010 Congestion Management Program. http://media.metro.net/docs/cmp_final_2010.pdf.

Los Angeles Regional Water Quality Control Board (LARWQCB). 2014. Water Quality Control Plan, Los Angeles Region, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.

LSA. 2017, April. Draft Greenhouse Gas Emissions Reduction Strategy and Development Review Processes for the City of Hope Campus Plan.

Main San Gabriel Basin Watermaster (MSGBW). 2016, August 24. About Us. http://www.watermaster.org/geninfo.html.

———. 2016, November. Five-Year Water Quality and Supply Plan, 2016-17 to 2010-21. http://media.wix.com/ugd/af1ff8_8f7f9eace4184cf780c0f6b7b0bb1b10.pdf.

McCune, Robin, RN. 2013, May 30. Biotherapy Update. Association of Pediatric Hematology/Oncology Nurses (APHON). http://www.aphon.org/files/public/renewalpacketcontent.pdf.

13. Bibliography

Morton, D.M., and F. K. Miller. 2003. Preliminary Geologic Map of the San Bernardino 30’ × 60’ Quadrangle, California. Open File Report 03-293. U.S. Geological Survey. Scale 1:100,000.

———. 2006. Geologic Map of the San Bernardino and Santa Ana 30’ × 60’ Quadrangles, California. Open File Report 2006-1217. U.S. Geological Survey. Scale 1:100,000.

New Jersey Department of Health and Senior Services (NJDHSS). 2007, April. Hazard Substance Fact Sheet: Oxygen. http://nj.gov/health/eoh/rtkweb/documents/fs/1448.pdf.

Nourse, J. A. 2002. Middle Miocene Reconstruction of the Central and Eastern San Gabriel Mountains, Southern California, with Implications for Evolution of the San Gabriel Fault and Los Angeles Basin. Special Paper 365. Geological Society of America.

Oak Ridge National Laboratory (ORNL). 2015, September 30 (released). *Transportation Energy Data Book*. Edition 34. http://cta.ornl.gov/data/download34.shtml.

Occupational Safety and Health Administration (OSHA). 2016, November 3. “Health Care Facilities.” Section VI of OSHA Technical Manual. US Department of Labor. See https://www.osha.gov/dts/osta/otm/otm_toc.html.

Office of Emergency Services (OES). 2017, March 6. California Hazardous Materials Incident Reports.

Office of Environmental Health Hazard Assessment (OEHHA). 2015, February. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf.

Office of Historic Preservation (OHP). 1995, March. Instructions for Recording Historical Resources. http://ohp.parks.ca.gov/pages/1054/files/manual95.pdf.

———. 2012, October 24. California Historical Resources. http://ohp.parks.ca.gov/listedresources/.

PlaceWorks. 2015, January. Population and Housing. Section 5.10 of Draft Environmental Impact Report for the Pasadena General Plan. http://www.cityofpasadena.net/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=8589939184&libID=8589939188.

———. 2017, April. Draft Construction Health Risk Assessment: City of Hope Campus Plan.

Praxair. 2014, October 3. Nitrogen, Refrigerated Liquid. Safety Data Sheet P-4630. http://www.praxair.com/-/media/documents/sds/nitrogen/liquid-nitrogen-medipure-gas-n2-safety-data-sheet-sds-p4630.pdf?la=en.

———. 2016, July 19. Carbon Dioxide Safety. Data Sheet P-4574. http://www.praxair.com/-/media/documents/sds/carbon-dioxide/carbon-dioxide-medipure-co2-safety-data-sheet-sds-p4574.pdf?la=en.

13. Bibliography

Reyes, Jose (Project Manager). 2016, October 19. Written questionnaire response. Southern California Edison.

Science & Collaboration for Connected Wildlands (SC Wildlands). 2008, December 2. South Coast Missing Linkages. Data Layer ds419 on Biogeographic Information and Observation System (BIOS). California Department of Fish and Wildlife. https://map.dfg.ca.gov/bios/.

Southern California Association of Governments (SCAG). 2016, April 7. Final 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): A Plan for Mobility, Accessibility, Sustainability, and a High Quality of Life. http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx.

———. 2016b, April. Demographics and Growth Forecast (2016–2040 RTP/SCS). http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS_DemographicsGrowthForecast.pdf.

Southern California Edison (SCE). 2015, November 18. Power Content Label: 2014. http://www.energy.ca.gov/sb1305/labels/2013_labels/IOUs/Southern_California_Edison_2013.pdf.

Southern California Gas Company (SCGC). 2015. Pipeline Safety, Pipeline Maps, Los Angeles County. http://www.socalgas.com/safety/pipeline-maps/LA.shtml.

South Coast Air Quality Management District (SCAQMD). 1993. California Environmental Quality Act Air Quality Handbook.

———. 2005, May. Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. http://www.aqmd.gov/home/library/documents-support-material/planning-guidance/guidance-document.

———. 2006, October. Final – Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds.

———. 2008, September. Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES III). http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iii.

———. 2008, June. Final Localized Significance Threshold Methodology. http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds.

———. 2010, September 28. Agenda for Meeting 15. Greenhouse Gases (GHG) CEQA Significance Thresholds Working Group. http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-main-presentation.pdf?sfvrsn=2.

13. Bibliography

———. 2011. Fact Sheet for Applying CalEEMod to Localized Significance Thresholds. http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/caleemod-guidance.pdf.

———. 2012, May 4. Final 2012 Lead State Implementation Plan: Los Angeles County. http://www.aqmd.gov/home/library/clean-air-plans/lead-state-implementation-plan.

———. 2013, February. 2012 Final Air Quality Management Plan. http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan.

———. 2015, October 3. Final Report Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES IV). http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv.

———. 2015, March (revised). SCAQMD Air Quality Significance Thresholds. http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2.

———. 2015. Health Effects of Air Pollution. http://www.aqmd.gov/home/library/public-information/publications.

———. 2015, October. "Blueprint for Clean Air: 2016 AQMP White Paper." 2016 AQMP White Papers Web Page. http://www.aqmd.gov/home/about/groups-committees/aqmp-advisory-group/2016-aqmp-white-papers.

———. 2016. Updates to CEQA Air Quality Handbook. Accessed July 2016. http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook.

———. 2017, March. Final 2016 Air Quality Management Plan. http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

Southern California Earthquake Data Center (SCEDC). 2016, August 9. Significant Earthquakes and Faults: Chronological Earthquake Index. http://www.data.scec.org/significant/chron-index.html.

State Water Resources Control Board (SWRCB). 2010. 2010 Integrated Report. Clean Water Act Section 303(d) List/303(b) Report.

———. 2017, May 3. Total Maximum Daily Load Program: Background. http://www.waterboards.ca.gov/water_issues/programs/tmdl/background.shtml#current.

SWCA Environmental Consultants. 2016, March 16. Summary of Cultural Resources Identification Efforts and Preliminary Results for the City of Hope Specific Plan and Environmental Impact Report, Cities of Duarte and Irwindale, Los Angeles County, California

———. 2016, April. Paleontological Resources Impact Assessment Report for the City of Hope Specific Plan, City of Duarte, Los Angeles County, California.

13. Bibliography

———. 2016, May. Draft Cultural Resources Technical Report for the City of Hope Specific Plan, City of Duarte, Los Angeles County, California.

———. 2017, July. Cultural Resources Technical Report for the City of Hope Specific Plan, City of Duarte, Los Angeles County, California.

Upper San Gabriel Valley Municipal Water District (Upper District). 2016, June. Upper San Gabriel Valley Municipal Water District 2015 Urban Water Management Plan. http://upperdistrict.org/wp-content/uploads/2012/11/Final_2015_Upper_District_UWMP.pdf.

US Census. 2016. 2009-2013 5-Year American Community Survey Employment Data. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

———. 2016, November 16. Longitudinal Employer-Household Dynamics (LEHD). OnTheMap. http://onthemap.ces.census.gov/.

US Energy Information Administration (EIA). 2014. Rankings: Total Carbon Dioxide Emissions 2014. Website accessed on April 17, 2017 at http://www.eia.gov/state/rankings/#/series/226.

US Environmental Protection Agency (EPA). 1971, December. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances. Prepared by Bolt, Beranek & Newman (Cambridge, MA) for the U.S. EPA Office of Noise Abatement and Control. Washington, D.C.

———. 1974, March. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Washington, D.C.: U.S. EPA Office of Noise Abatement and Control.

———. 1978, November. Protective Noise Levels. EPA 550/9-79-100. (Condensed version of 1971 and 1974 documents.)

———. 2009, December. EPA: Greenhouse Gases Threaten Public Health and the Environment. https://yosemite.epa.gov/opa/admpress.nsf/0/08d11a451131bca585257685005bf252.

———. 2016, May 5. Criteria Air Pollutants. https://www.epa.gov/criteria-air-pollutants.

———. 2017. Overview of Greenhouse Gases. http://www3.epa.gov/climatechange/ghgemissions/gases.html.

US Geological Survey (USGS). 2016, April 7. The Modified Mercalli Intensity Scale. http://earthquake.usgs.gov/learn/topics/mercalli.php.

Wald, David J., et al. 1999, August. "Relationships between Peak Ground Acceleration, Peak Ground Velocity, and Modified Mercalli Intensity in California." Earthquake Spectra 15 No. 3.

Walker Parking Consultants. 2016, June. City of Hope Campus Plan Parking Study.

13. Bibliography

Water Systems Consulting, Inc. (WSC). 2016, June 30. Final 2015 Urban Water Management Plan for the Southern Division: Los Angeles County District, California American Water. https://wuedata.water.ca.gov/public/uwmp_attachments/6452893912/Final%20Los%20Angeles%20County%20District%202015%20Urban%20Water%20Management%20Plan.pdf.

———. 2017, September 22. Final Water Supply Assessment for the City of Hope Specific Plan,

Weltz, Jerry. 2003. Jobs-Housing Balance. Planning Advisory Service Report Number 516. American Planning Association.

Western Regional Climate Center (WRCC). 2016. Western U.S. Historical Summaries: Azusa City PK FC 143 Station Monitoring Station (Station ID No. 040410). http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0410.

Woodring, W. P, M. N. Bramlette, and W. S. W. Kew. 1946. Geology and Paleontology of the Palos Verdes Hills, California. Professional Paper 207. U.S. Geological Survey.