PROGRAM ENVIRONMENTAL IMPACT REPORT

LOMA LINDA UNIVERSITY HEALTH MASTER PLAN PROJECT

SCH No.: 2013051043

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Draft Program EIR
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1.0 EXECUTIVE SUMMARY/INTRODUCTION

A Program Environmental Impact Report (EIR), State Clearinghouse No. 2013051043, has been prepared for the Loma Linda University Health (LLUH) Master Plan Project. The Lead Agency is the City of Loma Linda Community Development Department (City). Loma Linda University Adventist Health Sciences Center (LLUAHSC) dba Loma Linda University Health (LLUH) ("Applicant" or "Project Proponent") has submitted an Application to the City for a Precise Plan of Design (PPD) to construct and operate a multi-phased development including new facilities and improvements to the existing campus facilities in order to accommodate existing demands in the services provided, and to meet regulatory requirements. A Conditional Use Permit (CUP) would be required if construction of a Southern California Edison (SCE) substation at the Elmer Digneo City Park is selected as the preferred option for the substation. The Proposed Project for purposes of the EIR includes the activities proposed in Section 3.0 Project Description of the Draft Program EIR.

Project Location

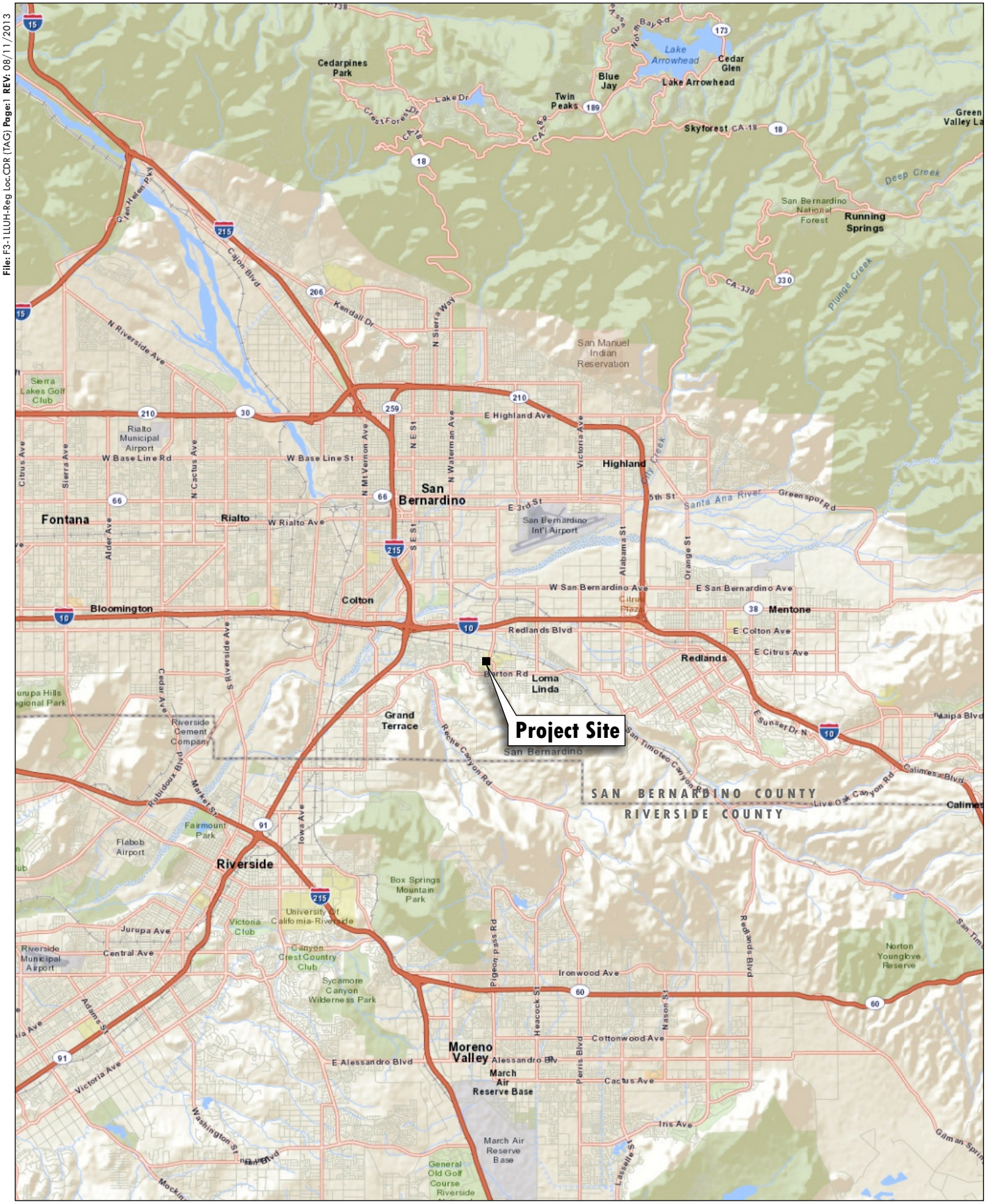
The approximate 23.8-acre Project Site is centrally located in the City of Loma Linda (Figure 1-1 Regional Location). Specifically, the Project Site is located on the north side of Barton Road, on the west side of Anderson Street, on the east side of Campus Street, and generally south of the Union Pacific Railroad (UPRR), with a small portion (Elmer Digneo City Park) extending north of the UPRR (Figure 1-2 Vicinity Map). The geographic coordinate location of the Project Site is 34.049347 north latitude and -117.264011 west longitude.

The Project Site includes the existing LLUH and its entireties (i.e., Medical Center, University, Dental School, etc.) and also includes Elmer Digneo City Park located to the north of the LLUH that may be used for siting a SCE substation to serve the campus. The park site is located east of Anderson Street and north of the UPRR. The main Medical Center campus is located north of Barton Road between Anderson Street and Campus Street. According to the City of Loma Linda General Plan Land Use Map, the existing hospital is designated Healthcare, and the remaining campus is designated Institutional. The Elmer Digneo City Park is designated Special Planning Area B, and is zoned Institutional (I).

Project Site History

In January 1901, Loma Linda, meaning "pretty hill," received its name when a post office was opened for the Seventh Day Adventists sanatorium. On August 26, 1905, Loma Linda Sanitarium was incorporated; six weeks later on October 13th the first two patients were admitted. The current 11-story (including two subterranean floors) Loma Linda University Medical Center (LLUMC) opened in 1967, an outgrowth of the original Sanitarium on the hill. Loma Linda University Health Care, a management service organization, supports the many programs and services provided by 400-plus faculty physicians. LLUMC operates some of the largest clinical programs in the United States in areas such as neonatal care and outpatient surgery and is recognized as the international leader in infant heart transplantation and proton treatments for cancer. Each year, the institution admits more than 33,000 inpatients and serves roughly half a million outpatients.

File: F3-1LLUH-Reg Loc.CDR (TAG) Page:1 REV: 08/11/2013



0 3.5
Miles
Source: World Street Map, 2013

LILBURN CORPORATION

REGIONAL LOCATION

LLUH MASTER PLAN PROJECT
Environmental Impact Report
City of Loma Linda, California

FIGURE 1-1

File: F3-1LLUH-Reg Loc.CDR (TAG) Page: 1 REV: 08/21/2013

N

0 3.5

Miles

Aerial: GOOGLE, June, 2012.

LILBURN CORPORATION

LEGEND

Project Site

PROJECT VICINTY

LLUH MASTER PLAN PROJECT

Environmental Impact Report

City of Loma Linda, California

FIGURE 1-2

As the only tertiary-care hospital in the area, LLUMC is the only Level I regional trauma center for Inyo, Mono, Riverside, and San Bernardino counties.

Loma Linda University Children's Hospital is the sole children's hospital for almost 1.3 million of California's youth (San Bernardino, Riverside, Inyo, and Mono Counties). With over 275 beds solely for children, the American Board of Surgeons has designated the Children's Hospital as a Level 1 Trauma Center, providing the highest level of trauma care within the Inland Empire four-county area (Figure 1-3). Each year, more than 15,000 children stay at the hospital and over 130,000 children visit the hospital for ambulatory care. The only medical facility in the Inland Empire specializing in the care of children, the Loma Linda Children's Hospital transports over 1,100 critically ill or injured children each year from surrounding hospitals.

Approximately 4,500 students study in seven schools and the Faculty of Religion and Faculty of Graduate Studies located on the campus. More than 55 programs are offered by the schools of Allied Health Professions, Dentistry, Medicine, Nursing, Pharmacy, Public Health, and Behavioral Health. Curricula offered range from certificates of completion and associate in science degrees to doctor of philosophy and professional doctoral degrees.

Brief Project Description

The Proposed Project is described in detail in Chapter 3.0 of the Draft Program EIR. In summary LLUH is proposing a Master Plan to include the renovation of its campus. The Project consists of a multi-phased development to construct new facilities and improvements to the existing campus in order to accommodate existing demand for the services provided and to meet regulatory requirements. The Proposed Project would provide construction of new facilities, modernization of existing facilities, and replacement of a portion of the main hospital in response to California's SB 1953 Hospital Seismic Safety Act. It is anticipated that the Master Plan would be built out in two phases over an estimated ten-year period.

The LLUMC is composed of a number of different structures that are connected including: the original 1967 building (round towers and buildings below them), the radiology building known as the Schuman Pavilion built in the mid 1980's, and the Children's Hospital built in the late 1980's. SB 90, an amendment to SB 1953, allows a seven-year seismic compliance extension, to the year 2020 for the 1967 portion of the hospital. It is this portion of the hospital that would be vacated and a new hospital is proposed to replace existing uses. Since certain operations of the Children's Hospital occur within the 1967 structure, the new hospital would include a designated area for children as well as adults. Upon appropriate seismic separation from the 1967 building, the current Children's Hospital would remain in compliance with SB 1953.

Proposed facilities and improvements associated with the Master Plan include: 1) a seven-story, approximately 250,000 square-foot, 760-space patient and visitor parking structure; 2) a 13-story (approximately 215 feet in height), approximately 732,000 square-foot hospital with 464 beds to replace a portion of the seismically-noncompliant existing hospital, and 80 parking spaces; 3) an approximate 34,000 square-foot new or retrofitted utility plant; 4) an approximate 14,000 square-foot Southern California Edison (SCE) on-site or off-site electrical substation; 5) a two-story, approximately 9,000 square-foot addition to the existing dental school; 6) a four-story approximately 90,000 square-foot research building; and 7) tenant improvements and reuse of the vacated portions of the existing hospital (Figure 1-4 Proposed Master Plan with Phasing).

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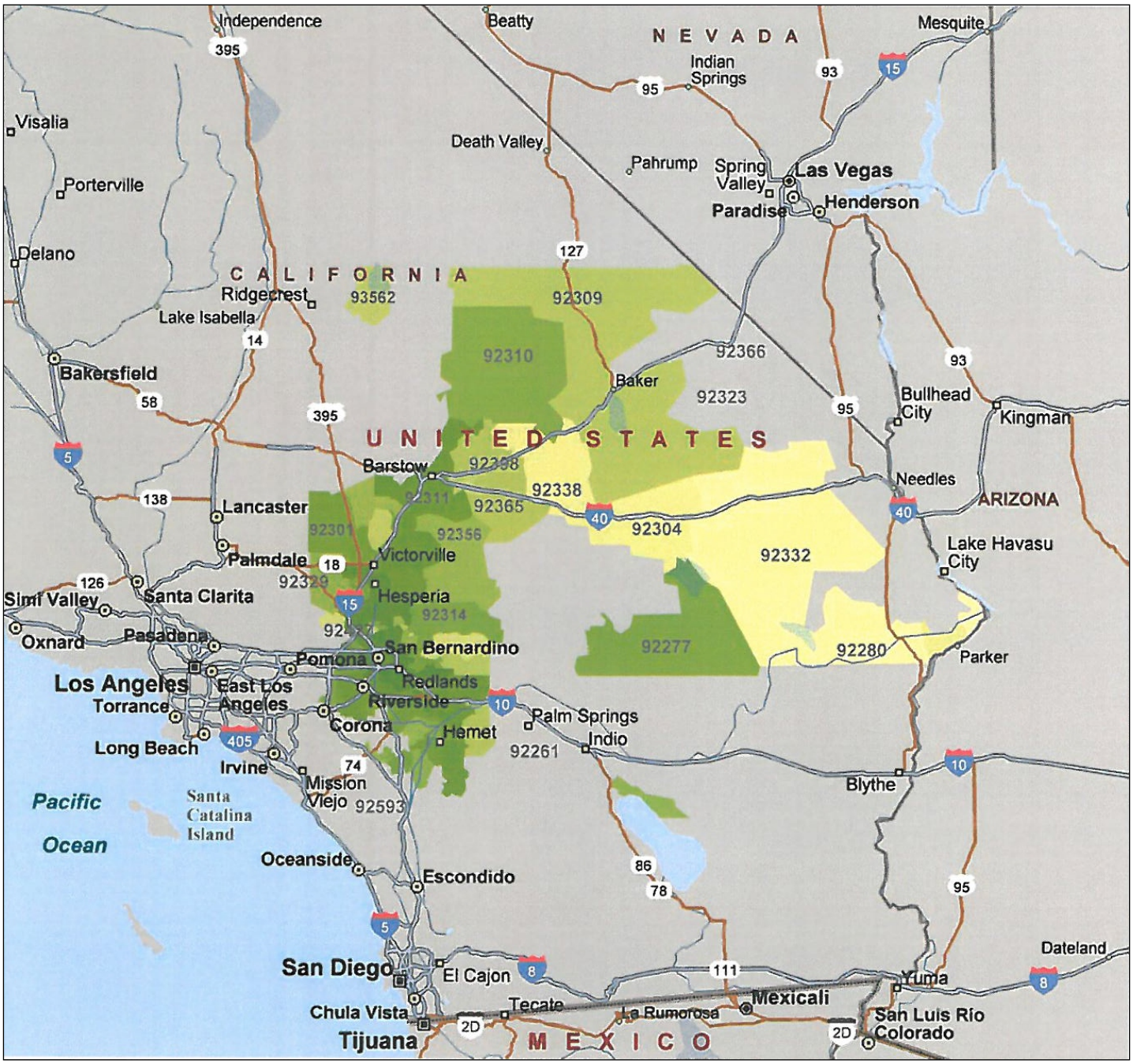

LEGEND

Patient discharges per 1,000 people by zip code

1 37 1,400

0 50
Miles
Source: LLUMC SB90 Application

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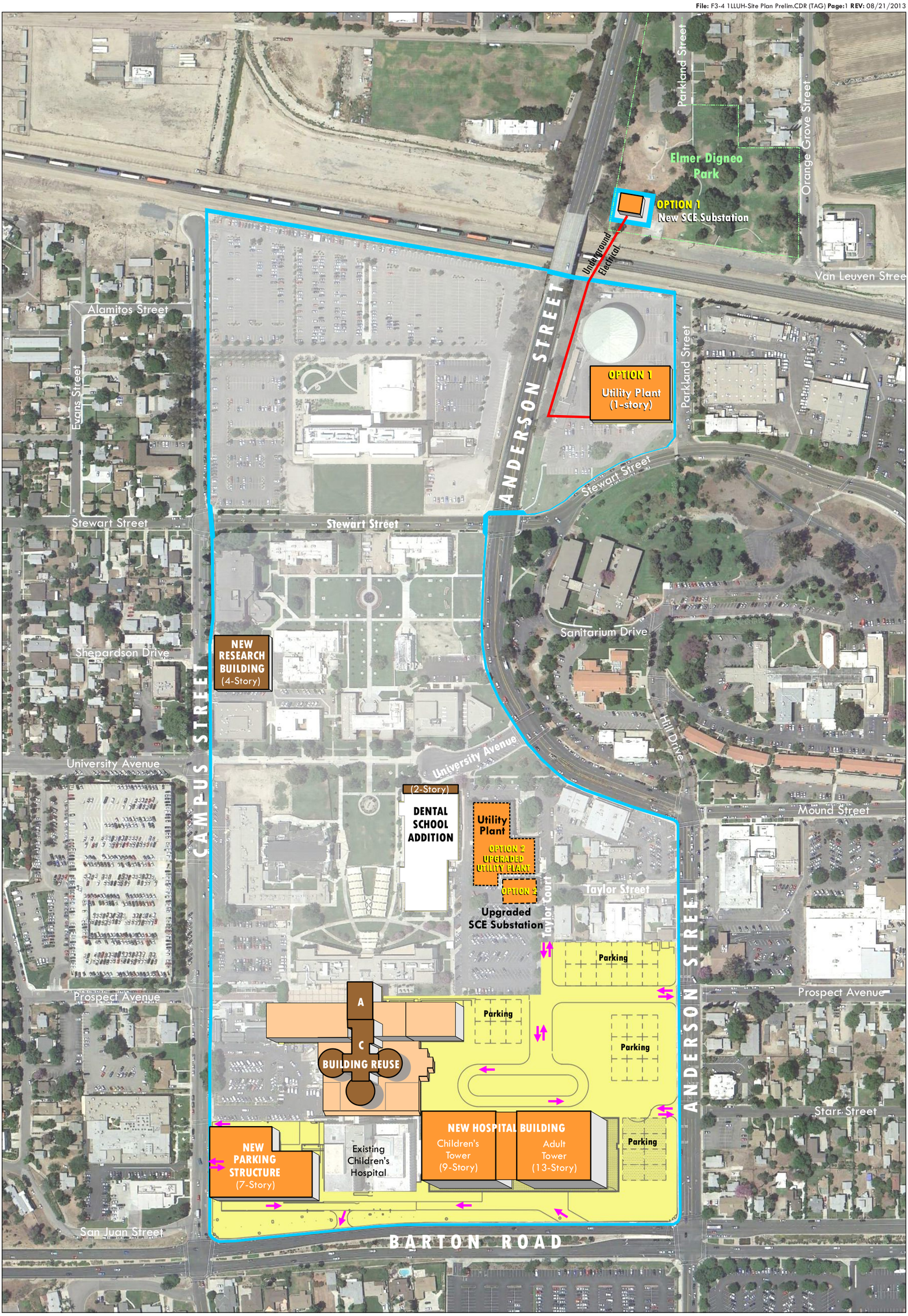
HOSPITAL SERVICE AREA

LLUH MASTER PLAN PROJECT
Environmental Impact Report
City of Loma Linda, California

FIGURE 1-3



LEGEND

- Project Site
- Phase 1 Master Plan Buildings
- Phase 1 Master Plan Site Work
- Phase 2 Master Plan Buildings
- New Underground Electrical
- Program Ingress and Egress

0 250' Feet

Aerial: GOOGLE, June, 2012.

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PROPOSED MASTER PLAN with PHASING

LLUH MASTER PLAN PROJECT
Environmental Impact Report
City of Loma Linda, California

FIGURE 1-4

Improvements and upgrades at the campus would also include potential expansion of utility lines or other infrastructure updates within streets that occur within the Project Site (i.e., Anderson Street, Taylor Drive, Loma Linda Drive, etc.).

Responsible, Trustee, and Other Interested Public Agencies

The State responsible agencies include the California Regional Water Quality Control Board - Santa Ana Region, the South Coast Air Quality Management District, and the Office of Statewide Health Planning and Development. Local agencies with jurisdiction include the County of San Bernardino, Hazardous Materials Division. Although the helistops may be considered a replacement of existing facilities, the Federal Aviation Administration may also issue an Airspace Determination Letter.

Required Permits and Approvals

The permits and approvals listed below are required prior to implementation of the Master Plan Project. The lead agency and responsible agencies will use the Draft EIR in their consideration of LLUM's application for the various permits and approvals including: The discretionary actions listed below are required prior to implementation of the LLUH Master Plan Project and construction of the Proposed Project's facilities.

City of Loma Linda

- Precise Plans of Design (PPD)
- Conditional Use Permits (CUP)
- Grading and Building Permits
- Finding of consistency with the County's adopted Airports Comprehensive Land Use Plan

Federal Aviation Administration

- Airspace Determination Letter

Regional Water Quality Control Board

- Storm Water Pollution Prevention Plan (SWPPP) [1]
- Waste Quality Management Plan (WQMP)

California Office of Statewide Health Planning and Development (OSHPD)

- Approval of hospital building permits

South Coast Air Quality Management District

- Permit to Construct (per Rules 201, 212 and 1401)

County of San Bernardino

- Medical Waste Generator's Health Permit
- Business Emergency Contingency Plan
- Medical Waste Management Plan

[1] For areas of disturbance of one-acre or greater. SWPPP submittal is through the City.

SUMMARY OF ENVIRONMENTAL ANALYSES

EIR Impacts and Mitigation Measures

Mitigation measures or imposed conditions of approval have been developed to reduce, or eliminate impacts determined to be potentially significant. Most of the potentially significant impacts evaluated in the EIR can be avoided, eliminated, or reduced to less than significant levels with implementation of the recommended mitigation measures, or conditions of approval and compliance with City Standard requirements.

With the exception of impacts from Greenhouse Gases, all other impacts associated with the Proposed Project would be reduced to a less than significant level after mitigation. Impacts from Greenhouse Gas Emissions associated with the power plant portion of the utility plant remain adverse and unavoidable even after implementation of mitigation measures.

Executive Summary Table 1-1 lists the potential environmental impacts associated with the Proposed Project, the mitigation measures that would reduce or eliminate potentially significant impacts, and the level of significance of an impact that would occur after mitigation is implemented. This information is presented in detail in Chapter 4.0 of the Draft Program EIR. The table summarizes all impacts that could occur with implementation of the Proposed Project. The second column presents the results of the EIR analysis prior to the implementation of any mitigation measures, but with consideration of design features, adherence to regulatory requirements and compliance with permit conditions. The final column presents the level of significance of the impact after implementation of any required mitigation measures.

A Traffic Impact Analysis (TIA) was prepared for the Proposed Project to review the University and related campus facilities proposed as part of the Master Plan. The report concluded that the intersections serving the Project Site at build-out would operate at a Level Of Service (LOS) of C for both the morning and evening peak hour. As required by Measure V, or the Growth Management Element of the amended General Plan, which is an initiative approved by Loma Linda voters in November 2006, any location where the level of service is below LOS C, the Transportation Element criterion, at the time an application for development is submitted, mitigation measures shall be imposed to ensure that the level of traffic service is maintained. Additionally, build-out of the University Medical Center Campus was reviewed in the TIA prepared for the General Plan Update (amended 2009), and the need for additional parking and parking structures were included in the analysis, the Proposed Project would not cause an increase in traffic or congestion at intersections within the vicinity, and therefore a traffic analysis is not presented in Chapter 4.0 of the Program EIR. The TIA prepared for the Proposed Project concluded that no impacts would occur, is included in Appendix A of this Program EIR.

As stated in the City's General Plan Chapter 2A, development projects that directly further the primary institutional purposes of Loma Linda University Adventist Health Sciences Center and/or related entities or subsidiaries are exempt from the traffic level of service requirements, so long as such development projects are either 1) non-residential in character, or 2) provide only student and/or staff housing for those exempt entities.

Impacts Remaining Significant After Implementation of Mitigation Measures

This EIR identified that impacts from Greenhouse gases would remain significant after implementation of mitigation measures (see Section 4.7 of this EIR).

Alternatives to the Proposed Project

Chapter 6.0 of the EIR includes an evaluation of a reasonable range of alternatives to the Proposed Project. The alternatives identified achieve the basic objectives of the Proposed Project while substantially lessening or avoiding significant environmental damage. Chapter 6.0 focuses on feasible alternatives capable of either eliminating any significant adverse effects, or reducing them to a less than significant level. Chapter 6.0 also includes a summary of alternatives considered and found to be infeasible. Finally, the identification of the Reduced Scale Alternative as the environmentally superior alternative is provided.

Alternatives considered and rejected include the following:

Expansion of the Existing Heart & Surgical Hospital Alternative: This alternative evaluates expansion of the existing Heart & Surgical Hospital located at the northeast corner of Barton Road and New Jersey Street (approximately 2.3 miles east of the Project Site). The existing Heart & Surgical Hospital, owned by LLUH, is approximately 6.3 acres in size and is currently developed with an existing 70,000 square-foot hospital that includes 24 medical beds and 11 same day surgery beds and related parking lot. Expansion of the existing on-site facility could require building/expanding to the property on the east, which occurs within the City of Redlands. In addition, appropriate parking would also need to be developed. Since only a hospital and parking structure would be required, this alternative would yield less impacts for air quality, cultural resources, hazards and hazardous materials than the Proposed Project. However, the alternative would not meet the Project's objective of expanding the City's economic base with medical support services, research facilities and professional offices, and upgrading the campus's infrastructure systems by providing new and improved services and facilities. Therefore, this alternative was rejected for further consideration in the analysis.

Evaluation of Feasible Alternatives

Two potentially feasible alternatives to the Proposed Project are evaluated in Chapter 6.0. These are:

- **No Project Alternative:** Continuation of the Proposed Project site in its current vacant condition.

- **Reduced Scale Alternative:** This alternative involves eliminating the following: new 90,000 square-foot Research Building, 9,000 square-foot dental school addition, new or retrofitted 34,000 square-foot utility plant and new or upgraded 14,000 square-foot SCE substation. The Reduced Scale Alternative would include the construction and operation of the new hospital and parking structure, and proposed new access and entry. Seismic separation would also take place to allow for the continued use of the existing Children's

Hospital, and reuse of the existing main hospital. This alternative would decrease upgrades and expansion square footage by 147,000 square feet or about 13 percent. The remainder of the site would continue to be utilized in its current developed state.

Environmentally Superior Alternative

Based on the evaluation of the two alternatives in this section, implementation of the No Project Alternative would result in fewer impacts than the Proposed Project but would not meet project objectives. The Reduced Scale Alternative would have less impacts than the Proposed Project, and impacts would be considered either less than significant or less than significant with mitigation for the Reduced Scale Alternative. Impacts related to Greenhouse Gases, associated with the utility plant, remain significant even after implementation of mitigation measures, thereby resulting in the need for Overriding Considerations to be adopted with project approval.

The Reduced Scale Alternative would not meet the objectives of providing a safe and modern university for students by providing upgrades and creation of new facilities, or increasing the City's economic base with new medical support services, research facilities, and professional offices. In addition, the Reduced Scale Alternative would not upgrade the campus infrastructure systems by providing new and improved services and facilities, and it would not meet the objective of providing a more self-reliant utility source in the event of an emergency.

Based on the summary provided above, the No Project Alternative would be considered the Environmentally Superior Alternative. However, under CEQA, another alternative must be selected as Environmentally Superior if in fact the "No Project" alternative is identified as such. For the proposed LLUH Master Plan Project, the Environmentally Superior Alternative would be the Reduced Scale Alternative.

Cumulative Impacts

Chapter 5.0 discusses cumulative impacts of the Proposed Project in conjunction with the City's 2009 General Plan build-out. Based on the cumulative impacts analysis, the Proposed Project would result in a cumulatively significant impact for greenhouse gases which would not be reduced to a less than significant level after mitigation.

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
SECTION 4.1 AESTHETICS			
Impact AES-1: The Proposed Project would result in the development of the LLUH Master Plan Project which includes new construction and improvements that would require the removal of trees This is a potentially significant impact.	Potentially Significant	**AES-1:** Prior to issuance of grading and/or building permits for the Proposed Project, all tree removals or relocations that occur within the public right-of-way and/or at the Elmer Digneo City Park shall be approved by the Community Development Department and monitored by the City's Public Works Department. **AES-2:** The trees of special significance as outlined in the August 2013 Arborist Report include: the Baby Fae Holly Oak, the Kiwanis Club Citrus Orchard, and the Elenore Graves Memorial Tree. Replacement of these trees requires a replacement with a minimum 36-inch box size.	Less Than Significant
Impact AES-2: The Proposed Project would result in the development of the LLUH Master Plan Project which includes the construction of a new hospital, dental school addition, and research building; upgrades to existing facilities; and construction of a new parking structure that would change the existing character of the LLUH campus. The Proposed Project could substantially degrade the existing visual character or quality of the site and its surroundings.	Potentially Significant	**AES-3:** In the event SCE Option 1 is selected and the a new SCE substation would be constructed at the Elmer Digneo Park City Park, the Community Development Department and Project Proponent shall meet to discuss appropriate design, materials and colors of the utilitarian structure to ensure that it blends with the existing restroom structure on-site. Screening of the building shall also be discussed and may include trees, bushes or vines to screen the structure.	

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
Impact AES-3: Implementation of the LLUH Master Plan Project would create a new source of light and/or glare which could adversely affect day or nighttime views in the area, and adjacent residential areas on the west side of Campus Street and near the northeast corner of Anderson Street and Barton Road. This is potentially significant impact.	Potentially Significant	**AES-4:** Prior to issuance of a grading or building permits, the Project Proponent shall submit a photometric plan for review and approval by the City Community Development Department. The plan may either be submitted for the individual structures or improvements as outlined in the Master Plan, or for the entire LLUH Master Plan Project. **AES-5:** Project design features shall be incorporated to provide landscaping, physical barriers, screening, or other buffers to minimize project-generated illumination from entering off-site areas and to prevent glare for residential development located south, east and west of the Project Site.	Less Than Significant
SECTION 4.3 CULTURAL RESOURCES			
Impact CR-1: Approval of the LLUH Master Plan Project would require earthwork, which may result in the unearthing of unknown archeological resources. This is a potentially significant impact.	Potentially Significant	**CR-1:** The Project Proponent (LLUH) shall have an archaeological monitor on-site during any proposed demolition and initial ground altering activities to ensure adequate and accurate recordation of the demolition and to document any potentially significant archaeological discoveries. The archeological monitor shall oversee excavations within the younger alluvial deposits. The extent and duration of any required monitoring shall be dependent upon the various task-related schedules and at the discretion of the City of Loma Linda.	Less than Significant

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
		CR-2: In accordance with 36 CFR 800.13(b)(3), the State Historic Preservation Officer and Native American tribal contacts of the Serrano and Gabrielino tribes, as well as the Advisory Council on Historic Preservation shall be notified within 48 hours of the discovery of any archaeological artifacts.	
Impact CR-2: The Proposed Project may require the demolition and/or alteration to on-site historical buildings. This is a potentially significant impact.	Potentially Significant	**CR-3:** In the event Risley Hall or the Housekeeping building are demolished or significantly altered, the structures shall be documented with additional photographs, compilation of any architectural drawings that may be available through the LLUH archives, and the preparation of a brief historical summary documenting the uses and associations of the buildings within the greater campus history.	Less Than Significant
Impact CR-3: The Proposed Project may unearth a paleontological resource during implementation of the Master Plan. This is a potentially significant impact.	Potentially Significant	**CR-4:** The Project Proponent (LLUH) shall have a paleontological monitor on-site during any proposed demolition and initial ground altering activities to insure adequate and accurate recordation of the demolition and to document any potentially significant paleontological discoveries. The paleontological monitor shall be responsible for overseeing excavations impacting older alluvium. The extent and duration of any required monitoring shall be dependent upon the various task-related schedules and at the discretion of the City of Loma Linda.	Less Than Significant

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
Impact CR-4: Implementation of the LLUH Master Plan Project would require grading and other ground-disturbing activities, which may result in the disturbance of unknown human remains. This is a potentially significant impact.	Potentially Significant	**CR-5:** If human remains of any kind are found during construction activities, all activities must cease immediately and the San Bernardino County Coroner and a qualified archaeologist must be notified. The Coroner shall examine the remains and determine the next appropriate action based on his or her findings. If the Coroner determines the remains to be of Native American origin, he or she shall notify the Native American Heritage Commission. The Native American Heritage Commission shall then identify the most likely descendants to be consulted regarding treatment and/or reburial of the remains. If a most likely descendant cannot be identified, or the most likely descendant fails to make a recommendation regarding the treatment of the remains within 48 hours after gaining access to them, the Project Proponent shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.	Less Than Significant

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
SECTION 4.4 GEOLOGY AND SOILS			
Impact GS-1: The Proposed Project could be located soil that is unstable, or that would become unstable as a result of lateral spreading, subsidence, liquefaction or result in collapse. This is a potentially significant impact.	Potentially Significant	**GS-1:** Prior to issuance of grading and/or building permits for the Proposed Project, including permits for utilities, the Project Proponent shall submit updated Geologic and Geotechnical Investigations as recommended by the CHJ studies for addressing the final project design of all structures proposed for construction. **GS-2:** Prior to issuance of grading and/or building permits for the proposed new hospital towers, including permits for utilities, the Project Proponent shall submit development plans that incorporate the recommendations of the geotechnical report prepared by MACTEC Engineering and Consulting, Inc., dated July 13, 2011 (Appendix E-1) for preliminary foundation work, utility trenching, and concrete slabs. These include specifications for concrete slabs and footings, temporary excavation for utilities, preliminary pavement design, and protection of foundations from surface drainage. **GS-3:** As part of the new hospital towers construction, all existing fill and the upper natural soils shall be removed to allow for the placement of at least two feet of properly compacted fill beneath hardscape, concrete walkways, and paving. The required fill should be uniformly well compacted and observed and tested	Less Than Significant

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
		during placement. The on-site soils may be used in the required fill. **GS-4:** Prior to issuance of grading and/or building permits for the proposed new parking structure the Applicant shall submit a site-specific liquefaction and seismically-induced settlement evaluation as part of the geotechnical investigation for the project as recommended in the geotechnical report prepared by AMEC, dated July 28, 2013 (Appendix E-2). Recommendations contained in the site-specific liquefaction and seismically-induced settlement evaluation shall be incorporated in the parking structure final design. **GS-5:** Prior to issuance of grading and/or building permits for the SCE Option 1 substation site, the Project Proponent shall submit a site specific geotechnical investigation as recommended by the CHJ studies and based upon the final design provided by SCE. **GS-6:** Prior to issuance of grading and/or building permits for the Utility Plant Option 1 site, the Project Proponent shall submit a site specific geotechnical investigation as recommended by the CHJ studies and based upon the final utility plant design.	
Impact GS-2: The Proposed Project would increase impervious surfaces in an area that is used as a City Park, resulting in the potential		**GS-7:** In accordance with the Geologic/Geotechnical reports prepared for elements of the Master Plan, wind and water erosion of soils at the Elmer Digneo City	

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
for increased soil erosion. This could be a potentially significant impact.		Park shall be reduced by minimizing grading activities and grading occurring immediately prior to new construction activities. **GS-8:** Disturbed soils shall be watered at least twice daily to ensure the control of fugitive dust escaping off-site. **GS-9:** A National Pollutant Discharge Elimination System permit shall be obtained before construction is started. If the area of disturbance is greater than one acre, a Storm Water Pollution Prevention Program must be submitted to the City and shall show how storm waters will be controlled through Best Management Practices to avoid off-site sedimentation. **GS-10:** Soils left bare or inactive for longer than thirty days shall be planted with ground cover or covered by approved means to assure no loss of topsoil.	
SECTION 4.5 HAZARDS AND HAZARDOUS MATERIALS			
Impact HAZ-1: The Proposed Project includes demolition of buildings that may contain lead-based paint and asbestos. This may be a potentially significant impact.	Potentially Significant	**HAZ-1:** Prior to the issuance of a building or demolition permits the Project Proponent shall prepare an Asbestos Survey and Lead Inspection report to determine the quantity of materials present and establish proper handling procedures for safe removal and disposal. The applicant will be required to comply with the findings of the analysis.	Less Than Significant

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
SECTION 4.7 GREENHOUSE GASES			
Impact GHG-1: Implementation of the LLUH Master Plan may result in an increase in GHG emissions. This is a potentially significant impact.	Potentially Significant	**GHG-1:** The Applicant shall implement the following applicable GHG Mitigations Measures as listed in Table 4.7-3 which will be reviewed and imposed by the City as conditions of approval at the time of building permit issuance. **Energy** ***Building Energy Use*** • *Buildings Exceed Title 24 Building Envelope Energy Efficiency Standards By 10%)* • *Install Energy Efficient Appliances* • *Install Energy Efficient Boilers* ***Lighting*** • *Install Higher Efficacy Public Street and Area Lighting* ***Alternative Energy Generation*** • *Establish Onsite Renewable Energy Systems-Solar Power* **Transportation** ***Land Use/Location*** • *Increase Diversity of Urban and Suburban Development (Mixed Use)* • *Improve Destination Accessibility* • *Increase Transit Accessibility*	Significant and Unavoidable

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
		Neighborhood/Site Enhancements • *Provide Pedestrian Network Improvements* ***Parking Policy/Pricing*** • *Limit Parking Supply* ***Commute Trip Reduction Programs*** • *Implement Commute Trip Reduction Program* • *Implementation/Monitoring* • *Provide Ride-Sharing Programs* • *Implement Subsidized or Discounted Transit Program* • *Encourage Telecommuting and Alternative Work Schedules* • *Implement Commute Trip Reduction Marketing* • *Provide Employer-Sponsored Vanpool/Shuttle* **Water** ***Water Use*** • *Install Low-Flow Water Fixtures* • *Adopt a Water Conservation Strategy* • *Design Water-Efficient Landscapes* • *Use Water-Efficient Landscapes* • *Reduce Turf in Landscapes and Lawns*	

TABLE 1-1
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IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
SECTION 4.9 NOISE			
Impact N-1: Temporary construction and long-term operational activities may expose residents in the immediate area to excessive noise levels exceeding the City's noise ordinance. This is a potentially significant impact.	Potentially Significant	**N-1:** In the event Utility Plant Option 1 site is selected, a 12-foot temporary sound barrier shall be used along the south edge of the construction site. The temporary sound barrier may be constructed of plywood with a total thickness of 1-1/2 inches, or a sound blanket wall may be used. If sound blankets are used the blanket must have a Sound Transmission Class (STC) rating of 27. **N-2:** Prior to construction, the Project Proponent shall submit to the City a noise control plan that shows that the utility plant is designed to achieve a noise level of 50 dBA (Leq) or less at a distance of 300 feet. Achieving this noise level shall insure that the utility plant noise is less than ambient conditions at Lindsay Hall and would not have an adverse noise effect on the campus. **N-3:** A 12-foot temporary sound barrier shall be used along the east boundary of the new hospital construction site. The temporary sound barrier may be constructed of plywood with a total thickness of 1-1/2 inches, or a sound blanket wall may be used. If sound blankets are used the blanket must have a Sound Transmission Class (STC) rating of 27. **N-4:** The Project Proponent and contractor shall limit grading and building construction to the hours of	Less Than Significant

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
		7:00 am to 8:00 pm Monday through Friday, except no construction shall occur after 4:00 pm on Fridays. Heavy construction is not permitted on weekends or national holidays, unless approved by the City. During times extra work is necessary and is approved by the City to occur outside these times allowed, work shall not exceed noise levels at sensitive receptors of 100 dBA at 50 feet. All equipment must be properly equipped with standard noise muffling apparatus specifically for such equipment (i.e., exhaust mufflers).The City may require the Project Proponent to monitor and report noise levels on a daily basis.	
Impact N-2: Temporary construction activities of the new hospital may expose residents, students, staff and patients in the immediate area to excessive groundborne vibration and/or significant groundborne noise levels during times of subterranean excavations. This is a potentially significant impact.		**N-5:** The Project Proponent shall include the following language in all construction documents for all construction occurring during the period of the Master Plan and shall provide weekly monitoring reports to the City Engineer, as required. **Design considerations:** • Construct noise barriers, such as temporary walls between noisy activities and noise sensitive receivers. • Stationary noise sources shall be located as far away from sensitive receptors as possible. They shall be muffled and enclosed within temporary sheds or insulated barriers.	

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
		• Reroute truck traffic away from residential streets and most sensitive medical facilities, if possible. **Sequence of Operations:** • Combine noisy operations to occur in the same time period. The total noise level produced will not be significantly greater than the level produced if the operations were performed separately. • Avoid nighttime activities. Sensitivity to noise increases during nighttime hours. **Alternative construction methods:** • Select demolition methods not involving impact, where practicable. • Avoid impact pile driving where possible. Drilled piles or the use of a sonic or vibratory pile driver are quieter alternatives where the geological conditions permit their use. • Impact tools shall be hydraulically or electrically powered wherever possible to avoid noise from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler shall be used.	

TABLE 1-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES/REGULATORY REQUIREMENTS FOR THE PROPOSED PROJECT

IDENTIFIED IMPACTS	LEVEL OF SIGNIFICANCE (Before Mitigation)	MITIGATION MEASURES/ REGULATORY REQUIREMENTS	LEVEL OF SIGNIFICANCE (After Mitigation)
UTILITIES			
Impact USS-1: The Proposed Project includes the demolition of existing structures including residential structures, roads, and parking lots that may generate substantial construction debris waste. Because the City of Loma Linda has not met its goal of diverting 50 percent of waste from landfills, this is a potentially significant impact.	Potentially Significant	**USS-1:** The Project Proponent shall comply with City-adopted policies regarding the reduction of construction and demolition (C&D) materials. Removal of vegetation shall be in accordance with application City policies.	Less Than Significant

2.0 PURPOSE OF EIR

2.1 INTRODUCTION

An Environmental Impact Report (EIR) as defined in Section 21061 of the California Environmental Quality Act (CEQA) Statute & Guidelines, is an informational document to be considered by every public agency prior to its approval or disapproval of a project. The purpose of an EIR is to generally inform public agency decision-makers and the public of the potentially significant environmental effects associated with a proposed project, identify ways to minimize or eliminate the significant effects, and evaluate a reasonable range of alternatives that would meet the major objectives of the proposed project but further reduce or avoid significant environmental effects.

Specifically the Proposed Project is being evaluated as a Program EIR. A Program EIR as defined in Section 15168 CEQA Statute & Guidelines, is an EIR that is prepared on a series of actions that can be characterized as one large project and are related either: 1) geographically; 2) logical parts in the chain of contemplated actions; 3) in connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or 4) as individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways. Within the Program EIR, feasible mitigation measures are developed for the subsequent actions in the Project.

The preparation of a Program EIR would allow the Lead Agency to consider broad policy alternatives and program-wide mitigation measures at an early stage when the agency has greater flexibility to deal with basic impacts. Additionally, it would ensure duplicate reconsideration of basic policy considerations would not result. Further, proposed activities in the Master Plan are examined at a program level to determine whether additional environmental analysis is warranted. For example, if a later activity would have effects that were not examined in the Program EIR, a new Initial Study would be required, which would lead to a Negative Declaration or an EIR. If the agency finds that no new effects would occur or not new mitigation measures would be required, the agency could approve the activity as being within the scope of the project covered by the Program EIR, and no new environmental document would be required.

This Program EIR has been prepared in compliance with CEQA, the State Guidelines for Implementation of CEQA, and the City of Loma Linda Guidelines for CEQA Implementation to document existing environmental conditions and evaluate the potentially significant environmental effects that could result from the implementation of the LLUH Master Plan Project over the two-Phase, estimated 10-year period. The Project Site totals approximately 23.8 acres and is located in the City of Loma Linda, in San Bernardino County. The Project Site includes the existing LLUH and its entireties (i.e., Medical Center, University, Dental School, etc.) and also includes the Elmer Digneo City Park site located to the north of the LLUH that may be used for siting a Southern California Edison (SCE) substation to serve the campus. The park site is located east of Anderson Street and north of the Union Pacific Railroad (UPRR). The

main Medical Center campus is located north of Barton Road between Anderson Street and Campus Street.

The Project Applicant (Loma Linda University Adventist Health Sciences Center [LLUAHSC] doing business as Loma Linda University Health [LLUH]) is proposing a Master Plan (herein "Project") to include the renovation of its campus. The Project would consist of a two-phased development to construct new facilities and improvements to the existing campus in order to accommodate growth in the services provided and to meet regulatory requirements. The Proposed Project would provide construction of new facilities, modernization of existing facilities, and replacement of a portion of the main hospital in response to California's SB 1953 Hospital Seismic Safety Act. It is anticipated that the Master Plan would be built out in two phases over a 10-year period.

The existing LLUH hospital in Loma Linda is composed of different structures that are connected including the 1967 building (round towers and buildings below them) and the Children's Hospital built in the late 1980's. SB 90, an amendment to SB 1953, allows a seven-year seismic compliance extension, to the year 2020 for the 1967 portion of the hospital. It is this portion of the hospital that would be vacated and a new hospital is proposed to replace existing uses. Since certain operations of the Children's Hospital occur within the 1967 structure, part of the new construction would be dedicated for the children's hospital. Upon separation from the 1967 building, the current Children's Hospital would remain in compliance.

Proposed facilities and improvements associated with the Master Plan are described in detail in Section 3.4 and include: replacement facilities for the children's and adult hospitals, a parking lot and parking structure; a retrofitted or new utility plant; an upgraded or new Southern California Edison (SCE) electrical substation (either on or off-site); an addition to the existing dental school; and a research building.

2.2 AUTHORITY

An EIR provides objective planning and environmental information to guide and assist decision-makers, lead agency staff and the public in their evaluation of the potential environmental effects that may result from implementation of the project as proposed. The California Environmental Quality Act (CEQA) Guidelines Section 15151 contains the following standards of adequacy:

> *"An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection; but for adequacy, completeness, and good faith effort at full disclosure."*

This program EIR considers a series of actions that are needed to achieve the implementation of the proposed LLUH Master Plan and Precise Plan of Design (PPD), and was prepared in accordance with the *California Environmental Quality Act of 1970* (Public Resources Code, Section 21000 et seq.), the *Guidelines for Implementation of the California Environmental*

Quality Act published by the Resources Agency of the State of California, and the City of Loma Linda's local CEQA Guidelines. A Conditional Use Permit (CUP) would also be required if a new Southern California Edison (SCE) substation at the Elmer Digneo City Park is selected as the preferred substation option. This EIR was prepared by Lilburn Corporation, a private environmental consulting firm, under contract to the City of Loma Linda.

During the development review process, the City must consider implementation of all feasible mitigation measures and alternatives addressed in the EIR to substantially lessen anticipated environmental impacts of the project. As mandated by the CEQA Guidelines, this program EIR reflects the independent judgment of the City of Loma Linda Planning Division regarding the proposed project in accordance with CEQA Guidelines Section 15084(e)).

2.3 LEAD AGENCY

The City of Loma Linda Community Development Department is the lead agency as defined in section 15051(b) of the Guidelines for implementing the California Environmental Quality Act (CEQA) which states "If the project is to be carried out by a non-governmental person, the Lead Agency shall be the public agency with the greatest responsibility for supervising or approving the project as a whole." Additionally, other agencies may have authority over resources that may be affected by the project, or may be required to issue permits or give other input on implementation of the project. These "responsible agencies" include the County of San Bernardino, California Regional Water Quality Control Board (RWQCB), the South Coast Air Quality Management District (SCAQMD), and the California Office of Statewide Health Planning and Development (OSHPD) which is responsible for enforcing building standards and regulating the design and construction of health care facilities. The document may also be used by the Federal Aviation Administration in the consideration of an Airspace Determination Letter.

2.4 ORGANIZATION OF THE EIR

The Draft Project EIR is organized into the following chapters:

Chapter 1.0 – Executive Summary: Summarizes the Proposed Project, areas of controversy, issues to be resolved, regulatory compliance requirements, the potential environmental effects that may result from the implementation of the Proposed Project (including cumulative), the mitigation measures proposed to reduced or eliminate significant effects, and a summary of the proposed alternatives.

Chapter 2.0 – Purpose of EIR: Provides an introduction and overview of the EIR and describes the intended use of the document and the Lead Agency authority under CEQA. This chapter includes a brief description of the Proposed Project, describes the purpose of an EIR, summaries the review process, and lists the documents incorporated by referenced. This chapter also includes a list of acronyms and glossary of terms.

Chapter 3.0 - Project Description: Provides a detailed description of conditions on the project site and vicinity and the various components of the Proposed Project. This chapter includes a

statement of project objectives and provides background data on the project and project site. This chapter also includes a list of permits required to implement the project.

Chapter 4.0 – Environmental Setting and Impact Evaluation: Describes the existing environmental conditions on the site and in the vicinity of the project site, and the regulatory environment. Describes the project's characteristics related to each of the topical environmental issues and states the significance criteria used to evaluate potentially significant effects of the proposed project. Evaluates the potential environmental effects, identifies mitigation measures to reduce or eliminate effects found to be significant, and determines the level of significance of the effect after measures have been implemented.

Chapter 5.0 - Other CEQA-Required Analysis: Evaluates environmental effects of the project when considered with the effects of other approved and/or reasonably foreseeable projects that when combined, would be cumulatively significant. Also includes descriptions of: 1) ways in which the project may foster economic or population growth and thereby be growth inducing; and 2) any significant irreversible environmental changes which may result with the implementation of the proposed project (CEQA Guidelines section 15126.2(c)(d)).

Chapter 6.0 - Alternatives: Describes a reasonable range of alternatives to the project that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects identified in the environmental analysis of the project.

Chapter 7.0 - References: Includes a list of lead agency staff members who participated in the preparation of the EIR as well as the consultants who prepared the technical reports to support the environmental analysis. Chapter 7.0 also includes a bibliography of information used to prepare the EIR and lists persons and organizations consulted during report preparation.

2.5 INCORPORATION BY REFERENCE

As permitted by section 15150 of the CEQA Guidelines, this Draft Program EIR has referenced several technical studies, analyses, and reports, which are included in the technical appendices included in the EIR. Information from documents incorporated by reference has been summarized in the appropriate section(s) that follow. The following documents are hereby incorporated by reference and are available for review at the City of Loma Linda offices located at 25541 Barton Road, Loma Linda, CA 92354:

- City of Loma Linda General Plan
- City of Loma Linda Municipal Code

2.6 REQUIRED PERMITS AND APPROVALS

The discretionary actions listed below are required prior to implementation of the LLUH Master Plan Project. The lead agency and responsible agencies will use the program EIR in their consideration of LLUH's application for the various permits and approvals. The document may also be used by other agencies in their review of the project for issuance of other determinations or approvals outside the purview of CEQA.

City of Loma Linda

- Precise Plans of Design (PPD)
- Conditional Use Permits (CUP)
- Grading and Building Permits
- Finding of consistency with the County's adopted Airports Comprehensive Land Use Plan

Federal Aviation Administration

- Airspace Determination Letter

Regional Water Quality Control Board

- Storm Water Pollution Prevention Plan (SWPPP) [1]
- Waste Quality Management Plan (WQMP)

California Office of Statewide Health Planning and Development (OSHPD)

- Approval of hospital building permits

South Coast Air Quality Management District

- Permit to Construct (per Rules 201, 212 and 1401)

County of San Bernardino

- Medical Waste Generator's Health Permit
- Business Emergency Contingency Plan
- Medical Waste Management Plan

The Program EIR (State Clearinghouse No. 2013051043) has been prepared by the City of Loma Linda to evaluate the environmental effects of the proposed LLUH Master Plan Project, a multi-phased development to construct new facilities and improvements to the existing campus in order to accommodate growth in the services provided and to meet regulatory requirements. The Proposed Project would provide construction of new facilities, modernization of existing facilities, and replacement of a portion of the main hospital in response to California's SB 1953 Hospital Seismic Safety Act.

The City of Loma Linda Community Development Department is the lead agency as defined in Section 15051(b) of the Guidelines for implementing California Environmental Quality Act (CEQA) which states "If the project is to be carried out by a non-governmental person, the Lead Agency shall be the public agency with the greatest responsibility for supervising or approving the project as a whole."

2.7 PROJECT UNDER REVIEW

The Project Applicant (Loma Linda University Adventist Health Sciences Center [LLUAHSC] doing business as LLUH) is proposing a Master Plan to include the renovation of its campus. The Project consists of a multi-phased development to construct new facilities and improvements

[1] For areas of disturbance of one-acre or greater. SWPPP submittal is through the City.

to the existing campus in order to accommodate existing demands of the services provided and to meet regulatory requirements. The Proposed Project would provide construction of new facilities, modernization of existing facilities, and replacement of a portion of the main hospital in response to California's SB 1953 Hospital Seismic Safety Act. It is anticipated that the Master Plan would be built out in two phases over an estimated 10-year period.

The LLUMC is composed of a number of different structures that are connected including: the original 1967 building (round towers and buildings below them), the radiology building known as the Schuman Pavilion built in the mid 1980's, and the Children's Hospital built in the late 1980's. SB 90, an amendment to SB 1953, allows a seven-year seismic compliance extension to the year 2020 for the 1967 portion of the hospital. It is this portion of the hospital that would be vacated and a new hospital is proposed to replace existing uses. Since certain operations of the Children's Hospital occur within the 1967 structure, the new hospital would include a designated area for children as well as adults. Upon appropriate separation from the 1967 building, the current Children's Hospital would remain in compliance with SB 1953.

Proposed facilities and improvements associated with the Master Plan include: 1) a seven-story, approximately 250,000 square-foot, 760-space patient and visitor parking structure; 2) a 13-story (approximately 215 feet in height), approximately 732,000 square-foot hospital with 464 beds to replace a portion of the seismically-noncompliant existing hospital, and 80 parking spaces; 3) an approximate 34,000 square-foot new or retrofitted utility plant; 4) an approximate 14,000 square-foot Southern California Edison (SCE) electrical substation (either on-site existing substation upgraded or new off-site); 5) a two-story, approximately 9,000 square-foot addition to the existing dental school; 6) a four-story approximately 90,000 square-foot research building; and 7) tenant improvements and reuse of the vacated portions of the existing hospital. Improvements and upgrades at the campus would also include potential expansion of utility lines or other infrastructure updates within streets that occur within the Project Site (i.e., Anderson Street, Taylor Drive, Loma Linda Drive, etc.).

2.8 ENVIRONMENTAL REVIEW PROCESS

2.8.1 CEQA Process

The purpose of this program EIR is to evaluate the potential environmental effects of the proposed project and all actions related for the approval of the Master Plan. A Notice of Preparation (NOP) was issued by the City to surrounding property owners and local organization on March 11, 2013, and then to state agencies on May 17, 2013 pursuant to State CEQA Guidelines, Section 15082 (a), 15103, and 15375 (State Clearinghouse No. 2013051043). The City circulated the NOP to responsible and trustee state agencies, local organizations, and interested individuals to identify issues to be addressed in the EIR. The 30-day circulation period required by CEQA began on March 11, 2013 and ended on April 9, 2013 for surrounding property owners, and then began on May 17, 2013 and ended on June 17, 2013 for state agencies. Comments that were received on the May 17, 2013 NOP have been addressed during the preparation of the EIR, and copies of the comments letters are included in Appendix B.

2.8.2 Scope of the EIR

Evaluation of the existing LLUH campus, meetings with the lead agency and applicant, and evaluation of comment letters received during circulation of the NOP (circulated March 11, 2013 and May 17, 2013) and the scoping meeting, determined that the following potential environmental issues should be analyzed in this EIR:

- Aesthetics
- Air Quality
- Greenhouse Gas
- Cultural Resources
- Geology and Soils
- Land Use
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Utilities

A copy of the NOP (circulated March 11, 2013 and May 17, 2013) and comment letters are included in Appendix B of this EIR.

2.8.3 Issues Raised in Comments on the NOP

The following issues were raised in comments received on the NOP:

- California Department of Transportation (Caltrans)
  - Caltrans indicated that a Traffic Impact Study is necessary to determine the Proposed Project's near-term and long-term impacts to the State facilities and to proposed appropriate mitigation measures. The study should be based on *Caltrans' Guide for the Preparation of Traffic Impact Studies*.
  - Submit a hard copy of all Traffic Impact Analysis documents and an electronic Synchro Analysis file.

2.8.4 Public Scoping Meeting

The City of Loma Linda held a public scoping meeting for the Proposed Project on Thursday, March 21, 2013. A total of six (6) members of the public attended, and two comments, neither of which related to the EIR, were received.

2.8.5 Draft EIR

Circulation of the Draft Program EIR begins when a Notice of Completion (NOC) is filed with the State Office of Planning and Research (State Clearinghouse). Filing the NOC starts the 45-day review period for the Draft Program EIR. Concurrent with the filing of the NOC, the lead agency will also provide a Notice of Availability of the Draft Program EIR to all organizations and individuals that have previously requested such notice or are located in proximity to the Project Site. This notice briefly describes the Proposed Project; identifies the date when comments must be received and where they are to be sent; and provides locations where copies

of the Draft Program EIR can be reviewed (CEQA Guidelines section 15085 through section 15087).

Anyone reviewing the document may submit written comments to the City of Loma Linda Community Development Department during this period. Responses to the comments received will be prepared and included in the Final EIR to be prepared prior to the City taking action on the Proposed Project during a public hearing before the City's Planning Commission.

Comments on the Draft EIR may be sent to:

City of Loma Linda Community Development Department
Attn: Guillermo Arreola, Associate City Planner
25541 Barton Road
Loma Linda, CA 92354
Email: garreola@lomalinda-ca.gov

In conjunction with the preparation of the Draft Project EIR, a Mitigation Monitoring and Reporting Program (MMRP) has been prepared (CEQA section 21081.6). The MMRP contains the mitigation measures along with the action that must be taken to implement them and the method that would be used to document or verify fulfillment of the measure. A procedure for determining and recording compliance is outlined for each action that must be implemented by the project applicant to mitigate impacts as identified in the EIR and adopted when the project is approved. This procedure identifies what action would be taken and when, designates who would be responsible for implementing the action, and to whom and when compliance would be reported.

2.8.6 Final EIR

At the end of the public review period, written comments on the project will be compiled and responses generated in conjunction with the preparation of the Final Program EIR. The Final Program EIR will consist of a list of all persons, organizations, and public agencies commenting on the Draft Program EIR; copies of the comments received on the Draft Program EIR; responses to comments; and any other pertinent information added by the lead agency (CEQA Guidelines section 15132).

The Final Program EIR will serve as the CEQA compliance document for the City of Loma Linda and any other agencies that may be responsible for review of the Proposed Project and issuance of required permits (see Section 1.2.2).

2.9 ACRONYMS

AAQS Ambient air quality standards
AB Assembly Bill
ACOE Army Corps of Engineers
AQMD Air Quality Management District
AQMP Air Quality Management Plan

ARB	Air Resources Board
ARP	Accidental Release Prevention
BACT	Best available control technology
BMP	Best Management Practices
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
CAFÉ	corporate average fuel economy
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board (also ARB)
CAT	Climate Action Team
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CFCs	chlorofluorocarbons
CGS	California Geological Survey
CHL	California Historical Landmarks
CHP	California Highway Patrol
CIWMB	California Integrated Waste Management Board
CNEL	Community Noise Equivalent Level
CNRA	California Natural Resources Agencies
CO	Carbon monoxide
CO_2	Carbon dioxide
CPHI	California Points of Historical Interest
CRHR	California Register of Historical Resources
CUP	Conditional Use Permit
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted decibel scale
DHS	Department of Health Services
DOT	Department of Transportation
DPM	Diesel particulate matter
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EIR	Environmental Impact Report
EPA	Environmental Protection Agency (federal and state)
ERCs	Emissions Reduction Credits
F	Fahrenheit
FAA	Federal Aviation Administration
FCAA	Federal Clean Air Act

FEMA	Federal Emergency Management Agency
GHG	Greenhouse gases
GPM	Gallons per minute
HAPS	Hazardous air pollutants
HFCs	hydrofluorocarbons
HIA	acute hazard index
HMMD	Hazardous Materials Management Division
HNL	Hourly Noise Level
HRI	Historic Resources Inventory
HSWA	Hazardous and Soil Waste Amendments
HVAC	heating ventilation and air conditioning
HVLP	high volume low pressure
IPCC	Intergovernmental Panel on Climate Change
JPA	Joint Powers Agreement
LCFS	low-carbon fuel standards
LID	Low Impact Development
$\mathbf{L_{eq}}$	Equivalent noise levels
Ldn	day-night
$\mathbf{L_{max}}$	Maximum sound level
$\mathbf{L_{min}}$	Minimum sound level
LOS	Level of service
LLU	Loma Linda University
LLUAHSC	**Loma Linda University Adventist Health Science Center**
LLUH	Loma Linda University Health
LLUMC	**Loma Linda University Medical Center**
MCE	Maximum Credible Earthquake
MG	million gallons
MGD	Million gallons per day
MMRP	Mitigation Monitoring and Reporting Program
MPE	Maximum probable [earthquake] event
MPO	Metropolitan Planning Organization
MSL	Mean sea level
$\mathbf{M_w}$	Moment Magnitude
MWMA	Medical Waste Management Act
MWMP	Medical Waste Management Program
NAAQS	National ambient air quality standards
NAHC	North American Heritage Commission
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NIFZ	Newport-Inglewood Fault Zone
NO	Nitric oxide
$\mathbf{NO_2}$	Nitrogen dioxide
$\mathbf{NO_x}$	Nitrogen oxides
NOC	Notice of Completion
NOI	Notice of Intent
NOP	Notice of Preparation

NO_x	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRHP	National Register of Historic Place
OAL	Office of Administrative Law
OEHHA	Office of Environmental Health Hazards Assessment
OES	Office of Emergency Services
OPR	Office of Planning and Research (California)
OSHA	Occupational Safety and Health Administration
OSHPD	Office of Statewide Health Planning and Development
O_3	Ozone
Pb	Lead
PFCs	perfluorocarbons
PHBT:	Puente Hills Blind Thrust
$PM_{2.5}$	Fine particulate matter with diameter of 2.5 microns or less
PM_{10}	Particulate matter with diameter of 10 microns or less
ppm	Parts per million
ppm_v	Parts per million by volume
PUC	Public Utilities Commission
RCRA	Resources Conservation and Recovery Act
RI/X	Rapid Infiltration/Extraction
RMP	Risk Management Plan
ROWD	Report of Waste Discharge
ROG	Reactive organic gases
RPLI	Regional Paleontologic Location Inventory
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SBC	San Bernardino County
SBCFD	San Bernardino County Fire Department
SBIA	San Bernardino International Airport
SHPO	State Historic Preservation Office
SIP	State Implementation Plans
SO_2	Sulfur dioxide
SO_x	Sulfur oxides
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SF	square feet
SCE	Southern California Edison
SR	State Route
SRA	Source receptor area
STC	Sound Transmission Class
SWP	State Water Project

SWPPP	Stormwater Pollution Prevention Program
SWRCB	State Water Resources Control Board
TAC	Toxic air contaminants
TCM	Transportation Control Measures
TDS	total dissolved solids
TIA	Traffic Impact Analysis
TPD	tons per day
UPRR	Union Pacific Railroad
USGS	United States Geological Survey
VOC	Volatile organic compound
WDR	Waste discharge requirements
WQMP	Water Quality Management Plan

2.10 GLOSSARY OF TERMS

Acre-foot: Volume of liquid or solid required to cover an area of one acre to a depth of one foot. Equals approximately 325,850 gallons of water.

Active fault: Geologic fault with recent seismic activity that has displaced materials not more than 12,000 years old.

Alquist-Priolo Fault Zone: State-identified areas of potentially active and recently active faults.

Alquist-Priolo Special Studies Zones Act: Places specific responsibilities on local governments for identification and evaluation of seismic and geologic hazards, and formulation of programs and regulations to reduce risk in identified locations.

Aquifer: A geological formation that is sufficiently permeable to conduct groundwater and to yield significant quantities of water to wells and springs.

California Environmental Quality Act (CEQA): Policies enacted in 1970, and subsequently amended (through September 2004), the intent of which is the maintenance of a quality environment for the people of California now and in the future.

CALINE4: Computer Model, air quality model developed by the California Department of Transportation.

CNEL: Community Noise Equivalent Level-a noise index that accounts for the greater annoyance of noise during evening and nighttime hours.

Discretionary actions: Conditions which can be imposed on a project action prior to approval for implementation. The approval would thus be “at the discretion” of an agency.

EMFAC2002: A computer program published by the California Air Resources Board (CARB) that calculates on road vehicle emissions.

Environmental Impact Report (EIR): Document in which the impacts of any state or local, public or private project action which may have a significant environmental effect are evaluated prior to its approval and subsequent construction or implementation, as required by the California Environmental Quality Act.

Fault: A geologic fracture or fracture zone along which there has been displacement of the sides relative to one another.

Groundwater: Water found beneath the land surface in the zone of saturation below the water table.

Hazardous material: Substance which, because of its potential for either corrosivity, toxicity, ignitability, chemical reactivity, or explosiveness, may cause injury to persons or damage to property.

Hydrogeology: The study of surface and subsurface water.

Lead Agency: The public agency which has the principal responsibility for carrying out or approving a project.

Level of Service (LOS): An indicator or traffic conditions at an intersection or on a stretch of roadway, and of the delay that can be expected in the general area; A is the best (no delay) and F is the worst.

Notice of Preparation (NOP): A brief notice sent by the public agency with principal responsibility for carrying out or approving a project to notify other agencies that an EIR is being prepared.

NO_x: A generic term for various oxides of nitrogen.

Ozone (O_3): An end product of complex reactions between reactive organic gases (or non-methane hydrocarbons) and nitrogen oxides (NO_x) in the presence of intense ultraviolet radiation.

Regional Water Quality Control Board (RWQCB): Agency which administers the requirements of the California Administrative Code, Title 23, Division 3, Chapter 15 (Section 2595,g,7) to ensure the highest possible water quality consistent with all demands.

Responsible agency: A public agency which proposes to carry out or approve a project for which a lead agency has prepared an EIR. A responsible agency is any agency with discretionary approval over a project.

Right-of-way (ROW): The right to pass over property owned by another. The strip of land over which facilities such as roadways, railroads, or power lines are built.

Seismicity: The likelihood of an area being subject to earthquakes.

Sensitive species: Generic term for any plant or animal species which is recognized by the government or by any conservation group as being depleted, rare, threatened, or endangered.

Significant environmental impact: As defined by CEQA, Chapter 3, Article 1, Section 15002(g), "a substantial adverse change in the physical conditions which exist in the area affected by the proposed project."

Trustee Agency: A state agency having jurisdiction over natural resources that may be affected by the project, which are held in trust by the state. These include the California Department of Fish and Game, State Lands Commission, and State Department of Parks and Recreation.

Waste discharge requirements: Regulation described in Title 23, Division 3, Chapter 15, of the California Code of Regulations which governs discharge of wastes to land in order to preserve the quality of the state's surface and ground waters.

3.0 PROJECT DESCRIPTION

3.1 INTRODUCTION

3.1.1 Purpose and Need for the Project

The Project Applicant/Project Proponent (Loma Linda University Adventist Health Sciences Center [LLUAHSC] doing business as Loma Linda University Health [LLUH]) is proposing a Master Plan (herein "Project") to include the renovation of its campus. The Project will consist of a multi-phased development to construct new facilities and improvements to the existing campus in order to accommodate growth in the services provided and to meet regulatory requirements. The Proposed Project would provide construction of new facilities, modernization of existing facilities, and replacement of a portion of the main hospital in response to California's SB 1953 Hospital Seismic Safety Act. It is anticipated that the Master Plan would be built out in phases over a 10-year period.

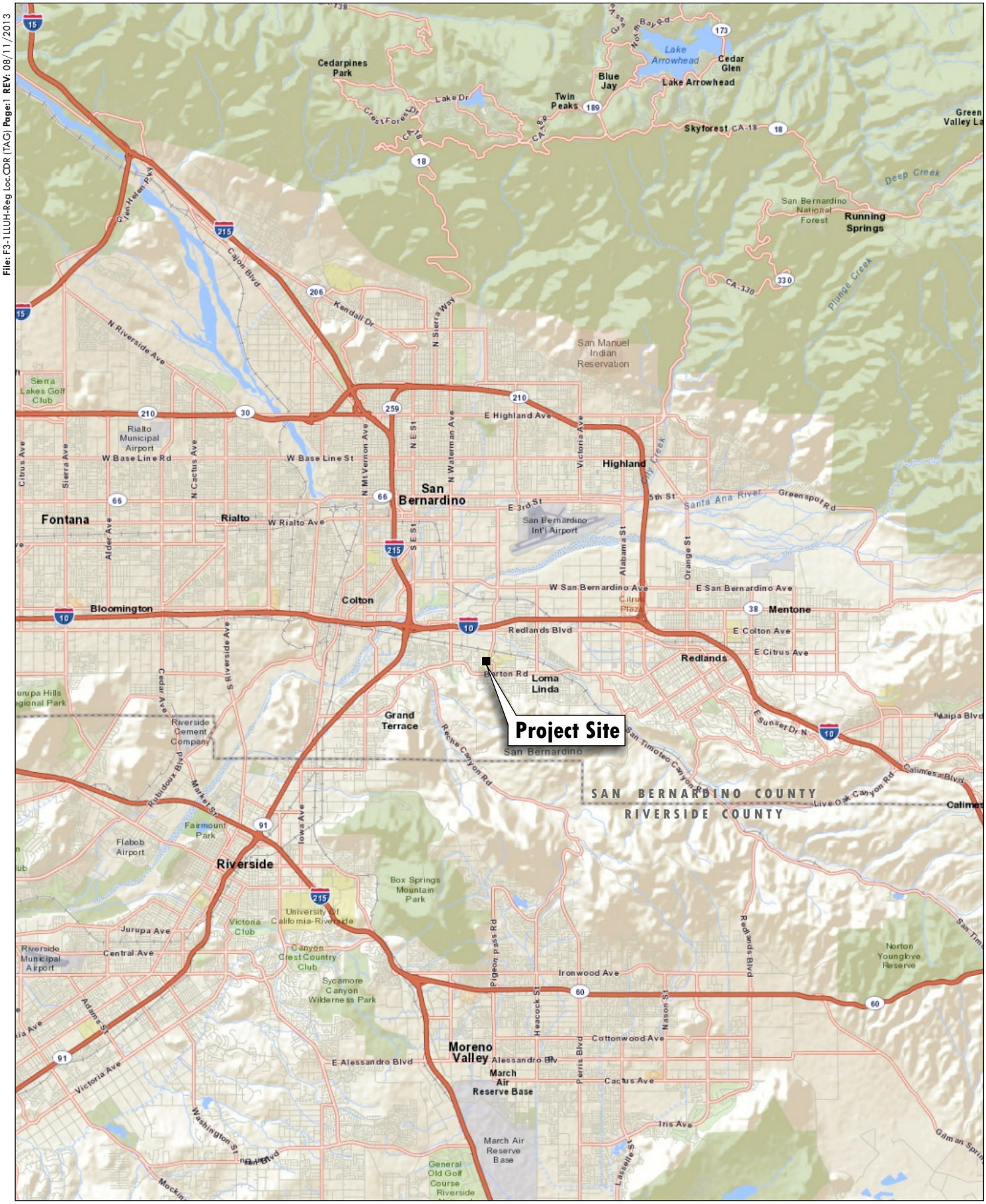
The existing LLUH hospital in Loma Linda is composed of different structures that are connected including the 1967 building (round towers and buildings below them) and the Children's Hospital built in the late 1980's. As a result of the passage of SB 1953, the 1967 portion of the hospital would be non-compliant. SB 90, an amendment to SB 1953, allows a seven-year seismic compliance extension, to the year 2020 for the 1967 portion of the hospital. It is this portion of the hospital that would be vacated and a new hospital is proposed to replace existing uses. Since certain operations of the Children's Hospital occur within the 1967 structure, a portion of the new construction would be dedicated for the children's hospital. Upon separation from the 1967 building, the current Children's Hospital would remain in compliance.

Proposed facilities and improvements associated with the Master Plan are described in detail in Section 3.4 and include: replacement facilities for the children's and adult hospitals; a parking lot and parking structure; a retrofitted or new utility plant; an upgraded or new Southern California Edison (SCE) electrical substation (either on or off-site); an addition to the existing dental school; a research building; tenant improvements; and reuse of the vacated portions of the existing hospital.

3.1.2 Project Location and Land Use Designation

The Project Site includes the existing LLUH and its entireties (i.e., Medical Center, University, Dental School, etc.) and also includes Elmer Digneo City Park located to the north of the LLUH that may be used for siting a new SCE substation to serve the campus. The park site is located east of Anderson Street and north of the Union Pacific Railroad (UPRR). The main Medical Center campus is located north of Barton Road between Anderson Street and Campus Street (see Figure 3-1 and Figure 3-2). According to the City of Loma Linda General Plan Land Use Map, the existing hospital is designated Healthcare, and the remaining campus is designated Institutional. The Elmer Digneo City Park is designated Special Planning Area B, and is zoned Institutional (I).

File: F3-1LLUH-Reg Loc.CDR (TAG) Page:1 REV: 08/11/2013



0 3.5
Miles
Source: World Street Map, 2013

LILBURN CORPORATION

REGIONAL LOCATION

LLUH MASTER PLAN PROJECT
Environmental Impact Report
City of Loma Linda, California

FIGURE 3-1

File: F3-1LLUH-Reg Loc.CDR (TAG) Page: 1 REV: 08/21/2013

N

0 3.5
Miles

Aerial: GOOGLE, June, 2012.

LILBURN CORPORATION

LEGEND

Project Site

PROJECT VICINTY

LLUH MASTER PLAN PROJECT
Environmental Impact Report
City of Loma Linda, California

FIGURE 3-2

3.1.3 Project Objectives

CEQA Guidelines Section 15124(b) requires that the project description include a statement of objectives sought by the proposed project. The statement of objectives will assist the Lead Agency in developing a reasonable range of alternatives for evaluation in the EIR. The objectives will also assist the Lead Agency in developing findings for a statement of overriding considerations, if required.

The specific Project Objectives stated below are intended to be consistent with the City's goals for implementing the General Plan, and include the following:

- Comply with California's SB 1953 Alfred E. Alquist Hospital Seismic Safety Act.
- Continue to maintain current licensing compliance and provide health care on a regional basis.
- Provide an attractively designed, mastered-planned campus that would be an amenity for the area and surrounding communities.
- Provide necessary parking needed to meet the demand of visitors, patients, physicians, students and staff.
- Continue to provide a safe and modern university for students by upgrades and creation of new facilities.
- Expand the City's economic base with medical support services, research facilities, and professional offices.
- Continue to maintain the image of the City as a university town where education, health and medical services, and recreation are important.
- Upgrade the campus's infrastructure systems by providing new and improved services and facilities.
- Improve site access and safety along Barton Road, Campus Street, and Anderson Street.
- Provide a more self-reliant utility source in the event of an emergency

3.2 REGIONAL SETTING

The Project Site is located in the City of Loma Linda within the San Bernardino Valley region of San Bernardino County (see Figure 3-1). The San Bernardino Valley, approximately 100 square miles in size, lies at the south base of the Transverse Ranges (a group of mountain ranges that begin at the southern end of the California Coast Ranges and lie between Santa Barbara and San Diego counties). The valley is bordered on the north by the San Gabriel Mountains and the San Bernardino Mountains, on the east by the San Jacinto Mountains, and on the south and west by the Santa Ana Mountains, and has an elevation that varies from 590 feet on valley floors near Chino to 1,380 feet near San Bernardino and Redlands.

Loma Linda is approximately 60 freeway miles east of downtown Los Angeles along Interstate 10 (I-10) and located between Los Angeles and Palm Springs. The City of Loma Linda is bordered on the north by San Bernardino, on the east by Redlands, on the west by Colton, and on the south by a small area of unincorporated territory separating Loma Linda from the city of Moreno Valley.

The City of Loma Linda encompasses the area south of the I-10 freeway, west of Nevada Street, east of Gage Canal and north of the northwestern tip of the San Timoteo Badlands (also referred to as Loma Linda Hills). The City's total planning area is 7.5 square miles.

At the time of the 2010 census, the City had a population of 23,261, up from 18,681 at the 2000 census. The central area of the City was originally known as Mound City and its eastern half was known as Bryn Mawr (the remnants of the unincorporated Bryn Mawr were annexed by the City in 2006).

The City of Loma Linda is located in a geologically complex area situated between the Transverse Ranges and the Peninsular ranges Geomorphic Provinces within California. The intersection of the northwest-trending Peninsular Ranges and east-west-trending Transverse Ranges has created a compressional uplifting and extensional downwarping, which have sculpted the topography within the City.

Loma Linda features a somewhat cooler version of a Mediterranean climate with cool to chilly winters, with occasional frost, and hot, dry summers. The arid climate during the summer prevents tropospheric clouds from forming, which accounts for the area's high temperatures with the highest recorded summer temperature at 118 °F in 2006. Loma Linda receives an annual average of 13.6 inches of rain.

Located in the South Coast Air Basin, an area that includes Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties, air quality regulation within the City is administered by the South Coast Air Quality Management District (SCAQMD), a regional agency created for the air basin.

3.3 LOCAL SETTING

3.3.1 Location

The approximate 23.8-acre Project Site is centrally located in the City of Loma Linda. Specifically, the Project Site is located on the north side of Barton Road, on the west side of Anderson Street, on the east side of Campus Street, and generally south of the UPRR, with a small portion (Elmer Digneo City Park) extending north of the UPRR. The geographic coordinate location of the Project Site is 34.049347 north latitude and -117.264011 west longitude.

The Project Site encompasses the existing LLUH campus, with the exception of a small area located adjacent to the existing hospital. Figure 3-2 illustrates the local vicinity of the Project Site. Major arterials in the vicinity of the Project Site include Barton Road, Anderson Street,

Redlands Boulevard, Mountain View Avenue and I-10. The San Bernardino International Airport is approximately 3.2 miles northeast of the Project Site. The UPRR generally bounds the Project Site on the north with the Elmer Digneo City Park extending north of the UPRR on the northeastern boundary of the Project Site.

3.3.2 Surrounding Land Uses

Existing land uses surrounding the Project Site are shown in Table 3-1. The table also indicates the General Plan Designation and zoning for the Project Site and the surrounding properties.

Table 3-1
Existing Land Use and General Plan/Zoning Designations

Direction	Existing Land Use	General Plan Designation	Zoning Designation
Campus Site	LLUH	Health Care, Institutional	Institutional
North	Vacant land, Union Pacific RR Tracks, Loma Linda Academy	Special Planning Area B, Institutional	Institutional
South	Barton Road, LLUH East Campus, Single-family Residential	Healthcare, Low Density Residential	Institutional, Single Residence (R-1)
East	Anderson Street, Commercial, LLUH related facilities	Special Planning Area C, Institutional	Institutional
West	Campus Street, LLUH parking, Multi-family residential	Institutional	Institutional, Duplex (R-2), Multi-Family Residence (R-3)

Surrounding land uses, General Plan Land Use Designations and Zoning Districts for the Option 1 SCE substation site are shown in Table 3-2.

Table 3-2
Option 1 SCE Substation Site
Existing Land Use and General Plan/Zoning Designations

Direction	Existing Land Use	General Plan Designation	Zoning Designation
Substation Site	City Park	Special Planning Area B	Institutional
North	Single-family homes	Special Planning Area B	Institutional
South	Union Pacific RR Tracks, LLUMC Campus	Heath Care	Institutional
East	Vacant Land	Special Planning Area B	Institutional
West	Anderson Street, Vacant Land	Special Planning Area B	Institutional

3.3.3 Legal Description

The Project Site is found on the San Bernardino South USGS 7.5-minute quadrangle map in portions of Sections 25 and 26, Township 1 South, Range 4 West, San Bernardino Baseline and

Meridian. The Project Site totals approximately 23.8 acres and consists of all or parts of the following parcels: 0284-081-03, 0284-083-33, 0284-082-18, 0283-071-38, 0283-071-50, 0284-102-17, 0284-083-09, 11, 12, 18, and 32.

3.3.4 History of the Project Site

In January 1901, Loma Linda, meaning "pretty hill," received its name when a post office was opened for the Seventh Day Adventists sanatorium. On August 26, 1905, Loma Linda Sanitarium was incorporated; six weeks later on October 13th the first two patients were admitted. The current 11-story high Loma Linda University Medical Center (LLUMC) opened in 1967, an outgrowth of the original Sanitarium on the hill. Loma Linda University Health Care, a management service organization, supports the many programs and services provided by 400-plus faculty physicians. LLUMC operates some of the largest clinical programs in the United States in areas such as neonatal care and outpatient surgery and is recognized as the international leader in infant heart transplantation and proton treatments for cancer. Each year, the institution admits more than 33,000 inpatients and serves roughly half a million outpatients. As the only tertiary-care hospital in the area, LLUMC is the only Level I regional trauma center for Inyo, Mono, Riverside, and San Bernardino counties.

Loma Linda University Children's Hospital is the sole children's hospital for almost 1.3 million of California's youth (San Bernardino, Riverside, Inyo, and Mono Counties). With over 275 beds dedicated for children, the American Board of Surgeons has designated the Children's Hospital as a Level 1 Trauma Center, providing the highest level of trauma care within the Inland Empire four-county area. Each year, more than 15,000 children stay at the hospital and over 130,000 children visit the hospital for ambulatory care. The only medical facility in the Inland Empire specializing in the care of children, the Loma Linda Children's Hospital transports over 1,100 critically ill or injured children each year from surrounding hospitals (Figure 3-3).

Approximately 4,500 students study in seven schools and the Faculty of Religion and Faculty of Graduate Studies located on the campus. More than 55 programs are offered by the schools of Allied Health Professions, Dentistry, Medicine, Nursing, Pharmacy, Public Health, and Behavioral Health. Curricula offered range from certificates of completion and associate in science degrees to doctor of philosophy and professional doctoral degrees.

Elmer Digneo City Park is a four-acre multi-purpose park. According to archival photographs on file with the City, the park has been at its existing site since at least 1997, and has a playground tot area, barbecue pits, restrooms, half basketball court, shade trees, benches and drinking fountains.

3.4 PROJECT DESCRIPTION

The Project Applicant/Project Proponent (Loma Linda University Adventist Health Sciences Center [LLUAHSC] doing business as LLUH) is proposing a Master Plan to provide for the renovation of its campus. The Project consists of a multi-phased development to construct new facilities and improvements to the existing campus in order to accommodate growth in the services provided and to meet regulatory requirements. The Proposed Project would provide construction of new facilities, modernization of existing facilities, and replacement of a portion

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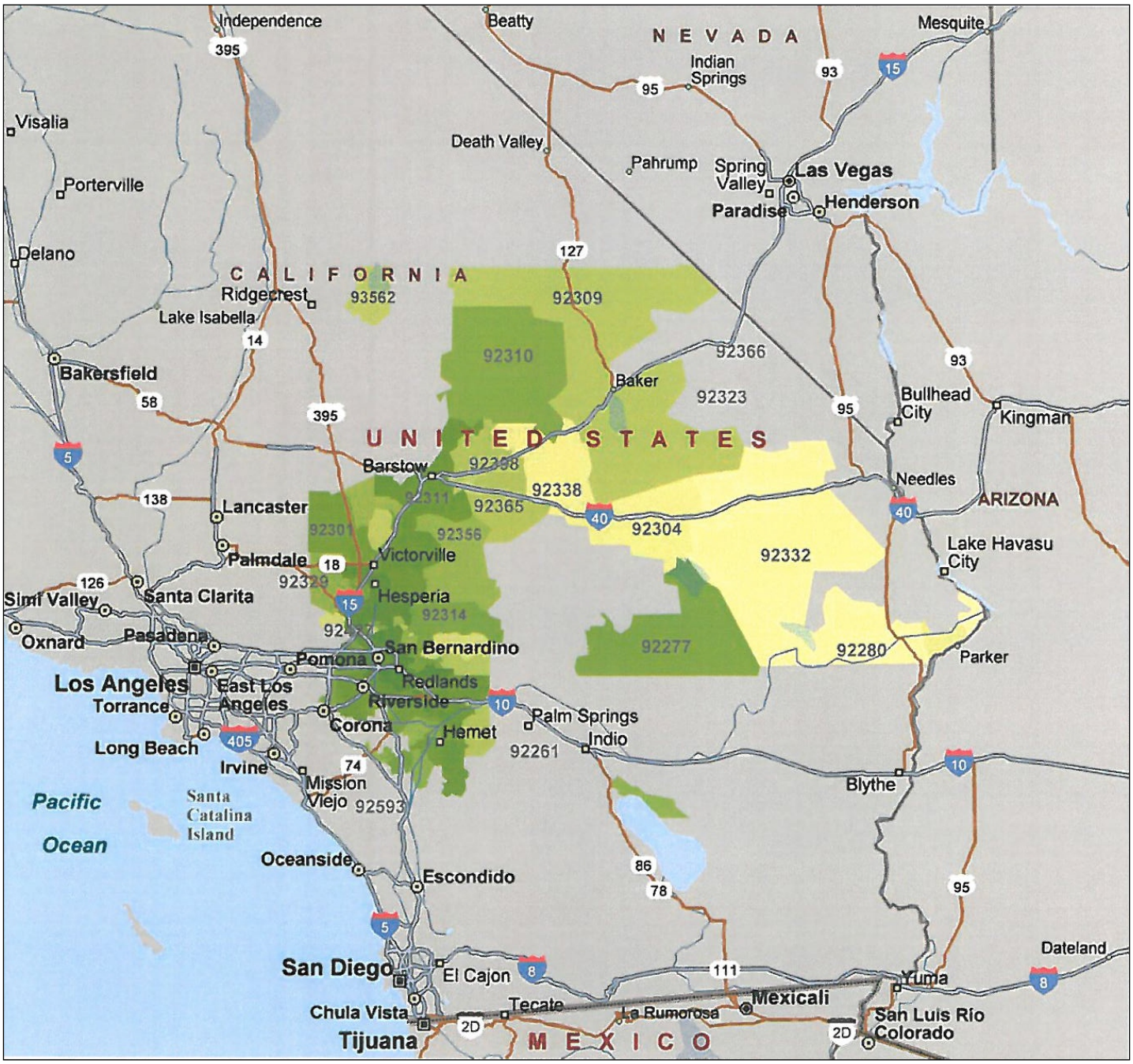


LEGEND

Patient discharges per 1,000 people by zip code

1 37 1,400

0 50
Miles
Source: LLUMC SB90 Application

LILBURN CORPORATION

HOSPITAL SERVICE AREA

LLUH MASTER PLAN PROJECT
Environmental Impact Report
City of Loma Linda, California

FIGURE 3-3

of the main hospital in response to California's SB 1953 Hospital Seismic Safety Act. It is anticipated that the Master Plan would be built out in phases over a 10-year period.

The LLUMC is composed of a number of different structures that are connected including: the original 1967 building (round towers and buildings below them), the radiology building known as the Schuman Pavilion built in the mid 1980's, and the Children's Hospital built in the late 1980's. SB 90, an amendment to SB 1953, allows a seven-year seismic compliance extension, to the year 2020 for the 1967 portion of the hospital. It is this portion of the hospital that would be vacated and a new hospital is proposed to replace existing uses. Since certain operations of the Children's Hospital occur within the 1967 structure, the new hospital would include a designated area for children as well as adults. Upon appropriate separation from the 1967 building, the current Children's Hospital would remain in compliance with SB 1953.

Proposed facilities and improvements associated with the Master Plan include: 1) a seven-story, approximately 250,000 square-foot, 760-space patient and visitor parking structure; 2) a 13-story (approximately 215 feet in height), approximately 732,000 square-foot hospital with 464 beds to replace a portion of the seismically-noncompliant existing hospital, and 80 parking spaces; 3) an approximate 34,000 square-foot new or retrofitted utility plant; 4) an approximate 14,000 square-foot new or upgraded Southern California Edison (SCE) electrical substation (on-site or off-site); 5) a two-story, approximately 9,000 square-foot addition to the existing dental school; 6) a four-story approximately 90,000 square-foot research building; and 7) tenant improvements and reuse of the vacated portions of the existing hospital. Improvements and upgrades at the campus would also include potential expansion of utility lines or other infrastructure updates within streets that occur within the Project Site (i.e., Anderson Street, Taylor Drive, Loma Linda Drive, etc.).

The proposed new hospital would consist of acute care hospital space, some of which may remain as shell space for future build out. The facility would have shared and support services located in the first three levels of a shared podium (one subterranean level, and the remaining two levels above grade), with two bed towers above serving separate pediatric and adult populations. The new hospital would provide for the relocation and decommissioning of the existing acute care services in seismically non-compliant structures. The new building would include: new nursing units, new Pediatric and Adult Emergency Departments, Perioperative Suites, Imaging Departments, and other support service departments. The total licensed capacity of the existing construction (186 patient beds) and new construction (464 patient beds) for the Medical Center would decrease from the current license of 718 beds to a new license of approximately 650 beds. Upon completion of the new building and surrounding site, all inpatient functions in non-compliant space will transfer to the new hospital.

The new parking structure would be located on the northwest corner of Barton Road and Campus Street. The 1.9-acre site is currently developed with 83 surface parking spaces. Improvements would include a new access point on Barton Road and removal of the 83 surface parking spaces. The new hospital would be located on the Project site off of Anderson Street between Barton Road and Prospect Avenue. The area for the new hospital is currently developed with 550 surface parking spaces. Improvements at the site would include two new access points on Barton Road and two new road alignments on Anderson Street at Prospect Avenue and Starr Street. New driveways along Barton Road would allow access for the new parking structure and for emergency vehicles only. The new main hospital entry would be aligned with Prospect

Avenue, and the alignment from Starr Street would be dedicated emergency department access only.

The existing utility plant and existing SCE substation would need to be retrofitted/upgraded, or newly constructed during the first phase of construction in order to provide adequate utilities for the upgraded medical center facilities. The Project Applicant is proposing a new plant ("Utility Plant Option 1") at the site of the existing Housekeeping Building ("Radiation Safety Building") as an alternative to upgrading the plant at its existing site ("Utility Plant Option 2") (see Figure 3-4 Master Plan Options). To meet the demands of the new hospital building, a new or upgraded SCE electrical substation would also be required. The Applicant is considering two optional sites for the substation: the first option ("SCE Option 1") would be located at the Elmer Digneo City Park site located on Anderson Street just north of the UPRR, and the second option ("SCE Option 2") would be an upgrade of the existing on-site substation located to the south of the existing utility plant. This option would be selected if the Utility Plant Option 2 is selected.

The 8,900-square foot dental school addition would occur on the north side of the existing School of Dentistry (Prince Hall) located at 11029 University Avenue. Approximately 3,000 square feet of the existing building would need to be remodeled to accommodate the addition. No substantial changes in building height would occur.

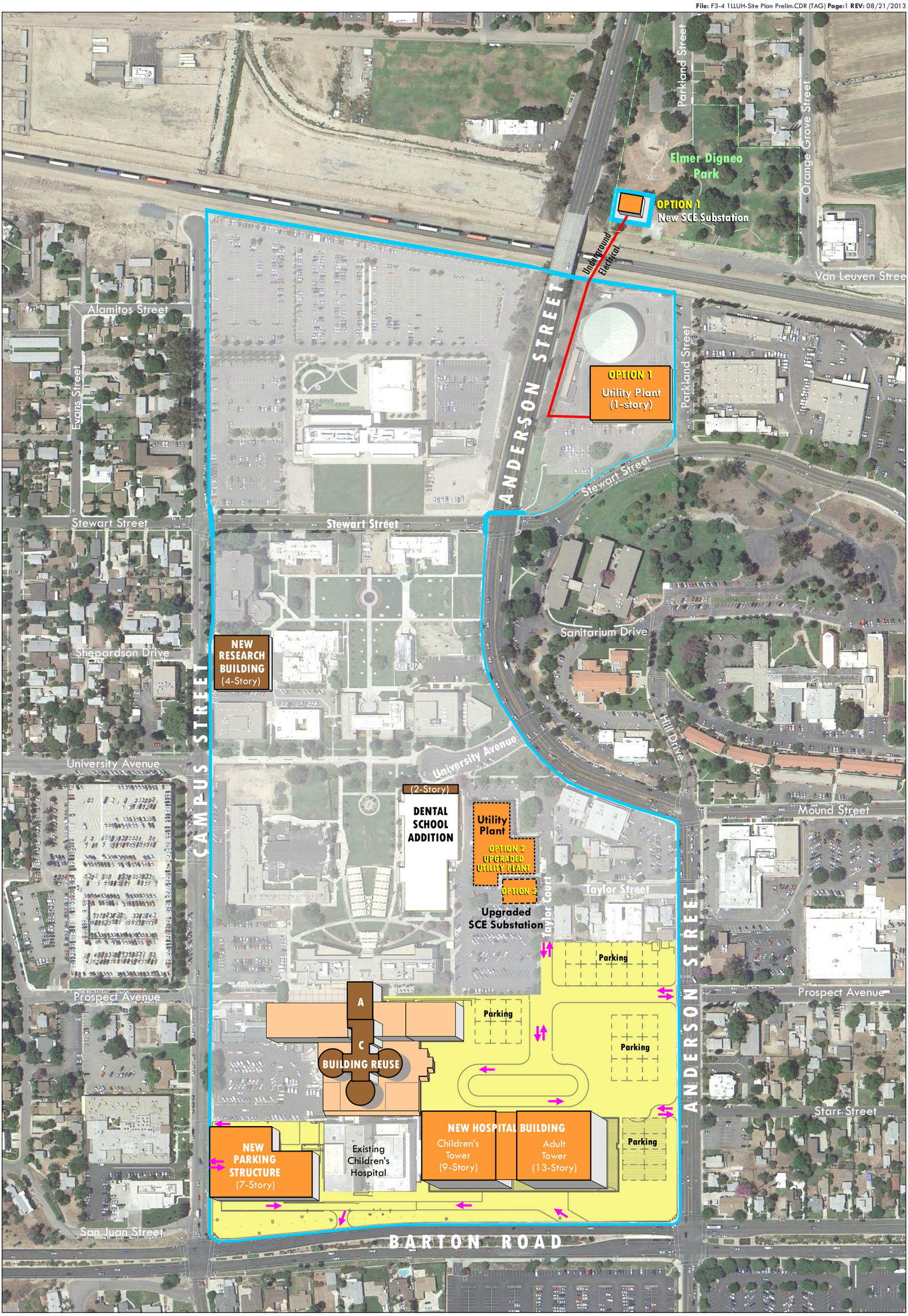
A new 90,000-square-foot research facility is proposed on or near the site of Risley Hall, an existing laboratory and classroom building. The new facility will provide expanded laboratory and research office space as well as space for new high-tech research modalities to allow for increased interdisciplinary research. The facility is planned to be a three to four-story structural steel building approximately 60 feet in height.

A total of ten (10) residential structures (currently used for office/administrative space) located at the northwest corner of Prospect Avenue and Anderson Street would be demolished to allow for the expansion and re-alignment of Prospect Avenue (a separate City project), and re-alignment of the main entrance of the hospital. The space would also provide a staging area for equipment during construction.

The Proposed Project would occur within two phases over an approximate 10-year period. Figure 3-4 outlines facilities to be constructed and/or improved for each phase. A description of Phases 1 and 2 is provided herein.

3.4.1 Phase 1: New Parking Structure, Hospital Tower, SCE Substation, New or Upgraded and Expanded Utility Plant, and Other On-site Improvements

New Patient and Visitor Parking Structure: In order to maintain operations during the construction of the new hospital, a seven-level, approximate 85-foot high, 760-space parking structure would be constructed east of Campus Street adjacent to the existing hospital's South Tower to replace the existing surface lots on the site of the new hospital. Construction of the parking structure would require the demolition of approximately 83 surface parking stalls currently dedicated to hospital administration. Modifications to site access, circulation and various landscaping improvements are proposed. A new access point from Barton Road is also proposed for the parking structure.



LEGEND

- Project Site
- Phase 1 Master Plan Buildings
- Phase 1 Master Plan Site Work
- Phase 2 Master Plan Buildings
- New Underground Electrical
- Program Ingress and Egress

N

0 250'

Feet

Aerial: GOOGLE, June, 2012.

LILBURN CORPORATION

PROPOSED MASTER PLAN with PHASING

LLUH MASTER PLAN PROJECT
Environmental Impact Report
City of Loma Linda, California

FIGURE 3-4

New Hospital: Proposed construction includes a 732,000 square-foot acute care hospital, with portions to remain as shell space for future build out. The hospital would have support services located in the first three levels of a podium, with bed towers above serving separate pediatric and adult populations. The new hospital would provide for the relocation and decommissioning of the existing acute care services in existing buildings that will be deemed as seismically non-compliant structures starting in the year 2020 in accordance with SB 1953 and SB 90. The new building will include approximately 464 patient beds, new pediatric and adult emergency departments, perioperative suites, imaging departments, and other support services. The total licensed capacity of the facility will decrease from the current license of 719 beds to 650 beds.

The existing hospital is eleven (11) stories (including two subterranean floors) and has a total height of approximately 167 feet, and is approximately 138 feet in height at the main entrance level 1. The difference in the reported heights of the structure is due to existing slopes at the site. The new hospital is being evaluated for an overall height of 13 stories and approximately 215 feet in height.

The existing hospital includes two roof-top helistops: one on Tower A and one on the Children's Hospital, and an emergency helistop on the lawn area north of the Medical Center. The helistop on the Children's Hospital would remain operational once the new hospital is constructed. There are on average, two to four helicopter flights per day for the transit of patients to the hospital. During construction of the new hospital one of the roof-top helistops would remain operational and a second would be constructed on the tallest tower of the new hospital. During emergency situations, the lawn north of the Medical Center would continue to be used as a helistop.

New Electrical Substation – Two options are being considered to develop a new connection to the power grid provided by Southern California Edison (SCE). Option 1 would connect to the north at a new 12,240 square-foot substation proposed to be constructed in the Elmer Digneo City Park site, and Option 2 would upgrade the existing SCE substation located to the south of the existing utility plant ("power plant") on an area currently used for surface parking. The substation would be enclosed within an approximately 8-foot high wall.

Utility Plant: The existing campus utility plant is located west of Anderson Street and south of University Avenue and serves the campus and the existing hospital with efficient and centralized power and other utilities. The utility plant consists of three areas: the original Central Heating and Cooling Plant, a Centrifugal Chiller Plant, and the Cogeneration Plant. The three plants are adjacent to each other and are referred to herein as the "utility plant". The Central Heating and Cooling Plant includes absorption chillers, pumps, cooling towers, and a backup boiler as well as office and other administrative space. The Centrifugal Chiller Plant includes 5 chillers, pumps, and a roof-mounted cooling tower. The utility plant also provides softened, reverse osmosis, and deionized water treatment systems; and compressed air.

LLUH is currently reviewing two options to modernize and expand these services. The capacity of the cogeneration power plant would be increased in phases from the existing 10 megawatts (MW) up to a maximum of 22 MW, allowing LLUH to become less reliant in time, on power purchased from others. The capacity increases are planned to be constructed in units of 7.3 MW

and the maximum buildout would be 22 MW. The two utility plant options evaluated in the EIR are:

Option 1: A new 34,000 square-foot plant is proposed in order to respond to SB 1953 mandates, modernize obsolete and antiquated utility services, avoid disruption to ongoing patient care activities, and allow for increased future capacity. Construction of a new plant would occur near the thermal energy storage tank, located east of Anderson Street and just south of the UPRR tracks. Construction activities would require the removal of the existing 10,000 square-foot Radiation Safety ("Housekeeping") Building and 40 surface parking spaces. The new single-story utilities plant would renovate and expand the current services provided on the campus. Upon completion of the new plant, the existing plant would be decommissioned.

Option 2: Expansion of the existing cogeneration plant located at 11100 Anderson would require structural upgrades to the existing building, replacement of equipment within the existing plant, retrofitting the existing utility plant, as well as a new 3,000 square-foot walled courtyard, and new utility feeds. The retrofitted facility would expand onto an area north of the existing plant site and include the current grassy knoll area at Anderson Street and University Avenue. New equipment would be provided to upgrade the existing services currently provided.

In addition to electrical power provided from the SCE substation directly adjacent to the south of the plant, the plant uses natural gas as a source of energy. The natural gas is used to power the plant's steam-turbine-generators at the co-generation building. Emissions from the utility plant include reactive organic gases, carbon monoxide, carbon dioxide, methane, sulfur oxides, nitrogen oxides and particulate matter.

The upgraded SCE substation ("SCE Option 2") would be at the existing substation site, south of the existing utility plant.

Other On-site Improvements: Site clearing and excavation for the new hospital footprint would include temporary relocation and rerouting of various underground utilities. As these utilities serve the existing acute care buildings, a building permit from Office of Statewide Health Planning and Development (OSHPD) would be required. West of Anderson Street and north of Barton Road the new hospital footprint would result in the demolition of approximately 550 surface parking spaces and require a new site access point to align with Prospect Avenue. Modifications to site access, circulation and various landscaping improvements are also proposed.

3.4.2 Phase 2: Existing Hospital Re-use, New Research Building, and Dental School Addition

Re-use of the existing Hospital - Towers A & C: The decommissioning and relocation of acute services would allow for the reuse of approximately 400,000-square feet within the existing hospital's A and C towers. The new uses are anticipated to be split between existing support spaces, continuing outpatient services and possible future educational services. Construction activities are anticipated to include work required for seismic separation, remodeling, and reconfiguration of the existing emergency department, ambulance entrances and loading dock.

Research Building: A new research facility is proposed that would transform the University's ability to provide interdisciplinary and translational research in a single facility. The proposed facility would be located on or near the site of Risley Hall, an existing laboratory and classroom building. The new facility would provide expanded laboratory and research office space as well as space for new high-tech research modalities to allow for increased interdisciplinary research. The 90,000 square-foot facility is proposed to be a 3-4 story building (approximately 60 feet in height).

Dental School Addition: The proposed dental school addition would be constructed on the north side of the School of Dentistry (Prince Hall). The proposed expansion would create an additional 4,450 square feet on each of two floors for a total added floor area of 8,900 square feet.

The first floor of the addition would provide additional reception, administration and consultant space and an expanded and reconfigured waiting area for the Surgery Center for Dentistry. The second floor would add a resident's lounge, support staff space and offices as well as expanded clinical dentistry space for several specialties. Approximately 3,000 square feet of the existing building would be remodeled to accommodate the addition.

3.4.3 Related On-Site Improvements

Parking improvements, along with future site identification signage and landscaping are included in the Master Plan.

Parking

In coordination with the City, the Project Proponent would continue to maintain the actively managed Master Parking Plan (agreement with the City) that is documented weekly. As part of the Project, LLUH would continue to maintain parking requirements per the existing agreement. Currently, a total of 7,739 spaces exist. Additional parking will be phased with construction to match demand. The Proposed Project at build-out will have approximately 9,300 parking spaces. The Project Site would provide a vast majority of the spaces located within parking structures. The sizes and spacing of all parking spaces would be provided consistent with the City of Loma Linda Municipal Code.

Lighting/Signs

Commercial lighting for the Project Site would be consistent with existing lighting and would continue to be provided for safety, identification and aesthetic purposes. New applications would include building lighting, and area/parking lot lights. Proposed lighting for the Project would be consistent with existing lighting. A Master Sign Program will be approved by the City Planning Commission prior to the construction of any new signage on- or off-site related to the LLUMC. The Master Sign Program is not included in this CEQA review. All signage would be consistent with the City's Municipal Code current at the time of submittal and the approved Master Sign Program.

Landscaping

Perimeter landscaping is proposed along the Project Site's street frontages and throughout the interior of the Project Site. All landscaping required of the Proposed Project would be implemented consistent with the Loma Linda Municipal Code and the 2008 LLUAHSC Landscape Master Plan.

Off-Site Improvements

Primary ingress and egress to the site would be provided via new access points on Anderson Street and Barton Road. The Master Plan would continue to provide pedestrian sidewalks around the Project Site along Barton Road and Anderson Street. The existing Class I bike lane would continue along Barton Road. Analysis of the proposed access points is included in Appendix A, Traffic, and all improvements would be in accordance with the City of Loma Linda Public Works Department, Traffic Engineering Division.

Utilities, including electricity, natural gas, water, sewer, drainage, and telecommunications would be extended to the new facilities from existing utilities and lines. Water service for the Project Site is currently provided by the Loma Linda University Water System (LLUWS). Proposed facilities and improvements would continue to be provided by the LLUWS. Off-site sewer collection service would continue to be provided by the City of Loma Linda Public Works Department, with wastewater treatment provided by the City of San Bernardino Water Department. Stormwater runoff would continue to be collected in existing public and private storm drain facilities. Stormwater runoff from the Proposed Project would be treated in accordance with the requirements of San Bernardino County and the City of Loma Linda prior to being collected in the existing and/or upgraded storm drain facilities.

3.4.4 Schedule

Proposed development to be completed for the LLUH Master Plan Project would occur in two phases over an approximate ten-year period commencing in 2014 with the demolition of the ten (10) residential structures to allow for re-alignment of the hospital main entrance from Anderson Street near Prospect Avenue. Construction Years 1 through 2 would also include construction of the parking structure at the northeast corner of Campus Street and Barton Road, and re-alignment of the main hospital entrance and Prospect Avenue (a separate City project). Construction Years 2 (late year 2, not to overlap with the construction of the Parking Structure) through 6 would include: construction of the new hospital, removal of the 80-space parking lot, construction of the retrofitted or new utility plant and new or retrofitted SCE substation. Construction Year 7 would include the construction of the new Research Building.

4.0 ENVIRONMENTAL IMPACT EVALUATION

This section presents a description of the affected environment and the potential environmental impacts that would result from implementation of the Proposed Project. Cumulative impacts are discussed in Section 5.0 and an evaluation of project alternatives are discussed in Section 6.0.

The City of Loma Linda significance thresholds were used to assess the Project impacts on individual resources. The significance thresholds are provided for each resources area for which impacts were evaluated. The impact analysis discusses potential impacts in the order of the thresholds presented for each resource area.

Under CEQA, Section 15128, if the Lead Agency determines that an EIR will be required for a project, the Lead Agency must focus on the significant effects of a project and indicate the reasons that other effects would not be significant or potentially significant. The City of Loma Linda issued a Notice of Preparation (NOP) to surrounding property owners and local organization on March 11, 2013, and then to state agencies on May 17, 2013 pursuant to State CEQA Guidelines, Section 15082 (a), 15103, and 15375.

The following topics have been included in the EIR analysis appearing in subsequent chapters.

4.1 Aesthetics
4.2 Air Quality
4.3 Cultural Resources
4.4 Geology and Soils
4.5 Hazards and Hazardous Materials
4.6 Hydrology and Water Quality
4.7 Greenhouse Gases/Climate Change
4.8 Land Use and Planning
4.9 Noise
4.10 Utilities and Service Systems

4.1 AESTHETICS

4.1.1 Introduction

This section of the EIR discusses the visual setting of the Project Site and the general scenic quality of the surrounding area that may by impacted by the Proposed Project. An aesthetic and visual quality analysis based on site photographs and conceptual designs of the new campus buildings was undertaken to study the impact to adjacent properties and existing views of the Project Site. The analysis provided herein is based on information from site visits, site photographs, and Applicant-provided conceptual design prepared for the Proposed Project.

4.1.2 Environmental Setting

Area-Wide Visual Character

The Project Site includes the existing LLUH and its entireties (i.e., Medical Center, University, Dental School, etc.) and also includes a portion of the approximate 4-acre Elmer Digneo City Park located to the north of the LLUH that may be used for siting a Southern California Edison (SCE) substation to serve the campus. The park site is located east of Anderson Street and north of the Union Pacific Railroad (UPRR). The main Medical Center campus is located north of Barton Road between Anderson Street and Campus Street (see Figure 3-1 and Figure 3-2). The approximate 23.8-acre Project Site is centrally located in the City of Loma Linda. Specifically, the Project Site is located on the north side of Barton Road, on the west side of Anderson Street, on the east side of Campus Street, and generally south of the UPRR, with a small portion (Elmer Digneo City Park) extending north of the UPRR.

Views from LLUH Campus

North – The view looking north from the Project Site consists of the UPRR and vacant land in the foreground, followed by scattered commercial development, the Loma Linda Academy, the I-10 Freeway in the middle ground, followed by the San Bernardino Mountains in the background.

South – The view from the Project Site to the south consists of parkway landscaping, sidewalk and Barton Road (a four-lane roadway with a landscaped center median) in the foreground, followed by additional parkway landscaping and fencing associated with the backyards of single-family residences located on the south side of Barton Road. Infrastructure along Barton Road consists of typical curb and gutter, sidewalks, a landscaped center median, above-ground power lines on the south side of Barton Road and a designated Class I bike lane on both the north and south sides of the road.

East The primary view from the Project Site to the east includes Anderson Street. Single-family residences are viewed on the east side of Anderson Street from Barton Road to Prospect Avenue. From Prospect Avenue to Mound Street commercial development is visible, and from Mound Street to UPRR LLUH facilities and buildings are in the foreground. The middle ground views include trees and streets within the residential areas, surface parking within the commercial

areas, and interior drives and parking space associated with the LLUH facilities. Background views from the east include distant view of the San Bernardino Mountains and foothills within Redlands and Yucaipa.

West – Views west of the Project Site are mainly composed of LLUH facilities and related parking areas spanning the area from the northwest corner of Barton Road and Campus Street to the southwest corner of Shepardson Drive and Campus Street. North of Shepardson Drive to the UPRR is mainly composed of single-family and multi-family residences. The area is landscaped with typical residential lawns and mature trees; there are no overhead power or telephone lines.

Views of LLUH Campus

North – From the Project Site's northern boundary looking south, surface parking is visible in the foreground, followed by LLUH buildings including the Centennial Complex, Shryock Hall and Evan's Hall, Alumni Hall and the existing hospital in the middle ground, and the Loma Linda Badlands (foothills) in the background.

South – From the south side of Barton Road looking north at the Project Site, the four-lane Barton Road with a center landscaped median and east- and west-bound Class I bike lanes is visible in the immediate foreground. The LLUH Children's Hospital and the towers of the existing hospital are visible in the middle ground as well as surface parking, parking structures, other LLUH buildings and landscape. Portions of San Bernardino Valley and the San Bernardino Mountains are visible in the background.

East – Views of the LLUH Campus looking east, from Campus Street include LLUH buildings including the existing hospital as well as related surface parking and landscaping in the foreground and middle ground. Views of San Gorgonio Mountain and foothills within Redlands and Yucaipa are visible in the background.

West – From Anderson Street looking west at the Project Site, surface parking up to Prospect Avenue as well as related campus lighting and landscape are visible in the foreground. The hospital (including both the Children's and the 1967 structure) is most visible from the east, and makes up the middle ground. Reche Canyon and Grand Terrace are visible in the southwest background. North of Prospect Avenue, a small portion of commercial development is visible. Once Anderson veers west near Mound Street, LLUH structures are visible in the foreground as well as related surface parking and landscaping. A large open space area with grass, sculptures and trees separates the Shryock Hall and Evans Hall from the Centennial Complex north of Stewart Street in the middle ground. There are no major landmarks or structures visible in the background. Near the Project Site's northern boundary, surface parking associated with the Centennial Complex dominates the foreground, with single-family residential in the middle ground followed by Loma Linda in the background.

Views from the Elmer Digneo City Park Site

North –Views looking north from the Elmer Digneo City Park site consists of open space parkland including: grass, trees, playground equipment parking area and single-family residences. The San Bernardino Mountains span across the background.

South – Views from the Elmer Digneo City Park looking south include a chain-link fence marking the boundary of the park, overhead power lines, the UPRR followed by a water storage tank, mature Cypress trees, parking lot and portions of the LLUH buildings. A portion of the Loma Linda Badlands ridgeline can be seen in the background.

East – Views from the Elmer Digneo City Park site looking east include open space grass area, paved basketball court in the foreground, followed by landscaped open space with mature trees in the middle ground, which shield views of San Bernardino Mountains in the background.

West – Views from the Elmer Digneo City Park site looking west include a vegetative slope that supports Anderson Street which is an overpass at this location. The UPRR traverses beneath Anderson Street and the tracks and yard are visible from the portion of the park site that is evaluated as an optional location for the Master Plan's SCE substation. With the exception of the UPRR, middle ground and background views are limited due to the slope and overpass.

Views of the Elmer Digneo City Park Site

North – From the north views of the potential substation location are limited due to the presence of mature trees. However from within the park, the site is visible and occurs near the southwestern corner of the park, near the paved basketball court. The substation would limit views of the UPRR tracks and yard.

South – Views from the south looking at the park site include chain link fence and the UPRR in the foreground, followed by open space park land vegetated with grass and mature trees. Background views would be limited due to mature trees.

East – Views from the east looking west at the park site include open space park land, with grass and mature trees. An approximate 12-foot by 25-foot brick restroom building is visible in the middle ground, as well as playground equipment. Views of the parking area are limited due to mature trees. Views of the potential substation location are limited from the residential development (located northeast and across from the park, due to mature trees.

West – Views from the west looking east toward the park site are limited to vehicle and pedestrian traffic along Anderson Street. Since Anderson Street is elevated at this location, vehicles have limited views of the park and mainly see tree tops. Given the travel speed along this portion of Anderson Street (e.g. 35 miles per hour), the parking area, restroom building and playground equipment area visible to vehicle drivers/passengers for a brief moment.

Photo 1: Looking southwest from the Elmer Digneo City Park toward the UPRR.

Photo 2: View from within the Elmer Digneo City Park looking north.

Photo 3: From the Elmer Digneo City Park looking south.

Photo 4: Interior view looking south from the Campus quad area at the existing hospital

4.1.3 Applicable Policies, Plans and Regulations

City of Loma Linda General Plan

The Land Use Element of the General Plan designates the general distribution, location, and extent of uses, such as housing, business, industry, open space, institutions, city facilities and other categories of public and private uses of land. The City's Municipal Code is the primary mechanism for implementing the general land use categories of the General Plan. It provides the detailed regulations pertaining to permitted and conditional uses, site development standards, and performance criteria to implement the goals and policies of the General Plan.

The City of Loma Linda General Plan establishes comprehensive goals, objectives, policies, and proposed implementation programs to meet the City's future planning needs. According to the City of Loma Linda General Plan, the existing hospital is designated Healthcare, and the remaining campus as well as the Elmer Digneo City Park is designated Institutional. According to the City of Loma Linda General Plan, the existing hospital is designated Health Care, and the remaining campus is designated Institutional, and both the hospital and remaining campus are zoned Institutional. The Elmer Digneo City Park site is currently zoned Institutional with a General Plan land use designation of Special Planning Area B.

According to the City's Municipal Code Title 17 Zoning, Chapter 17.60 Institutional Zone, Section 17.60.010 the purpose of the I zone is: 1) To accommodate a wide range of major public and quasi-public institutional and auxiliary uses, most of which are provided for in general plan elements to fulfill the health, safety, educational, cultural, and welfare needs of the community; and 2) To also recognize the aggregation of such specific facilities into efficient, functionally compatible, and attractively planned administrative centers and to allow site plan approval ensuring compatibility with the public service character of the zone.

Permitted uses within the I zone, as listed in the City's Municipal Code Title 17 Zoning, Chapter 17.60 Institutional Zone, Section 17.60.020, include: 1) Colleges, universities, schools and other educational institutions; 2) Convention and exhibition centers; 3) Cultural centers, including auditoriums and theaters; 4) Fire stations; 5) Historical landmarks or monuments; 6) Libraries; 7) Medical facilities, health centers, clinics, hospitals, and similar uses; 8) Museums; 9) Police stations; 10) Public governmental offices; 11) Religious uses including churches, temples, or other places of religious worship and accessory facilities; 12) Residences for institutional personnel, owned and operated by the institution involved; 13) Trade or vocational schools if associated with a school, college, or university; and 14) Other retail uses by an institution and in close proximity thereto, which supply direct consumer goods or services to the personnel of that institution.

The General Plan Land Use and Community Development elements include goals and policies pertaining to aesthetics. The Community Design Element serves several purposes that help to define the visual character desired for Loma Linda. The focus of this Element is to provide policy direction through verbal descriptions of appropriate design to guide future improvements, revitalization projects, and new development by private, non-profit, and City entities. This Element works in concert with the Land Use Element by taking the general design

provisions closely related to land use, such as site layout, and providing further detail such as appropriate architectural style to reflect the Loma Linda community.

Goals and policies of the General Plan pertaining to aesthetics are enumerated below (refer to pages 2-12 through 2-14 and 3-9 of the General Plan):

Health Care Guiding Policy (2.2.4.3)

Promote health care facilities that are conveniently located and well designed to aid patients and to make a positive visual contribution to the community in general.

Health Care Implementing Policies

a. Encourage LLU in the implementation of its master plan process for its diverse health care facilities and future facilities to ensure consistency with the General Plan, zoning, and other City requirements.

b. Encourage associated health care facilities and services to locate within close proximity of each other and require pedestrian connections (and bicycle paths, where appropriate) between such uses in order to limit necessary vehicle trips for patients, visitors, health care workers, and health care students.

c. Ensure that health care uses are designed so that site layout, architectural elements, and signage clearly direct visitors to parking areas, appropriate buildings, and building entries. Encourage health care uses to employ similar clarity of design and signage on the interior of buildings to ease visitors' stress through a well-designed wayfinding approach.

Institutional Guiding Policy (2.2.6.1)

Strengthen the physical layout and visual identity of LLU as it relates to the community as a whole so that it both functionally integrates with the larger community and is an identifiable landmark.

Institutional Implementing Policy

a. Increase the functionality, identity, and appearance of LLU, especially at the edges where it meets with the surrounding community, through appropriate land uses and land use controls, site planning, and use of design elements.

b. Encourage LLU in its implementation of its master plan process for university-related facilities and future facilities to ensure consistency with the General Plan, zoning, and other City requirements.

Institutional Development (3.1.7)

Religious assembly facilities (e.g., churches, temples), schools (e.g., LLU, Loma Linda Academy, and Bryn Mawr Elementary), and hospital facilities (e.g., Veterans Administration Hospital) comprise the institutional category. The City of Loma Linda acknowledges that some

uses within the institutional category may be outside of the jurisdictional control of the City and that the corresponding public entities might not be required to follow the City's development standards. In such cases, the following design policies are intended to serve as a guideline for the public agency. It is also recognized that institutional uses are unique, often with special architectural requirements and style preferences that reflect the buildings' users and sometimes their religious beliefs; therefore, photo examples of appropriate building styles for Loma Linda are not specifically provided within the Community Design Element. However, the following policies address general layout and design for institutional uses.

Guiding Policies for Institutional Development (3.1.7.1)

For institutional development (located within institutional or mixed use designations as indicated in the Land Use Element) ensure that site and building design reduce traffic and circulation conflicts, minimize disruption to adjacent sensitive uses, and promote high quality architectural design.

Implementing Policies for Institutional Development (3.1.7.2)

a. Provide vehicular access via a collector road, instead of from an arterial, wherever feasible. Vehicular access points should be consolidated and designed with proper width and turning radii to alleviate impacts to traffic flow.

b. When located within or adjacent to residential areas, facilitate pedestrian access from off-site.

c. Avoid impacts to adjacent sensitive uses (e.g., residences, hospitals) through proper design that limits effects from noise and glare (i.e., through site layout, building orientation, circulation/parking layout, noise attenuation, landscape buffering, and lighting design/location).

d. Design the various buildings within an institutional facility so that the architectural style, materials, and colors are complementary.

e. Feature architectural details that relate to the building's scale and acknowledge pedestrian entryways through the use of detailed rooflines, enhanced entry statements for principal buildings, and building ornamentation.

f. Design access to schools with sufficient staging areas such that vehicles waiting to drop off or pick up a student do not block travel lanes on public streets.

g. Encourage the use of architectural elements that define the main entrance of buildings and organize space at the ground plane (e.g., arcades, colonnades, and covered walkways) is encouraged. Such elements help to reinforce the pedestrian scale of the building and contribute to its overall low-rise character. Ensure that the site design of institutional uses distinguishes between primary and secondary uses within the site.

h. Encourage the grouping of buildings or the configuration of a building to create courtyards, plazas, or seating areas where people can gather.

4.1.4 Project Impact Analysis and Mitigation Measures

Although the Project would consist of a multi-phased development to construct new facilities and improvements to the existing campus, the impact analyses provided below are based on build-out of all phases of the Master Plan for determining potential impacts to aesthetics.

4.1.4.1 Thresholds of Significance

Significant impacts related to aesthetics are determined from criteria stated with the CEQA Checklist. The Checklist identifies the primary thresholds of significance relating to CEQA issues. Potential impacts to scenic vistas, historic buildings, state scenic highways, and impacts from light or glare are addressed in the CEQA process to identify and evaluate possible impacts to aesthetic resources that could potentially result from implementation of the Proposed Project. The Proposed Project would have a significant effect on Aesthetics if it would:

- Have a substantial adverse effect on a scenic vista as identified in the City's General Plan.
- Substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- Substantially degrade the existing visual character or quality of the site and its surroundings.
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

4.1.4.2 Issues Identified to Have No Impact or Less Than Significant Impact

The Proposed Project was determined to not have the potential to result in significant impacts in the issue area listed below. An explanation of the impact and a determination of no need for mitigation measures is provided.

Have a substantial adverse effect on a scenic vista as identified in the City's General Plan.

Local conservation groups within the City passed the Hillside Preservation Initiative in 1993 to preserve the natural hillside amenities within the City boundaries. According to City's General Plan, conservation of the hillsides and maximizing the preservation of natural open space are a part of the City's long-range plan for the South Hills area. Since the LLUH Master Plan Project would occur within the boundaries of the LLUH campus identified as occurring north of Barton Road, generally south of the UPRR (with a small portion at the Elmer Digneo City Park site extending north of the UPRR), east of Campus Avenue and west of Anderson Street, no portion of the Proposed Project would result in significant impacts to a scenic vista including the South Hills area. Similarly, potential development of a substation on the Elmer Digneo City Park occurring north of the UPRR, would not result in any significant impacts to a scenic vista as

none are identified by the City's General Plan as occurring on or near the Elmer Digneo City Park.

4.1.4.3 Issues Determined to Have Potentially Significant Impacts

The Proposed Project could potentially result in significant impacts in the issue areas listed below. For each issue, the potential impact is provided in a numbered impact statement, followed by analysis, and mitigation measures if the impact is determined to remain significant after the analysis.

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

Impact AES-1:

The Proposed Project would result in the development of the LLUH Master Plan Project which includes new construction and improvements that would require the removal of trees. This is a potentially significant impact.

The City's General Plan Conservation and Open Space Element does not identify any State Scenic Highways within the city limits. The nearest eligible State Scenic Highway includes a segment of I-210, located approximately six miles northeast of the Project Site, where it meets State Route 330. The segment is identified as eligible for future nomination as a Scenic Highway, at which time it would be protected by provisions of the California Scenic Highway Program. Since the Proposed Project would not impact any portion of I-210, it would not have an adverse impact to a State Scenic Highway.

The Proposed Project does however include the development of a new hospital and parking structure in areas that contain existing trees. The Project Proponent is anticipating that the entire surface parking area located on the northwest corner of Anderson Street and Barton Road, and the surface parking area located on the northeast corner of Campus Street and Barton Road would be completely graded and trees within these areas would be removed. In addition, trees located within the areas designated for the: SCE Option 2 substation site; Utility Plant Option 1 and Option 2 sites; the new Research building; and the dental school addition would require removal. Based on the proposed location of the SCE substation at the Elmer Digneo City Park, there does not appear to be any trees that would be affected or require removal by that Project option.

According to the *Loma Linda University Medical Center Arborist Report*, prepared by Gerhard Steudel, in August 2013, there are a total of 17 trees on the portion of the Project Site currently developed as the campus that have special significance including:

- The "Baby Fae" Holly Oak located in Upper Parking Lot A
- The Kiwanis Club Citrus Orchard that contains a total of 15 trees: two (2) Myer lemon trees; two (2) Valencia orange trees; four (4) Navel orange trees; three (3) grapefruit

trees; three (3) tangelo trees, and one (1) kumquat tree. The grove is located between Upper and Lower Parking Lot A adjacent to Barton Road. All of the trees within the orchard are suitable for transplant.

- The Elenore Graves memorial tree located in front of the Children's Hospital.

The Arborist Report documents the survey and assessment conducted on a portion of the Project Site including the area south of Prospect Street, west of Anderson Street, east of Campus Street and north of Barton Road. The report documents a total of 302 trees, and of these a total of 32 could be transplanted. In addition there are 45 Modesto Ash trees; some of the smaller ones could also be transplanted. The tree inventory list indicates that one of the Modesto Ash trees is one of the oldest trees within the area surveyed and is estimated to be approximately 85 years old. To ensure potential impacts from removal of any trees is reduced to a less than significant impact the following mitigation measures shall be required:

Mitigation Measures

Mitigation Measure AES-1:

Prior to issuance of grading and/or building permits for the Proposed Project, all tree removals or relocations that occur within the public right-of-way and/or at the Elmer Digneo City Park shall be approved by the Community Development Department and monitored by the City's Public Works Department.

Mitigation Measure AES-2:

The trees of special significance as outlined in the August 2013 Arborist Report include: the Baby Fae Holly Oak, the Kiwanis Club Citrus Orchard, and the Elenore Graves Memorial Tree. Replacement of these trees requires a replacement with a minimum 36-inch box size.

Level of Significance After Mitigation

Implementation of the above mitigation measures would reduce impacts to a less than significant level.

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

Impact AES-2:

The Proposed Project would result in the development of the LLUH Master Plan Project which includes the construction of a new hospital, dental school addition, and research building; upgrades to existing facilities; and construction of a new parking structure that would change the existing character of the LLUH campus. The Proposed Project could substantially degrade the existing visual character or quality of the site and its surroundings.

Design Considerations

Proposed facilities and improvements associated with the Master Plan include: 1) a seven-story, approximately 250,000 square-foot, 760-space patient and visitor parking structure; 2) a 13-story (approximately 215 feet in height), approximately 732,000 square-foot hospital with 464 beds to replace a portion of the seismically-noncompliant existing hospital, and 80 parking spaces; 3) an approximate 34,000 square-foot new or retrofitted utility plant; 4) an approximate 14,000 square-foot Southern California Edison (SCE) on-site upgraded or off-site new electrical substation; 5) a two-story, approximately 9,000 square-foot addition to the existing dental school; 6) a four-story approximately 90,000 square-foot research building; and 7) tenant improvements and reuse of the vacated portions of the existing hospital. Improvements and upgrades at the campus would also include potential expansion of utility lines or other infrastructure updates within streets that occur within the Project Site (i.e., Anderson Street, Taylor Drive, Loma Linda Drive, etc.).

In order to reduce potential visual impacts to the surrounding area, certain architectural designs were taken into consideration. The proposed building façades would be contemporary in nature and would include characteristics such as parapets, textured building materials, and towers to create a visually appealing development. Development of the new hospital, parking structure, electrical substation, research building, and other building upgrades would be architecturally designed to create visual continuity and maintain a sense of project identity. Landscaping and architectural enhancements would incorporate variation to the design of the development and aesthetically enhance the campus.

Master Sign Program

The Proposed Project would include the implementation of a Master Sign Program for the installation of appropriate signage throughout the campus. The Master Sign Program would incorporate sign regulations for all signs including freestanding, monument and pylon style signs, as established in the City's Municipal Code to assure consistent quality, size, variety, and placement of signs across buildings for identification purposes.

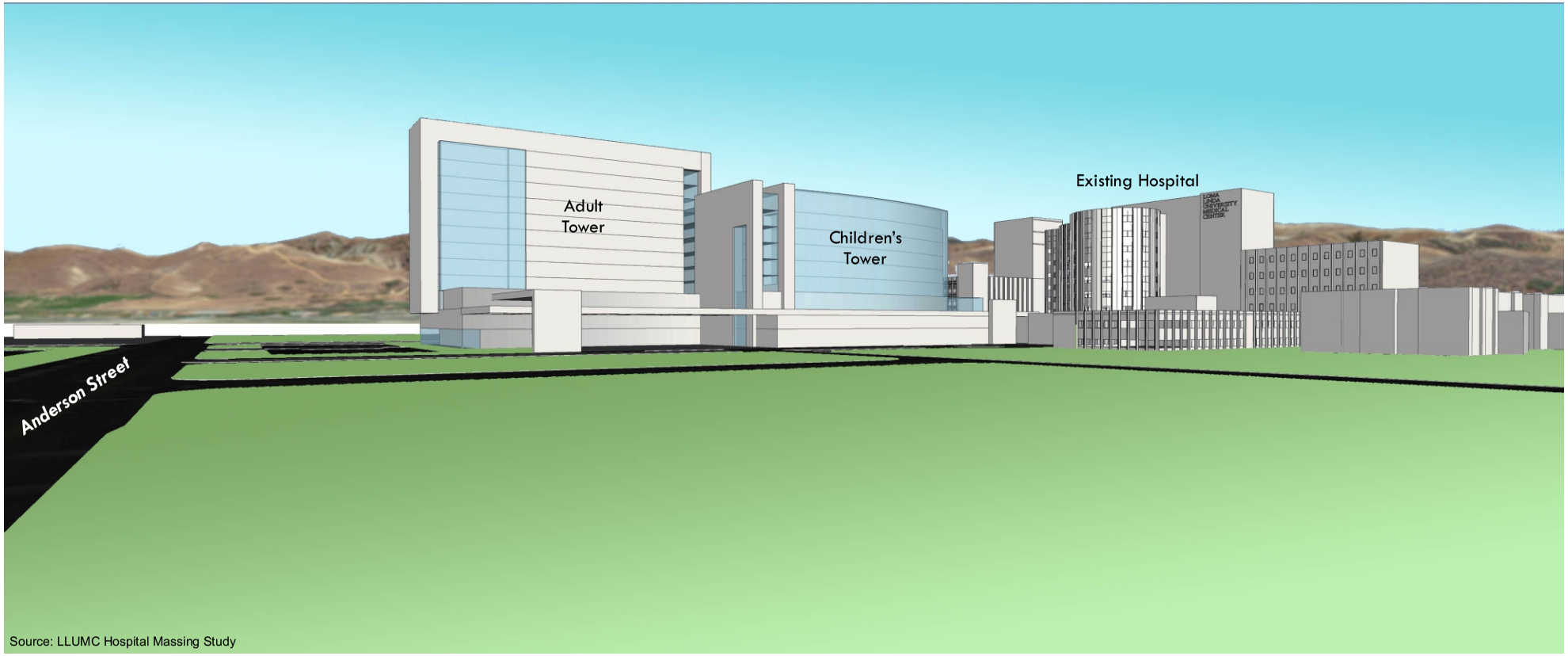
General signs along the side of builds, for identification purposes are proposed and would be similar to what is currently present on campus. The Master Sign Program would be reviewed by the Community Development Department and ultimately approved by the Planning Commission.

Massing Analysis

In order to evaluate the visual impact of the new hospital (which would be the tallest structure on campus and is therefore evaluated as providing the maximum extent of potential visual impacts), a massing analysis was prepared. The massing analysis illustrates the location and scale but not the conceptual appearance (as this has not been finalized by the Project Proponent) of the new hospital as seen from Anderson Street just northeast of the existing hospital (see Figure 4.1-1).

The objectives of the massing analysis were to: 1) illustrate the change from existing conditions following construction of the new hospital; and 2) show the location and scale of the new hospital.

File: F3-1LLUH-Hospital Massing.CDR (TAG) Page:1 REV: 09/05/2013



Source: LLUMC Hospital Massing Study

View looking south from the west side of Anderson Street at the massing of the new hospital building relative to the existing hospital.

HOSPITAL MASSING

LLUH MASTER PLAN PROJECT
Environmental Impact Report
City of Loma Linda, California

FIGURE 4.1-1

LILBURN CORPORATION

New Hospital

The new hospital construction would consist of approximately 730,000 square-feet of new building to be located southeast of the existing hospital. The footprint of the base level is estimated to be 130,000 square feet. The lower levels would consists of a three-story podium that would be connected to the existing Children's Hospital to the immediate west. Currently it is visualized that the Children's portion of the new hospital building would have bed towers that rise five stories above the podium level for a total of nine stories in height. The Adult Tower may extend to 13 total stories. The existing hospital has a number of different structures (refer to Figure 3-4). The tallest of the structures is the original hospital (Tower A) which is nine (9) stories above grade. The Children's Hospital to the south of the existing hospital has a small tower that aligns with the nine-story Tower A of the existing hospital, but the majority of the existing Children's Hospital is five stories in height. The existing hospital has a number of smaller structures that make up the complex including: six stories for the support building to the north, five stories for the office and research building to the west (Tower B), and two stories for the Schuman pavilion to the East.

Views of the New Hospital from the South

The massing of the new hospital illustrates two separate towers including an Adult Tower and a Children's Tower, extending east and connecting to the existing Children's Hospital (refer to Figure 3-4). Grades for the site of the new hospital (like the existing hospital) are below the street grade of Barton Road to the south and the new hospital would sit at a slightly lower elevation (similar to the existing hospital) as viewed from Barton Road. However, even at a lower grade, views of the San Bernardino Mountains to the north would be obscured for users of the existing surface parking lot south of Barton Road. Residents that occur south of Barton Road, immediately across from the existing hospital, would be located southwest of the new hospital and would still have views of the mountains to the north. The new hospital would be a visual extension of the existing Children's Hospital (both including towers that are nine (9) stories in height. , At a maximum height, the Adult Tower of the new hospital (proposed east of the new Children's Tower) could be up to 13 stories in height, extending possibly four (4) stories above the existing hospital (Tower A). However, the existing hospital is considered a landmark for the City and the extension of the facilities within this location would further denote the presence of the LLUH campus and facilities. Since there is a substantial setback occurring between the proposed Adult Tower and residential structures to the east, no significant impacts are anticipated.

Views of the New Hospital from the West

From the west, views of the proposed new hospital would be obscured by the existing Children's Hospital. However, the proposed parking structure would create new massing at the northeast corner of Barton Road and Campus Street. Since there are only LLUH facilities to the west, no significant impact would result.

Views of the New Hospital from the East

Residential development occurs intermittently between surface parking and commercial development along on the east side of Anderson Street from Barton Road to Prospect. The nearest residences would be located approximately 250 feet east of the proposed new hospital (specifically the Adult Tower). The existing hospital has been at the site since 1967, and residential development east the Project Site has viewed the hospital and related facilities/infrastructure since that time. Construction of the new hospital would be an expansion of the existing visual hospital environment at the site. There are no mountains or other scenic vistas in the background to the west that would be obscured with development of the new hospital, and there is a substantial setback from Anderson Street (approximately 175 feet) which is designated for landscaped open space. Views of the new parking structures would be obscured by existing and proposed structures, resulting in a less than significant impact.

Views of the New Hospital from the North

There are no sensitive receptors that would be visually impacted by the development of a new hospital. Existing LLUH facilities occur north of the proposed hospital and therefore no impacts would result.

New Seven-Story Parking Structure

The new seven-story, 760-space parking structure would be located on the northeast corner of Barton Road and Campus Street and west of the existing Children's Hospital. The structure would be constructed of concrete and would have a footprint of 48,000 square-feet and would be up to seven (7) stories in height and therefore two (2) stories less than the 9- story tower of the existing Children's Hospital. Since the new parking structure is relatively the same scale and height as other structures within the vicinity, and since it would only span the length of four residential units on the south side of Barton Road, no significant impacts would result for these sensitive receptors. Views from the west, north and east are anticipated to be minimally affected as the scale is in line with the existing hospital structure and views from these directions would be from other LLUH facilities or grounds. No significant impacts would result.

New SCE Substation

The SCE Option 1 would result in a new substation located in the Elmer Digneo City Park. The SCE Option 2 would result in an upgrade to the existing substation located along the south side of the campus cogeneration plant. The substation's open courtyard, proposed for either option, would have a footprint of 8,000 square feet and would be constructed with an eight (8)-foot metal fence. The yard would house electrical equipment, switchgears and transformers; a small portion of which may be visible above or through the fencing. Views at the existing substation are anticipated to be minimally affected, as the area is utilitarian in nature and the extension of such uses would not impact the existing visual environment of the site. Views at the Elmer Digneo City Park are also anticipated to be minimally impacted as the new substation would be constructed in the far southwest corner of the park and would be visually screened from residents to the northeast. However, on-site users of the park would notice an additional structure at the park on or near the site of the existing basketball court. Mitigation Measure AES-4 is provided

below to ensure potential impacts at the park site are reduced to a less than significant level. Also refer to Section 4.8 Land Use for discussion regarding siting of the substation.

Dental School Extension and New Research Building

The existing architectural context of the area is defined by three major elements – the existing medical center complex, the university campus hill and quad and the predominantly single-story residential neighborhood that surrounds it. The most prominent landmark of the area is the medical center towers often referred to as the 'cloverleaves' for the three round columns that are the tallest structure for miles around. Other major elements in the area include the seven-story employee parking structure on Campus Street and a number of smaller university buildings to the north. The campus architecture has a range of materiality and expression, with a general modern theme with minimal building ornamentation. The expansion of the Dental School, and addition of a new Research Building would be designed to blend and balance with surrounding LLUH facilities. No aesthetic impacts would be associated with the development/extension of these two structures, and no mitigation measures are required.

Future City Retail Corridor and Downtown Revitalization

Looking into the future, the City has noted the area to the east of the Project Site, along Prospect Avenue as a special planning district and dedicated future uses or developments for shaping a new retail corridor and downtown revitalization (not a part of this project).

The Project would relate to this context by drawing from the existing hospital façade and exterior treatments. The existing hospital exterior treatment is predominantly a panelized concrete with punched openings for glazing. The concrete is formed with repeating vertical batten and reveal details tied into shading elements at different building facades. The glazing area makes up roughly 15 percent of the general wall area. The concrete is painted beige over most of the elements with dark metal mullions and tinted glazing. Other buildings around campus employ similar detailing and coloring but may utilize a stucco system for the exterior skin.

Mitigation Measures

Mitigation Measure AES-3:

In the event SCE Option 1 is selected and the a new SCE substation would be constructed at the Elmer Digneo City Park, the Community Development Department and Project Proponent shall meet to discuss appropriate design, materials and colors of the utilitarian structure to ensure that it blends with the existing restroom structure on-site. Screening of the building shall also be discussed and may include trees, bushes or vines to screen the structure.

Level of Significance After Mitigation

Implementation of Mitigation Measure AES-3 would reduce potential visual impacts at the Elmer Digneo City Park to a less than significant level.

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

Impact AES-3:

Implementation of the LLUH Master Plan Project would create a new source of light and/or glare which could adversely affect day or nighttime views in the area, and adjacent residential areas on the west side of Campus Street and near the northeast corner of Anderson Street and Barton Road. This is potentially significant impact.

Development of the LLUH Master Plan Project would take place in areas that are currently developed and that include existing light sources (i.e., lighting within existing surface parking areas). However, development of the Proposed Project would require more extensive lighting than what currently exists in areas proposed for improvements. For example, areas currently used for parking contain light poles appropriately spaced throughout the area for safety and to illuminate driving areas. Upon implementation of the LLUH Master Plan Project, light poles would be replaced with structures that would be substantially greater in height (up to 13 stories). However, light sources would be mainly interior (i.e., patient room lights, exterior building lights, and lighting illuminating the interior of the parking structure, etc.) and relatively dim from application of window tinting.

The main hospital has been at the site since 1967 and is considered a landmark not only within the City of Loma Linda but the surrounding San Bernardino Valley. Nighttime lighting occurring at the main hospital provides a likely reference for future lighting conditions expected at the new hospital. Similarly, the existing parking structure on the west side of Campus Street, provides an example of the low light expected of the new seven-level parking structure.

The impact of nighttime lighting depends on the proximity of sensitive receptors, intensity of the new light sources, and existing ambient lighting combined. Sensitive receptors located in the vicinity of the Project Site include in addition to the hospital and university itself, residential development south, east and west of the Project Site. However there are existing streets that separate residential development from the Project Site boundary (i.e., Barton Road, Anderson Street and Campus Street). Existing nighttime illumination sources include: street lights along Barton Road, Anderson Street and Campus Street; security lighting through the campus and in the residential development areas; traffic signals; and glow from vehicle traffic. While the Proposed Project would continue to involve nighttime activities such as late night emergency arrivals, hospital staff shift changes and on-call activities, the addition of new sources of permanent light and glare as a result of implementation of the Proposed Project would not significantly increase ambient lighting in the project vicinity.

Sensitive receptors within the vicinity of the Elmer Digneo City Park include residential development located approximately 500 feet to the northeast. Existing lighting conditions at the site include security lighting throughout the park and within the parking lot, vehicle traffic along Anderson Street, and exterior lighting from residential development. The proposed SCE substation that could be developed at the park (SCE Option 1) would not require a significant amount of new lighting that would disrupt day or nighttime views of the area. It is likely only

exterior illumination of the building for security purposes would be required and would be similar to existing security lighting at the park.

All lighting would comply with the regulations set in the City's Municipal Code. The standards require that on-site lighting be arranged to reflect away from adjoining property or any public streets. To ensure potential impacts are reduced to a less than significant level the following mitigation measures shall be implemented:

Mitigation Measure AES-4:

Prior to issuance of a grading or building permits, the Project Proponent shall submit a photometric plan for review and approval by the City Community Development Department. The plan may either be submitted for the individual structures or improvements as outlined in the Master Plan, or for the entire LLUH Master Plan Project.

Mitigation Measure AES-5:

Project design features shall be incorporated to provide landscaping, physical barriers, screening, or other buffers to minimize project-generated illumination from entering off-site areas and to prevent glare for residential development located south, east and west of the Project Site.

Level of Significance After Mitigation

Implementation of Mitigation Measure AES-4 and AES-5 would ensure potential impacts from light and glare are reduced to a less than significant level.

4.2 AIR QUALITY

4.2.1 Introduction

This section of the EIR provides an evaluation of potential air quality impacts that could occur with implementation of the Proposed Project. The Project's potential impacts are discussed and mitigation measures are provided for impacts determined to be potentially significant. Information in this section is based on the "Air Quality Assessment" prepared by Lilburn Corporation dated September 2013. The Air Quality Analysis is included in Appendix C.

4.2.2 Environmental Setting

Regional Setting

The Proposed Project is located in the South Coast Air Basin (SCAB). The SCAB is comprised of parts of Los Angeles, Riverside and San Bernardino counties and all of Orange County. The basin is bounded on the west by the Pacific Ocean, the San Gabriel Mountains north, the San Bernardino Mountains north and east, the San Jacinto Mountains to the southeast, and Santa Ana Mountains to the south. The basin forms a low plain and the mountains channel and confines airflow, which trap air pollutants.

The primary agencies responsible for regulations to improve air quality in the SCAB are the South Coast Air Quality Management District (SCAQMD) and the California Air Resources Board (CARB). The Southern California Association of Governments (SCAG) is an important partner to the SCAQMD, as it is the designated metropolitan planning authority for the area and produces estimates of anticipated future growth and vehicular travel in the basin, which is used for air quality planning. The SCAQMD sets and enforces regulations for non-vehicular sources of air pollution in the basin and works with SCAG to develop and implement Transportation Control Measures (TCM). TCM measures are intended to reduce and improve vehicular travel and associated pollutant emissions.

CARB was established in 1967 by the California Legislature to attain and maintain healthy air quality, conduct research into the causes and solutions to air pollution, and systematically attack the serious problem caused by motor vehicles, which are the major causes of air pollution in the State. CARB sets and enforces emission standards for motor vehicles, fuels, and consumer products. It sets the health based California Ambient Air Quality Standards (CAAQS) and monitors air quality levels throughout the state.

CARB identifies and sets control measures for toxic air contaminants (TACs). The Board also performs air quality related research, provides compliance assistance for businesses, and produces education and outreach programs and materials. CARB provides assistance for local air quality districts, such as SCAQMD.

The U.S. Environmental Protection Agency (U.S. EPA) is the primary federal agency for regulating air quality. The EPA implements the provisions of the Federal Clean Air Act (FCAA). This Act establishes national ambient air quality standards (NAAQS) that are applicable

nationwide. The EPA designates areas with pollutant concentrations that do not meet the NAAQS as non-attainment areas for each criteria pollutant. States are required by the FCAA to prepare State Implementation Plans (SIP) for designated non-attainment areas. The SIP is required to demonstrate how the areas will attain the NAAQS by the prescribed deadlines and what measures will be required to attain the standards. The EPA also oversees implementation of the prescribed measures. Areas that achieve the NAAQS after a non-attainment designation are redesignated as maintenance areas and must have approved Maintenance Plans to ensure continued attainment of the NAAQS.

The California Clean Air Act (CCAA) required all air pollution control districts in the state to prepare a plan prior to December 31, 1994 to reduce pollutant concentrations exceeding the CAAQS and ultimately achieve the CAAQS. The districts are required to review and revise these plans every three years. The SCAQMD satisfies this requirement through the publication of an Air Quality Management Plan (AQMP). The AQMP is developed by SCAQMD and SCAG in coordination with local governments and the private sector. The AQMP is incorporated into the SIP by CARB to satisfy the FCAA requirements.

Climate

The climate in and around the project area, as with all of Southern California, is controlled largely by the strength and position of the subtropical high pressure cell over the Pacific Ocean. It maintains moderate temperatures and comfortable humidity, and limits precipitation to a few storms during the winter "wet" season. Temperatures are normally mild, excepting the summer months, which commonly bring substantially higher temperatures. In all portions of the basin, temperatures well above 100 degrees F. have been recorded. The annual average temperature in the basin is approximately 62 degrees Fahrenheit.

Winds in the project area are usually driven by the dominant land/sea breeze circulation system. Regional wind patterns are dominated by daytime onshore sea breezes. At night, the wind generally slows and reverses direction traveling towards the sea. Wind direction will be altered by local canyons, with wind tending to flow parallel to the canyons. During the transition period from one wind pattern to the other, the dominant wind direction rotates into the south and causes a minor wind direction maximum from the south. The frequency of calm winds (less than 2 miles per hour) is less than 10 percent. Therefore, there is little stagnation in the project vicinity, especially during busy daytime traffic hours.

Southern California frequently has temperature inversions, which inhibit the dispersion of pollutants. Inversions may be either ground-based or elevated. Ground-based inversions, sometimes referred to as radiation inversions, are most severe during clear, cold, early winter mornings. Under conditions of a ground-based inversion, very little mixing or turbulence occurs, and high concentrations of primary pollutants may occur local to major roadways. Elevated inversions can be generated by a variety of meteorological phenomena. Elevated inversions act as a lid or upper boundary and restrict vertical mixing. Below the elevated inversion, dispersion is not restricted. Mixing heights for elevated inversions are lower in the summer and more persistent. This low summer inversion puts a lid over the SCAB and is responsible for the high levels of ozone observed during summer months in the air basin.

Regulatory Setting

Both the State and the federal government have established health-based Ambient Air Quality Standards (AAQS) for six air pollutants. These pollutants are carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead, and suspended particulate matter ($PM_{2.5}$ and PM_{10}). Refer to Table 4.2-1 for both federal and State standards for these criteria pollutants. The State AAQS are more stringent than the federal AAQS.

Ozone (O_3)

Ozone is a secondary pollutant (it is not directly emitted). Ozone is the result of chemical reactions between volatile organic compounds (VOC) (also referred to as reactive organic gasses, ROG) and nitrogen oxides (NO_x). These occur only in the presence of bright sunlight. Sunlight and hot weather cause ground-level ozone to form in the air (aka. summertime air pollutant). Ground-level ozone is the primary constituent of smog. As ozone is formed in the atmosphere, high concentrations can occur in areas well away from sources of its constituent pollutants.

Children, older adults, and people with lung disease or who are active can be affected when ozone levels are unhealthy.

Particulate Matter (PM_{10} & $PM_{2.5}$)

Particulate matter includes both aerosols and solid particles of a wide range of size and composition. Of particular concern are those particles smaller than 10 microns in size (PM_{10}) and smaller than or equal to 2.5 microns ($PM_{2.5}$). The size of the particulate matter is referenced to the aerodynamic diameter of the particulate. Smaller particulates are of greater concern as they can penetrate deeper into the lungs than large particles.

The principal health effect of airborne particulate matter is on the respiratory system. Short-term exposures to high $PM_{2.5}$ levels are associated with premature mortality and increased hospital admissions and emergency room visits. Long-term exposures to high $PM_{2.5}$ levels are associated with premature mortality and development of chronic respiratory disease. Short-term exposures to high PM_{10} levels are associated with hospital admissions for cardiopulmonary diseases, increased respiratory symptoms and possible premature mortality. The EPA has concluded that available evidence does not suggest an association between long-term exposure to PM_{10} at current ambient levels and health effects. PM_{10} generally settles out of the atmosphere rapidly and is not readily transported over large distances. $PM_{2.5}$ is directly emitted in combustion exhaust and formed from atmospheric reactions between of various gaseous pollutants including NO_x, SOx, and VOC. PM_{10} is generally emitted directly as a result of mechanical processes that crush or grind larger particles or the re-suspension of dusts most typically through construction activities and vehicular travels. $PM_{2.5}$ can remain suspended in the atmosphere for days and weeks and can be transported long distances.

Table 4.2-1
State and Federal
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1-Hour	0.09 ppm (180 μg/m^3)	Ultraviolet Photometry	---	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 μg/m^3)		0.075 ppm (147 μg/m^3)		
Respirable Particulate Matter (PM_{10})[8]	24-Hour	50 μg/m^3	Gravimetric or Beta Attenuation	150 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetic Analysis
	Annual Arithmetic Mean	20 μg/m^3		---		
Fine Particulate Matter ($PM_{2.5}$)[8]	24-Hour	---		35 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetic Analysis
	Annual Arithmetic Mean	12 μg/m^3	Gravimetric or Beta Attenuation	12 μg/m^3	15 μg/m^3	
Carbon Monoxide (CO)	1-Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)		Non-Dispersive Infrared Photometry (NDIR)
	8-Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–		
Nitrogen Dioxide (NO_2)[9]	1-Hour	0.18 ppm (339 μg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 μg/m^3)	---	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)		0.053 ppb (100 μg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[10]	1-Hour	0.25 ppm (655 μg/m^3)	Ultraviolet Fluorescence	75 ppd (196 μg/m^3)	–	Ultraviolet Flourescence, Spectrophotometry (Pararosaniline Method)
	3-Hour	---		--	0.5 ppm (1300 μg/m^3)	
	24-Hour	0.04 ppm (105 μg/m^3)		0.14 ppm (for certain areas)[10]	---	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas)[10]	–	
Lead[11,12]	30-day average	1.5 μg/m^3	Atomic Absorption	–	–	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average[11]	--		1.5 μg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Calendar Quarter	–		0.15 μg/m^3		
Visibility-Reducing Particles[13]	8-Hour	See footnote 13	Beta Attenuation and Transmittance through Filter Tape	**No Federal Standards**		
Sulfates	24-Hour	25 μg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 μg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[11]	24-Hour	0.01 ppm (26 μg/m^3)	Gas Chromatography			

Source: ARB, June, 4, 2013.
1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, 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 ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone 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/m^3 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. Contact U.S. EPA for further clarification and current federal policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

8. On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m^3 to 12.0 μg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) was retained at 25 μg/m^3, as was the annual secondary standard of 15 μg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 μg/m^3 also were retained. The form of the annual primary and secondary standards in the annual mean, averaged over 3 years.
9. To attain the 1-hour national standard, the 3-year average of the 98th percentile of the 1-hour daily maximum concentration at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
10. On June 2, 2010, a new 1-hour SO2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
Note that 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 new primary 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.
11. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
12. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
13. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Carbon Monoxide (CO)

Carbon monoxide (CO) is a colorless and odorless gas, which in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. CO combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High carbon monoxide concentrations can lead to headaches, aggravation of cardiovascular disease, and impairment of central nervous system functions. CO concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near crowded intersections, along heavily used roadways carrying slow-moving traffic, and at or near ground level. Even under the most severe meteorological and traffic conditions, high concentrations of carbon monoxide are limited to locations within a relatively short distance (i.e., up to 600 feet or 185 meters) of heavily traveled roadways. Overall CO emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973.

Nitrogen Dioxide (NO_2)

Nitrogen gas, normally relatively inert (unreactive), comprises about 80% of the air. At high temperatures (i.e., in the combustion process) and under certain other conditions it can combine with oxygen, forming several different gaseous compounds collectively called NO_x. Nitric oxide (NO) and NO_2 are the two most important compounds. Nitric oxide is converted to nitrogen dioxide in the atmosphere. Nitrogen dioxide (NO_2) is a red-brown pungent gas. Motor vehicle emissions are the main source of NO_x in urban areas.

NO_2 is toxic to various animals as well as to humans. Its toxicity relates to its ability to form nitric acid with water in the eye, lung, mucus membrane and skin. In animals, long-term exposure to nitrogen oxides increases susceptibility to respiratory infections lowering their resistance to such diseases as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of NO_2 can suffer lung irritation and potentially, lung damage. Epidemiological studies have also shown associations between NO_2 concentrations and daily mortality from respiratory and cardiovascular causes and with hospital admissions for respiratory conditions.

NO_x is a combination of primarily NO and NO_2. While the NAAQS addresses NO_2, NO and the total group of nitrogen oxides are of concern. NO and NO_2 are both precursors in the formation of ozone and secondary particulate matter. Because of this and that NO emissions largely convert to NO_2, NO_x emissions are typically examined when assessing potential air quality impacts.

Sulfur Dioxide (SO_2)

Sulfur oxides (SO_x) constitute a class of compounds of which sulfur dioxide (SO_2) and sulfur trioxide (SO_3) are of greatest importance. Ninety-five percent of pollution related SO_x emissions are in the form of SO_2. SO_x emissions are typically examined when assessing potential air quality impacts of SO_2. Combustion of fossil fuels for generation of electric power is the primary contributor of SO_x emissions. Industrial processes, such as nonferrous metal smelting, also contribute to SO_x emissions. SO_x is also formed during combustion of motor fuels. However, most of the sulfur has been removed from fuels greatly reducing SO_x emissions from vehicles.

SO_2 combines easily with water vapor, forming aerosols of sulfurous acid (H_2SO_3), a colorless, mildly corrosive liquid. This liquid may then combine with oxygen in the air, forming the even more irritating and corrosive sulfuric acid (H_2SO_4). Peak levels of SO_2 in the air can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposures to high levels of SO_2 gas and particles cause respiratory illness and aggravate existing heart disease. SO_2 reacts with other chemicals in the air to form tiny sulfate particles which are measured as $PM_{2.5}$.

Lead (Pb)

Lead is a stable compound, which persists and accumulates both in the environment and in animals. In humans, it affects the blood-forming or hematopoietic, the nervous, and the renal systems. In addition, lead has been shown to affect the normal functions of the reproductive, endocrine, hepatic, cardiovascular, immunological, and gastrointestinal systems, although there is significant individual variability in response to lead exposure. Since 1975, lead emissions have been in decline due in part to the introduction of catalyst-equipped vehicles, and decline in production of leaded gasoline. In general, an analysis of lead is limited to projects that emit significant quantities of the pollutant (i.e. lead smelters) and are not applied to transportation projects.

Visibility Reducing Particulates

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. The Statewide standard is intended to limit the frequency and severity of visibility impairment due to regional haze. A separate standard for visibility-reducing particles that is applicable only in the Lake Tahoe Air Basin is based on reduction in scenic quality.

Sulfates

Sulfates are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.

The CARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and, due to fact that they are usually acidic, can harm ecosystems and damage materials and property.

Hydrogen Sulfide (H_2S)

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. It can also be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation. Breathing H_2S at levels above the standard will result in exposure to a very disagreeable odor. In 1984, an ARB committee concluded that the ambient standard for H_2S is adequate to protect public health and to significantly reduce odor annoyance.

Vinyl Chloride (Chloroethene)

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.

Short-term exposure to high levels of vinyl chloride in air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure to vinyl chloride through inhalation and oral exposure causes in liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation. Vinyl chloride exposure has been shown to increase the risk of angiosarcoma, a rare form of liver cancer in humans.

Local Air Quality

Based on monitored air pollutant concentrations, the U.S. EPA and CARB designate areas relative to their status in attaining the NAAQS and CAAQS respectively. Table 4.2-2 lists the current attainment designations for the SCAB. For the Federal standards, the required attainment date is also shown. The Unclassified designation indicates that the air quality data for the area does not support a designation of attainment or nonattainment.

As shown in Table 4.2-2, the U.S. EPA has designated SCAB as Severe-17 non-attainment for ozone, serious non-attainment for PM_{10}, non-attainment for $PM_{2.5}$, and attainment/maintenance for CO and NO_2. The basin has been designated by the state as non-attainment for ozone, PM_{10}, and $PM_{2.5}$. For the federal designations, the qualifiers, Severe-17 and Serious, affect the required attainment dates as the federal regulations have different requirements for areas that exceed the standards by greater amounts at the time of attainment/non-attainment designation. The SCAB is designated as in attainment of the Federal SO_2 and lead NAAQS as well as the state CO, NO_2, SO_2, lead, hydrogen sulfide, and vinyl chloride CAAQS.

Table 4.2-2
Designations of Criteria Pollutants for the SCAB

Pollutant	Designation/Classification	
	Federal Standards	**State Standards**
Ozone	Severe-17 Nonattainment (2021)	Nonattainment
PM_{10}	Serious Nonattainment (2006)	Nonattainment
$PM_{2.5}$	Nonattainment (2015)	Nonattainment
Carbon Monoxide	Attainment/Maintenance (2000)	Attainment
Nitrogen Dioxide	Attainment/Maintenance (1995)	Attainment
Sulfur Dioxide	Attainment	Attainment
Lead (Particulate)	Attainment	Attainment
Hydrogen Sulfide	N/A	Attainment
Sulfates	N/A	Unclassified
Visibility Reducing Particles	N/A	Unclassified
Vinyl Chloride	N/A	Attainment

Source: CARB 2013

4.2.3 Applicable Polices, Plans and Regulations

The CAA requires plans to demonstrate attainment of the NAAQS for which an area is designated as nonattainment. The CCAA requires SCAQMD to revise its plan to reduce pollutant concentrations exceeding the CAAQS every three years. In the SCAB, SCAQMD and SCAG, in coordination with local governments and the private sector, developed the AQMP for the air basin to satisfy these requirements. The AQMP is the most important air management document for the basin because it provides the blueprint for meeting state and federal ambient air quality standards.

The l997 AQMP with the 1999 amendments is the current Federally approved applicable air plan for ozone. The successor 2003 AQMP was adopted locally on August 1, 2003, by the governing board of the SCAQMD. CARB adopted the plan as part of the California State Implementation Plan on October 23, 2003. The PM_{10} attainment plan from the 2003 AQMP received final approval from the U.S. EPA on November 14, 2005 with an effective date of December 14, 2005. As of February 14, 2007 the U.S. EPA had not acted on the ozone attainment plan of the 2003 AQMP. On this date, CARB announced that it was rescinding the ozone attainment plan from the 2003 AQMP with the intention to expedite approval of the 2007 AQMP. The 2007

AQMP was adopted by the SCAQMD on June 1, 2007. CARB adopted the plan as a part of the California State Implementation Plan on September 27, 2007. The State Implementation Plan was submitted to the U.S. EPA on November 16, 2007. The U.S. EPA has not taken action on the 2007 AQMP at this time. The SCAQMD prepared the 2012 AQMP that was adopted by the AQMD Governing Board on December 7, 2012. Control measure IND-01 was approved for adoption and inclusion in the Final 2012 AQMP at the February 1, 2013 Governing Board meeting.

SCAQMD staff is initiating an early development process for the 2015 AQMP, which will be a comprehensive and integrated Plan primarily focused on addressing the ozone standards. The Plan will be a regional and multi-agency effort (AQMD, California Air Resources Board, Southern California Association of Governments (SCAG) and US Environmental Protection Agency). State and federal planning requirements include developing control strategies, attainment demonstrations, reasonable further progress, and maintenance plans. The 2015 AQMP will incorporate the latest scientific and technical information and planning assumptions, including the latest applicable growth assumptions, Regional Transportation Plan/Sustainable Communities Strategy, and updated emission inventory methodologies for various source categories.

The AQMP is based on a series of control measures and strategies that vary by source type (i.e., stationary or mobile) as well as by the pollutant that is being targeted. Short-term and mid-term control measures are defined to achieve the $PM_{2.5}$ standard by 2015. These measures are designed to also contribute to reductions in ozone levels. Additional, long-term measures are defined to attain the 8-hour ozone standard by 2024. The measures rely on actions to be taken by several agencies that have statutory authority to implement such measures. Each control measure will be brought for regulatory consideration in a specified time frame. Control measures deemed infeasible will be substituted by other measures to achieve the total emission reduction target for each agency.

The control measures in the AQMP are based on facility modernization, energy efficiency and conservation, good management practices, market incentives/compliance flexibility, area source programs, emission growth management and mobile source programs. In addition, CARB has developed a plan of control strategies for sources controlled by CARB (i.e. on-road and off-road motor vehicles and consumer products). Further, Transportation Control Measures (TCM) defined in SCAG's Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP) are needed to attain the standards.

The AQMP includes additional short- and mid-term control measures aimed at reducing emissions from sources that are primarily under state and federal jurisdiction including on-road and off-road mobile sources, and consumer products. Measures committed to be enacted by CARB include (1) improvements to the smog check program, (2) cleaner in-use heavy duty truck emission regulations, (3) increased regulations on goods movement sources including ships, harbor craft, and port trucks, (4) regulations for cleaner in-use off-road equipment including agricultural equipment, (5) various measures to reduce evaporative VOC emissions from fuel storage and dispensing, (6) tightened emission standards and product reformulation for consumer products that emit VOC's, and (7) reductions in emissions from pesticide applications.

Monitored Air Quality

Air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates for the SCAB have been made for existing emissions ("2012 Air Quality Management Plan", February 2013). The data indicate that on-road (e.g.; automobiles, busses and trucks) and off-road (e.g.; trains, ships, and construction equipment) mobile sources are the major source of current emissions in the SCAB. Mobile sources account for approximately 64% of VOC emissions, 92% of NOx emissions, 39% of direct $PM_{2.5}$ emissions, 59% of SOx emissions and 98% of CO emissions. Area sources (e.g., architectural coatings, residential water heaters, and consumer products) account for approximately 30% of VOC emissions and 32% of direct $PM_{2.5}$ emissions. Road dust account for approximately 20% of direct $PM_{2.5}$ emissions.

The SCAQMD has divided the SCAB into 38 air monitoring areas with a designated ambient air monitoring station in most areas. The project is in the East San Bernardino Valley Source-Receptor Area 35 and the Redlands monitoring station is the facility identified for this source-receptor area. The data collected at this station is considered representative of the air quality experienced in the vicinity of the project and includes ozone, $PM_{2.5}$, and PM_{10}.

The air quality data monitored from 2008 to 2012 are presented in Table 4.2-3 and were obtained from the CARB. The Redlands monitoring data presented in Table 4.2-3 show that ozone is the air pollutant of primary concern in the project area. The federal 8-hour Ozone standard has been exceeded between 61 and 80 days per year during the past five years and the State 8-hour standard was exceeded between 82 to 101 days per year over the past five years.

PM_{10} concentrations during the last five years at the Redlands monitoring station didn't exceed the federal ambient air quality standards. The State standard was exceeded 0 to 2 days per year over the past five years. $PM_{2.5}$ levels exceeded the ambient air quality standards in the project area between 0 and 3 days per year over the past five years.

CO historically has been an important pollutant. CO levels are due mainly to motor vehicles. Currently, CO levels in the project region are in compliance with the state and federal 1-hour and 8-hour standards. NO_2 levels are low in the project area and throughout the basin, and no exceedances have occurred for many years.

<u>City of Loma Linda General Plan</u>

In additional to the mandatory elements, the City of Loma Linda General Plan (GP) includes a Conservation and Open Space Element. Goals and policies pertaining air quality as listed within the General Plan are as follows:

General Plan Guiding Policy (9.3.6)

Policies in the GP Air Quality Section intended to minimize air pollutant emissions within the Loma Linda Planning Area so as to assist in achieving State and Federal air quality standards and seek to attain or exceed the more stringent of Federal or State Ambient Air Quality Standards for each measured pollutant.

Table 4.2-3
Redlands Air Monitoring Station
2008 – 2012

Ozone				
Year	**Days Exceeding One-Hour State Standard**	**Days Exceeding 8-Hour Federal Standard**	**Days Exceeding 8-Hour State Standard**	**Maximum One Hour Reading (ppm)**
2008	72	100	75	0.120
2009	62	91	73	0.122
2010	43	82	61	0.111
2011	64	96	80	0.133
2012	66	101	79	0.109

Source: CARB, 2013
State Standard – 0.09 ppm based on one-hour average. No Federal one-hour standard (removed in 2006).
State 8-Hour Standard 0.070 ppm; Federal 8-Hour standard is 0.075 ppm

Particulate Matter (PM_{10}) Data			
Year	**Days Exceeding State Standard**	**Days Exceeding Federal Standard**	**Maximum 24-Hour Reading ($\mu g/m^3$)**
2008	2	0	58
2009	0	0	52
2010	1	0	57
2011	1	0	71
2012	0	0	48

State Standard – 50 $\mu g/m^3$ based on 24-hour average
Federal Standard – 150 $\mu g/m^3$ based on 24-hour average
$\mu g/m^3$ = micrograms per cubic meter
Measurements taken every 6 days.
Source: CARB, 2013

Fine Particulate Matter ($PM_{2.5}$) Data			
Year	**Days Exceeding State Standard**	**Days Exceeding Federal Standard**	**Maximum 24-Hour Reading ($\mu g/m^3$)**
2008	N/A	3	43.5
2009	N/A	2	37.8
2010	N/A	2	39.3
2011	N/A	2	65.0
2012	N/A	0	34.8

No 24-hour State Standard for $PM_{2.5}$.
Federal Standard – lowered to 35 $\mu g/m^3$ in 2006; based on 24 hour average.
$\mu g/m^3$ = micrograms per cubic meter
Source: CARB, 2013

Implementing Policies

a. Cooperate with and support regional, State and federal agencies to improve air quality throughout the South Coast Air Basin.

b. Budget for purchase of clean fuel vehicles, including electrical and hybrid vehicles where appropriate, and if feasible, purchasing natural gas vehicles as diesel-powered vehicles are replaced.

c. Require developers of large residential and non-residential projects to participate and to take measures to improve traffic flow and/or reduce vehicle trips resulting in decreased vehicular emissions. Examples of such efforts may include, but are not limited to the following: development of mixed-use projects, facilitating pedestrian and bicycle transportation, and permitting consolidation of vehicular trips; provision of charging stations for electric vehicles within large employment generating and retail developments; and contributions for off-site mitigation for transit use.

d. As part of the development review process for non-residential development, require the incorporation of best available technologies to mitigate air quality impacts.

4.2.4 Project Impact Analysis and Mitigation Measures

4.2.4.1 Thresholds of Significance

Significant impacts related to air quality are determined from criteria stated with the CEQA Checklist and SCAQMD thresholds. The Checklist identifies the primary thresholds of significance relating to CEQA issues and the SCAQMD identifies specific significance thresholds for pollutant emissions. Potential impacts are addressed in the CEQA process to identify and evaluate possible impacts to air quality that could potentially result from implementation of the proposed project. Significant impacts to air quality may result if the Proposed Project would:

- Conflict with or obstruct implementation of an applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Air quality impacts are divided into short-term and long-term effects. Short-term impacts are the result of construction or grading operations. Long-term impacts are associated with the built out condition of the Proposed Project. The SCAQMD has established significance thresholds to assess the impact of project-related short-term construction and long-term operational air pollutant emissions. A project with daily emission rates below these thresholds are considered to have a less than significant effect on air quality.

Thresholds of Significance for Construction:

- 75 pounds per day of ROC
- 100 pounds per day of NO_x
- 550 pounds per day of CO
- 150 pounds per day of SO_X
- 150 pounds per day of PM_{10}
- 55 pounds per day of $PM_{2.5}$

Thresholds of Significance for Operations:

- 55 pounds per day of ROC
- 55 pounds per day of NO_x
- 550 pounds per day of CO
- 150 pounds per day of SO_X
- 150 pounds per day of PM_{10}
- 55 pounds per day of $PM_{2.5}$

Toxic Air Contaminants

- Maximum Incremental Cancer Risk ≥ 10 in 1 million
- Hazard Index ≥ 1.0 (project increment)

4.2.4.2 Issues Identified to Have No Impact or Less Than Significant Impact

The Proposed Project was determined to not have the potential to result in significant impacts in the issue areas listed below. For each issue, an explanation of the impact and a determination of no need for mitigation measures are provided.

Create objectionable odors affecting a substantial number of people.

The LLUMC has been in operation since 1967. Emissions generated by the proposed project would be from short-term construction of all new and renovated facilities and operational emissions from the utility plant. The utility plant operational emissions are associated with the replacement of the 1985 Cogen Size 10MW utility plant with a new, more efficient 22MW power plant. No other operational emissions are anticipated as the improvements are associated with replacing and/or improving existing services. Objectionable odors are typically not associated with the construction or operation of the proposed improvements. Therefore, impacts from objectionable odors are not anticipated.

Conflict with or obstruct implementation of an applicable air quality plan.

The LLUMC has been in operation since 1967. Emissions generated by the proposed project would be from short-term construction of all new and renovated facilities and operational emissions from the utility plant. No other operational emissions are anticipated as the improvements are associated with replacing and/or improving existing services. Buildout of the medical center campus was evaluated in the City of Loma Linda General Plan Update; the proposed project improvements are consistent with the City of Loma Linda General Plan that has been included in the AQMP. Therefore, less than significant impact is anticipated.

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

Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors?

Expose sensitive receptors to substantial pollutant concentrations.

Construction Activities

LLUH has submitted an application for campus improvements associated with a Master Plan. The improvements will be developed in two phases: Phase I will include the development of a 760-space patient and visitor parking structure and an 80-space parking lot, a 732,000 square-foot acute care hospital with 464 beds, a new or upgraded SCE substation, and a new or retrofitted utility plant. Phase II will include the development of a research building, expansion to the dental school, and re-use of the existing hospital towers A and C.

Emissions generated by the proposed project would be from short-term construction of all new and renovated facilities and operational emissions from the utility plant. No other operational emissions are anticipated as the improvements are associated with replacing and/or improving existing services. The existing campus utility plant, which includes a cogeneration power plant, is located on the campus west of Anderson Street and south of University Avenue and serves the campus and the existing hospital with efficient and centralized power and other utilities. The utility plant consists of three areas: the original Central Heating and Cooling Plant, a Centrifugal Chiller Plant, and the Cogeneration Plant. The three plants are adjacent to each other and are referred to herein as the "utility plant". The Central Heating and Cooling Plant includes absorption chillers, pumps, cooling towers, and a backup boiler as well as office and other administrative space. The Centrifugal Chiller Plant includes 5 chillers, pumps, and a roof-mounted cooling tower. The utility plant also provides softened, reverse osmosis, and deionized water treatment systems; and compressed air.

LLUH is currently reviewing two options to modernize and expand these services. The capacity of the cogeneration power plant would be increased in phases from the existing 10 megawatts (MW) up to a maximum of 22 MW, allowing LLUH to become less reliant in time, on power purchased from others. The capacity increases would be constructed in units of 7.3 MW and the maximum buildout would be 22 MW. Air Quality reviewed Utility Plant Option 1, the construction and operation of a new 22 MW utility plant as this represents the worst case scenario of selecting either option.

The proposed project was screened using the CalEEMod version 2013.2 emissions model. The criteria pollutants analyzed included reactive organic gases (ROG), nitrous oxides (NO_x), carbon monoxide (CO), and particulates (PM_{10} and $PM_{2.5}$. Construction emissions were screened and quantified to document the effectiveness of control measures. Model results are detailed in Appendix C.

The CalEEMod model allows the user to set certain defaults and run the model to incorporate SCAQMD required rules and regulations. Therefore, per SCAQMD Rules 402 and 403, the mitigation requiring that exposed surfaces during construction be watered twice per day was "turned on". The developer and its contractor will be required to comply with mandated SCAQMD rules and regulations, including but not limited to, Rules 402 and 403. Therefore, the following dust control requirements applicable to the site activities as recommended by Rules 402 and 403 shall be implemented to comply with the SCAQMD:

1. The project proponent shall ensure that any portion of the site to be graded shall be pre-watered prior to the onset of grading activities.
   (a) The project proponent shall ensure that watering of the site or other soil stabilization method shall be employed on an on-going basis after the initiation of any grading activity on the site at least 2x per day. Portions of the site that are actively being graded shall be watered regularly to ensure that a crust is formed on the ground surface, and shall be watered at the end of each workday.
   (b) The project proponent shall ensure that all disturbed areas are treated to prevent erosion until the site is constructed upon.
   (c) The project proponent shall ensure that landscaped areas are installed as soon as possible to reduce the potential for wind erosion.
   (d) The project proponent shall ensure that all grading activities are suspended during first and second stage ozone episodes or when winds exceed 25 miles per hour.

During construction, exhaust emissions from construction vehicles and equipment and fugitive dust generated by equipment traveling over exposed surfaces, would increase NO_X and PM_{10} levels in the area. The following SCAQMD emissions control requirements shall be implemented as a part of the Proposed Project.

2. To reduce emissions, all equipment used in grading and construction must be tuned and maintained to the manufacturer's specification to maximize efficient burning of vehicle fuel. Site development will be limited to one acre disturbed per day.
3. The contractor shall utilize (as much as possible) pre-coated building materials and coating transfer or spray equipment with high transfer efficiency, such as high volume, low pressure (HVLP) spray method, or manual coatings application such as paint brush, hand roller, trowel, dauber, rag, or sponge.
4. The contractor shall utilize water-based or low VOC coating per SCAQMD Rule 1113. The following measures shall also be implemented:
   - Use Super-Compliant VOC paints whenever possible.
   - If feasible, avoid painting during peak smog season: July, August, and September.
   - Recycle leftover paint. Take any left-over paint to a household hazardous waste center; do not mix leftover water-based and oil-based paints.
   - Keep lids closed on all paint containers when not in use to prevent VOC emissions and excessive odors.
   - For water-based paints, clean up with water only. Whenever possible, do not rinse the clean-up water down the drain or pour it directly into the ground or the storm

drain. Set aside the can of clean-up water and take it to a hazardous waste center (www.cleanup.org).

- Recycle empty paint cans.
- Look for non-solvent containing stripping products.
- Use Compliant Low-VOC cleaning solvents to clean paint application equipment.
- Keep all paint and solvent laden rags in sealed containers to prevent VOC emissions.

5. The project proponent shall ensure that existing power sources are utilized where feasible via temporary power poles to avoid on-site power generation.
6. The project proponent shall ensure that construction personnel are informed of ride sharing and transit opportunities.
7. All buildings on the project site shall conform to energy use guidelines in Title 24 of the California Administrative Code as updated to reduce energy consumption and reduce GHG emissions.
8. The operator shall maintain and effectively utilize and schedule on site equipment and delivery trucks in order to minimize exhaust emissions from truck idling.

Modeled Analysis

The emissions calculations for the construction phase include fugitive dust from grading and exhaust emissions from on-site equipment and worker travel and are summarized in Tables 4.2-4 thru 4.2-6. The fugitive dust emissions are based on earthwork activities per day. The proposed construction activities will include implementation of the "best available fugitive dust control requirements" listed above and the developer will comply with SCAQMD rules and regulations particularly Rules 402 and 403 that require controls for fugitive dust. These standard conditions will reduce emissions to the lowest amounts feasible. Construction emissions were screened and quantified to document the effectiveness of control measures. The following construction parameters were analyzed:

- Construction Years 1 thru 2
  - Demolition of 10 structures (residential used as office)
  - 760-space parking structure

- Construction Years 2 (late year 2, not to overlap with the construction of the Parking Structure) thru 6
  - 464 bed Hospital
  - 80 parking lot
  - 9,000 square feet dental building
  - 4,000 sq.ft SCE substation
  - 34,000 sq.ft New 22MW Central Plant Building
  - Demolition of 10,000 square feet building

- Construction Year 7
  - 90,000 square foot Research Building

Table 4.2-4
Construction Emissions Summary
Years 1 thru 2
(Pounds Per Day)

Source/Phase	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Demolition	5.3	51.3	38.6	0.0	3.8	2.6
Site Preparation	5.8	57.7	44.3	0.0	11.5	7.5
Grading	4.3	41.2	27.8	0.0	5.5	5.8
Building Construction	8.4	28.0	35.1	0.0	4.1	2.7
Paving	2.7	25.3	16.0	0.0	1.6	1.3
Architectural Coating	44.2	2.8	3.6	0.0	0.5	0.3
Highest Value (lbs/day)	**44.2**	**57.7**	**44.3**	**0.0**	**11.5**	**7.5**
SCAQMD Threshold	75	100	550	150	150	55
Significant	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod 2013.2
Construction Phases don't overlap and represent the highest concentration

Table 4.2-5
Construction Emissions Summary
Years 2 thru 6
(Pounds Per Day)

Source/Phase	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Demolition	5.0	49.2	37.6	0.0	3.1	2.5
Site Preparation	5.6	56.9	43.8	0.0	11.4	7.4
Grading	4.0	38.5	26.9	0.0	5.3	3.6
Building Construction	7.7	35.5	34.8	0.0	4.2	2.4
Paving	1.9	17.2	15.1	0.0	1.1	0.9
Architectural Coating	53.3	2.1	3.1	0.0	0.5	0.2
Highest Value (lbs/day)	**53.3**	**56.9**	**43.8**	**0.0**	**11.4**	**7.4**
SCAQMD Threshold	75	100	550	150	150	55
Significant	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod 2013.2
Construction Phases don't overlap and represent the highest concentration.

Table 4.2-6
Construction Emissions Summary
Year 7
(Pounds Per Day)

Source/Phase	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Site Preparation	2.2	22.3	14.8	0.0	1.2	1.0
Grading	2.4	22.7	17.5	0.0	4.0	2.6
Building Construction	3.0	18.3	17.7	0.0	1.4	1.1
Paving	1.3	10.6	12.1	0.0	0.8	0.6
Architectural Coating	28.2	1.5	2.1	0.0	0.2	0.1
Highest Value (lbs/day)	**28.2**	**22.7**	**17.7**	**0.0**	**4.0**	**2.6**
SCAQMD Threshold	75	100	550	150	150	55
Significant	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod 2013.2
Construction Phases don't overlap and represent the highest concentration

As shown in Tables 4.2-4 thru 4.2-6, construction emissions are less than the SCAQMD thresholds and would be considered less than significant.

Operational Emissions

The proposed project will not include the manufacture or production of any products on-site; therefore, no industrial type emissions will be generated. Operational emissions generated by the proposed project would be from the cogeneration plant at the utility plant. The utility plant operational emissions are associated with the replacement of the 1985 Cogen Size 10MW power plant with a new more efficient 22MW power plant. The construction of a new utility plant, or the upgrade of the existing plant will result in the same operational emissions. No other operational emissions are anticipated as the improvements are associated with replacing and/or improving existing services and are not anticipated to generate an increase in vehicular traffic (see Appendix A: Traffic Impact Analysis).

Goss Engineering, Inc. prepared an emissions inventory of the existing and proposed utility plant (on file with the City). Emissions associated with the operational activities are listed in Table 4.2-7. Refer to Appendix C for calculations and assumptions.

Table 4.2-7
Operations Emissions Summary
(Pounds Per Day)

Source	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$[1]
Existing 10MW Plant	21.0	201.4	104.9	22.5	22.0
Proposed 22MW Plant	32.9	41.1	49.3	19.2	19.0
Difference from Baseline or Existing (+/-)	**+11.9**	**-160.3**	**-55.6**	**-3.3**	**-3.0**
SCAQMD Threshold	55	55	550	150	55
Significant	**No**	**No**	**No**	**No**	**No**

Source: Goss Engineering, Inc. 2013
[1]PM2.5 is 98% of PM10

As shown in Table 4.2-7, replacing the existing 25-year old plant with a new or retrofitted plant with a larger capacity and with the requirement to implement current air pollutant control measures as required by SCAQMD rules and regulations would substantially reduce NO_x and CO emissions. No criteria emissions would exceed thresholds, therefore no significant impacts are expected.

Toxic Air Contaminants (TAC) or Health Risk Evaluation

The new utility plant must comply with SCAQMD Rules 201 and 212 that require permits and strict emission limitations and controls to construct and operate the facility. These rule requirements were taken into account in the criteria emission inventory listed in Table 10 and Appendix B. In addition, new or modified sources are subject to strict limitations for TACs spell out which are enforced through SCAQMD Regulation XIV. Rule 1401 requires that the maximum increase of individual cancer risk due to TAC emissions from the new or upgraded facilities be less than 1 in a million (1×10^{-6}) at any residential or worker receptors, or 10 in a million (1×10^{-5}) if the permit unit is installed with BACT for toxics (T-BACT). The increase in

total chronic hazard index (HIC) and total acute hazard index (HIA) because TAC emissions must be less than 1. Therefore, with mandatory compliance with Rule 1401 and its limitations above which are the same as the SCAQMD CEQA thresholds, no health impacts due to the emission of TACs are expected.

4.2.4.3 Impacts Determined To Be Potentially Significant Impacts

As a result of the analysis conducted, no identified areas of environmental concern related to air quality were determined to have a potentially significant impact.

4.3 CULTURAL RESOURCES

4.3.1 Introduction

This section of the EIR addresses historic and pre-historic resources that together comprise Cultural Resources. Historic resources are defined as buildings, structures, objects, sites and districts of significance in history, archaeology, architecture and culture. These resources include intact structures of any type that are 50 years or more of age. Historic resources are preserved because they provide a link to a region's past as well as a frame of reference for a community. Archaeological resources are the physical remains of past human activities and can be either prehistoric or historic in origin. Archaeological sites are locations that contain significant evidence of human activity. Generally a site is defined by a significant accumulation or presence of one or more of the following: food remains, waste from the manufacturing of tools, concentrations or alignments of stones, modification of rock surfaces, unusual discoloration or accumulation of soil, or human skeletal remains. Archaeological sites are often located along creek areas, ridgelines, and vistas.

Paleontological resources are the fossilized remains of organisms from prehistoric environments found in geologic strata. These resources are valued for the information they yield about the history of the earth and its past ecological settings. There are two types of resources including: vertebrate and invertebrate paleontological resources. Paleontological sites are those areas that show evidence of pre-human activity.

Information for this section of the EIR is summarized from the *Loma Linda University Health Master Plan – Campus Renovation in the City of Loma Linda, San Bernardino County, CA Cultural Resources Investigation*, prepared by McKenna et al., July 31, 2013, and *An Architectural Evaluation of Structures Within the Loma Linda University Medical Center Ambulatory Pavilion in the City of Loma Linda, San Bernardino County, CA*, prepared by McKenna et al., October 18, 2007 (on file at the City of Loma Linda Community Development Department).

4.3.2 Environmental Setting

Project Location

The Project Site is located in the City of Loma Linda within the San Bernardino Valley region of San Bernardino County (see Figure 3-1). The San Bernardino Valley, approximately 100 square miles in size, lies at the south base of the Transverse Ranges (a group of mountain ranges that begin at the southern end of the California Coast Ranges and lie between Santa Barbara and San Diego counties). The valley is bordered on the north by the San Gabriel Mountains and the San Bernardino Mountains, on the east by the San Jacinto Mountains, and on the south and west by the Santa Ana Mountains, and has an elevation that varies from 590 feet on valley floors near Chino to 1,380 feet near San Bernardino and Redlands.

The City of Loma Linda encompasses the area south of the I-10 freeway, west of Nevada Street, east of Gage Canal and north of the northwestern tip of the San Timoteo Badlands (also referred to as Loma Linda Hills).

Specifically the Project Area is located within the boundaries of the existing LLUH within the City of Loma Linda (originally Mound City) and extends from Anderson Street (originally Mound Street; east) to Campus Street (originally San Bernardino Street; west), Barton Road (south) to an irregular boundary on the north, including areas north of the existing UPRR alignment.

Cultural Resources

Cultural resources generally consist of sites of archeological significance that are prehistoric or historic, and a few historic structures. Prehistoric archaeological resources may date from prior to 8,000 years ago to around 1770, the time of historic contact between indigenous people and Europeans. Historic archaeological resources include refuse deposits such as can and bottle dumps, filled-in privy pits and cisterns, melted adobe walls and foundations, collapsed structures and associated features, and roads and trails. They may date back from the earliest Spanish mission to the beginning of the last century, roughly the period between 1770 and 1900.

Historic Background

The project area is located with the historic core of the City of Loma Linda. Loma Linda was originally established as "Mound City" (Park 2007:xii). Gudde (1998: 214) describes Mound City/Loma Linda as follows:

> When the Colton-Indio sector of the Sunset Route was built in 1875-76, the name Mound Station was applied to the stop, doubtless because of the slight elevation south of it; it is so named on the Land Office map of 1879, but later Southern Pacific maps have Mound City. When the Seventh Day Adventists built a sanatorium in the 1890s and a post office was established on January 14, 1901, the name Loma Linda "pretty hill", first spelled Lomalinda, was chosen.

For clarification, the term "sanatorium" (or "sanitorium") refers to a hospital or hospital complex. "Sanitarium" refers to a health resort. The earlier uses in Loma Linda have been referenced as "sanitarium" facilities, indicating health resort, while the later facilities are referenced "sanitorium", meaning hospital-related. In the quote presented above, the use of "sanatorium" is misleading and Gudde should have used the term "sanitarium." Subsequently, once the Seventh-day Adventists acquired the facilities and established their medical school and hospital, etc., the use of "sanitorium" is appropriate.

The Project Site is located within the boundaries of the historic Rancho San Bernardino, originally granted by Mexican Governor Alvarado to Jose del Carmen Lugo, Jose Maria Lugo,

Vicente Lugo, and Diego Sepulveda in June, 1842 (Avina 1933:68; Beck and Haase 1974). The rancho covered eight square leagues (35,509.41 acres).

The Rancho San Bernardino was purchased in 1851 by a group of Mormons settlers from Salt Lake City, Utah. Small farms were established throughout the rancho, including areas now associated with the cities of Redlands and Loma Linda (Guide 1998: 330). Citing Park (2007:xii).

Following the demise of Mound City, the land (267 acres in all) was sold to H.E. Hills (ca. 1882). Hills plowed the land, obliterating many of the original street alignments, farmed the area, and planted orchards and vineyards. The Mound City Land and Water Company bought Hills' holdings in 1887 (he was in failing health) and re-platted the land in 1888. This attempt to establish a town also failed (ca. 1889), but some families remained, including Dr. Benjamin Barton (for which Barton Road was named). An amended map of Mound City was filed in 1892.

Shortly after 1900, Southern California was becoming known for its climate and health benefits. A group of doctors and private investors concluded that the Mound City area was a likely location for "health conscious" persons and established the Loma Linda Association to pursue the development of a "tourist" destination or "health resort." Mound City was renamed "Loma Linda" and the resort was founded, but, it too, failed. Lilburn Corporation (2013:3-6) states that in January, 1901, Loma Linda received its name and post office, opened for the Seventh Day Adventist sanatorium. The Sanatorium was officially incorporated in 1905.

In 1905, the Southern California Conference of Seventh-day Adventists purchased the holdings of the Loma Linda Association. Pastor John Burden, under the supervision of Ellen G. White, handled the purchase with some reservations. The President of the Conference instructed him to hold off on the purchase, but White decided to purchase the land in his own name (in July 1905). He signed the property (76 acres) over to the Seventh-day Adventist Church in September of 1905.

Loma Linda University (originally the College of Medical Evangelists) was established within the "circle" by 1911 and other facilities began appearing outside the "circle" shortly thereafter. Many of the improvements associated with the early campus were described as "cottages" that provided housing and support services. By 1915, the campus included the properties west of the Mound – west to San Bernardino Street (now Campus Street and north of Barton Road). The expanding complex/community was renamed "Loma Linda University" in 1961 and the Hospital was opened in 1967. By 1970, the complex was known as the Loma Linda University Medical Center (incorporated in 1980). Extensive expansion of the LLUMC has occurred in modern times (post-1967), including significant construction and redevelopment in the very recent past (last five years).

Modest growth within the sanatorium site and the establishment of the educational facilities were recognized between 1905 and 1967, when the much larger LLUMC was opened. Significant changes took place in the period surrounding 1967 in Loma Linda. The new hospital was opened and the realignment of Anderson Street north of the "Mound" was considered. The City began talk of incorporation (finalized in 1970). After 1970, the realignment of Anderson Street was

completed, resulting in the triangular piece of land later to be identified as Elmer Digneo City Park. The realignment moved Anderson Street from the east side of the existing Housekeeping building to the west side of the building and included the construction of the overpass crossing the UPRR. The Elmer Digneo City Park is considered a modern addition to the area. The Housekeeping building was present as the original power plant (including co-generation of electricity by steam) built in 1912, although there is evidence of more modern additions to the building. Extensive expansion of the LLUMC has occurred in modern times (post-1967), including significant construction and redevelopment in the very recent past (last five years).

4.3.3 Applicable Policies, Plans, and Regulations

The treatment of cultural resources is governed by federal and state laws and guidelines. There are specific criteria for determining whether prehistoric and historic sites or objects are significant and/or protected by law. Federal and State significance criteria generally focus on the resource's uniqueness, its relationship to similar resources, and its potential to contribute important information to scholarly research. Some resources that do not meet federal significance criteria may, nevertheless, be considered significant by State criteria. The laws and regulations that seek to address and/or mitigate impacts on significant prehistoric or historic resources are summarized below.

<u>The National Historic Preservation Act of 1966</u>

The National Historic Preservation Act of 1966 established the National Register of Historic Places (NRHP) as the official federal list of cultural resources that have been nominated by State offices for their historical significance at the local, State, or national level. Properties listed in the NRHP, or “determined eligible” for listing, must meet certain criteria for historical significance and possess integrity of form, location, and setting.

Significance is determined by four aspects of American history or prehistory recognized by the NRHP Criteria, which are listed below:

1. Associated with events that have made a significant contribution to the broad patterns of our history.
2. Associated with the lives of persons significant in our past.
3. Embody the distinctive characteristics of a type; period, or method of construction; represent the work of a master; possess high artistic values, represent a significant and distinguishable entity whose components may lack individual distinction.
4. Have yielded, or may be likely to yield, information important in prehistory or history (See 36 CFR §60.4).

Eligible properties must meet at least one of the criteria and possess integrity of location, design, setting, materials, workmanship, feeling, and association. Historical integrity is measured by the degree to which the resource retains its historical properties and conveys its historical character, the degree to which the original fabric has been retained, and the reversibility of changes to the

property. The National Register recognizes these seven aspects or qualities that, in various combinations, define the integrity of a property:

1. Location: Location is the place where the historic property was constructed or the place where the historic event occurred.
2. Design: Design is the combination of elements that create the form, plan, space, structure, and style of a property.
3. Setting: Setting is the physical environment of a historic property.
4. Materials: Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
5. Workmanship: Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or pre-history.
6. Feeling: Feeling is a property's expression of the aesthetic or historic sense of a particular period of time.
7. Association: Association is the direct link between an important historic event or person and a historic property.

The California Register of Historic Resources (CRHR) (Public Resources Code Section 5020 et seq.)

The State Historic Preservation Office (SHPO) maintains the CRHR. Properties listed, or formally designated as eligible for listing, on the NRHP are automatically listed on the CRHR, as State Landmarks and Points of Interest. Significant historical resources are those eligible for the CRHR, properties designated under local ordinances, or those identified through local historical resource surveys.

State law seeks to protect cultural resources by requiring evaluations of the significance of prehistoric and historic resources in CEQA documents. A cultural resource is a significant historical resource if it meets any of the CRHR eligibility criteria found in Section 15064.5(a)(3) of the CEQA Guidelines. These criteria, which are nearly identical to those for the NRHP, are listed below.

a. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
b. Is associated with lives of persons important in our past.
c. 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.
d. Has yielded, or may be likely to yield, information important in prehistory or history.

California Health and Safety Code Sections 7050.5, 7051, and 7054

Sections of the California Health and Safety Code collectively address the protection from interference with human burial remains, as well as the disposition of Native American burials in archaeological sites. The law protects such remains from disturbance, vandalism, or inadvertent destruction, and establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project, including the treatment of remains prior to, during, and after evaluation, and reburial procedures.

CEQA Guidelines Section 15064.5 (e)

CEQA Guidelines Section 15064.5 (e) addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction. The section establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project and establishes the Native American Heritage Commission as the entity responsible to resolve disputes regarding the disposition of such remains.

City of Loma Linda General Plan

In additional to the mandatory elements, the City of Loma Linda General Plan includes a Conservation and Open Space Element. Goals and policies pertaining archeological resources as listed within the General Plan are as follows:

Conservation and Open Space Element Goals and Polices

Guiding Policy (9.7.5)

Preserve and protect the City's historic structures and neighborhoods. Identify and preserve the archaeological and paleontological resources in Loma Linda.

Implementing Policies

a. Update the Survey of Historic Properties Inventory of 1988, taking into consideration buildings, neighborhoods, and other features of historic, architectural, or cultural significance.

b. Establish priorities and pursue designating historic districts, following study and recommendation by the Historic Commission to preserve historic areas.

c. Consider pursuing the designation of new historic landmarks.

d. Preserve significant historic structures through review of demolition permits or alterations to such structures by the Historic Commission. Permit reuse of historic landmark structures for institutional, office, or commercial uses, where improvements to

the structure retain the integrity of the historic landmark (see Community Design Element, Section 3.2).

e. Where new development occurs around an historic structure, ensure that the surrounding setting is compatible with the historic structure (see Community Design Element).

f. As a standard condition of approval for new development projects, require that, if cultural or paleontological resources are encountered during grading, alteration of earth materials in the vicinity of the find be halted until a qualified expert has evaluated the find and recorded identified cultural resources.

4.3.4 Project Impact Analysis and Mitigation Measures

Although the Project would consist of a multi-phased development to construct new facilities and improvements to the existing campus, the impact analyses provided below are based on build-out of all phases of the Master Plan for determining potential impacts to cultural resources. A focused study analyzing potential impacts to cultural resources was prepared based on the ultimate build-out of the Master Plan. A separate study prepared for the Proposed Ambulatory Pavilion in 2007, evaluated the area and residential structures occurring west of Anderson Street, north of Prospect Avenue, east of Taylor Court (historically Loma Linda Drive) and south of Taylor Street (including the ten (10) residential structures proposed for removal in this Master Plan). This study was utilized for this impact analysis and at the time (October 2007) did not include the current Master Plan Project.

4.3.4.1 Thresholds of Significance

Significant impacts related to cultural resources are determined from criteria stated within the CEQA Checklist. The Checklist identifies the primary thresholds of significance relating to CEQA issues. Potential impacts to historic, archeological and paleontological resources are addressed in the CEQA process to identify and evaluate possible impacts to cultural resources that could potentially result from implementation of the proposed project. The Proposed Project would have a significant effect on Cultural Resources if it would:

- Be developed in a sensitive archaeological area as identified in the City's General Plan.
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5 of CEQA.
- Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5 of CEQA.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature,
- Disturb any human remains, including those interred outside of formal cemeteries.

4.3.4.2 Issues Identified to Have No Impact or Less Than Significant Impact

The Proposed Project was determined to not have the potential to result in significant impacts in the issue areas listed below. For each issue, an explanation of the impact and a determination of no need for mitigation measures is provided.

Be developed in a sensitive archaeological area as identified in the City's General Plan.

According to the City of Loma Linda General Plan, Section 9.7 Cultural Resources, the Project Site, with the exception of the Elmer Digneo City Park, occurs within one of the four potential Historic Districts (namely the Campus District) identified in the 1988 historical study. Historic Districts are areas containing concentrations of improvements with historic interest or value. The Campus District was identified in association with the growth of the campus. The following resources were identified as potentially contributing features of the Campus District:

- Nichol Hall (Sanitarium complex and associated features. This is now the Schools of Public Health and Allied health profession).
- Campus Hill Seventh Day Adventist Church
- Main University Campus (Art Deco buildings: 1934 Burden Hall, 1936 Evans Hall, etc.)
- University Church
- "Old" office buildings on Hill (four early 1900's Queen Anne Cottages on Campus Hill)

The City's General Plan Draft Program EIR concluded that a more in-depth evaluation of the potential Campus District would likely incorporate additional buildings and features, and only after a more complete inventory and analysis of the resources represented could any decisions be made regarding the Campus District.

The entire Project Site including all portion of proposed construction, were evaluated within the *Cultural Resources Investigation for the Loma Linda University Health Master Plan – Campus Renovation in the City of Loma Linda, San Bernardino County, CA*, prepared by McKenna et al., July 31, 2013. The whole campus has not been declared a district, but there are portion of the surrounding area that have been recorded as district areas (e.g. to the northeast of the current project). The current campus area would not qualify because the new building phases have diluted the period of significance and 66 percent of the buildings within a proposed district boundary need to qualify as contributing elements. The four buildings in the core area of the campus may be considered a district, but the surrounding developments and campus growth have impacted the historic area and, therefore, a historic district has not been identified. The proposed LLUH Master Plan Project would not impact a sensitive archaeological area as identified in the City's General Plan. A less than significant impact would result.

4.3.4.3 Issues Determined to Have Potentially Significant Impacts

The Proposed Project could potentially result in significant impacts in the issue areas listed below. For each issue, the potential impact is provided in a numbered impact statement, followed

by analysis, and mitigation measures if the impact is determined to remain significant after the analysis.

Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5 of CEQA.

Impact CR-1

Approval of the LLUH Master Plan Project would require earthwork, which may result in the unearthing of unknown archeological resources. This is a potentially significant impact.

The City of Loma Linda is located within a geographical area generally described to the Serrano, a Native American population currently associated with the San Manuel Band of Mission Indians in Highland, San Bernardino County, California. The area is also associated with the Gabrielino/Tongva, a prehistoric population associated with Southern California and specifically aligned with the San Gabriel Mission in Los Angeles County.

The *Asistencia* in Redlands (ca. 1810) is a facility associated with the San Gabriel Mission and once established to serve the Native American population in this inland territory. There is always a potential to identify prehistoric cultural resources within a project area. In many instances, these remains will be found in a buried context.

Although no formal reporting of Native American resources has occurred to date, no resources were discovered on the Project Site, and the archaeological sensitivity of the project area is considered to be low, in the event that any archaeological materials are encountered the following mitigation measures shall be implemented:

Mitigation Measures

Mitigation Measure CR-1:

The Project Proponent (LLUH) shall have an archaeological monitor on-site during any proposed demolition and initial ground altering activities to ensure adequate and accurate recordation of the demolition and to document any potentially significant archaeological discoveries. The archeological monitor shall oversee excavations within the younger alluvial deposits. The extent and duration of any required monitoring shall be dependent upon the various task-related schedules and at the discretion of the City of Loma Linda.

Mitigation Measure CR-2:

In accordance with 36 CFR 800.13(b)(3), the State Historic Preservation Officer and Native American tribal contacts of the Serrano and Gabrielino tribes, as well as the Advisory Council on Historic Preservation shall be notified within 48 hours of the discovery of any archaeological artifacts.

Level of Significance After Mitigation

Application of the above mitigation measures would reduce the potential impacts to archeological resources to a less than significant level.

Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5 of CEQA.

Impact CR-2

The Proposed Project may require the demolition and/or alteration to on-site historical buildings. This is a potentially significant impact.

The LLUH Master Plan includes the construction of a new seven-level parking structure, to be constructed east of Campus Street and adjacent to the existing hospital. The parking structure would be constructed in an area currently providing street level parking and no buildings would be removed to complete this structure. The Master Plan also includes construction of a new hospital building on the northwestern corner of Barton Road and Anderson Street; in an area currently used for surface parking; no building demolition would be required to complete the new hospital. The SCE substation necessary to serve the project would be placed in one of two alternative locations: (SCE Option 1) new substation within the Elmer Digneo City Park; or (SCE Option 2) to upgrade the existing substation located south of the existing utility plant; demolition of historical resources would not be required for either option.

The Project also includes the construction of a new utility plant or a retrofit of the existing utility plant. Option 1 includes the construction of a new utility plant at the site of the existing Housekeeping building (aka Radiation Safety) located east of Anderson Street and south of the UPRR (see Figure 3-4). Utility Plant Option 1 would require the demolition of the existing Housekeeping building, which has been identified as a ca. 1912 Art Deco building. Option 2 would require significant upgrades to a modern building (existing utility plant) and no impacts to a historic structure would result.

The LLUH Master Plan Project includes an addition to the existing dental school that would involve the north elevation of the building and include a new reception area, administration and consultant space, waiting area, resident's lounge, support staff space, and clinical/specialty space. The addition would consist of a two-story addition that would extend towards and into part of the University Avenue alignment and would require the removal of some existing parking areas. The existing Dentistry School is a modern building surrounded by other modern buildings. The proposed addition would not constitute an adverse environmental impact.

The Master Plan Project also includes the construction of a new Research Building that may be developed near or on the site of the existing Risley Hall complex (ca. 1940). This new facility would be a three (3) to four (4) story structure providing expanded laboratory and research office space and a new high-tech research facility for interdisciplinary research.

Research into previously completed cultural resources studies was performed at the San Bernardino County Museum Archaeological Information Center, Redlands, California. This

research identified a minimum of thirty-three area specific studies and another nine general overviews within one mile of the Project Site. Three studies (McKenna 2007, 2008, and 2012) were completed within the Master Plan project area. These studies included the Stewart Street frontage, the proposed ambulatory pavilion, and portions of the Anderson Street frontage (southwest of the Mound).

As a result of the studies, a total of eight (8) historic archaeological sites, one (1) pending historic archaeological site, thirty-seven (37) historic structures, two (2) possible historic structures, and two (2) California Points of Historical Interest were identified (see Table 4.3-1). In some instances, resources were identified more than once (e.g. by site number or CPHI reference). As a result, a total of 43 resources were identified within one-mile. Of these, 20 resources were within the current Master Plan study area and the remaining 23 were adjacent or within one-mile of the project area. These resources were addressed between 1987 and 2008; some more than once.

Table 4.3-1
Resources Identified within One-Mile of the Project Area

Resource	Citation	Description	Location
P1074-77H	Hatheway 1987	University Campus District	Within
P36-000647	Apple et al. 1988	Historic Refuse Scatter	
P36-007168	Smith 1995	Gage Canal	
P36-010330	Tibbett 2010	Union Pacific Railroad	Adjacent
P36-012871	Smallwood 2005	10752 Poplar Street	
P36-012872	Smallwood 2005	10762 Poplar Street	
P36-012873	Smallwood 2005	10845 Poplar Street	
P36-012874	Smallwood 2005	10861 Poplar Street	
P36-11282H	Walter & VanWormer 2003	Montecito Memorial Park	
P36-013878	Jacquemain 2007	Teel Residence	
P36-014126	McKenna 2007	24871 Taylor Street	Within
P36-014127	McKenna 2007	24865 Taylor Street	Within
P36-014128	McKenna 2007	24873 Taylor Street	Within
P36-014129	McKenna 2007	24897 Taylor Street	Within
P36-014130	McKenna 2007	24899 Taylor Street	Within
P36-014131	McKenna 2007	11180 Anderson Street	Within
P36-014132	McKenna 2007	11188 Anderson Street	Within
P36-014133	McKenna 2007	24886 Prospect Avenue	Within
P36-014134	McKenna 2007	24888 Prospect Avenue	Within
P36-014135	McKenna 2007	24880 Prospect Avenue	Within
P36-014136	McKenna 2007	24856 Prospect Avenue	Within
P36-014137	McKenna 2007	24858 Prospect Avenue	Within
P36-014138	McKenna 2007	24850 Prospect Avenue	Within
P36-014139	McKenna 2007	24854 Prospect Avenue	Within
P36-014040	McKenna 2007	24885 Prospect Avenue	Within
P36-015505	Hatheway 1987	11170-76 Ritchie Circle	
P36-016417	Ballester 2003; Kaiser 1973; Beattie 1925	San Bernardino-Sonora Road	CPHI-21
P36-017533	Kaiser 1973	Mound City (Loma Linda)	CPHI-19
P36-020339	Hatheway 1987; McDougall and Moloney 2008	25500-25300 Redlands Blvd.	
P36-020252	Hatheway 1987	24955 Redlands Blvd.	
P36-020253	Hatheway 1987	10650 Anderson Street	

Resource	Citation	Description	Location
P36-020254	Hatheway 1987	24954 Prospect Avenue	
P36-020255	Hatheway 1987; Chasteen 2008	11110-12 Anderson Street	Within
P36-020801	McKenna 2008	24785 Stewart Street	Within
P36-020802	McKenna 2008	24745 Stewart Street	Within
P36-020811	Chasteen 2008	24831 Redlands Blvd.	
P36-020812	Chasteen 2008	24821 Redlands Blvd.	
P36-020813	Chasteen 2008	24809 Redlands Blvd.	
P36-020814	Chasteen 2008	24747 Redlands Blvd.	
P36-020815	Chasteen 2008	11145-47 Anderson Street	
P36-020816	Chasteen 2008	10559 Anderson Street	
P36-020826	Chasteen 2008	10535 Anderson Street	
P36-024899	Gallardo 2012	Historic Refuse Deposit	

At the time of the recent assessment, it was confirmed that all earlier improvements north of Stewart Street, west of Anderson Street, west of Campus Street, and south of the UPRR alignment were replaced by a relatively large parking lot and the recently constructed Centennial Complex. Likewise, the improvements south of University Avenue are primarily modern additions to the campus. The areas exhibiting historic structures (pre-1967) include the frontages along Taylor Street and Taylor Court and the core area of the original campus located south of Stewart Street and west of Anderson Street. Here, the structures of concern include Evans Hall (ca. 1936); Cutler Hall (ca. 1936); Shryock Hall (ca. 1936); Burden Hall (ca. 1934); and Risley Hall (ca. 1940). In addition to the standing structures, monuments are present on Anderson Street, a plaque is placed on Burden Hall, and another plaque is present on Risley Hall.

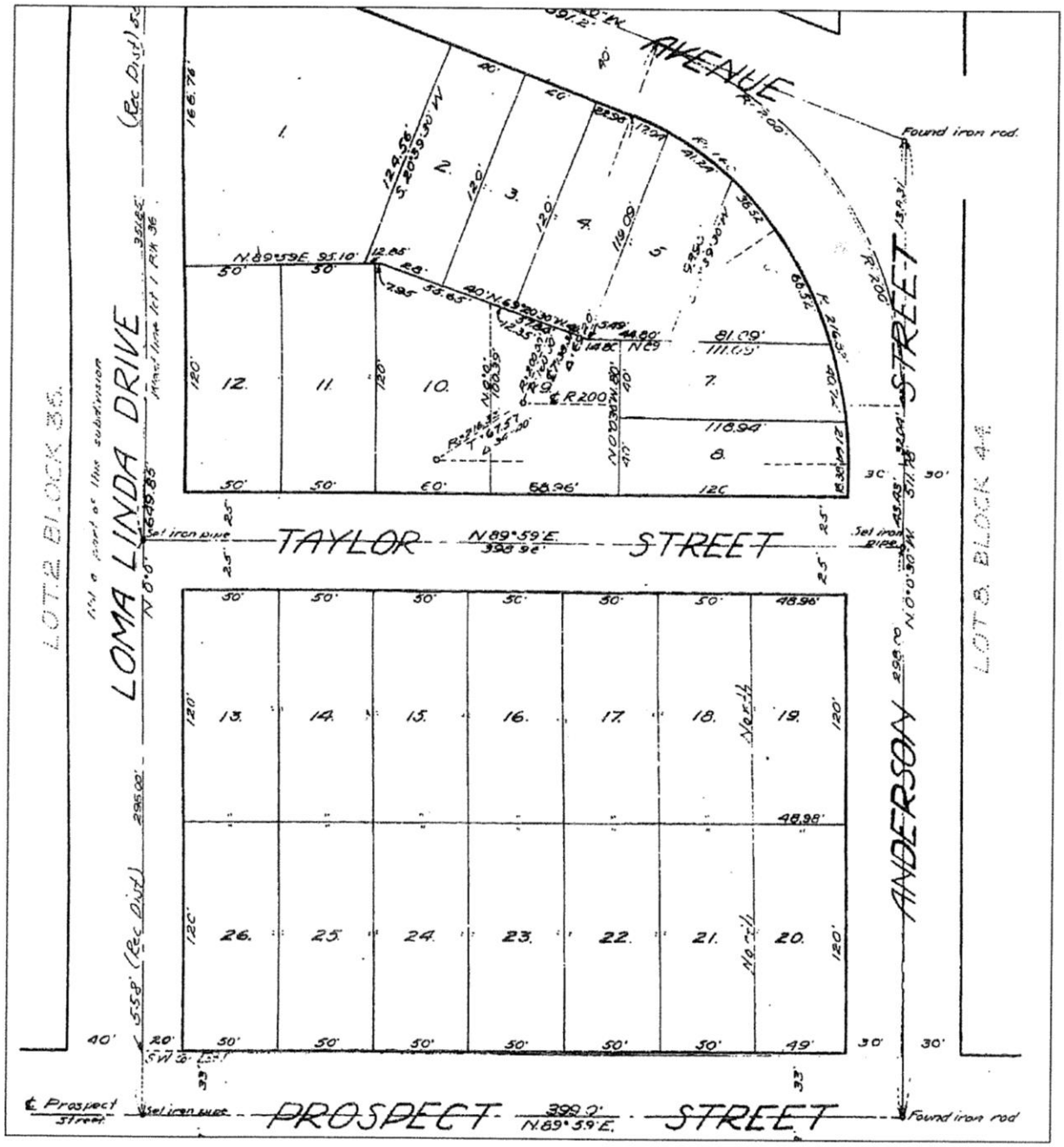
Residential Structures at Taylor Court, Taylor Street and Prospect Avenue

The ten residential structures (lots 20 through 26 of Historic Tract 2421; see Figure 4.3-1) were acquired by the University in the 1960s and 1970s and are generally located west of Anderson Street, north of Prospect Avenue, south of Taylor Drive and east of Taylor Court. These ten structures would be demolished to allow for future construction staging and parking lot area. All structures (lots 13 through 26), as shown on Figure 4.3-1, were evaluated between August and September 2007, and findings were reported in *An Architectural Evaluation of Structures Within the Loma Linda University Medical Center Ambulatory Pavilion in the City of Loma Linda, San Bernardino County, CA*, prepared by McKenna et al., October 18, 2007 (on file with the City of Loma Linda Community Development Department). As Lots 20 through 26 are proposed to be removed in the Master Plan, only findings of these lots are discussed in detail herein.

Lot 20 - Two structures are located on lot 20 including: a small converted garage that is currently used as commercial ("A Gift of Time") at 11180 Anderson Street and a residential structure ("Office of Sponsored Research") at 11188 Anderson Street. Both structures on Lot 20 fail to meet any of the minimum requirements for recognition as an historically significant resource.

Lot 21 – Cross-referenced as 24886 and 24888 Prospect Avenue and developed as a multi-family/multi-office complex being used by the University. The property is associated with Wayne White, a local minister, but this association does not rise to the level of a significant association. There are no outstanding architectural elements and the structures cannot be

associated with any known or recognized architect. Overall, the two structures located on this lot, fail to meet the minimum requirements for significance or recognition as an historical resource as defined in CEQA.



Historic Tract 2421

Figure 4.3-1

Lot 22 – Crossed-referenced as 24878 and 24880 Prospect Avenue and historically associated with Thomas and Florence Zirkle. A residential structure and altered two-car garage in the rear currently being used as offices of "Sponsored Projects Management." Overall, the structures are considered simple, with no outstanding architectural elements or integrity. There has been altering through window replacement, moving doors, added railings and ramps, and resurfacing. The property is not associated with any individual or event meeting the requirements of CEQA criteria and it is not considered a significant resource or an historical resource.

Lot 23 and 24 – Both lots are currently being used for surface parking. Previous on-site residential structures were demolished sometime after 1965 and subsequent to the acquisition of each lot by the University. The properties contain no structures of significance, and therefore no historical resources exist.

Lot 25 – Cross-referenced as 24856 and 24858 Prospect Avenue and associated in 1935 with Herbert and Isa Clark, with no improvements listed for the property until 1945. Field investigations conducted in August and September 2007 identified two structures on the property. The rear structure, 24856 Prospect Avenue, is a converted garage currently being used as the Human Resources Management Annex. Although dating to the 1940s, the building lacks integrity and fails to meet any of the minimum requirements for recognition as an historical resource.

The front structure identified as 24858 Prospect Avenue, houses the Assistive Technology Assessment Center. Although the floor plan is original, the replacement of windows, doors, resurfacing, and adding the wheel chair ramp has significantly impacted the architectural integrity of the building. Further, the property cannot be associated with any significant person or event that would qualify as meeting the minimum requirements for recognition under CEQA. Therefore, this structure fails to qualify as an historical resource.

Lot 26 – Located at the corner of Prospect Avenue and Taylor Court, Lot 26 represents the earliest development on the block bounded by Prospect Avenue, Taylor Court, Taylor Street and Anderson Street. Generally referred to as "The White House," this structural complex on the property is actually associated with Herbert and Isa Clark. The property was sold to Wayne and Nelva White in 1947, and they improved the property into at least five units to generate rental income.

The main house (24850 Prospect Avenue) is the original 1933 residence attributed to Clark. The architectural design of this residence is indicative of an eclectic building exhibiting elements of both California Ranch and Spanish Revival elements. The structure is intact, exhibiting very minor alternations. Nonetheless, the structure cannot be associated with any significant individual or events and the architecture, while maintaining integrity, cannot be associated with any architect of renown nor does it present a unique or distinctive design.

To the rear of 24850 Prospect Avenue is the original garage (facing Taylor Court) that has been altered to accommodate three more rental units. Overall, the garage has been significantly altered, with an addition of a second story negating the integrity of the structure, and therefore, it is not considered an historically significant component of the complex.

The assessment concluded that none of the existing structures within Lots 20 through 26, as individual resources, have met the requirements defined in CEQA for recognition as historic resources. Similarly, Lots 13 through 19 (not discussed in detail within this EIR) are not considered historically significant, and therefore, future removal of the structures on these lots would not result in a significant impact.

Housekeeping Building and Risley Hall

The research completed for the Proposed Project involved a review of previously completed projects and the assessment of resources not previously assessed. Based on the Proposed Master Plan, the areas of concern involve the ca. 1912 Housekeeping building, located south of the UPRR alignment and east of Anderson Street, and Risley Hall located within the core area of the historic campus. All other areas within the Project Area and associated with the proposed construction and renovations are of modern origin and would not result in any adverse impacts to potentially significant cultural resources.

As noted, the ca. 1912 Housekeeping building is located to the east of Anderson Street and south of the UPRR alignment. When originally constructed, the building was west of Anderson Street and has since been realigned. In 1912, the facility consisted of a single, irregularly shaped building with a water tower to the west. To the north of the original building was a complex consisting of five structures referenced as “shops” and including the “Mound City Market” (Figure 4.3-2). This complex of shops has long since been removed from the property.

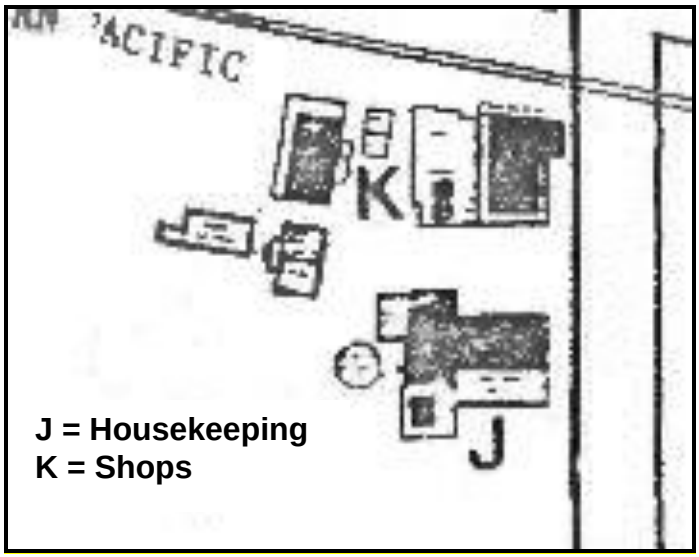


Figure 4.3-2
Map of 1929 Illustrating Early Housekeeping Complex

Currently, the facility consists of the single original building, a modern water tower to the northwest of the building, and a modern utility structure to the west. The current Housekeeping building is a single-story building with a flat roof, flat stucco walls, steel framed door, steel

windows frames, modern glass industrial doors, and elements of the original Art Deco design. The building has been resurfaced, but still exhibits the essence of the original design.

The building still exhibits its irregular plan, with offices to the south and east sides of the building and more utilitarian uses to the north and west. The building is still used, in part for housekeeping and office space (e.g. Office of Public Health Practice & Workforce Development). Other areas of the complex are service-oriented. The original water tower is gone and a new, larger tower is located northwest of the Housekeeping building. Given the extent of the alterations to this building, the physical integrity has been compromised. Nonetheless, the building is one of the earliest examples of development within the Project Site and can be associated with the period of growth exemplified by the other improvements dating to the 1920s (e.g. the core area of the campus located to the southwest).

In applying the criteria for federal, state, or local recognition, the cultural resources investigation concluded that the Housekeeping building cannot be associated with any known or significant individual in history, but can be attributed to the growth of Loma Linda University (event). It is a utilitarian structure with evidence of alterations and a loss of substantial physical integrity, yielding very little of the original Art Deco design elements (assuming they existed originally). There is minimum chance of subsurface resources in this area. Therefore, the building fails to meet the minimum requirements for recognition on the federal (NEPA) or state level (CEQA), but does have some local associations with the connection to the early campus.

Risley Hall is a 1940 building located within the core area of the Loma Linda University campus and one of the four core area buildings representing the pre-War World II improvements. These four buildings replaced the original College of Medical Evangelists facility (one larger building). Risley Hall (1940) is located on the southwestern corner of the core area, south of Shryock Hall (1936), southwest of Evans Hall (1936), and west of Burden Hall (1934).

The McKenna et al. study of 2008 (*Historic Property Survey Report: A Cultural Resources Investigation for the Proposed Stewart Street Improvements Project, Located Between Anderson Street and Campus Street in the City of Loma Linda, San Bernardino County, CA*) found that Evans Hall and Shryock Hall, both constructed in 1936, represent the original core of the campus. In 1964, Risley Hall was damaged by a fire. The rehabilitation of the building was completed by removing the second floor and constructing an addition to the west side of the building, and therefore does not represent original construction. However, Shryock Hall. although in need of some maintenance, is presented in its original construction and impacts should be avoided. The proposed Master Plan would not impact either of these two structures and, therefore would not result in adverse impacts to these resources.

The recent investigations for the LLUH Master Plan Project, emphasizing areas of direct impact, resulted in the identification of two historically sensitive and locally significant resources (the original Housekeeping building and Risley Hall). These structures are part of the larger Loma Linda University Campus (joining another 20 historic structures within the Master Plan boundaries). If the historic structures cannot be avoided (e.g. either demolished or significantly altered), the following mitigation measure shall be implemented:

Mitigation Measures

Mitigation Measure CR-3:

In the event Risley Hall or the Housekeeping building are demolished or significantly altered, the structures shall be documented with additional photographs, compilation of any architectural drawings that may be available through the LLUH archives, and the preparation of a brief historical summary documenting the uses and associations of the buildings within the greater campus history.

Level of Significance After Mitigation

Implementation of the above mitigation measure would lessen impacts to historic resources to a less than significant level.

Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Impact CR-3:

The Proposed Project may unearth a paleontological resources during implementation of the Master Plan. This is a potentially significant impact.

With respect to paleontological sensitivity, a paleontological overview was completed as part of previous campus studies, as listed in Section 4.3.1, resulting in the conclusion that the campus is associated with some surficial exposures of younger alluvium that is not consistent with fossil bearing deposits. However, older Quaternary deposits are present to the east of the Project Site (exposed on the "Mound") and may extend beneath the younger alluvium within the current Project Site. Extensive excavations for structure footings may impact the older alluvium and expose fossil bearing deposits.

In order to account for any potential paleontological resources that may be uncovered during excavation activities, the following mitigation measure shall be implemented:

Mitigation Measures

Mitigation Measure CR-4:

The Project Proponent (LLUH) shall have a paleontological monitor on-site during any proposed demolition and initial ground altering activities to insure adequate and accurate recordation of the demolition and to document any potentially significant paleontological discoveries. The paleontological monitor shall be responsible for overseeing excavations impacting older alluvium. The extent and duration of any required monitoring shall be dependent upon the various task-related schedules and at the discretion of the City of Loma Linda.

Level of Significance After Mitigation

Application of the above mitigation would reduce the potential impacts to paleontological resources to a less than significant level.

Disturb any human remains, including those interred outside of formal cemeteries.

Impact CR-4:

Implementation of the LLUH Master Plan Project would require grading and other ground-disturbing activities, which may result in the disturbance of unknown human remains. This is a potentially significant impact.

As previously described, the City of Loma Linda is located within a geographical area generally described to the Serrano, a Native American population currently associated with the San Manuel Band of Mission Indians in Highland, San Bernardino County, California. Although no formal reporting of Native American resources has occurred to date there is always a potential to identify cultural resources within a project area.

Ground-disturbing activities have the potential to uncover previously unknown buried human remains. Should this occur, federal laws and standards apply including the Native American Graves Protection and Repatriation Act and its regulations found in the Code of Federal Regulations at 43 CRF 10. In the event of an accidental discovery or recognition of any human remains, California State Health and Safety Code Section 7050.5 dictates that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to CEQA regulations and Public Resource Code Section 5097.98. During construction activities, there is a potential for previously unknown buried human remains to be uncovered and therefore, the following mitigation measure would be implemented:

Mitigation Measure CR-5:

If human remains of any kind are found during construction activities, all activities must cease immediately and the San Bernardino County Coroner and a qualified archaeologist must be notified. The Coroner shall examine the remains and determine the next appropriate action based on his or her findings. If the Coroner determines the remains to be of Native American origin, he or she shall notify the Native American Heritage Commission. The Native American Heritage Commission shall then identify the most likely descendants to be consulted regarding treatment and/or reburial of the remains. If a most likely descendant cannot be identified, or the most likely descendant fails to make a recommendation regarding the treatment of the remains within 48 hours after gaining access to them, the Project Proponent shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

Level of Significance After Mitigation

Application of the above mitigation would reduce the potential impacts to any unknown buried human remains to less than significant.

4.4 GEOLOGY AND SOILS

4.4.1 Introduction

This section of the EIR describes the existing Project Site conditions related to geology and soils. The Proposed Project's potential impacts in these areas are discussed and mitigation measures are provided for impacts determined to be potentially significant. Except as noted in the text, information contained within this section has been directly extracted, summarized, or restated from the following reports:

Report of Geotechnical Investigation Proposed Hospital Towers, Northwest Corner of Barton Road and Anderson Street, Loma Linda University Medical Center, Loma Linda, California, prepared by MACTEC, July 13, 2011 (See Appendix E-1). The MACTEC report specifically focuses on the site of the new hospital towers (The Adult and Children's Towers) to be constructed in Phase 1.

Report of Geologic-Seismic Hazards Evaluation Proposed Parking Structure, Loma Linda University Medical Center, Northeast Corner of Campus Street and Barton Road, Loma Linda California, Prepared by AMEC, June 28, 2013 (See Appendix E-2). The AMEC report focuses specifically on the Proposed New Parking Structure.

Geologic/Geotechnical Evaluations Campus Transformation Project EIR, Four Sties, Loma Linda Health Services, Loma Linda, California, prepared by CHJ Consultants, April 30, 2013 (See Appendix E-3). The CHJ Consultants (CHJ) report addresses four areas within the Project Site, including the Option 1 SCE substation and utility plant, and the Phase 2 Research Building and Dental School addition.

4.4.2 Environmental Setting

The entire approximate 23.8-acre Project Site (including portion of the City park site) is centrally located in the City of Loma Linda. Specifically, the Project Site is located on the north side of Barton Road, on the west side of Anderson Street, on the east side of Campus Street, and generally south of the UPRR. The Elmer Digneo City Park is to the north of the campus and north of the UPRR east of Anderson Street. The geographic coordinate location of the Project Site is 34.049347 north latitude and -117.264011 west longitude and it is located in Section 26, Township 1 South, Range 4 West, San Bernardino Base and Meridian.

The City of Loma Linda is located in a geologically complex area situated between the Transverse Ranges and the Peninsular ranges Geomorphic Provinces within California. The intersection of the northwest-trending Peninsular Ranges and east-west-trending Transverse Ranges has created a compressional uplifting and extensional downwarping, which have sculpted the topography within the City.

Regional Geologic Setting and Site Geology

The Project Site is located in the San Bernardino Valley - a structural basin of the northern Peninsular Ranges geomorphic province. The San Bernardino Valley is formed by a structurally down-dropped block of crystalline bedrock overlain by a thick accumulation of alluvium composed of floodplain and alluvial-fan deposits derived from highlands located to the south, east, north and northwest. The valley is bordered to the north and east by the northwest-to-southeast-trending San Andreas fault and San Bernardino Mountains. The San Jacinto fault zone, located southwest of the Project Site, forms the boundary between two low-relief regions; the Perris Block and the San Jacinto Mountains Block (Morton and Miller, 2006). The San Timoteo Badlands are located south of the Project Site and form the northern limit of the Jacinto Mountains Block.

Local Groundwater

The Project Site is located near the southern boundary of the Bunker Hill Groundwater Basin. The alluvial materials beneath the Project Site are part of the waterbearing deposits of the basin. Historical high groundwater levels in the area occurred in 1945 when groundwater levels were roughly between elevations 1050 to 1075 north of the University campus corresponding to a depth of approximately 90 to 65 feet, respectively, below the site's existing ground surface. (USGS, 1963)

According to borings drilled in the vicinity of the Project Site, groundwater was encountered in borings drilled in 1963 at an elevation of 1076' corresponding to a depth of 64 feet at the Project Site (LeRoy Crandall & Associates, 1963). Groundwater was not encountered in the borings drilled in 1984 to a maximum depth of 61 feet, corresponding to about elevation 1080' (LeRoy Crandall & Associates, 1984). Water was not encountered in the borings drilled in 1987 to a maximum depth of 80 feet, corresponding to about elevation 1057' (LeRoy Crandall & Associates, 1987). MACTEC borings in the site vicinity also encountered no groundwater to a maximum depth of 80 feet below the existing ground surface.

Groundwater level data for Well No. 01S04W25E007S, located 0.5 mile north of the Project Site, indicated a maximum high groundwater level at a depth of 39.7 feet in 2005. This measurement corresponds to an elevation of 1040.3', corresponding to 99.7 feet below the ground surface at the Project Site. Based on the data discussed above, the historical maximum high groundwater level for the Project Site is conservatively estimated to be deeper than 60 feet below the existing ground surface.

Geologic Structure and Seismic Setting

Regionally, the Project Site is located in a zone that straddles the Peninsular and Transverse geomorphic provinces. The Peninsular Range province is characterized by northwest/southeast trending alignments of mountains, hills and intervening basins (known as badlands), reflecting the influence of northwest trending major faults and folds, such as the nearby San Jacinto and Elsinore fault zones. These faults control the general geologic structural fabric of the region. This province extends northwesterly from Baja California into the Los Angeles basin and Western

San Bernardino County. Its western and eastern extents are the Southern California offshore islands and Mojave Desert, respectively. The northern boundary of the province is the Transverse Ranges. The Transverse Ranges geomorphic province is characterized by east-west-trending mountain ranges that include the San Gabriel and San Bernardino Mountains. The eastern boundary of the province is the Colorado Desert geomorphic province along the San Jacinto fault system. Locally, the proposed site is located in the San Bernardino Valley on a broad alluvial fan bordering the San Timoteo Badlands to the south. The San Bernardino Mountains border the north side of the valley. Unconsolidated alluvium is the predominant surficial material (California Geological Survey, 2010). Consolidated Tertiary age sedimentary rocks underlie the alluvial deposits below the young sediments (USGS, 1963; USGS, 1991).

The San Bernardino area is a region of large-scale neo-tectonism, a result of the intersection of the east-west-trending Transverse Ranges Province represented by the San Bernardino Mountains and the northwest-trending Peninsular Ranges Province. The San Bernardino Valley is a structural depression between the San Jacinto Fault on the west and the San Bernardino Mountains on the north and northeast. The San Andreas Fault is located at the base of the San Bernardino Mountains.

Earthquake History

No large earthquakes have occurred on the San Bernardino Mountains segment of the San Andreas fault within the regional historical time frame. Using dendrochronological evidence, Jacoby and others (1987) inferred that a great earthquake on December 8, 1812 ruptured the northern reaches of this segment. Recent trenching studies have revealed evidence of rupture on the San Andreas fault at Wrightwood occurred within this time frame (Fumal and others, 1993). Comparison of rupture events at the Wrightwood site and Pallett Creek and analysis of reported intensities at the coastal missions led Fumal and others (1993) to conclude that the December 8, 1812 event ruptured the San Bernardino Mountains segment of the San Andreas fault largely to the southeast of Wrightwood, possibly extending into the San Bernardino Valley. The average recurrence interval for large earthquakes along the southern San Andreas fault at six paleoseismic sites is 182 years (Stone and others, 2002).

Active Faults

San Jacinto Fault Zone:

The active San Jacinto fault zone, considered one of the most seismically active faults in Southern California, is located approximately ½-mile southwest of the Project Site. This fault zone includes several en echelon branches or segments and displays many features characteristic of recent activity such as fault line scarps, sag ponds, and groundwater barriers. Historically, the San Jacinto fault zone has triggered a number of small to moderate-sized earthquakes and at least four large tremors of local magnitudes greater than 6.0. These four tremors were the Imperial Valley earthquake of May 18, 1940 (local magnitude of 7.1), the Borrego Mountain earthquake of April 9, 1968 (local magnitude of 6.5), and the November 23 and 24, 1987 Westmorland earthquakes (respective local magnitudes of 6.0 and 6.3). The Imperial Valley and the Borrego Mountain earthquakes occurred on the Imperial fault and the Coyote Creek fault, respectively, which are both considered to be part of the San Jacinto fault zone. The Westmorland earthquakes

resulted from movement on the Superstition Hills fault, which is considered to be part of the San Jacinto fault zone. The California Geological Survey (2003) has assigned a maximum moment magnitude of 6.6 to 7.2 to these segments of the San Jacinto fault zone.

San Andreas Fault Zone:

The active San Andreas fault zone is located about 7.5 miles northeast of the Project Site. This fault zone, California's most prominent geological feature, trends generally northwest for almost the entire length of the state. The 1857 Fort Tejon earthquake was the last major earthquake along the Andreas fault zone in Southern California. According to the California Geological Survey, the San Bernardino North Section of the San Andreas fault has a slip rate of 22 millimeters a year and a maximum moment magnitude of 7.5.

Loma Linda Fault

The Loma Linda fault is located approximately 200 feet northeast of the Option 1 SCE substation proposed on the Elmer Digneo City Park and 0.2 miles northeast of the Proposed New Research building (Morton and Miller, 2006). The Loma Linda fault displaces the Plio-Pleistocene San Timoteo Formation south of the City of Loma Linda and has been traced along a northwest trend by magnetic and seismic evidence (Fife and others, 1976). The elevated topography of Loma Linda Hill in relation to surrounding areas is apparently the result of ancient movement along this fault. North of Loma Linda, this fault forms a partial barrier to groundwater movement, but it is overlain by more than 100 feet of unfaulted alluvial sediments (Dutcher and Garrett, 1963; Hart, 1976). The Loma Linda fault was formerly included in an Alquist-Priolo Zone; however, subsequent trenching studies showed no evidence of Holocene rupture of the fault. The Loma Linda fault is not considered a significant seismic or ground rupture hazard.

Rialto-Colton Fault

The Rialto-Colton fault/groundwater barrier is depicted by U.S. Geological Survey (2010), based on Treiman and Lundberg (1999), as a northwest-trending structure located approximately 1.5 miles southwest of the Dental School Addition Research Building, and 1.8 miles southwest of Sites “Utility Plant Option 1” and the Elmer Digneo City Park. Additional depictions of the Rialto-Colton fault that approximate the locations depicted by U.S. Geological Survey include Morton and Miller (2006), Woolfenden and Kadhim (1997), Hart (1976) and Morton (1974). Gravity data interpreted by Andersen and others (2000) depict the trend of the Rialto-Colton fault as an 8-mile-long, 1/2-mile-wide gravity anomaly trending northwest from the San Jacinto fault zone to San Sevaine Canyon at the foot of the San Gabriel Mountains. Catchings and others (2008) interpreted vertical offset in basement rocks near the projected surface trace of the Rialto-Colton fault and thus consider this fault, rather than the San Jacinto fault, to represent the southwest margin of the San Bernardino Valley structural basin. They also interpret faults of the San Bernardino Valley including the Rialto-Colton fault as having multiple parallel strands. Treiman and Lundberg (1999) state that the Rialto-Colton fault has no recognized geomorphic expression and is known principally as a groundwater barrier. Trenching studies along the trend of the Rialto-Colton fault revealed 6 feet of unfaulted Pleistocene age sediments overlying a buried fault trace.

Faults in San Bernardino Valley

Several short fault splays defined by trenching studies for the I-215/SR210 interchange and analysis of regional photographic lineaments and seismicity were reported by Schell (2008) at a location approximately 7 miles northwest of the Loma Linda University campus. These features are postulated to be a portion of an active fault zone that extends 5.6 to 7.5 miles southeastward from the San Gabriel Mountains into the San Bernardino Valley along a trend located between and sub parallel to the San Andreas and San Jacinto faults. Based on length/magnitude relations this structure is estimated to produce magnitude 6 to magnitude 6.75 earthquakes (Schell, 2008). An unnamed northeast-southwest trending fault has been postulated by Morton and Miller (2006) to be located within approximately 100 feet of the new Research Building. However, no evidence for this fault has been reported. Therefore, CHJ considers this fault to be inactive and not a significant hazard to any of the sites. The Claremont fault, Live Oak Canyon Fault, Redlands fault and Reservoir Canyon fault are located approximately 1.0 mile southwest, 4.0, 4.5 and 5.5 miles southeast of the Loma Linda University campus, respectively. These and more distant regional faults are capable of producing strong ground shaking in the southern California region.

Historic Earthquakes

A number of earthquakes of moderate to major magnitude have occurred in the Southern California area within the last 100 years. A partial list of these earthquakes and their relationship to the Project Site is included in Table 4.4-1.

Table 4.4-1
List of Historic Earthquakes

Earthquake Location/Name	Date of Earthquake	Earthquake Magnitude	Epicenter Distance from Project Site	Direction from Project Site to Epicenter
San Bernardino Mtns.	September 20, 1907	6.0	12	NE
Lake Elsinore	May 15, 1910	6.0	26	SSW
San Jacinto-Hemet area	April 21, 1918	6.8	31	SSE
Loma Linda area	July 23, 1923	6.3	4	S
Long Beach	March 11, 1933	6.4	5	SW
San Clemente Island	December 26, 1951	5.9	106	SW
Tehachapi	July 21, 1952	7.5	123	NW
San Fernando	February 9, 1971	6.6	70	NW
Whittier Narrows	October 1, 1987	5.9	47	W
Sierra Madre	June 28, 1991	5.8	45	NW
Landers	June 28, 1992	7.3	48	ENE
Big Bear	June 28, 1992	6.4	27	ENE
Northridge	January 17, 1994	6.7	74	WNW
Hector Mine	October 16, 1999	7.1	68	NE

Source: Loma Linda University Medical Center – Report of Geotechnical Investigation July 13, 2011 MACTEC Engineering and Consulting, Inc., Project 4953-10-091

Potentially Active Faults

Arrowhead Fault:
The closest potentially active fault to the site is the Arrowhead fault located about 10 miles to the northeast. The Arrowhead is a reverse fault approximately 9.3 miles in length.

Santa Ana Fault:
The potentially active Santa Ana fault is located about 11 miles northeast of the site. This northdipping reverse fault trends west to east from Running Springs to Pipes Wash, a distance of about 25 miles. The Santa Ana fault, Waterman Canyon fault, and Pipes Canyon fault form a northdipping thrust zone along the southern flank of the San Bernardino Mountains. The latest offset in portions of this thrust zone are Pleistocene age (Meisling, 1984). The Santa Ana fault is considered potentially active (Jennings and Bryant, 2010).

Slope Stability

According to the County of San Bernardino Seismic Safety Element (2005) and the City of Loma Linda Seismic Safety Element (2009), the Project Site is not located within an area of steep slopes and slope instability. The site of the proposed new hospital towers is located on gently sloping ground with no slope stability problems. There is no potential for lurching (movement at right angles to a steep slope during strong ground shaking). The CHJ, Geologic/Geotechnical Investigation, AMEC Geologic-Seismic Hazard Evaluation and the MACTEC Report of Geotechnical Investigation all prepared for various aspects of the Proposed Project concluded that there was no evidence of landsliding observed on any portions of the Project Site, and therefore landsliding is not anticipated. All the reports concluded that the Project Site is not located in an area identified as having a potential for slope instability and that the slopes on Loma Linda Hills appear to be stable. The Proposed Project is not known to be on or in the path of any existing or potential landslide.

Liquefaction and Seismically-Induced Settlement

Liquefaction potential is greatest where the groundwater level is shallow, and submerged loose, fine sands occur within a depth of about 50-feet or less. Liquefaction potential decreases as grain size and clay and gravel content increase. As ground acceleration and shaking duration increase during an earthquake, liquefaction potential increases. Based on the groundwater data summarized above, the historical maximum high groundwater level for the campus area is conservatively estimated to be deeper than 60 feet below ground surface.

The City of Loma Linda General Plan (2006) and the County of San Bernardino General Plan indicate that the optional SCE substation site located within the Elmer Digneo City Park is in an area identified as having a moderate potential for liquefaction.

4.4.3 Applicable Policies, Plans and Regulations

Federal

Clean Water Act (CWA)

The CWA was enacted with the primary purpose of restoring and maintaining the chemical, physical, and biological integrity of the Nation's waters. The EPA has delegated responsibility for implementation of portions of the CWA to the State Water Resources Control Board (SWRCB) and the RWQCB for water quality control planning and control programs, such as the National Pollutant Discharge Elimination System (NPDES) Program.

As explained in further detail in Section 4.6 (Hydrology and Water Quality) of this EIR, a Stormwater Pollution Prevention Plan (SWPPP) prepared in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit application would be required. The SWPPP would detail the specific construction site; the existing and proposed construction erosion and sediment controls; the existing and proposed systems for monitoring runoff water quality; means of waste disposal; implementation of approved local plans; proposed program and methods to control post-construction sediment, erosion, and maintenance responsibilities; and construction and post-construction non-stormwater management controls.

State

Seismic Hazards Mapping Act

The California Geological Survey (CGS) provides guidance with regard to seismic hazards under the Seismic Hazards Mapping Act. Seismic hazard zones are identified and mapped by the CGS to assist local governments in land use planning. The intent of the Act is to protect the public from the effects of strong ground shaking, liquefaction, landslides, ground failure, or other hazards caused by earthquakes. In addition, CGS Special Publication 117, Guidelines for Evaluating and Mitigating Seismic Hazards in California, provides guidance for the evaluation and mitigation of earthquake-related hazards for projects within designated zones of required investigations.

California Building Code (Title 24)

Title 24 of the California Code of Regulations (CCR) governs the design and construction of buildings, associated facilities, and equipment. These regulations are also known as building standards. CCR Title 24 is published by the California Building Standards Commission and it applies to all building occupancies, related features, and equipment throughout the State of California. The California Building Standards Code contains structural, mechanical, electrical, and plumbing system requirements and requires measures for energy conservation, green design, construction and maintenance, fire and life safety, and accessibility. Title 24 was last updated and adopted for an effective date of January 1, 2011.

Cities and Counties are required by state law to enforce CCR Title 24. Due to varying local climatic, geological, and topographic conditions, City and County agencies have the prerogative

of adopting requirements more restrictive than those provided for by CCR Title 24. An adoption of building standards differing from those established in CCR Title 24 must be filed with the California Building Standards Commission along with a finding of need statement. Additionally, cities and counties may adopt ordinances that require fire suppression sprinkler systems and other fire protections that are more restrictive than those found in CCR Title 24. Such ordinances must be filed with the Department of Housing and Community Development.

City of Loma Linda General Plan

The Public Health and Safety Element of the General Plan provides decision makers with the information necessary to evaluate the nature of a given hazard and possible courses of action. This element identifies various hazards, where they exist, who is managing them, the probability of the hazards occurring, and the severity of the hazards should they occur.

Policies:

Seismic and Geologic Hazards Guiding Policy (10.1.2)

Minimize the risks of property damage and personal injury resulting from seismic and geologic hazards.

Implementing Policies

a. Limit development to low density in areas near geologic hazards such as the San Jacinto Fault that would create adverse conditions to those inhabiting the area and to the overall community.

b. Enforce the provisions of the Alquist-Priolo Earthquake Fault Zoning Act.

c. Require geologic and soils reports to be prepared for proposed development sites, and incorporate the findings and recommendations of these studies into project development requirements.

d. Provide information and establish incentives such as free inspections or possibly reduced fees for property owners to rehabilitate existing buildings using construction techniques to protect against seismic hazards particularly in buildings with high occupancy such as churches and other places of assembly.

e. Identify and publicize the geologic and seismic hazards within Loma Linda and advise residents and property owners of appropriate protection measures to reduce or eliminate structural damage.

f. Encourage continued investigation by State agencies of geologic conditions within the Inland Empire to update knowledge of seismic hazards and promote public awareness.

g. Require that engineered slopes be designed to resist seismically induced failure.

h. Require that structures overlie both cut and fill areas within a grading operation be overexcavated to mitigate the potential for seismically induced differential settlement.

i. Require specialized soils reports in areas suspected of having problems with potential liquefaction and areas depicted as liquefaction zones as shown on Figure 10.1 (Geologic

Hazards), bearing strength, expansion, settlement, or subsidence, including implementation of the recommendations of these reports into the project development.

j. Work with Southern California Edison, the Southern California Gas Company, pipeline companies, and industrial companies to implement measures to safeguard the public from seismic hazards associated with high voltage transmission lines, caustic and toxic gas and fuel lines, and flammable storage facilities.

Slope Failure Guiding Policy (10.3.2)

Reduce the potential for property damage and personal injury from slope failure hazards and erosion.

Implementing Policies

a. Limit cut and fill slopes to 3:1 (33% slope) throughout the City to maintain slope stability unless an engineering geologist can establish to the City's satisfaction that a steeper slope would not pose undue risk to people and property.
b. Blend cut-and fill slopes with existing contours to avoid high cut slopes and steep embankments which could lead to silting of lower slopes and soil erosion.
c. Require geologic and soils reports as part of the development review process and/or building permit process for development in the affected areas to minimize slope failure.
d. Require erosion-control measures in areas of steep slopes or areas with high erosion problems on all grading plans to reduce soil erosion from wind, grading and construction operations, and stormwater runoff.

4.4.4 Project Impact Analysis and Mitigation Measures

The impact analyses provided below are based on build-out of all phases of the Master Plan for determining ultimate impacts related to land use. The construction in Phase I of a SCE substation on the off-site optional location that is an existing park site would require approval of a Conditional Use Permit by the City.

4.4.4.1 Thresholds of Significance

Significant impacts related to Geology and Soils are determined from criteria stated with the CEQA Checklist. The Checklist identifies the primary thresholds of significance relating to CEQA issues. Potential impacts related to local or on-site geological and soil conditions are addressed in the CEQA process to identify and evaluate possible impacts that could potentially result from implementation of the proposed project. The Proposed Project would have a significant effect if it would:

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

- 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.
- Strong seismic ground shaking
- Seismic-related ground failure, including liquefaction
- Landslides

b) Result in substantial soil erosion or the loss of topsoil.

c) 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.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater

4.4.4.2 Impacts Determined to Have No Impact or Less Than Significant Impact

The Proposed Project was determined to not have the potential to result in significant impacts in the issue areas listed below. For each issue, an explanation of the impact and a determination of no need for mitigation measures is provided.

Result in substantial soil erosion or the loss of topsoil.

Generally, all portions of the Project Site, with the exception of the Elmer Digneo City Park, are currently developed with structures, asphalt or other impervious surface. Although there are landscaped areas on the campus, the majority of the Project Site is comprised of impervious surfaces (i.e. existing buildings, asphalt parking areas and/or hardscape improvements). Aspects of the Proposed Project would involve improvements to existing facilities and construction of new facilities which would require grading on-site to meet the finished building pad elevations as designed. Site grading can result in erosion and siltation both on- and off-site during construction. The project was evaluated in a *Preliminary Hydrology Report for Loma Linda University Medical Center Campus Transformation Project* prepared by Kettler Leweck Engineering, on July 22, 2013. Compliance with the NPDES permit requirements, implementation of a SWPPP, and compliance with the mitigation measure as outlined in Section 4.6, Hydrology and Water Quality of this EIR would protect the campus portion of the Project Site from the loss of any topsoil and off-site sedimentation.

Be located on expansive soil, as defined in Table 18 1 B of the Uniform Building Code (1994), creating substantial risks to life or property.

AMEC concluded that based on prior nearby explorations and the available geologic information, the upper soils beneath Project area are considered non-expansive. Therefore, the potential for expansive soils impacting the Proposed Project is considered to be low.

Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater

The Proposed Project does not include the use of septic tanks or alternative wastewater disposal systems as sewers are available for the disposal of wastewater; therefore no impact would occur.

4.4.4.3 Issues Determined to Have Potentially Significant Impacts

Campus

Impact GS-1:

The Proposed Project could be located on soil that is unstable, or that would become unstable as a result of lateral spreading, subsidence, liquefaction or result in collapse. This is a potentially significant impact.

In July 2011, MACTEC Engineering and Consulting, Inc., (MACTEC) completed a geotechnical investigation focusing on the site of the new hospital towers (The Adult and Children's Towers) to be constructed in Phase 1. The MACTEC subsurface explorations, engineering analyses, and foundation design conclusions and recommendations are included in Appendix E-1 and are summarized herein. MACTEC concluded that based on the historic high groundwater level and the measurements from their current and prior explorations, the potential for liquefaction and liquefaction-induced settlement at the proposed location of the new hospital is considered low; however, they estimate that the seismically-induced settlement above the historic high groundwater level could be up to 2 inches beneath the foundations. In addition they identified that deeper fill could occur between borings, particularly near existing structures and underground utilities. The natural soils consist of loose to medium dense silty sand and sand with varying amounts of gravel. The upper soils were determined to be susceptible to hydroconsolidation and may become weaker and more compressible when wet.

The existing fill soils are not considered suitable for support of foundations, floor slabs on grade, hardscape, or paving. However, the existing fill soils are anticipated to be automatically removed by the excavation for the lower levels of the proposed hospital towers. Therefore, the proposed hospital towers may be supported on a mat foundation established in the undisturbed natural soils at the planned excavation level. As an alternative to the use of a mat foundation, the proposed hospital towers could be supported on conventional spread footings established in the undisturbed natural soils at the planned excavation level, provided that the estimated total and differential settlements (both static and seismic) provided herein are acceptable to the structural engineer.

Minor structures that are structurally separate from the proposed hospital towers, such as short retaining walls, and free-standing walls may be supported on conventional spread footings underlain by at least two feet of properly compacted fill soil. If such structures will not be able to accommodate the estimated static and seismically-induced settlements, additional investigation and study may be necessary for specific structures.

MACTEC concluded that for construction of the new hospital, all existing fill and the upper natural soils should be removed to allow for the placement of at least two feet of properly compacted fill beneath hardscape, concrete walkways, and paving. The required fill should be uniformly well compacted and observed and tested during placement. This conclusion regarding on-site soils would apply as well to the Dental School Addition, Research Building, utility plant, and SCE Substation to be constructed on-site.

In June of 2013, AMEC's evaluation of the proposed parking structure concluded that based on the historic high groundwater level and the measurements from their current and prior explorations, the potential for liquefaction and liquefaction-induced settlement is considered low; however, based on their prior nearby borings, there is a potential for significant seismically induced settlement beneath the Parking Structure. The upper soils beneath the Parking Structure are susceptible to hydroconsolidation and may become weaker and more compressible when wet. AMEC recommend that a site-specific liquefaction and seismically-induced settlement evaluation should be performed at the site as part of the geotechnical investigation for the project. They concluded that based on their experience in the immediate vicinity of the site and with similar project sites, it is their opinion that the anticipated potential for seismically-induced settlement can be mitigated if appropriate geotechnical recommendations are provided and implemented. Potential mitigation measures could include the use of structural methods, such as a mat foundation or pile foundations, or ground improvement methods, such as removal and re-compaction or aggregate piers. The AMEC subsurface explorations, engineering analyses, and conclusions and recommendations are included in Appendix E-2

The April 2013 CHJ Geologic/Geotechnical Investigation addressing the "SCE Option 1" substation site, the "Utility Plant Option 1 site , and the Phase 2 Research Building and Dental School addition, concluded the proposed Phase 2 Dental School addition and Research Building are not identified within an area identified as having a potential for liquefaction and groundwater levels are not within 50 feet of the ground surface; therefore, liquefaction is not anticipated in these areas.

CHJ also evaluated the soils northeast of the intersection of Anderson Street and Stewart Street adjacent to the Housekeeping Building where the Option 1 New Utility Plant is proposed and concluded that seismic-induced settlement may be on the order of 1-inch and differential seismic-induced settlement of ½-inch may be anticipated in that area. This may indicate a potential for seismic-induced liquefaction or settlement in this area of the Project Site and recommends the site be further evaluated before development is undertaken. This is a potentially significant impact.

City Park Site

The CHJ investigation (Appendix E-3) evaluated the soils north and west of the intersection of Parkland Street and Van Leuven Street (SCE Option 1) and concluded that the maximum seismic settlement at the surface may be on the order of 8¼-inches. Global seismic differential settlement may be at a level less than 1:480 for the area. Localized values of seismic differential settlement might slightly exceed 1:480[1]. CHJ concluded that this may indicate a potential for seismic-induced liquefaction or settlement in this area of the Project Site and recommends the site be further evaluated before development is undertaken. This is a potentially significant impact.

To ensure the levels of the Proposed Project's potentially significant impacts are reduced, mitigation measures shall be implemented.

Mitigation Measures:

Mitigation Measure GS-1:

Prior to issuance of grading and/or building permits for the Proposed Project, including permits for utilities, the Project Proponent shall submit updated Geologic and Geotechnical Investigations as recommended by the CHJ studies for addressing the final project design of all structures proposed for construction.

Mitigation Measure GS-2:

Prior to issuance of grading and/or building permits for the proposed new hospital towers, including permits for utilities, the Project Proponent shall submit development plans that incorporate the recommendations of the geotechnical report prepared by MACTEC Engineering and Consulting, Inc., dated July 13, 2011 (Appendix E-1) for preliminary foundation work, utility trenching, and concrete slabs. These include specifications for concrete slabs and footings, temporary excavation for utilities, preliminary pavement design, and protection of foundations from surface drainage.

Mitigation Measure GS-3:

As part of the new hospital towers construction, all existing fill and the upper natural soils shall be removed to allow for the placement of at least two feet of properly compacted fill beneath hardscape, concrete walkways, and paving. The required fill should be uniformly well compacted and observed and tested during placement. The on-site soils may be used in the required fill.

[1] The 8 ¼ inches is settlement over the entire site as a unit. Differential settlement is measured between two points within the site and is given here as a gradient (1:480). So it's one unit vertical in 480 units horizontal. Example – 1 inch across 480 inches OR 1 inch vertical across 40 feet horizontal. If the site is 120 feet wide, one might expect 3 inches of differential settlement across that distance.

Mitigation Measure GS-4:

Prior to issuance of grading and/or building permits for the proposed new parking structure the Applicant shall submit a site-specific liquefaction and seismically-induced settlement evaluation as part of the geotechnical investigation for the project as recommended in the geotechnical report prepared by AMEC, dated July 28, 2013 (Appendix E-2). Recommendations contained in the site-specific liquefaction and seismically-induced settlement evaluation shall be incorporated in the parking structure final design.

Mitigation Measure GS-5:

Prior to issuance of grading and/or building permits for the SCE Option 1 substation site, the Project Proponent shall submit a site specific geotechnical investigation as recommended by the CHJ studies and based upon the final design provided by SCE.

Mitigation Measure GS-6:

Prior to issuance of grading and/or building permits for the Utility Plant Option 1 site, the Project Proponent shall submit a site specific geotechnical investigation as recommended by the CHJ studies and based upon the final utility plant design.

Level of Significance After Mitigation

Implementation of the above mitigation measures GS-1 through GS-6 would ensure that impacts associated with geological and geotechnical hazards would be less than significant pursuant to the significance criteria set forth by CEQA.

Park Site

Impact GS-2:

The Proposed Project would increase impervious surfaces in an area that is used as a City Park, resulting in the potential for increased soil erosion. This could be a potentially significant impact.

Development of a site in which grading and filling activities take place can leave soils especially vulnerable to wind and water erosion during construction. The lack of soil moisture and the minimal amount of clay material for binding could subject loose soils to high winds or substantial rainfall. Grading a portion of the City Park site for construction of a SCE substation would involve soil movement.

Blowing soil not only depletes soils on-site, it reduces visibility, decreases air quality, abrades surfaces, and can affect the operation of machinery off-site as well. Water-eroded soil can make travel on roads dangerous; it can affect water levels by blocking culverts and increasing the chance of flooding. Eroded sediment could carry petroleum or other pollutants into the water

system, and the sediment from eroding soils could affect light penetration into water bodies reducing the photosynthetic ability of water plants.

Soils left bare during construction activities can erode due to high wind speeds or the presence of swiftly moving water. To avoid these detrimental effects mitigation measures would be implemented to control off-site migration of soils. In addition, as part of the NPDES, a storm water management plan would be required delineating the methods used to control the erosion process on-site and the types of containment structures that would be used to control eroding soils such as sand bags or hay bales. The NPDES permit process causes developers or contractors to reduce, to the extent practical, the discharge of pollutants into water bodies by using Best Management Practices (BMPs). Compliance with NPDES permitting process requires storm water quality management to be considered during a project's planning phase and to be implemented during construction. A SWPPP would be prepared to identify structural and non-structural controls using BMPs to avoid storm water effluence.

After construction of the substation facilities and buildings, erosion potential would be expected to be minimal with the implementation of BMPs and landscaping. However, to ensure the level of the Proposed Project's potentially significant impacts is reduced, mitigation measures shall be implemented.

Mitigation Measures:

Mitigation Measure GS-7

In accordance with the Geologic/Geotechnical reports prepared for elements of the Master Plan, wind and water erosion of soils at the Elmer Digneo City Park shall be reduced by minimizing grading activities and grading occurring immediately prior to new construction activities.

Mitigation Measure GS-8

Disturbed soils shall be watered at least twice daily to ensure the control of fugitive dust escaping off-site.

Mitigation Measure GS-9

A National Pollutant Discharge Elimination System permit shall be obtained before construction is started. If the area of disturbance is greater than one acre, a Storm Water Pollution Prevention Program must be submitted to the City and shall show how storm waters will be controlled through Best Management Practices to avoid off-site sedimentation.

Mitigation Measure GS-10

Soils left bare or inactive for longer than thirty days shall be planted with ground cover or covered by approved means to assure no loss of topsoil.

Level of Significance After Implementation

Implementation of the above Mitigation Measures GS-7 through GS-10 would ensure impacts to soils or the loss of topsoil would be less than significant.

4.5 HAZARDS & HAZARDOUS MATERIALS

4.5.1 Introduction

This section of the EIR discusses any potential hazards that currently exist in the area surrounding the Project Site, or that could exist as a result of the Proposed Project. Information about existing conditions was derived from site visits, existing hazardous waste business plans prepared for the existing hospital facility, and a review of the City of Loma Linda General Plan.

4.5.2 Environmental Setting

The Project Site includes the existing LLUH and its entireties (i.e., Medical Center, University, Dental School, etc.) and also includes the Elmer Digneo City Park site located to the north of the LLUH that may be used for siting a Southern California Edison (SCE) substation to serve the campus. The park site is located east of Anderson Street and north of the Union Pacific Railroad (UPRR). The main Medical Center campus is located north of Barton Road between Anderson Street and Campus Street (see Figure 3-1 and Figure 3-2).

The LLUH is an existing medical facility and therefore produces medical waste which classifies the Project Site as a "medical waste generator" in California. Medical wastes are handled, stored, treated, and transported from the site. Non-medical hazardous wastes such as fuels, oils, paints, etc. are also transported to the site and stored for use on-site. The primary local agency, known as the Certified Unified Program Agency, with responsibility for implementing federal and state laws and regulations pertaining to hazardous materials management in the City of Loma Linda is the San Bernardino County Fire Department. Consistent with the CUPA regulations, the University maintains a Business Emergency Contingency Plan with the San Bernardino County Fire Department that is updated annually. The plan identifies the types and quantities of hazardous materials, underground storage tanks, and hazardous waste generated by the Medical Center and University campus as a whole.

4.5.3 Applicable Policies, Plans, and Regulations

Federal

<u>Hazardous Waste Issues</u>

The management of hazardous materials and hazardous wastes is subject to numerous laws and regulations at all levels of government. These laws and regulations apply to operational and disposal activities on the Project Site. Summaries of federal and state laws and regulations related to hazardous materials management are presented below. California State law allows for certain hazardous materials regulatory programs, including those pertaining to oil wells, hazardous materials storage, and hazardous materials management, to be delegated to local agencies. State and federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and, in the event that such materials are accidentally released, to prevent or to mitigate injury to health or the environment.

Primary federal agencies with responsibility for hazardous materials management include the Environmental Protection Agency (EPA), Department of Labor (Federal Occupational Safety and Health Administration [OSHA]), Department of Transportation (DOT), and Nuclear Regulatory Commission (NRC). Major federal laws and issue areas include the following statutes (and regulations promulgated there under):

- Resources Conservation and Recovery Act (RCRA) - hazardous waste management.
- Hazardous and Solid Waste Amendments Act (HSWA) - hazardous waste management.
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - cleanup of contamination.
- Superfund Amendments and Reauthorization Act (SARA) - cleanup of contamination.
- Emergency Planning and Community Right-to-Know (SARA Title III) - business inventories and emergency response planning.

State

Primary state agencies with jurisdiction over hazardous chemical materials management are the California Environmental Protection Agency (Cal-EPA), the Department of Toxic Substances Control (DTSC), and the Regional Water Quality Control Board (RWQCB). Other state agencies involved in hazardous materials management are the Department of Industrial Relations (state OSHA implementation [Cal/OSHA]), State Office of Emergency Services (OES-California Accidental Release Prevention implementation), California Department of Fish and Wildlife (CDFW), California Air Resources Board (CARB), California Highway Patrol (CHP), State Office of Environmental Health Hazard Assessment (OEHHA-Proposition 65 implementation), and California Integrated Waste Management Board (CIWMB).

Hazardous chemical and biohazardous materials management laws in California include the following statutes (and regulations promulgated there under):

- Hazardous Waste Control Act - hazardous waste management
- Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) - releases of and exposure to carcinogenic chemicals.
- Hazardous Substances Act.
- Hazardous Waste Management Planning and Facility Siting - "Tanner Act"
- Hazardous Materials Storage and Emergency Response - including response to hazardous materials incidents
- California Medical *Waste Management Act* - medical and biohazardous wastes

The Medical Waste Management Act (MWMA) governs the management of medical waste statewide through the Health and Safety Code. The Medical Waste Management Program (MWMP) housed within the Environmental Management Branch of the California Department of Public Health (CDPH), implements the Act through regulation of the generation, handling,

storage, treatment, and disposal of medical waste. The MWMP permits and inspects all medical waste off-site treatment facilities and medical waste transfer stations.

Under the MWMA, any entity that produces medical waste is considered a "medical waste generator" in California. Medical waste generators are classified as large quantity generators (generating more than 200 lbs./month), or small quantity generators (generating less than 200 lbs./month), and are required to prepare medical waste disposal programs. Loma Linda University Hospital is currently registered with the MWMP as a large quantity generator.

Local

The primary local agency, known as the Certified Unified Program Agency (CUPA), with responsibility for implementing federal and state laws and regulations pertaining to hazardous materials management is the San Bernardino County Fire Department (SBCFD). The Unified Program is the consolidation of six state environmental regulatory programs into one program under the authority of a CUPA. A CUPA is a local agency that has been certified by Cal EPA to implement the six state environmental programs within the local agency's jurisdiction. This program was established under the amendments to the California Health and Safety Code made by SB 1082 in 1994. The six consolidated programs are as follows:

- Hazardous Materials Business Emergency Contingency Plan
- Risk Management and Prevention Plan
- Hazardous Waste (including Tiered Permitting)
- Underground Storage Tanks
- Above Ground Storage Tanks (including the SPCC)
- UFC Article 80 HMMP and HMIS

The CUPA is charged with the responsibility of conducting compliance inspections for over 7,000 regulated facilities in San Bernardino County. These facilities handle hazardous material, generate or treat hazardous waste and/or operate an underground storage tank. The CUPA provides a comprehensive environmental management approach to resolve environmental issues. This balanced approach utilizes education and effective enforcement procedures to minimize the potential risk to human health and the environment and establish an atmosphere to promote fair business practices.

Consistent with the CUPA regulations, the University maintains a Business Emergency Contingency Plan with the San Bernardino County Fire Department – Hazardous Materials Division that is updated annually. The plan identifies the types and quantities of hazardous materials, underground storage tanks, and hazardous waste generated by the Medical Center and University campus as a whole.

City of Loma Linda General Plan

The Public Health and Safety Element of the General Plan provides decision makers with the information necessary to evaluate the nature of a given hazard and possible courses of action. This element identifies various hazards, where they exist, who is managing them, the probability of the hazards occurring, and the severity of the hazards should they occur. Guiding and implementing policies of the General Plan related to hazards and hazardous materials are listed below.

Hazards and Hazardous Materials Guiding Policy (10.5.2)

Minimize the negative impacts associated with the storage, use, generation, transport, and disposal of hazardous materials.

Implementing Policies:

a. Promote the reduction, recycling, and safe disposal of household hazardous wastes through public education and collection programs.

b. Support and implement policies contained in the San Bernardino County Hazardous Waste Management Plan that encourages and assist the reduction of hazardous waste from businesses and homes in Loma Linda.

c. Continue a program of regular inspections and monitoring to ensure compliance with local, State, and Federal regulations, in order to reduce the risks associated with the use and handling of hazardous materials and wastes.

d. Carefully review and require appropriate mitigation for pipelines and other channels for hazardous materials.

e. Where applicable, identify and regulate appropriate regional and local routes for transportation of hazardous material and hazardous waste by maintaining formally designated hazardous materials routes away from populated and other sensitive areas and restricting all processors and new large generators to access only along established material carrier routes.

f. Ensure adequate provisions are made for emergency responses to all crises involving hazardous materials by requiring emergency response plans for all hazardous waste processors and large generators be submitted as part of use permit application.

g. Provide educational and technical assistance to all hazardous materials users and waste generators to aid in their source reduction efforts (e.g., substitution of less hazardous products and modification of operation procedures in cooperation with the County.

h. Maintain a "Hazardous Materials" ordinance to define siting criteria to be used for various types of facilities, requirements for application submittal, and required finds for approval.

i. Locate hazardous materials facilities at a sufficient distance from populated areas to reduce potential health and safety impacts by requiring risk assessment studies to determine potential health impacts for all proposed hazardous waste processors and large generators as part of permit application submittals.

Fire Hazards Guiding Policy (10.4.2)

Minimize the threat to persons, property, and the environment resulting from wildfires.

Implementing Policies

a. Require fire protection agency review of all development in high fire risk areas and minimize risks accordingly.

b. Require new development in areas of high wildfire hazard to utilize fire-resistant building materials. As appropriate, require on-site fire suppression systems, including, automatic sprinklers, buffers and fuel breaks, and fire retardant landscaping.

c. Require detailed fire prevention and control measures, including, community firebreaks, for development projects in high fire hazard zones.

d. Require fire sprinklers in all structures greater than 200 square feet.

e. Prohibit single-access neighborhoods in high fire hazard areas. Provide adequate access for fire and other emergency response personnel and vegetation management programs.

Emergency Preparedness Guiding Policy (10.6.2.)

Maintain a level of preparedness to adequately respond to emergency situations and disasters.

Implementing Policies

a. Maintain and update the City's Emergency Plan, as required by State law.

b. Develop a public awareness program on the nature and extent of natural hazards in the Planning Area, and ways of minimizing disasters.

c. Require all City staff to be adequately trained to respond to emergency situations and conduct regular emergency preparedness drills with local organizations including City and County Fire, Police, Emergency Medical Services, and Public Works.

d. Establish community programs that train volunteers to assist police, fire, and civil defense personnel during and after disasters.

4.5.4 Project Impact Analysis and Mitigation Measures

The impact analyses provided below are based on build-out of all phases of the Master Plan for determining ultimate impacts related to hazards and hazardous materials. The construction in Phase I of a SCE substation on the off-site optional location that is an existing park site would not create an additional impact related to hazards and hazardous materials. Therefore that optional site has not been included in the analyses as no hazardous materials impacts would occur with development at that site.

4.5.4.1 Thresholds of Significance

Hazardous wastes and materials are regulated independently of the CEQA process by numerous federal, state, county and local laws and regulations. These laws and regulations are enforced by federal, state, county, and local agencies, particularly the Department of Toxic Substances Control (DTSC). Hazardous wastes, materials, and remediation issues are addressed in the CEQA process to identify and evaluate possible impacts to human, plant and animal populations that could potentially result from implementation of the proposed Project.

For the purposes of this analysis, a significant impact would result if the project would:

- Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school?
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?
- For a project located within an airport land use plan or, where such a plan has not been adopted, within 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?
- 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?
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?
- Expose people or structures to a significant risk of loss, injury or death involving wildfires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

4.5.4.2 Issues Determined to Have No Impact or Less Than Significant Impact

The Proposed Project was determined to not have the potential to result in significant impacts in the issue areas listed below. For each issue, an explanation of the impact and a determination of no need for mitigation measures is provided.

Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

The United States Department of Transportation (USDOT) Office of Hazardous Materials Safety prescribes strict regulations for the safe transportation of hazardous materials, as described in Title 40, 42, 45, and 49 of the Code of Federal Regulations (CFR), and implemented by Title 17, 19, and 27 of the California Code of Regulations (CCR). Accidents during transport of hazardous materials or waste to and from the site could also occur under the proposed use. The precise amount of hazardous materials transported to or from the proposed medical uses cannot be definitively predicted as detailed descriptions of the potential development projects are not yet available. It is possible that future potential uses could result in some hazardous materials being brought to and from the medical facilities; however, appropriate documentation for all hazardous waste that is transported in connection with project site activities would be provided as required for compliance with the existing hazardous materials regulations within the federal and State codes. In addition, the proposed uses would comply with the federal Department of Transportation (DOT) regulations that specify packaging requirements to ensure that hazardous materials shipments can sustain transport. Continued adherence to these regulations would reduce the likelihood and severity of accidents during transit, and it is therefore expected that a less than significant impact would occur

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.

Patient care facilities involve relatively small amounts of hazardous materials, primarily in clinical laboratories, cleaning and sterilization processes and pharmacies. Medical waste that would be generated would continue to be stored in proper waste containers until it is collected by the hospital staff. Collected waste would continue to be stored in a secure area prior to on-site treatment or shipment off-site for treatment. Worker safety requirements and the Medical Waste Management Act provide procedures to prevent exposures to infectious agents.

The State of California adopted the Medical Waste Management Act effective April 1, 1991. The Act establishes procedures for the proper handling, storage, treatment, and transportation of medical waste. The Act requires that both small and large quantity generators pursuant to Sections 117930 and 117950, respectively, file a Medical Waste Management Plan with the local enforcement agency. The Medical Waste Management Plan establishes procedures and methods for on-site treatment, including steam sterilization and incineration, to properly treat medical waste to eliminate or minimize the risk of personnel exposure to or contamination by untreated medical waste. In addition, the California Accidental Release Prevention (CalARP) Program for the prevention of accidental release of regulated toxic and flammable substances would require the facility to prepare a Risk Management Plan, but only if sufficient quantities of hazardous materials would be located at the facilities.

For those employees who would work with hazardous materials (non-medical waste), the amount of hazardous materials that are handled at any one time would generally be relatively small given the type of land use thus reducing the potential consequences of an accident during handling. Employees who would work around hazardous materials are required to wear appropriate protective equipment and safety equipment, which is routinely available in all areas where hazardous materials are used. Additionally, the post-construction activities associated with the Proposed Project will not increase the quantity of hazardous waste used or generated or create any additional potential exposure to these materials beyond current use. Therefore, the risk of upset from hazardous materials handling is anticipated to be less than significant.

Disposal of Hazardous Waste

Prior to the operational use of the proposed hospital the applicant would be required to implement a Medical Waste Management Plan per the County of San Bernardino Waste Management Division. Compliance with existing hazardous materials regulations would ensure that this impact is less than significant.

Existing hazardous materials regulations must be implemented by employers/businesses, as appropriate, and are monitored by the state (e.g., OSHA in the workplace or DTSC for hazardous waste) and local jurisdictions (e.g., the County of San Bernardino). Adherence to existing hazardous materials regulations would ensure compliance with existing safety standards related to hazardous materials, and the safety procedures mandated by applicable federal, state, and local laws and regulations (RCRA, California Hazardous Waste Control Law, and principles prescribed by the California Department of Health Services, Centers for Disease Control and Prevention, and National Institutes of Health) would ensure that risks resulting from the routine use, storage, transport or disposal of hazardous materials of hazardous wastes associated with construction and implementation of the Prosed Project uses would be less than significant.

Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school?

The Project Site is a teaching hospital and university and therefore technically considered an existing school. However, the students attending the university are not young developing children spending considerable time playing, running, and exercising outdoors and thus are not considered in the same light as students of primary, secondary, or high schools. The nearest primary school, Loma Linda Academy is located at 10656 Anderson Street in Loma Linda approximately ½-mile north of the Project Site. The facility is a K-12 Seventh-day Adventist private school with over 1,300 students that was established in 1906. The next closest school, Reche Canyon Elementary School is located at 3101 Canyon Vista Drive in Colton, approximately ¾-mile southwest of the Project Site. This school has an enrollment of approximately 650 students and provides educational services to students from K through 6th grade. Because of the distance from the Project Site to primary grade level schools, a less than significant impact to schools is anticipated.

Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

This Project Site does not occur on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Therefore, this Project would not be located on a site, which would create a significant hazard to the public or the environment.

For a project located within an airport land use plan or, where such a plan has not been adopted, within 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?

The Project Site is not located within an airport land use plan and is not within two miles of a public airport. The nearest airports are the San Bernardino International Airport, located approximately 3.2 miles north of the Project Site and the Redlands Municipal Airport; located approximately six miles northeast of the Project Site. According to Figure 10.4 of the City of Loma Linda General Plan, the Project Site is located outside of the San Bernardino International Airport influence area. The Prosed Project would not create a safety hazard to people or aircraft. Therefore, no impacts are anticipated.

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?

There are no private airstrips within the vicinity of the Project Site however; the Loma Linda University Hospital operates two rooftop helistops[1] and one ground emergency helistop for the transportation of emergency patients. One rooftop helistop, located atop of the existing hospital tower would be decommissioned and relocated to the new 13-story hospital; the other rooftop helistop, located on the roof-top of the existing Children's Hospital would remain in operation in its current location. The emergency helistop, located on the lawn area north of the existing hospital, would continue to be utilized during construction and upon build-out of the Master Plan. The helistops are considered existing conditions and would not represent a new safety hazard or exacerbate existing safety hazards for people residing or working in the Project area. No impacts are anticipated.

Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The California Emergency Services Act requires the City to manage and coordinate the overall emergency and recovery activities within its jurisdictional boundaries. The City's Emergency Operations Plan includes policies and procedures to be administered by the City in the event of a disaster. During disasters, the City of Loma Linda is required to coordinate emergency operations with the County of San Bernardino. Policies within the City's General Plan including updates to the City's Emergency Plan as required by State law, would ensure the Proposed Project would not interfere with adopted policies and procedures. No impact is anticipated.

[1] A helistop is defined as a place where helicopters can take off and land, usually without the support facilities (fueling, maintenance, repair, etc.) found at a heliport

Expose people or structures to a significant risk of loss, injury or death involving wildfires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Wildfires are a potential hazard to development located in forest and brush areas. Due to a combination of topography, weather, fuel and exacerbated by possible high winds and limited access, portions of the City of Loma Linda are highly susceptible to wildland fire hazards. The City has specified a boundary, signifying the areas at risk of wildland fires which is called the Urban Wildland Interface division line. This division line is identified in Figure 10.3 of the General Plan. The Project Site is located over 4,000 feet north of the nearest identified hazardous fire area. The Project Site is located north of Barton Road and is surrounded by urban land uses. Therefore, the Proposed Project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires. Therefore, no impacts due to wildland fires are anticipated.

4.5.4.3 Issues Determined to Have Potentially Significant Impacts

Impact HAZ-1

The Proposed Project includes demolition of buildings that may contain lead-based paint and asbestos. This may be a potentially significant impact.

As many of the existing on-site structures were constructed prior to 1968, the most apparent hazard existing within the Project Site is the likely presence of asbestos and lead based paint. Asbestos was used in building insulation, roofing materials, and construction adhesives. If this type of asbestos is crumbled and broken into airborne particles, it can lodge in the deepest parts of the lungs and cause permanent breathing difficulties. Lead-based paint, which was banned in 1978, can cause a range of health effects through ingestion and inhalation. Children six years old and under are most at risk, as their bodies are growing quickly. Research suggests that the primary sources of lead exposure for most children are: (1) deteriorating lead-based paint; (2) lead-contaminated dust; and (3) lead-contaminated residential soil. The hazard that threatens adults from lead-based paint exposure is breathing lead dust while renovating painted surfaces.

Since the Project would include the demolition or remodeling of buildings constructed prior to 1968, the applicant will be required to prepare and Asbestos Survey and Lead Inspection Report. The total volume of lead-based paint and asbestos is unknown at this time. If these hazardous materials are not handled properly pursuant to State and local laws and ordinances, potentially significant impacts to workers could result. Implementation of the following mitigation measure would reduce the impacts to less than significant.

Mitigation Measure HAZ-1

Prior to the issuance of a building or demolition permits the Project Proponent shall prepare an Asbestos Survey and Lead Inspection report to determine the quantity of materials present and establish proper handling procedures for safe removal and disposal. The applicant will be required to comply with the findings of the analysis.

Level of Significance After Mitigation

Impacts are anticipated to be less than significant with the preparation of/and adherence to the findings of the Asbestos Survey and Lead Inspection Reports.

4.6 HYDROLOGY AND WATER QUALITY

4.6.1 Introduction

This section of the EIR describes the existing Project Site conditions related to hydrology and water quality. The Proposed Project's potential impacts in these areas are discussed and mitigation measures are provided for impacts determined to be potentially significant. Information contained within this section is based in part on the *Preliminary Hydrology Report for Loma Linda University Medical Center Campus Transformation Project* prepared by Kettler Leweck Engineering, on July 22, 2013, *Preliminary Water Quality Management Plan (WQMP) for Loma Linda University Medical Center Campus Transformation Project* prepared by Kettler Leweck Engineering, on July 22, 2013, and information contained in the City of Loma Linda General Plan. These technical reports are included as Appendix H and I respectively.

4.6.2 Environmental Setting

Regional Hydrology

The Project Site lies within the Santa Ana River Watershed; the entire Santa Ana River Watershed covers approximately 2,650 square miles including portions of San Bernardino, Riverside, and Orange Counties. The Santa Ana River is the largest stream system in southern California and is also the region's main surface water body. The watershed's headwaters are located in the San Gabriel and San Bernardino Mountains to the north and the San Gorgonio and San Jacinto Mountains to the east. The Santa Ana River flows southwesterly from its origin at the confluence with Bear Creek in the San Bernardino Mountains to the Pacific Ocean near Newport Beach.

Groundwater is water below the ground surface that is stored in water-bearing formations called aquifers. Groundwater basins are areas with highly permeable soils that allow for the replenishment (or recharge) of aquifers. The Bunker Hill Subbasin (*"Bunker Hill Basin"*) is under the northern portion of the City of Loma Linda. The Bunker Hill Basin receives most of its natural recharge (estimated at over 60%) from the Santa Ana River, Mill Creek to the east, and Lytle Creek. The total estimated groundwater storage capacity of the basin is nearly 6 million acre-feet (an acre-foot of water is approximately 325,850 gallons).

Local Hydrology & Drainage

Storm drains and flood control facilities within the City of Loma Linda include natural and manmade channels, storm drains, street waterways, natural drainage courses and debris basins. Storm drain facilities are primarily administered by the City and the County Flood Control District. The design and construction of storm drain and flood control facilities are managed by the City Public Works Department.

Currently the Project Site is developed with buildings, public streets (i.e. Campus Street, Anderson Street, Taylor Street, Taylor Court, Prospect Avenue, University Avenue, and Stewart Street), private drives, surface parking areas, hardscape areas, and landscape areas. Although

there are landscape areas on the campus, the majority of the Project Site, with the exception of the Elmer Digneo City Park, is comprised of impervious surfaces (i.e. existing buildings, asphalt parking areas and/or hardscape improvements). Runoff from the Project Site (including the Elmer Digneo City Park) would be conveyed to both public and private on-site storm drain facilities. The public drainage facilities include two separate systems; one located in Anderson Street heading generally north towards the UPRR where it traverses west and the second located in Barton Street where it traverses north in Campus Street. The two systems join on the south side of the existing railroad facilities at the north end of Campus Street in the existing cul-de-sac before crossing under the UPRR and discharging into an existing County drainage channel on the north side of the UPRR. This existing drainage channel drains north to San Timoteo Creek (*Preliminary Hydrology Report, July 2013, page 6).*

Flooding

The topography of the City of Loma Linda, the presence of naturally occurring streambeds, and the existence of large detention basins creates an area potentially susceptible to flooding hazards. The principal types of flood hazards in the City include: 1) stream flooding as associated with San Timoteo Creek, Mission Channel and the Santa Ana River; 2) bridge scour including bridge foundations vulnerable to scouring during a flood; 3) dam inundation with the northern portion of the City occurring within the inundation area of the Seven Oaks Dam; and 4) earthquake-induced flooding (seiches) whereas an earthquake may cause local flooding by creating reverberating waves in an enclosed body of water (i.e., detention basins). As part of the National Flood Insurance Program, Flood Insurance Rate Maps are prepared to officially delineate flood insurance zones and base flood elevation lines. The Federal Emergency Management Agency periodically updates and refines these maps. The Project Site, including the Elmer Digneo City Park, is located within Zone X which is identified as occurring outside of the 500 year floodplain.

Water Quality

Surface water quality in urban areas is affected by various point-source and nonpoint-source pollutants. Point-source pollutants are those emitted at a specific point (e.g. a pipe) while nonpoint-source pollutants are those typically generated by surface runoff from a diffuse area and sheet flows into surface waters. Urban runoff would flow over source areas such as streets, paved areas, or landscaped areas, but because it is ultimately conveyed in storm drainage systems that discharge to surface waters at discrete locations, it is regulated as a point source under the National Pollutant Discharge Elimination System (NPDES) Program. In developed areas, the highest pollutant concentrations in stormwater runoff are usually generated at the beginning of the wet season and during the “first flush” following a storm event.

Water quality degradation due to high concentrations of nitrogen and total dissolved solids (TDS) is considered among the most significant regional water quality problems in the Santa Ana River Watershed. Historically, the Santa Ana River and its major tributaries likely flowed during most of the year and recharged the groundwater basins. However, the diversion of surface waters for irrigation use greatly diminished the quantity of groundwater

recharge. Crops were fertilized with nitrogen-containing fertilizers which led to the elevated concentrations of nitrogen and TDS. Today, water from the Santa Ana River is used multiple times as it flows downstream toward the Pacific Ocean. Each cycle of use adds an increment of salt (or TDS) to the water quality.

To characterize water quality conditions and establish objectives for water quality protection, the main stem of the Santa Ana River is divided into six reaches. Stormwater runoff from the City of Loma Linda primarily flows into Reach 5 which extends from the Seven Oaks dam to the San Jacinto Fault which marks the lower end of the Bunker Hill Groundwater Basin. A beneficial use is one of various ways that water can be used for the benefit of people and/or wildlife. Beneficial uses of water established by the Santa Ana Regional Water Quality Control Board in its Water Quality Control Plan (Basin Plan) for Reach 5 of the Santa Ana River are designated as shown below. Water quality objectives are established in the Basin Plan to protect beneficial uses.

MUN	Municipal and Domestic Supply
AGR	Agricultural Supply
GWR	Groundwater Recharge
POW	Hydropower Generation
REC1	Water Contact Recreation
REC2	Non-contact Water Recreation
WARM	Warm Freshwater Habitat
WILD	Wildlife Habitat
RARE	Rare, Threatened and Endangered Species.

(Source: 1995 Water Quality Control Plan for the Santa Ana River Basin (Region 8), Updated February 2008)

Recharge to the Bunker Hill Groundwater Basin has historically been from infiltration of runoff from the surrounding mountain ranges, surface water, precipitation and storm flows, and the importation and percolation of State Water Project water. Groundwater in the Basin is predominately of a calcium-bicarbonate type, which is the type of mineral/material that predominates in the groundwater and is used to classify the groundwater basin water. TDS levels range from 150 mg/liter to 550 mg/liter; the average sampled from over 200 public water supply systems in the basin if 324 mg/liter (*City of San Bernardino, Palm/Industrial Distribution Center Project EIR, pp. 4.7-8 – 4.7-9*).

4.6.3 Applicable Policies, Plans and Regulations

Groundwater and surface water are impacted by the quantity and quality of storm water flows received from surrounding land uses. Urban runoff and storm water runoff are terms that are often used interchangeably (California Storm Water BMP Handbook – Industrial and Commercial, 2003), and in this context include all flows discharged from urban land uses (i.e., land not in its natural, undisturbed state) into storm water conveyance systems and receiving waters: including both dry weather non-storm water sources as well as wet weather storm water runoff.

Storm water runoff naturally contains numerous constituents. Without engineering controls and Best Management Practices (BMPs), human activities in the natural environment can increase constituent concentrations to levels that impact water quality. Pollutants typically associated with stormwater from urban development include sediment, nutrients, bacteria and viruses, oil and grease, metals, organics, pesticides, gross pollutant (floatables), vectors, and miscellaneous waste (California Storm Water BMP Handbook- Industrial and Commercial 2003, Table 3.5-1).

Federal Clean Water Act

The Clean Water Act (CWA), as amended by the Water Quality Act of 1987, is the major legislation governing water quality. The objective of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Important applicable sections of the CWA are as follows:

- Section 301 prohibits the discharged of any pollutant by any person, except as in compliance with Sections 302, 306, 307, 318, 402, and 404 of the CWA. Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for any federal permit that proposes an activity which may result in a discharge to "waters of the United States" to obtain certification from the State that the discharge will comply with other provisions of the Act. Certification is provided by the Regional Water Quality Control Boards (RWQCBs).
- Section 402 establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharge of any pollutant (except for dredge or fill material) into waters of the United States. This permit program is administered by the RWQCBs.
- Section 404 established a permit program for the discharge of dredge or fill material into waters of the United States. This program is administered by the U.S. Army Corps of Engineers (ACOE).

National Flood Insurance Program

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities complying with FEMA regulations that limit development in floodplains. FEMA issues flood insurance rate maps for communities participating in the NFIP. These maps delineate flood hazard zones in the community. Executive Order 11988 (Floodplain Management) addresses floodplain issues related to public safety, conservation, and economics. It requires:

- Avoidance of incompatible floodplain development;
- Consistency with the standards and criteria of the NFIP; and
- Restoration and preservation of the natural and beneficial floodplain values.

California Porter-Cologne Water Quality Control Act

The State of California's Porter-Cologne Water Quality Control Act (California Water Code Section 13000, et seq.) provides the basis for water quality regulation within California. The Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the State. Waste discharge requirements (WDRs) resulting from the Report of Waste Discharge are issued by the RWQCBs. In practice, these requirements are typically integrated with the NPDES permitting process.

The State Water Resources Control Board (SWRCB) carries out its water quality protection authority through the adoption of specific Water Quality Control Plans (Basin Plans). These plans establish water quality standards for particular bodies of water. California water quality standards are composed of three parts: the designation of beneficial uses of water; water quality objectives to protect beneficial uses; and implementation programs designed to achieve and maintain compliance with the water quality objectives.

The Santa Ana RWQCB is responsible for the Basin Plan that covers the area which includes the City of Loma Linda. The RWQCB implements management plans to modify and adopt standards under the provisions set forth in Section 303(c) of the Federal CWA and California Water Code (Division 7, Section 13240). Under Section 303(d) of the 1972 CWA, the State is required to develop a list of waters with segments that do not meet water quality standards.

Municipal Stormwater NPDES Permit

WDRs for the discharge of urban runoff from areas of San Bernardino County and the incorporated cities of San Bernardino County that are within the Santa Ana Region are established by NPDES No. CAS 618036 (Regional Board Order No. R8-2010-0036) issued February 3, 2010. Basic requirements of the Municipal NPDES Permit for new development and significant redevelopment within the jurisdiction of these entities include:

- Each Permittee shall continue to ensure (prior to issuance of any local permits or other approvals) that project sites that disturb one acre or greater, and sites less than one acre if part of a common plan of development have obtained coverage under the Construction General Permit and have been issued a valid Waste Discharge Identification (WDID) number.
- Each Permittee shall ensure that the erosion and sediment control plans it approves include appropriate erosion and sediment control BMPs such that an effective combination of BMPs consistent with site risk is implemented through all phases of construction.
- Each Permittee shall ensure consistent with the maximum extent practicable standard, that runoff from development projects it approves does not cause nuisance to adjoining or downstream properties and stream channels.
- Each Permittee shall ensure to the MEP that urban runoff conveyance systems created resulting from development projects it approves are appropriately maintained consistent

with Section XIII of Order No. R8-2010-0036 or are adequately maintained by a legally responsible party.

- Each Permitee shall ensure that appropriate control measures to reduce erosion and maintain stream geomorphology (e.g. hydrograph modification effects) are included in the design for replacement of existing culverts or construction of new culverts and/or bridge crossings.
- Each Permittee shall minimize the short and long-term adverse impacts on receiving water quality from public and private new development and significant re-development projects, as required in Section XI.D (Water Quality Management Plan), by continuing to review, approve, and verify implementation of project-specific WQMPs, emphasizing implementation of Low Impact Development (LID) principles where feasible, and addressing hydrologic conditions of concern, and long-term operation and maintenance mechanisms prior to project closure or issuance of certificates of occupancy.
- Each Permittee shall comply with the Municipal Inspection Programs guidelines in the Order and conduct regular inspections of industrial and commercial facilities and construction sites to evaluate compliance with applicable municipal ordinances, local permits, Storm Water Management Plan, and Water Quality Management Plans.

San Bernardino County Stormwater Program Model Water Quality Management Plan (SBC WQMP)

The County of San Bernardino completed the San Bernardino County Stormwater Program Model Water Quality Management Plan (July 2013) in compliance with the Municipal NPDES Permit, with components that are designed to achieve compliance with receiving water limitations. It is expected that compliance with receiving water limitations will be achieved through an iterative process and the application of increasingly more effective BMPs.

Each Agency, which is defined as a co-permittee, such as the City of Loma Linda, is individually responsible for compliance with the Permit. Each Agency with land use planning and development authority is responsible for implementing a program in their jurisdiction that requires the development and implementation of a WQMP for all covered projects, reviewing and approving WQMPs submitted by project sponsors, and verifying that WQMPs are implemented in conjunction with covered projects. Local agencies are also required to periodically update the WQMP guidance to reflect changes in the 303(d) impaired water body list.

Implementation of the SBC WQMP would occur through the review and approval by the City of Loma Linda of a project-specific WQMP prepared by the project applicant. The primary objective of the SBC WQMP is to ensure that the land use approval and permitting process of the co-permittees would minimize the impact of urban runoff.

Under the SBC WQMP, the City of Loma Linda must use the following conditions of approval prior to the issuance of grading and/or building permits:

- The project developer shall submit a project WQMP that includes water quality BMPs, long-term maintenance requirements, and funding mechanisms for the long-term operation and maintenance of BMPs.
- The property owner shall record a "Covenant and Agreement" with the County-Clerk Recorder or other instrument acceptable to the co-permittee, to inform future property owners of the requirement of implement the approved project WQMP.
- If the project will cause land disturbance of one acre or more, it must comply with the statewide General Permit for Storm Water Discharges Associated with Construction Activity.

City of Loma Linda General Plan

The City of Loma Linda General Plan includes goals and policies pertaining to groundwater and water quality, flooding, and storm water. These include:

Guiding Policy (9.6.2)

Water quality and availability are critical to the current and future residents of the City of Loma Linda, its planning area, and its sphere of influence. No new development shall be approved that endangers the quality or quantity of water delivered to households within the City.

Implementing Policies

a. No development project shall be approved which would cause the quality of water delivered to Loma Linda households to fail to meet State and/or Federal water quality standards, or which would cause an increase in residential rates, or which would result in a restriction of water usage, except for those projects exempt under State and/or Federal law.

b. Develop and encourage the implementation of water conservation programs by residents, employers, students, and service providers.

c. Participate with State and regional agencies to monitor groundwater supplies and take steps to prevent overuse, depletion, and toxicity.

d. Encourage sustainable landscapes or landscapes that require little irrigation through the use of drought-tolerant and native vegetation in new development.

e. Through the development review process require that water supply capacity is available or will be available prior to approval of a development project. Do not approve projects for which assured water supply is not available.

f. Pursue the use of reclaimed water for the irrigation of all appropriate open space facilities and City projects, and encourage existing and new developments to tie to the reclaim

water system when available and recommended by the San Bernardino Municipal Water Department (wastewater provider) to reduce demand on municipal water supplies.

g. Through the development review process, encourage water conservation in all new and rehabilitated development through the use of water conserving fixtures in all new residential and commercial development.

h. Require implementation of Best Management Practices to reduce drainage system discharge of non-point source pollutants originating from streets, parking lots, residential areas, businesses, industrial operations, and those open space areas involved with pesticide application.

Guiding Policy for Water Efficiency (9.6.1.2)

Maximize water efficiency, water reuse, and the beneficial use of stormwater, including groundwater recharge and water quality improvement.

Implementing Policy

a. Reduce the waste of potable water through efficient technologies, conservation efforts, and design and management practices, and by better matching the source and quality of water to the user's needs.

b. Support efforts to reduce waste and increase reuse through integrated planning of programs and complementary land use and building regulations. Assess and remove barriers to integrated water resource planning.

c. Initiate a Water Conservation Program. Develop model water demand management programs using best practices, including the following:

- Requiring water conservation in new construction;
- Requiring water conservation fixtures;
- Encouraging business rebates; and
- Encouraging plumbing maintenance programs.

d. Require site-appropriate, drought-tolerant low water use landscaping and efficient irrigation systems where appropriate for new development. For parcels adjacent to publicly managed open space, appropriate landscaping will also be non-invasive and have low flammability. Limit the amount of water intensive landscaping, particularly lawn area allowed, in order to reduce the amount of water needed for irrigation.

e. Encourage use of irrigation technologies such as evapo-transpiration systems—where real-time weather data are transmitted to installed controllers to automate water needs—that save water, promote greater plant health, and reduce runoff. Encourage water agencies to conduct irrigation training workshops for homeowners and professionals.

f. Encourage use of on-site rainwater capture, storage, and infiltration for irrigation and other non-potable uses, and work with appropriate authorities to establish standards for rainwater quality and use. Ensure that catchments do not adversely affect habitat dependent on in-stream flow.

Guiding Policy (10.2.3)

Protect the community from risks to lives and property created by flooding and stormwater runoff.

Implementing Policies

a. Through the San Bernardino County Flood Control District Citizen's Advisory Committee, continue to make recommendations to the County Board of Supervisors for improvements to the flood control facilities in the City of Loma Linda to reduce the potential of 100 – 500 year floods within the City.

b. In areas where local and sub-regional drainage facilities are not currently provided, require new development to prepare hydrologic studies to assess storm runoff on the local and sub-regional storm drainage systems and/or creek corridors and incorporate appropriate mitigation in project development.

c. Require new development to provide for the perpetual maintenance of detention basins, if necessary to support the new development.

d. Require new development to incorporate features into drainage plans that would reduce impermeable surface area, increase surface water infiltration, and minimize surface water runoff during storms.

e. Cooperate with the State and Federal agencies to encourage that streams and creeks in the south hills area be left in their natural state in order to preserve their value as percolation and recharge areas, natural habitat, scenic resources, and recreation corridors, if technically and financially feasible. If not, then the loss or modification of a creek stream should be appropriately mitigated.

f. Cooperate with San Bernardino County Flood Control District to reduce hazards caused by local flooding through maintenance and improvements to the area's storm drain system such as the jointly maintained Loma Linda storm drain.

g. Maintain current flood hazard data, and coordinate with the Federal Emergency Management Agency, San Bernardino Flood Control District, U.S. Army Corps of Engineers, and other responsible agencies to coordinate flood hazard analysis and management activities.

4.6.4 Project Impact Analysis and Mitigation Measures

4.6.4.1 Thresholds of Significance

Significant impacts related to hydrology and water quality are determined from criteria stated in the CEQA Checklist. The Checklist identifies the primary thresholds of significance relating to CEQA issues. Potential impacts are addressed in the CEQA process to identify and evaluate possible impacts to water quality that could potentially result from implementation of the Proposed Project. The Proposed Project would have a significant effect on Hydrology and Water Quality if it would:

- Violate any water quality standards or waste discharge requirements.
- 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.
- 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 substantial erosion or siltation on- or off-site.
- 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.
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, such as from areas of material storage, vehicle or equipment maintenance (including washing or detailing), waste handling, hazardous materials handling or storage, delivery areas, loading docks, or other outdoor areas.
- Otherwise substantially degrade water quality.
- 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
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- 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.
- Inundation by seiche, tsunami, or mudflow.

4.6.4.2 Issues Identified to Have No Impact or a Less Than Significant Impact

The Proposed Project would result in no impacts or less than significant impacts to environmental resources identified in the CEQA Checklist and as analyzed below.

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.

The LLUMC has their own water production and distribution system which is currently served from two wells (Well 2 and Well 3) located just north of the Project Site between Anderson Street and Poplar. Each well is operated with a 250 horsepower, 1,100 gallon per minute (gpm) pump. The wells have 10-inch diameter casings and drill depths of 1,100 feet. Well 2 has several issues that impact its production capability including excessive sand, a high total hardness level of 210 parts per million (PPM), and a nitrate level of 38 milligrams per liter (mg/l) which is approaching the State of California maximum nitrate contaminant level of 45 mg/l. Currently the well water is being treated for perchlorate by Lockheed. The campus water storage is provided by a 1.4 million gallon tank located south of Barton Road near the intersection of Lawton Avenue and Anderson Street.

With the exception of fire flow, the City does not provide water service to the LLUMC on a normal basis. The Project Site, with the exception of the Elmer Digneo City Park, is served by the LLUMC. The City of Loma Linda Department of Public Works, Water Division provides production and distribution of water to the Elmer Digneo City Park. The City Water Division's main source of water for its customers is the Bunker Hill Groundwater Basin. In addition to the groundwater wells, the City has two emergency connections with the City of San Bernardino and one with the City of Redlands. These connections area available only on an as-needed basis and only if a water supply is available. There are no groundwater recharge facilities located on or near the Project Site.

To meet the future domestic and fire water requirements for the Project Site, the applicant is currently constructing a new domestic water well (Well 4) to augment the existing two wells. As stated, existing Well 2 has issues with sand, nitrates and hardness that results in the LLUMC limiting its water production. Therefore Well 4 is expected, along with existing Well 3, to meet the current as well as Proposed Project's future water supply demands. The Proposed Project would not deplete groundwater supplies nor would it interfere with recharge since it is not within an area designated as a recharge basin or spreading ground.

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; and

Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

According to the City's General Plan, Figure 10-2, the entire Project Site including the Elmer Digneo City Park, occur within the Zone X which is described as: "areas outside of the 500-year

flood plain." The Proposed Project does not include any housing or other inhabitable structures. Therefore no impacts would occur from flood hazards and no impacts would occur related to the placement of housing in a flood hazard area.

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.

According to City's General Plan the entire Project Site is located outside of the Seven Oaks Dam inundation area (only the northernmost portion of the City, north of Redlands Boulevard) occurs within the inundation area). Therefore, flood inundation of the Project Site is not expected to result from the failure of the Seven Oaks Dam. No impacts would result from the Proposed Project.

Expose people or structures to inundation by seiche, tsunami, or mudflow.

There are no oceans, lakes or reservoirs near the Project Site. The nearest large bodies of water are Big Bear Lake, located 20 miles to the northeast and upstream of the Seven Oaks Dam, and the Pacific Ocean, located approximately 60 miles to the west. The Project Site would be protected from mudflows caused by major storm events eroding the foothills of the Loma Linda badlands, by major storm drains located along Campus Street and Barton Road for the LLUMC campus, and along Anderson Street and Van Leuven (north of the UPRR) for the Elmer Digneo City Park. Impacts to the Project Site, including the Elmer Digneo City Park from seiche, tsunami, or mudflow would not occur.

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 either flooding or substantial erosion or siltation on- or off-site.

Generally, all portion of the Project Site, with the exception of the Elmer Digneo City Park, are currently developed with structures, asphalt or other impervious surface. Aspects of the Proposed Project would involve improvements to existing facilities and construction of new facilities which would require grading on-site to meet the finished building pad elevations as designed. Site grading can result in erosion and siltation both on- and off-site during construction.

As part of the NPDES permit program, a storm water management plan which incorporates drainage design features to mitigate for storm related impacts would be submitted to and approved by the City. The NPDES permit process requires developers or contractors to reduce, to the extent practical, the discharge of pollutants into water bodies by using Best Management Practices (BMP's). Compliance with NPDES permitting process requires storm water quality management to be considered during a project's planning phase and be implemented during construction. A SWPPP would be prepared to identify structural and nonstructural controls using BMP's to minimize to the extent practical, storm water effluence, or off-site impacts.

Although there are landscape areas on the campus, the majority of the Project Site is comprised of impervious surfaces (i.e. existing buildings, asphalt parking areas and/or hardscape improvements). Runoff from the Project Site, including the Elmer Digneo City Park would be conveyed to both public off-site and private on-site storm drain facilities. The public drainage

facilities include two separate systems (with the size/diameter of the main storm drain pipes ranging from 36-inch to 48-inch): one located in Anderson Street traveling generally north towards the existing UPRR where it traverses west and the second located in Barton Street where it traverses north in Campus Street. The two systems join on the south side of the UPRR at the north end of Campus Street in the existing cul-de-sac before crossing under the tracks and discharging into an existing County drainage channel. This existing drainage channel drains north to San Timoteo Creek. In addition to the public storm drain facilities, there are private storm drain facilities within the campus. The private storm drain pipes range in diameter from 6-inch to 24-inch.

The Proposed Project would be designed to include pervious surfaces greater than or equal to the existing condition to maintain consistency with the pre-developed condition. Runoff from the developed condition would also be conveyed to both public and private on-site storm drain facilities consistent with the existing condition. Storm water would be collected in the onsite private and public storm drain systems. The Proposed Project may include changes to the existing storm drain facilities (i.e. existing private storm drains in conflict with the proposed buildings would be relocated or additional private storm drain as required to support the proposed buildings would be incorporated into the project design). However, the public drainage facilities, are not anticipated to be changed significantly and would be approved by the City Engineer prior to the issuance of grading permits.

The Proposed Project would not alter the course of any surface water that it is tributary to either San Timoteo Creek or the Santa Ana River. Results of the Preliminary Hydrology Study recognize that the estimated flows and volumes from the Proposed Project would be less than or equal to the pre-developed condition, the pre-development and redevelopment drainage basins are generally consistent, storm runoff from the project would be collected in the same existing drainage facilities, and there are no known issues with the existing public storm drain systems (i.e. onsite and offsite). The Proposed Project is expected to have no hydraulic impact on the existing adjacent City of Loma Linda storm drain facilities or hydrologic conditions of concern. As Master Plan facilities are designed, the Applicant would be required to submit construction plans to the City of Loma Linda for a grading permit and/or building permit. These future permit processes would require detailed drainage studies to support the Proposed Project design. The intent is for these future drainage studies, including the detailed calculations, to follow the framework contained in the Proposed Project's preliminary hydrology report demonstrating no increase in peak flow rates or volumes. Therefore, less than significant impact to existing drainage patterns resulting from an increase in runoff or substantial erosion or siltation would occur.

Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, such as from areas of material storage, vehicle or equipment maintenance (including washing or detailing), waste handling, hazardous materials handling or storage, delivery areas, loading docks, or other outdoor areas.

Otherwise substantially degrade water quality.

As stated above, the Preliminary Hydrology Study estimated that flows and volumes from the Proposed Project would be less than or equal to the pre-developed condition and storm runoff

from the site would be collected in the existing drainage facilities. Minor upgrades to the on-site drainage system may be required. There are no known issues with the existing public storm drain systems (i.e. on-site and off-site). Therefore, the Proposed Project, as evaluated in the Preliminary Hydrology Study is expected to have no hydraulic impact on the existing adjacent City of Loma Linda storm drain facilities or hydrologic conditions of concern.

The potential and expected pollutants of concern associated with the type of development proposed (e.g. hospital, parking structure, electrical substation) would occur from:

- Trash & debris
- Oil & grease
- Oxygen-demanding substances
- Heavy metals
- Organic compounds
- Nutrients
- Pesticides
- Sediments
- Bacteria/Virus

According to the Santa Ana Hydrologic Basin Planning Area Map, the project is located within the undefined sub-area 801.14 of the Santa Ana River Hydrologic Unit 801. There are not any pre-existing water quality problems that have been identified for this sub-area. The proximate receiving water body for the Project Site is San Timoteo Creek, which is tributary to the Santa Ana River Reach 5. According to 2010 Santa Ana Region 303(d) List of Impaired Water Quality, pollutants of concern in the downstream segments of Reach 3 & 4 include Bacteria, Copper (wet season only) and Lead (WQMP, pg. 11).

The Proposed Project anticipates both on and off-site drainage improvements. Runoff from the proposed development of impervious surfaces on-site would be directed to BMPs designed to detain and filter runoff to a high or median level pollutant removal efficiency and to the satisfaction of the City Engineer. Therefore, the Proposed Project would have less than significant impact in the degradation of water quality within the Santa Ana River Watershed.

Compliance with the NPDES permit issued by the Santa Ana RWQCB would insure the Proposed Project would not create or contribute runoff water that would violate any water quality standards or waste discharge requirements. Therefore, potential impacts would be less than significant.

A Storm Water Pollution Prevention Plan (SWPPP) would be developed for any elements of developing the Proposed Project that would result in disturbance of one acre or more, as part of the construction package. The SWPPP would describe and dictate management practices to prevent contaminants from entering storm water discharge and prevent unauthorized non-storm water discharges during project construction. Accordingly, storm water discharges to any surface or groundwater shall not cause or contribute to exceeding any applicable water quality objectives or standards contained in the Statewide Water Quality Control Plan, the California Toxics Rule, or the Santa Ana RWQCB's Basin Plan. Approval of the SWPPP by

the RWQCB would result in implementation of BMPs that would control pollutants in stormwater discharges from the Project Site.

BMPs are required to address erosion and sediment control, wind erosion control, source controls, and waste management. The Applicant is required to ensure that the SWPPP requirements are implemented at the Project Site and that water quality standards are maintained. Best management practices are required to be modified, as necessary, so that an adequate combination of erosion controls is implemented for disturbed and undisturbed areas. Examples of best management practices include: use of silt fence or fiber rolls to prevent the migration of sediment off-site, application of water to disturbed areas during working or windy conditions to prevent dust and erosion, and use of drip pans for mobile fueling. In addition, the SWPPP outlines a regular BMP maintenance and monitoring schedule.

The Proposed Project's Final WQMP would provide anticipated water quality protection measures that would be analyzed and confirmed during the final engineering process for all proposed new and upgraded facilities at the Project Site. The Preliminary WQMP for the Proposed Project was prepared in May 2013, and includes, but is not limited to the following BMPs:

- Minimize Stormwater Runoff, Minimize Project's Impervious Footprint, and Conserve Natural Areas;
- Minimize Directly Connected Impervious Areas
- Education of Property Owners
- Trash Storage Areas and Litter Control
- Roof Runoff Controls
- Activity Restrictions
- Wash Water Controls for Food Preparation Areas
- Efficient Irrigation
- Spill Contingency Plan
- Air/Water Supply Area Drainage
- Protect Slopes and Channels
- Employee Training/Education Program
- Common Areas Catch Basin Inspection
- Storm Drain Signage
- Street Sweeping Private Street and Parking Lots
- Landscape Planning
- Pervious Pavement
- Inlet Trash Racks
- Alternative Building Materials

As indicated, no Pollutants of Concern exist for San Timoteo Creek. However, according to 2010 Santa Ana Region 303(d) List of Impaired Water Quality, pollutants of concern in the downstream segments of Reach 3 & 4 include Bacteria, Copper (wet season only) and Lead.

The Preliminary Drainage Study analyzed the 10-year and 100-year storm events. Project runoff rates, volumes, velocities, and flow duration for the post-development condition would not exceed those of the pre-development condition for any storm event including 1-year, 2-year and 5-year frequency storm events. This condition would be substantiated with hydrologic modeling methods that are acceptable to the EPA, U.S. Army Corps of Engineers (ACOE), and to local watershed authorities.

Project-specific impacts related to the impairment of water quality would be less than significant upon the City's approval of the Proposed Project's SWPPP and individually submitted for review and approval WQMPs, and the City's compliance with Regional Board Order No. R8-2010-0036 as a co-permittee responsible for conducting regular inspections of institutional facilities and construction sites to evaluate compliance with applicable municipal ordinances, local permits, Storm Water Management Plan, and WQMPs.

4.7 GREENHOUSE GASES/CLIMATE CHANGE

4.7.1 Introduction

This section describes the existing environmental setting for greenhouse gas (GHG) emissions and global climate change. Potential impacts from implementation of the Proposed Project on both the region and the global climate are analyzed and discussed.

A GHG Assessment for the Proposed Project was prepared by Lilburn Corporation in September 2013, to specifically address potential impacts related to project construction as well as impacts on the existing land uses adjacent to the site. The GHG Analysis is included in Appendix C.

4.7.2 Environmental Setting

Climate change refers to global changes in the average weather of the earth measured by changes in wind patterns, storms, precipitation, and temperature. While climate change is global in scale, California-specific impacts to the climate may result in a loss of snow-pack, increased risk of large wildfires, and a potential reduction in the quality and quantity of certain agricultural products.

Gases that trap heat in the atmosphere are GHGs, analogous to the way a greenhouse retains heat. Consequently, these GHG emissions are believed to directly affect the global climate.

The accumulation of GHGs in the atmosphere contribute to the regulation of the earth's temperature. Some GHGs can remain in the atmosphere for long periods of time. The following six GHGs are recognized under the Kyoto Protocol and have been found by the Intergovernmental Panel on Climate Change (IPCC) to have an effect on global climate change.

Carbon Dioxide (CO_2) is an odorless, colorless natural GHG. CO_2 is emitted from natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include burning coal, oil, natural gas, and wood.

Methane (CH_4) is a flammable GHG. A natural source of CH_4 is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain CH_4, which is extracted for fuel. Other sources include landfills, fermentation of manure, and ruminants such as cattle.

Nitrous Oxide (N_2O) is a colorless GHG. N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load.

Hydrofluorocarbons (HFCs) are synthetic chemicals that are used as a substitute for chlorofluorocarbons (CFCs). Of all the GHGs, they are one of three groups with the highest

global warming potential. HFCs are human made for applications such as air conditioners and refrigerants.

Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere; therefore, PFCs have long atmospheric lifetimes, between 10,000 and 50,000 years. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing.

Sulfur Hexafluoride (SF_6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest global warming potential of any gas evaluated, 23,900 times that of CO_2. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Sources of Greenhouse Gases in California

The California Energy Commission (CEC) categorizes GHG generation by source into five broad categories. The categories are:

- **Transportation** includes the combustion of gasoline and diesel in automobiles and trucks. Transportation also includes jet fuel consumption and bunker fuel for ships.

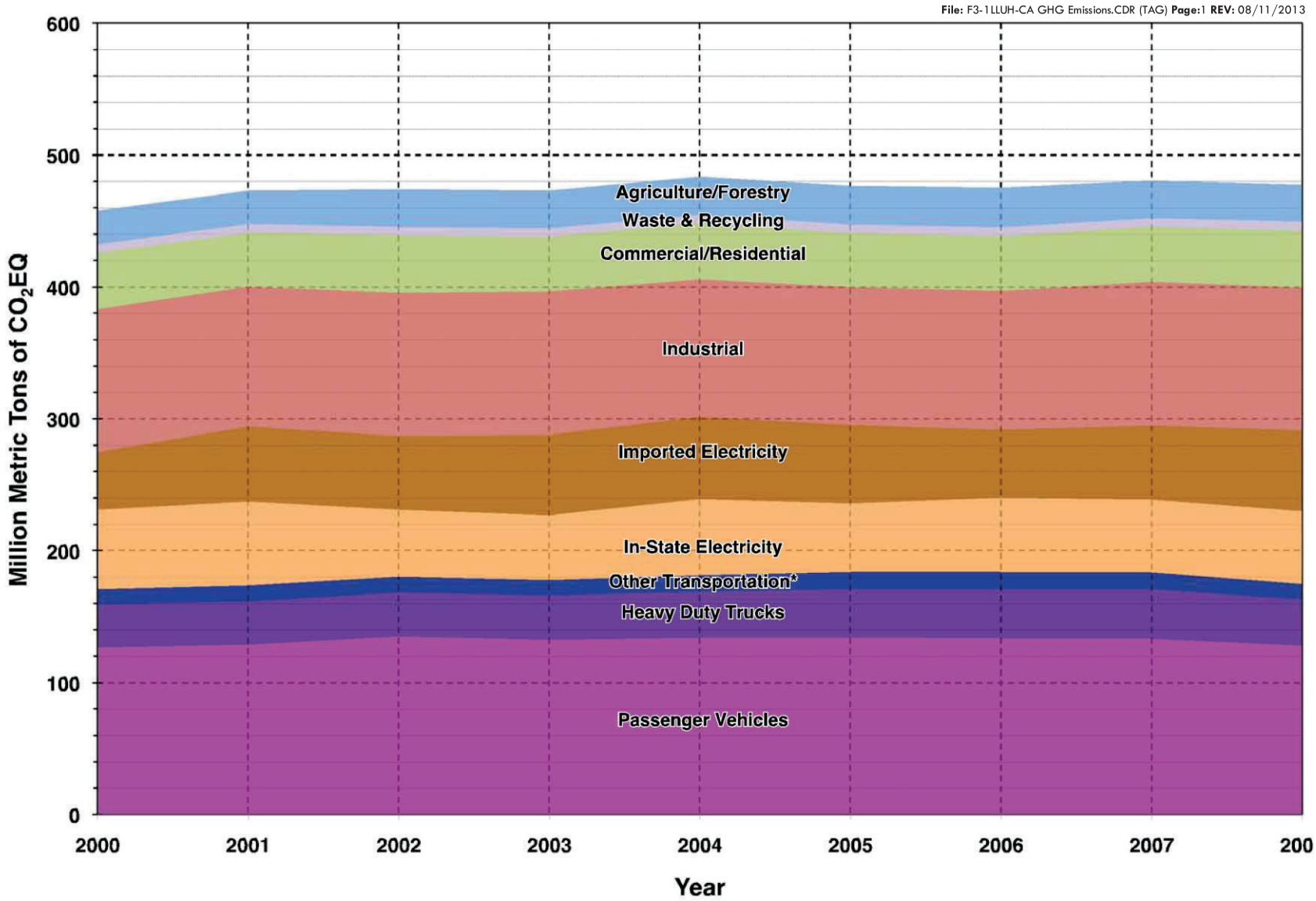
- **Agriculture and forestry** GHG emissions are composed mostly of nitrous oxide from agricultural soil management, CO_2 from forestry practice changes, methane from enteric fermentation, and methane and nitrous oxide from manure management.

- **Commercial and residential** uses generate GHG emissions primarily from the combustion of natural gas for space and water heating.

- **Industrial** GHG emissions are produced from many industrial activities. Major contributors include oil and natural gas extraction; crude oil refining; food processing; stone, clay, glass, and cement manufacturing; chemical manufacturing; and cement production. Wastewater treatment plants are also significant contributors to this category.

- **Electric generation** includes both emissions from power plants in California as well as power plants located outside of the state that supply electricity to the state.

Refer to Figure 4.7-1 for the amount of GHGs released from each of these categories in California from 2000 to 2008. As shown in Figure 4.7-1 most of California's GHGs are emitted by transportation sources (Passenger Vehicles, Heavy Duty Trucks, and Other Transportation uses). Combustion of fossil fuels in the transportation sector contributed approximately 38 percent of the California GHG. Followed by the electric power sector, approximately 24 percent (including both in-state and out-of-state sources) and the industrial sector, contributing approximately 23 percent. Residential and commercial activity accounted for approximately 9 percent of the emissions. The waste and recycling sector and the agricultural and forestry sector accounted for approximately 1 percent and 6 percent, respectively.



*Includes Rail, Ships & Commercial Boats, Intrastate Aviation, and Unspecified Transportation Sources

Source: CARB Greenhouse Gas Inventory Website
http://www.arb.ca.gov/cc/inventory/inventory.htm, data last updated 5/12/10

CALIFORNIA GHG EMISSIONS by SECTOR

LLUH MASTER PLAN PROJECT
Environmental Impact Report
City of Loma Linda, California

FIGURE 4.7-1

LILBURN CORPORATION

4.7.3 Applicable Policies, Plans and Regulations

Federal Plans, Policies, Regulations, and Laws

The federal government began studying global warming as early as 1978 with the National Climate Protection Act, 92 Stat. 601. More recently, in *Massachusetts v. EPA* (April 2, 2007), the United State Supreme Court held that GHGs fall within the Clean Air Act's definition of an "air pollutant," and directed the EPA to consider whether GHGs are causing climate change. On January 2, 2011 the EPA began regulating GHGs under the Clean Air Act (CAA) from mobile and stationary sources of air pollution. The EPA defined air pollution to include the six key GHGs – CO2, CH4, N2O, HFCs, PFCs, and SF6.

Congress has increased the corporate average fuel economy (CAFE) of the U.S. automotive fleet. In December 2007, President Bush signed a bill raising the minimum average miles per gallon for cars, sport utility vehicles, and light trucks to 35 miles per gallon by 2020. This increase in CAFE standard will create a substantial reduction in GHG emissions from automobiles, which is the largest single emitting GHG sector in California. However, there are no adopted federal plans, policies, regulations or laws setting a mandatory limit on GHG emissions.

California State Plans, Policies, Regulations, and Laws

In November 2008, California's Governor issued Executive Order S-13-08 directing state agencies to plan for sea level rise and other climate change impacts. There are four key actions in the Executive Order: (1) initiation of a climate change adaptation strategy that will assess the state's expected climate change impacts where the state is most vulnerable, with recommendations by early 2009; (2) an expert panel on sea level rise will inform state planning and development efforts; (3) interim guidance to state agencies on planning for sea level rise in coastal and floodplain areas for new projects; and (4) initiation of a report on critical existing and planned infrastructure projects vulnerable to sea level rise.

Pursuant to Assembly Bill (AB) 32, the California Air Resources Board (CARB) has adopted a number of relevant policies and directives. In December 2008, the Scoping Plan was adopted. The Plan is a central requirement of the statute. In addition, it has adopted a number of protocols for industry and government sectors, including one for local government.

In response to Senate Bill (SB) 97, the Office of Planning and Research (OPR) issued a Technical Advisory on CEQA and Climate Change in June 2008. The Advisory provides an outline of what should be included in a GHG analysis under CEQA (http://www.opr.ca.gov/ceqa/pdfs/june08-ceqa.pdf). In January 2009, OPR issued draft amendments to the CEQA Guidelines that address GHGs. Among the amendments are the following:

- Determining the Significance of Impacts from GHG Emissions (Guidelines § 15064.4);
- Thresholds of Significance (Guidelines § 15064.7(c));
- Discussion of Cumulative Impacts (Guidelines § 15130(a)(1)(B) and 15130(f); and
- Tiering and Streamlining the Analysis of GHG Emissions (Guidelines § 15183.5).

Assembly Bill 32

In 2006, the Legislature passed and Governor Schwarzenegger signed AB 32, the Global Warming Solutions Act of 2006, which set the 2020 GHG emissions reduction goal into law. It directed the California Air Resources Board (ARB or Board) to begin developing discrete early actions to reduce GHGs while also preparing a scoping plan to identify how best to reach the 2020 limit. In early 2013, ARB will initiate activities to update the AB 32 Scoping Plan.

Senate Bill 97 (2007)

Under SB 97, the Governor's Office of Planning and Research (OPR) is directed to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by the California Environmental Quality Act (CEQA), by July 1, 2009. The Resources Agency is required to certify and adopt these guidelines by January 1, 2010. OPR is required to periodically update these guidelines as CARB implements AB 32. In addition, SB 97 states that the failure to include a discussion of GHG emissions in any CEQA document for a project funded under the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, or projects funded under the Disaster Preparedness and Flood Prevention Bond Act of 2006 shall not be a cause of action under CEQA.

Executive Order S-01-07 (2007)

Executive Order S-01-07 calls for a reduction in the carbon intensity of California's transportation fuels by at least 10 percent by 2020. The low-carbon fuel standard ("LCFS") was adopted by CARB as one of its three "early action measures" on June 21, 2007.

Senate Bill 1368 (2006) (Public Utilities Code §§ 8340-41)

SB 1368 required the California Public Utilities Commission ("PUC") to establish a "GHG emission performance standard" by February 1, 2007, for all electricity providers under its jurisdiction, including the state's three largest privately-owned utilities (Pub. Res. Code § 8341(d)(1)). These utilities provide approximately 30 percent of the state's electric power. After the PUC acted, the CEC adopted a performance standard "consistent with" the PUC performance standard and applied it to local publicly-owned utilities on May 23, 2007 However, the California Office of Administrative Law ("OAL") found four alleged flaws in the CEC's rulemaking. The CEC overcame these alleged flaws and adopted reformulating regulations in August 2007.

Senate Bill 107 (2006)

Senate Bill 107 ("SB 107") requires investor-owned utilities such as Pacific Gas and Electric, Southern California Edison and San Diego Gas and Electric, to generate 20 percent of their electricity from renewable sources by 2010. Previously, state law required that this target be achieved by 2017.

Senate Bill 375 (September 2008)

In September 2008, SB 375 was signed by California's Governor. SB 375 is a comprehensive global warming bill that helps to achieve the goals of AB32. To help establish these targets, the CARB assigned a Regional Targets Advisory Committee to recommend factors to be considered and methodologies for setting GHG emission reduction targets. SR 375 also provides incentive – relief from certain CEQA requirements for development projects that are consistent with regional plans that achieve the targets. SB 375 requires CARB to develop, in collaboration with the Metropolitan Planning Organization (MPO), passenger vehicle GHG emissions reduction targets for 2020 and 2035 by September 30, 2010. The MPO is required to include and adopt, in their regional transportation plan, a sustainable community strategy that will meet the region's target provided by CARB.

Energy Conservation Standards (2009)

Energy Conservation Standards for new residential and non-residential buildings were adopted by the California Energy Resources Conservation and Development Commission in June 1977 and most recently revised in 2008 (Title 24, Part 6 of the California Code of Regulations [CCF]) with the standards going into effect in 2009. 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. The 2006 Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608), dated December 2006, 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-regulated appliances and non-federally regulated appliances. While these regulations are now often seen as "business as usual," they do exceed the standards imposed by any other state and reduce GHG emissions by reducing energy demand. On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (proposed Part 11, Title 24) was adopted as part of the California Building Standards Code (Title 24, California Code of Regulations). Part 11 established voluntary standards, some of which became mandatory in the 2010 edition of the Code, on planning and design for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants.

<u>California Environmental Quality Act (CEQA) Guidelines</u>

SB 97 required that the California Natural Resource Agency (CNRA) coordinate on the preparation of amendments to the CEQA Guidelines regarding feasible mitigation of GHG emissions or the effects of GHG emissions. Pursuant to SB 97, CNRA adopted CEQA Guidelines amendments on December 30, 2009. The amendments were approved by the Office of Administrative Law on February 16, 2010, and became effective on March 18, 2010.

With respect to the significance assessment, newly added CEQA Guidelines section 15064.4, subdivision (b), requires that the lead agency should consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment:

(1) The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;
(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

The CEQA Guidelines do not include or recommend any particular threshold of significance; instead, they leave that decision to the discretion of the lead agency. The CEQA Guidelines also do not suggest or recommend the use of any specific GHG emission mitigation measures. The added CEQA Guidelines provides that lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of GHG emissions.

South Coast Air Quality Management (SCAQMD) District Guidance

On December 5, 2008, the SCAQMD Governing Board adopted its staff proposal for an interim CEQA GHG significance threshold for projects where the SCAQMD is the lead agency. As to all other projects, where the SCAQMD is not the lead agency, the Board has, to date, adopted thresholds only for industrial (stationary source) projects. The SCAQMD has not yet adopted any significance thresholds for new residential/commercial development projects. However, has over the last few years proposed several draft thresholds. To assist in assessing the significance of GHG emissions from new residential/commercial development projects under CEQA, SCAQMD staff has been working on developing thresholds together with the SCAQMD's GHG CEQA Significance Thresholds Working Group. To achieve its policy objective of capturing 90% of GHG emissions from new residential/commercial development projects and implementing a “fair share” approach to reducing emission increases from each new residential/commercial development sector, SCAQMD staff has proposed combining performance standards and screening thresholds. According to the GHG CEQA Significance Working Group meeting (last meeting, September 2010), SCAQMD staff proposed a draft threshold for 2020 of 4.8 MT/SP/YR (metric tons of CO2EQ per service population per year) for mixed use developments. As the goal of AB 32 is to return to 1990 GHG emission levels by 2020, the basis for this threshold is the statewide emission inventory for 1990 based on “land use” related sectors divided by the statewide service population. The SCAQMD has also developed draft thresholds for commercial and residential projects, where it is not the lead. The draft recommends a 3,000 MTCO2EQ per year screening threshold. The SCAQMD’s working group has not set a date for finalizing the recommendations.

City of Loma Linda General Plan

The Public Health and Safety Element of the General Plan (GP) provides decision makers with the information necessary to evaluate the nature of a given hazard and possible courses of action. This element identifies various hazards, where they exist, who is managing them, the probability of the hazards occurring, and the severity of the hazards should they occur.

Guiding Policy (9.8.1)

Polices in the GP Air Quality Section intended to minimize GHG emissions that are reasonably attributable to the City's discretionary land use decisions and internal government operations, with the goal of reducing Loma Linda's GHG emissions to 1990 levels by 2020.

Energy Conservation and Air Quality Measures

d. Encourage energy-efficient landscaping for resource conservation by developing guidelines that emphasize proper irrigation techniques and sustainable landscaping (organic fertilizers and pesticides).
e. Consider light-colored surfacing on pavements and rooftops where feasible to reduce heat absorption.
f. As part of the development review process, work with builders to maximize energy conservation benefits in the placement of buildings on a site with regard to sun and natural breezes.
g. Actively support provision of infrastructure needed for alternative fuel vehicles, including fueling and charging stations. Review and consider revising applicable codes applying to refueling and recharging infrastructure to facilitate their inclusion in new development where appropriate.
h. Prohibit the installation of wood-burning fireplaces and other devices in new or renovated homes.
i. Facilitate implementation of renewable technologies through streamlined planning and development rules, codes, processing, and other incentives.
j. Incorporate measures to protect solar access from shading by neighboring structures and trees, thereby facilitating the use of passive or active solar systems.
k. Provide incentives such as expedited processing for facilities that use renewable energy sources. Work with State and Federal agencies to secure tax exemptions, tax rebates, or other financial incentives for such facilities.
l. Preserve and encourage planting trees in neighborhoods to provide shade in summer and reduce heat loss in winter. Successful methods include placing trees to the west and northwest of houses to shade from the hot summer sun and grouping trees to protect them from harsh elements and support their longevity. Trees can reduce air temperatures 5–10° F from shading and evapotranspiration (water in leaves converting into vapor, cooling the air).

4.7.4 Project Impact Analysis and Mitigation Measures

4.7.4.1 Thresholds of Significance

Significant impacts related to GHGs are determined from criteria stated with the CEQA Checklist and SCAQMD thresholds. Potential impacts are addressed in the CEQA process to identify and evaluate possible impacts related to GHG emissions that could potentially result from implementation of the Proposed Project. Significant impacts from GHG emissions may result if the Proposed Project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

SCAQMD staff has proposed a draft threshold for 2020 of 4.8 MT/SP/YR (metric tons of CO_2EQ per service population per year) for mixed-use developments. The SCAQMD has also developed draft thresholds for commercial and residential projects, where it is not the lead agency. The draft recommends a 3,000 MTCO2EQ per year screening threshold. The SCAQMD's working group has not set a date for finalizing the recommendations.

The project is most closely related to a commercial/residential project as identified by the SCAQMD. Therefore, for this project a significance threshold of 3,000 $MTCO_2EQ$ per year will be used.

4.7.4.2 Issues Determined to Have No Impact or Less Than Significant Impact

As a result of the analysis conducted for this EIR, the following area of environmental concern related to GHG emissions was identified to have less than significant impact with no need for mitigation measures:

Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The LLUMC has been in operation since 1967. Emissions generated by the proposed project would be from short-term construction of all new and renovated facilities and operational emissions associated with the retrofitted or new cogeneration power plant. No other operational emissions are anticipated as the improvements are associated with replacing and/or improving existing services. Buildout of the medical center campus was evaluated in the City of Loma Linda General Plan Update; the proposed project improvements are consistent with the City of Loma Linda General Plan that has been included in the AQMP. Therefore, the proposed improvements would not conflict with any applicable plan, policy, or regulation; therefore, impacts would be less than significant, and no mitigation would be required.

4.7.4.3 Issues Determined to Have Potentially Significant Impacts

Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

Impact GHG-1:

Implementation of the LLUH Master Plan may result in an increase in GHG emissions. This is a potentially significant impact.

Short Term Construction Emissions

Temporary impacts would result from construction activities. The primary source of GHG emissions generated by construction activities is from use of diesel-powered construction equipment and other combustion sources (i.e., generators, worker vehicles, materials delivery, etc.). The GHG air pollutants emitted by construction equipment would primarily be carbon dioxide.

The project would involve site preparation, grading, construction, painting, and paving. It is anticipated that the construction of the project would completed within tem years. The following construction parameters were analyzed:

- Construction Years 1 thru 2
  - Demolition of 10 structures (residential used as office)
  - 760-space parking structure

- Construction Years 2 (late year 2, not to overlap with the construction of the Parking Structure) thru 6
  - 464 bed Hospital
  - 80 space parking lot
  - 9,000 square feet dental building
  - 4,000 sq.ft SCE substation
  - 34,000 sq.ft New 22MW Utility Plant Building
  - Demolition of 10,000 square feet building

- Construction Year 7
  - 90,000 square foot Research Building

Typical emission rates for construction equipment were screened using the SCAQMD California Emissions Estimator Model (CalEEMod), released by the SCAQMD in 2011 and revised 2013. CalEEMod is a computer program used to estimate construction and operational emissions. Table 4.7-1 shows the modeled construction emissions for GHG associated with each construction phase. Refer to Appendix C for CalEEMod construction data worksheets.

Table 4.7-1
GHG Construction Emissions
MT Per Year

Phase	CO_2	CH_4	N_20
Years 1 thru 2	671.5	0.11	0.0
Years 2 thru 6	1,561.1	0.3	0.0
Year 7	575.1	0.1	0.0
Highest Value (CO2e)	**1,566.9**		
SCAQMD Threshold	3,000		
Significant	**No**		

Source: CalEEMod 2013.2
Construction Phases don't overlap and represent the highest concentration

As shown in Table 4.7-1 construction emissions are less than the SCAQMD thresholds and would be considered less than significant.

Operational Greenhouse Gas Emissions

The proposed project will not include the manufacture or production of any products on-site; therefore, no industrial type emissions will be generated. Emissions generated by the proposed project would be from short-term construction of all new and renovated facilities and operational emissions from the new or retrofitted cogeneration power plant. No other operational emissions are anticipated as the improvements are associated with replacing and/or improving existing services. The existing campus utility plant is located west of Anderson Street and south of University Avenue and serves the campus and the existing hospital with efficient and centralized power and other utilities. The utility plant consists of three areas: the original Central Heating and Cooling Plant, a Centrifugal Chiller Plant, and the Cogeneration Plant. The three plants are adjacent to each other and are referred to herein as the "utility plant". The Central Heating and Cooling Plant includes absorption chillers, pumps, cooling towers, and a backup boiler as well as office and other administrative space. The Centrifugal Chiller Plant includes 5 chillers, pumps, and a roof-mounted cooling tower. The utility plant also provides softened, reverse osmosis, and deionized water treatment systems; and compressed air.

LLUH is currently reviewing two options to modernize and expand these services. The capacity of the cogeneration power plant would be increased in phases from the existing 10 megawatts (MW) up to a maximum of 22 MW, allowing LLUH to become less reliant in time, on power purchased from others. The capacity increases would be constructed in units of 7.3 MW and the maximum buildout would be 22 MW. The Air Quality Analysis prepared for the Proposed Project evaluated "Utility Plant Option 1", that includes the proposed construction and operation of a new 22 MW power plant as this represented the worst case scenario.

Goss Engineering, Inc. prepared an emissions inventory of the existing and proposed natural gas plants emissions for CO_2. Lilburn Corporation prepared an analysis of CH_4 and N_2O emissions. Emissions associated with the operational activities are listed in Table 4.7-2. Refer to Appendix C for calculations and assumptions used.

Table 4.7-2
GHG Operational Emissions
"MT Per Year"

Source	CO_2[1]	CH_4[2]	N_2O[2]
Existing 10MW Plant	53,694	5.0	1.0
Proposed 22MW Plant	102,121	9.6	1.7
Difference	+48,427	+4.6	+0.7
Total CO2e	**48,432.3**		
SCAQMD Threshold	3,000		
Significant	**YES**		

[1]Goss Engineering, Inc.
[2] California Climate Action Registry General Reporting Protocol, Table C.8

As shown in Table 4.7-2, GHG emissions would exceed SCAQMD thresholds. Therefore, in compliance with GHG reduction strategies, the applicant will be required to implement the necessary project-level GHG measures. These measures are included in the CalEEMod model and are largely based on the California Air Pollution Control Officers Association (CAPCOA) "Quantifying GHG Mitigation Measures". Table 4.7-3 lists these measures. Measures that are to be implemented by the Project Applicant are listed in Mitigation Measure GHG-1.

Table 4.7-3
Quantifying GHG Mitigation Measures

Category	Measure No.	Measure Currently in practice at LLUH	Measure to be implemented with project approval
Energy			
Building Energy Use			
Buildings Exceed Title 24 Building Envelope Energy Efficiency Standards By 10%[1]	BE-1	Yes	Yes
Install Energy Efficient Appliances	BE-4	Yes	Yes
Install Energy Efficient Boilers	BE-5	Yes	Yes
Lighting			
Install Higher Efficacy Public Street and Area Lighting	LE-1	Yes	Yes
Alternative Energy Generation			
Establish Onsite Renewable Energy Systems-Solar Power	AE-2	Yes	Yes
Transportation			
Land Use/Location			
Increase Diversity of Urban and Suburban Development	LUT-3	Yes	Yes
Increase Destination Accessibility	LUT-4	Yes	Yes
Increase Transit Accessibility	LUT-5	Yes	Yes
Neighborhood/Site Enhancements			
Provide Pedestrian Network Improvements	SDT-1	Yes	Yes

[1] Applies to non-exempt from Title 24

Category	Measure No.	Measure Currently in practice at LLUH	Measure to be implemented with project approval
Parking Policy/Pricing			
Limit Parking Supply	PDT-1	In progress	Yes
Commute Trip Reduction Programs			
Implement Commute Trip Reduction Program - Voluntary Implement Commute Trip Reduction Program – Required	TRT-1	Yes	Yes
Implementation/Monitoring	TRT-2	In Progress	Yes
Provide Ride-Sharing Programs	TRT-3	Yes	Yes
Implement Subsidized or Discounted Transit Program	TRT-4	Yes	Yes
Encourage Telecommuting and Alternative Work Schedules	TRT-6	Yes	Yes
Implement Commute Trip Reduction Marketing	TRT-7	Yes	Yes
Provide Employer-Sponsored Vanpool/Shuttle	TRT-11	Yes	Yes
Water			
Water Use			
Install Low-Flow Water Fixtures	WUW-1	Yes	Yes
Design Water-Efficient Landscapes	WUW-3	Yes	Yes
Use Water-Efficient Landscapes	WUW-4	Yes	Yes
Reduce Turf in Landscapes and Lawns	WUW-5	Yes	Yes

Source: These measures are included in CalEEMod model and are largely based on the California Air Pollution Control Officers Association (CAPCOA) "Quantifying GHG Mitigation Measures"
1: City of Loma Linda Energy Action Plan Goal.

As shown in Table 4.7-3 the Applicant has numerous measures currently in practice throughout the campus. With implementation of the proposed project the City will require the Applicant to implement or continue to implement the following recommended measure.

Mitigation Measure GHG-1:

The Applicant shall implement the following applicable GHG Mitigations Measures as listed in Table 4.7-3 which will be reviewed and imposed by the City as conditions of approval at the time of building permit issuance.

Category	Measure No.
Energy	
Building Energy Use	
Buildings Exceed Title 24 Building Envelope Energy Efficiency Standards By 10%	BE-1
Install Energy Efficient Appliances	BE-4
Install Energy Efficient Boilers	BE-5
Lighting	

Category	Measure No.
Install Higher Efficacy Public Street and Area Lighting	LE-1
Alternative Energy Generation	
Establish Onsite Renewable Energy Systems-Solar Power	AE-2
Transportation	
Land Use/Location	
Increase Diversity of Urban and Suburban Development (Mixed Use)	LUT-3
Increase Destination Accessibility	LUT-4
Increase Transit Accessibility	LUT-5
Neighborhood/Site Enhancements	
Provide Pedestrian Network Improvements	SDT-1
Parking Policy/Pricing	
Limit Parking Supply	PDT-1
Commute Trip Reduction Programs	
Implement Commute Trip Reduction Program - Voluntary Implement Commute Trip Reduction Program – Required	TRT-1
Implementation/Monitoring	TRT-2
Provide Ride-Sharing Programs	TRT-3
Implement Subsidized or Discounted Transit Program	TRT-4
Encourage Telecommuting and Alternative Work Schedules	TRT-6
Implement Commute Trip Reduction Marketing	TRT-7
Provide Employer-Sponsored Vanpool/Shuttle	TRT-11
Water	
Water Use	
Install Low-Flow Water Fixtures	WUW-1
Adopt a Water Conservation Strategy	WUW-2
Design Water-Efficient Landscapes	WUW-3
Use Water-Efficient Landscapes	WUW-4
Reduce Turf in Landscapes an d Lawns	WUW-5

Source: These measures are included in CalEEMod model and are largely based on the California Air Pollution Control Officers Association (CAPCOA) "Quantifying GHG Mitigation Measures"
1: City of Loma Linda Energy Action Plan Goal.

Level of Significance After Mitigation

Implementation of the above mitigation would reduce potential impacts, however, not to a less than significant level. Impacts from greenhouse gas emissions remain significant and unavoidable. Therefore, as a part of adopting the CEQA document, the lead agency would be required to adopt a Statement of Overriding Considerations for GHG emissions exceeding thresholds.

4.8 LAND USE AND PLANNING

4.8.1 Introduction

This section of the EIR provides a description of current land use designations and existing land uses within the vicinity of the project site and evaluates potential land use impacts of the Proposed Project within the context of local and regional land use plans, and surrounding land use compatibility. CEQA Section 15125(d) states, "an EIR shall discuss any inconsistencies between the Proposed Project and applicable general plan and regional plans. Where a proposed project is compared with an adopted plan, the analysis shall examine the existing physical conditions as well as the potential future conditions discussed in an adopted plan."

4.8.2 Environmental Setting

The Project Site includes the existing LLUH and its entireties (i.e., Medical Center, University, Dental School, etc.) and also includes the Elmer Digneo City Park site located to the north of the LLUH that may be used for siting a Southern California Edison (SCE) substation to serve the campus. The park site is located east of Anderson Street and north of the Union Pacific Railroad (UPRR). The main Medical Center campus is located north of Barton Road between Anderson Street and Campus Street (see Figure 3-1 and Figure 3-2). According to the City of Loma Linda General Plan, the existing hospital is designated Health Care, and the remaining campus is designated Institutional. The Elmer Digneo City Park site is currently zoned Institutional with a General Plan land use designation of Special Planning Area B.

Figure 3-2 illustrates the local vicinity of the Project Site. Major arterials in the vicinity of the Project Site include Barton Road, Anderson Street, Redlands Boulevard, Mountain View Avenue, and I-10 (see Figure 3-2). The San Bernardino International Airport is approximately 3.2 miles northeast of the Project Site (see Figure 3-1). Surrounding land uses, General Plan Land Use Designations and Zoning Designations for the proposed campus improvements are shown in Table 4.8-1 and Figure 4.8-1.

Table 4.8.1
LLUH Campus
Existing Land Use and General Plan/Zoning Designations

Direction	Existing Land Use	General Plan Designation	Zoning Designation
Campus Site	LLUH	Healthcare, Institutional	Institutional
North	Vacant land, Union Pacific RR Tracks, Loma Linda Academy	Special Planning Area B, Institutional	Institutional
South	Barton Road, LLUH East Campus, Single-family Residential	Healthcare, Low Density Residential	Institutional, Single Residence (R-1)
East	Anderson Street, Commercial, LLUH related facilities	Special Planning Area C, Institutional	Institutional
West	Campus Street, LLUH parking, Multi-family residential	Institutional	Institutional, Duplex (R-2), Multi-Family Residence (R-3)

Surrounding land uses, General Plan Land Use Designations and Zoning Districts for the Option 1 SCE substation site are shown in Table 4.8-2 and Figure 4.8-1.

Table 4.8.2
Option 1 SCE Substation Site
Existing Land Use and General Plan/Zoning Designations

Direction	Existing Land Use	General Plan Designation	Zoning Designation
Substation Site	City Park	Special Planning Area B	Institutional
North	Single-family homes	Special Planning Area B	Institutional
South	Union Pacific RR Tracks, LLUMC Campus	Heath Care	Institutional
East	Vacant Land	Special Planning Area B	Institutional
West	Anderson Street, Vacant Land	Special Planning Area B	Institutional

4.8.3 Applicable Policies, Plans and Regulations

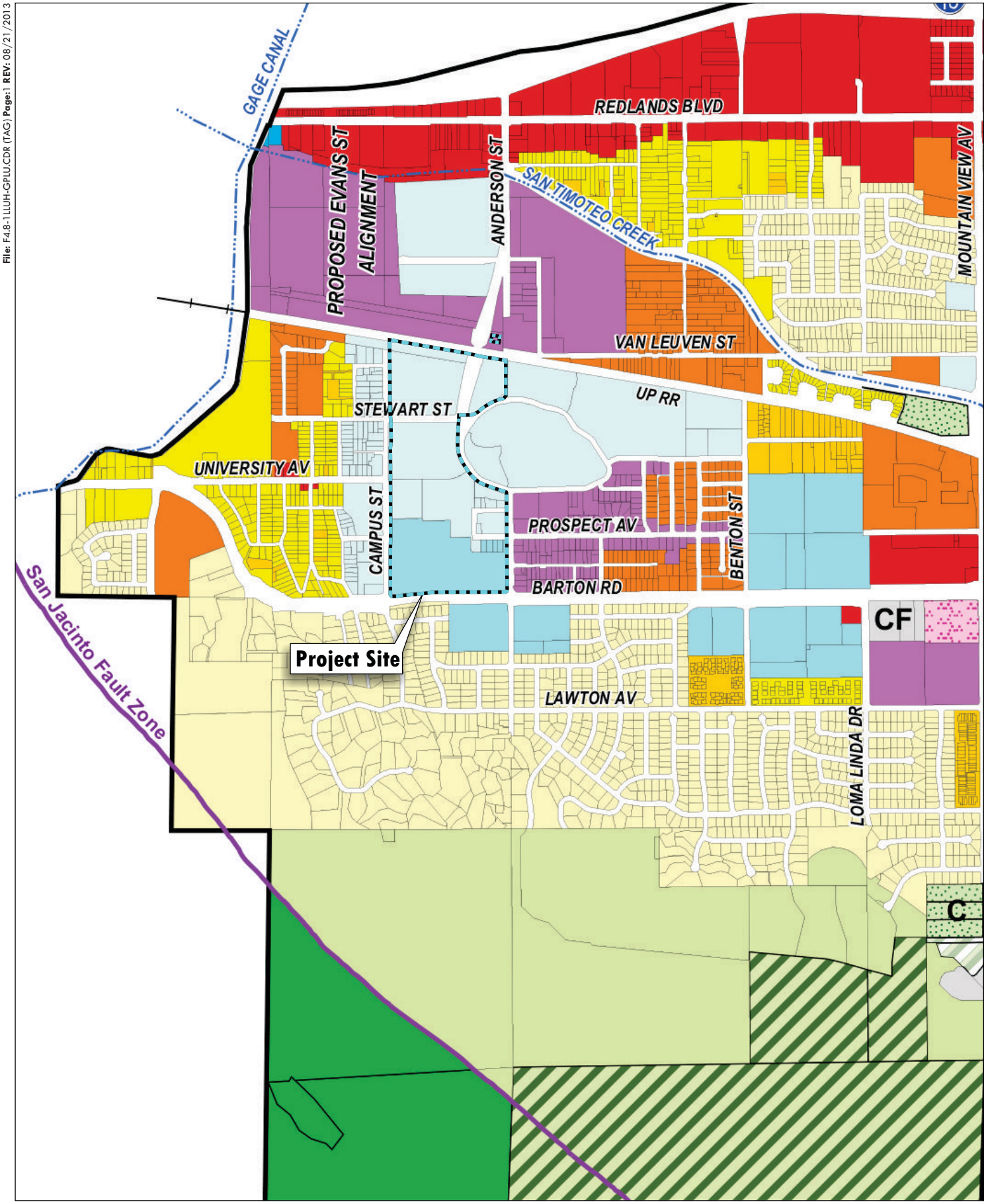
California Environmental Quality Act (CEQA)

CEQA Section 15125(a)(d)(e) states that an EIR shall include a description of the physical environmental conditions in the vicinity of the project as they exist at the time of publication of the Notice of Preparation (NOP) or if no notice of preparation is published, at the time the environmental analysis is commenced, from both a local and regional perspective; discuss any inconsistencies between the Proposed Project and applicable general plans and regional plans; and, where a Proposed Project is compared with an adopted plan, the analysis shall examine the existing physical conditions as well as the potential future conditions discussed in an adopted plan.

City of Loma Linda General Plan

The City of Loma Linda's General Plan, most recently updated and adopted on May 26, 2009, is a long-range, generalized planning document to guide development in the City. The General Plan Land Use Map broadly designates residential and non-residential land uses for all land in the City. According to the City of Loma Linda General Plan, the existing hospital is designated Health Care, and the remaining campus is designated Institutional. The Elmer Digneo City Park (site of SCE Option 1) is currently zoned Institutional with a General Plan land use designation of Special Planning Area B.

File: F4.8-1LLUH-GPLU.CDR (TAG) Page:1 REV: 08/21/2013



N

0 1,500'

Feet

Source: Loma Linda 2009 General Plan

LILBURN CORPORATION

LEGEND

- Low Density Residential (0 to 4 du/ac)
- Special Planning Area
- Health Care
- Institutional
- Project Site

GENERAL PLAN LAND USE DESIGNATIONS

LLUH MASTER PLAN PROJECT
Environmental Impact Report
City of Loma Linda, California

FIGURE 4.8-1

Applicable Goals, Objectives and Policies pertaining to Land Use within the General Plan include:

Health Care Guiding Policy (2.2.4.3)

Promote health care facilities that are conveniently located and well designed to aid patients and to make a positive visual contribution to the community in general.

Health Care Implementing Policies

a. Encourage LLU in the implementation of its master plan process for its diverse health care facilities and future facilities to ensure consistency with the General Plan, zoning, and other City requirements.
b. Encourage associated health care facilities and services to locate within close proximity of each other and require pedestrian connections (and bicycle paths, where appropriate) between such uses in order to limit necessary vehicle trips for patients, visitors, health care workers, and health care students.
c. Ensure that health care uses are designed so that site layout, architectural elements, and signage clearly direct visitors to parking areas, appropriate buildings, and building entries. Encourage health care uses to employ similar clarity of design and signage on the interior of buildings to ease visitors' stress through a well-designed wayfinding approach.
d. Require that any residential uses be clearly ancillary to the primary health care use and restricted to housing for employees of the onsite health care facility.

Guiding Policy for Anderson/Van Leuven Area Special Planning Area B

The intent for this area is to develop a mixed use[1] village with residential, office, retail, cultural, medical/health care, educational, and park and recreation uses. Religious assembly uses, such as a church, would also be appropriate within this area.

k. Implement development of Special Planning Area B through the adoption of a specific plan(s) or planned development(s), so that specific siting of land uses/buildings, architectural design, landscaping, road infrastructure, utilities, and other elements can be planned in a comprehensive, rather than piecemeal, manner throughout the Special Planning Area.

[1] "Mixed-use" development consists of two (2) or more primary land use components such as, but not limited to, residential and retail business, residential and offices, etc., which are harmoniously grouped into a visually compatible and functional land use arrangement that would not otherwise be permitted under a traditional residential, business park, or office zoning district. A "mixed-use" development needs to provide a common amenity or feature that ties different uses together into an integrated project. Thus, merely placing different uses adjacent to each other within a single development does not constitute "mixed-use" development. Mixed-use development may occur in either the same building (vertical mixed use) or on adjoining buildings on the same site (horizontal mixed use).

4.8.4 Project Impact Analysis and Mitigation Measures

4.8.4.1 Thresholds of Significance

Significant impacts related to land use are determined from criteria stated in the CEQA Checklist. The Checklist identifies the primary thresholds of significance relating to CEQA issues. Potential impacts are addressed in the CEQA process to identify and evaluate possible impacts to land use that could potentially result from implementation of the Proposed Project. The Proposed Project would have a significant effect on Land Use if it would:

- Physically divide an established community;
- 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; and/or
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

The impact analyses provided below is based on build-out of all phases of the Master Plan for determining ultimate impacts related to land use. The optional construction in Phase I of a SCE substation on the Elmer Digneo City Park located in Special Planning Area B would require approval of a Conditional Use Permit (CUP) by the City. Upon approval of a CUP, this option would be consistent with the City General Plan and zoning but may have generalized land use impacts that are discussed below.

4.8.4.2 Issues Identified to Have No Impact or a Less Than Significant Impact

The Proposed Project was determined to not have the potential to result in significant impacts in the issue areas listed below. For each issue, an explanation of the impact and a determination of no need for mitigation measures is provided.

Physically divide an established community.

According to the City's website, "Loma Linda is home to the world-famous Loma Linda University and Medical Center. The Loma Linda University Medical Center and Children's Hospital contain the largest neonatal intensive care unit in California, the Proton Accelerator Cancer treatment Center and the infant heart and multiple organ transplant center. While the LLU Medical Center, and nearby Jerry L. Pettis Memorial Veterans Medical Center are the backbone of the City's economy, Loma Linda is endeavoring to expand. Medical support services, research facilities, hospital supply firms, professional officers and lodging accommodations are logical additions". (http://www.lomalinda-ca.gov/asp/Site/OurCity/AboutUs/index.asp).

The project will occur within the boundaries of the existing LLUH campus and potentially on a portion of Elmer Digneo City Park to the immediate north (SCE Option 1) and therefore, will not

divide an established community. The project will expand services that are key to Loma Linda's growth and compatible with the community vision.

Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Proposed facilities and improvements associated with the Master Plan are described in detail in Section 3.4 and include: 1) a seven-story, approximately 250,000 square-foot, 760-space patient and visitor parking structure; 2) a 13-story (approximately 215 feet in height), approximately 732,000 square-foot hospital with 464 beds to replace a portion of the seismically-noncompliant existing hospital, and 80 parking spaces; 3) a new or retrofitted utility plant; 4) a new or upgraded Southern California Edison (SCE) on-site or off-site electrical substation; 5) a two-story, approximately 9,000 square-foot addition to the existing dental school; 6) a four-story approximately 90,000 square-foot research building; and 7) tenant improvements and reuse of the vacated portions of the existing hospital. Improvements and upgrades at the campus would also include potential expansion of utility lines or other infrastructure updates within streets that occur within the Project Site (i.e., Anderson Street, Taylor Drive, Loma Linda Drive, etc.).

The Master Plan's proposed facilities and improvements are consistent with the City's General Plan Land Use and Zoning designations and the Policies and Guidelines within the General Plan, and therefore do not represent a conflict.

<u>City Park Site</u>

Two options are being considered to develop a new connection to the power grid by Southern California Edison (SCE) as follows:

Option 1 would connect to new power grids to the north at a new 12,240 square-foot SCE substation to be located on the southwest portion of the approximate 4-acre Elmer Digneo City Park, located near the intersection of Anderson Street and Parkland Street. Development of Option 1 would require the City to issue a Conditional Use Permit prior to development of the new SCE substation within Special Planning Area B and the Elmer Digneo City Park.

Option 2 would upgrade the existing SCE substation located to the south of the campus' utility plant on an area currently used for surface parking. The upgraded substation would be enclosed within an approximately 8-foot high wall. Option 2 would not require the City to issue a Conditional Use Permit and would not represent a conflict with the City's General Plan or potentially create any new land use impacts.

Overhead electrical transmission lines currently traverse the Elmer Digneo City Park from north to south on the east side of the park, and from east to west toward the southern portion of the park. Power lines, electrical wiring, and appliances all produce electric and magnetic fields. Electric Magnetic Fields (EMFs) are invisible lines of force that surround any electrical device. Electric and magnetic fields have different properties and possibly different ways of causing biological effects. While electric fields are easily shielded or weakened by conducting objects

(e.g., trees, buildings, and human skin), magnetic fields are not. However, both electric and magnetic fields weaken with increasing distance from the source of generation[2].

The earth produces EMFs, mainly in the form of Direct Current (DC) {also called static fields}. Electric fields are produced by thunderstorm activity in the atmosphere. Near the ground, the DC electric field averages less than 200 volts per meter (V/m). Much stronger fields, typically about 50,000 V/m, occur directly beneath electrical storms.

Magnetic fields are thought to be produced by electric currents flowing deep within the earth's molten core. The DC magnetic field averages around 500 milligauss (mG)[3]. This number is larger than typical AC electric power magnetic fields, but DC fields do not create currents in objects in the way that AC fields do.

A typical American home has a background magnetic field level (away from any appliances) that ranges from 0.5 mG to 4 mG, with an average value of 0.9 mG. Most ordinary electrical appliances produce higher localized magnetic fields. A study conducted by the Electric Power Research Institute (EPRI) took measurements of magnetic fields in the center of rooms in 992 homes throughout the United States. Half of the homes studied had magnetic field measurements of 0.6 mG or less, when the average of measurements from all the rooms in the home was calculated (the all-room mean magnetic field). The all-room mean magnetic field for all homes studied was 0.9mG. Only 15% of the homes had mean magnetic fields greater than 2.1 mG. The measurements were made away from electrical appliances and primarily reflect the fields from outside power lines, household wiring, and electrical grounding sources.

Several EMF epidemiological studies have used 2 or 3 mG as a cutoff point to define broad categories of exposure. Below this level, subjects are considered "unexposed," and above this level they are considered "exposed." In some studies, a higher cancer risk was found within the exposed group. Other studies found no such increased risk. The significance of 2 mG is as a boundary to define the exposed group in some studies, not as a safety threshold. Although some experiments with cells have reported effects at field levels as low as 2 mG, there is no laboratory evidence for adverse human health effects at this level.

Substations are found frequently in residential areas to supply electricity. Substation equipment generates electromagnetic fields (EMFs), which also radiate from the associated overhead or underground cables or distribution lines. Most research reporting health effects from EMF sources is based on measured field levels. Cables can give off high fields near to them, in homes, or properties where they run close to the building or garden.

Currents from 60-Hz EMFs are weaker than natural currents in the body, such as those from the electrical activity of the brain and heart. Some scientists argue that it is therefore impossible for EMFs to have any important effects. Other scientists argue that, just as a trained ear can pick up a familiar voice or cry in a crowd, so a cell may respond to induced current as a signal, lower in

[2] Sources: http://www.lessemf.com/pamphlet.html#govactn ; and “Buying an “EMF Safe” Property”, Alasdair and Jean Philips,

[3] A Gauss is a unit of measurement of a magnetic field, which is also known as the "magnetic flux density" or the "magnetic induction". One Gauss equals 1×10^{-4} tesla (100 μT). A milligauss equals one thousandth of a gauss.

intensity yet detectable even through the background "noise" of the body's natural currents. Numerous laboratory studies have shown that biological effects can be caused by exposure to EMFs. In most cases, however, it is not clear how EMFs actually produce these demonstrated effects.

Strong electric fields, such as those found beneath large transmission lines, can cause hair on exposed human heads or arms to vibrate slightly at 60 Hz. This is felt by some people as a tingling sensation. EMFs from transmission lines can also in some circumstances cause nuisance shocks from voltages created by EMFs on objects like ungrounded metal fences.

Most recent reviews have concluded that the existing evidence, although suggestive, is not sufficient to show that EMFs cause cancer. These include national reviews by the U.S. Environmental Protection Agency, the Committee on Interagency Radiation Research and Policy Coordination, the Australian Minister of Health, the National Radiological Protection Board of the United Kingdom, the Danish Ministry of Health, the French National Institute of Health and Medical Research, and reviews sponsored by the states of California, Texas, Connecticut, Illinois, Maryland, and Colorado.

In general, the strongest EMFs around the outside of a substation come from the power lines entering and leaving the station. The strength of the EMFs from transformers decreases rapidly with increasing distance. Beyond the substation fence, the EMFs produced by the equipment within the station are typically indistinguishable from background levels.

At a distance of about 300 ft. and at times of average electricity demand, the magnetic field from many power lines can be similar to typical background EMF levels found in most homes. This is the distance at which the magnetic field from power lines becomes indistinguishable from typical background EMFs; less than significant impact would occur from operation of the substation.

The nearest homes to the Option 1 SCE substation are located in excess of 300 feet from the proposed substation location. However, the basketball court existing on the park site would be adjacent to the proposed substation if Option 1 is selected. There are overhead power lines that currently cross above the eastern portion of the park and within 50 feet from the basketball court. Therefore, some level of EMFs are present at the park site where there are no permanently inhabited structures. The City will impose a Condition of Approval that would require the substation be located a minimum of 200 feet from the existing basketball court. Upon final design of the substation, if this requirement cannot be met the City will require relocation of the basketball court. Development of Option 1, with the issuance of a Conditional Use Permit is consistent with the City’s General Plan, Policies, and Guidelines and does not represent a land use conflict; no impact would occur.

Option 2 would upgrade and expand the existing SCE substation located to the south of the existing utility plant onto an area currently used for surface parking. The substation would be enclosed within an approximately 8-foot high fence is also consistent with the City’s General Plan, Policies, and Guidelines and therefore does not represent a conflict; no impact would occur.

Conflict with any applicable habitat conservation plan or natural community plan.

The project would not conflict with any applicable habitat conservation plan or natural community conservation plan, because there is no habitat conservation plan or natural community conservation plan within the area surrounding the project site and no habitat conservation lands are required to be purchased as mitigation for the Proposed Project; no impact would occur.

4.9 NOISE

4.9.1 Introduction

This section of the EIR addresses the existing acoustical environment on and adjacent to the Project Site and evaluates off-site noise impacts related to project implementation. A Noise Assessment for the LLUH Master Plan Project was prepared by Mestre Greve Associates, July 24, 2013 to specifically address potential impacts related to project construction as well as impacts on the existing land uses adjacent to the site. The Noise Assessment is included as Appendix J.

4.9.2 Environmental Setting

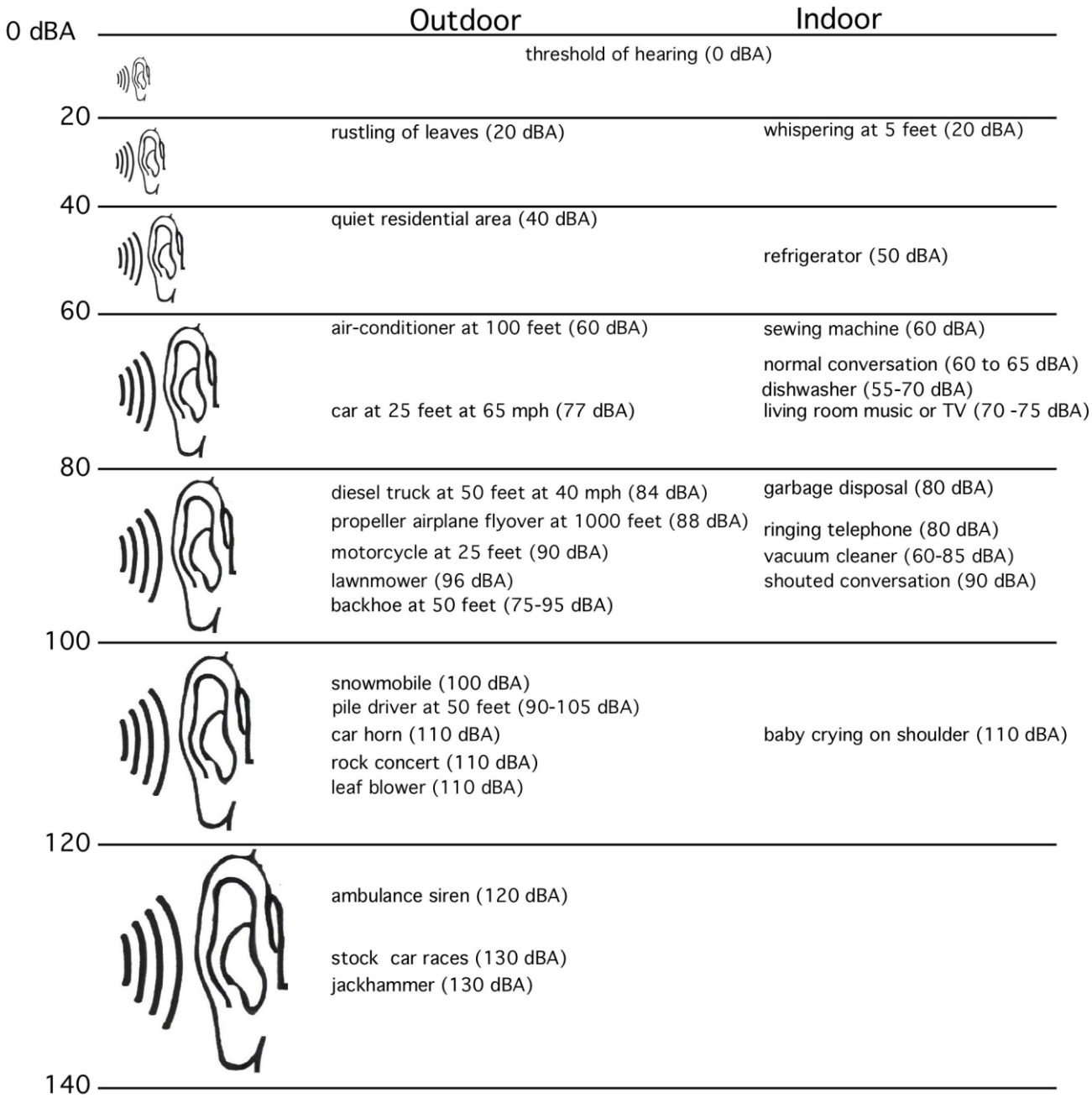
Background on Noise Measurement Methodology

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dB higher than another is judged to be twice as loud; and 20 dB higher four times as loud; and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud).

As the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Community noise levels are measured in terms of the "A-weighted decibel," abbreviated dBA. Refer to Figure 4.9-1 for examples of various noises and their typical A-weighted noise level.

Sound levels decrease as a function of distance from the source as a result of wave divergence, atmospheric absorption and ground attenuation. As the sound wave form travels away from the source, the sound energy is dispersed over a greater area, hence dispersing the sound power of the wave. Atmospheric absorption also influences the levels that are received by the observer. The greater the distance traveled, the greater the influence and the resultant fluctuations. The degree of absorption is a function of the frequency of the sound as well as the humidity and temperature of the air. Turbulence and gradients of wind, temperature and humidity also play a significant role in determining the degree of attenuation. Intervening topography can also have a substantial effect on the effective perceived noise levels.

Noise has been defined as unwanted sound and it is known to have several adverse effects on people. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. This criteria is based on known impacts of noise on people as hearing loss, speech interference, sleep interference, physiological responses and annoyance. A brief description of each of these potential noise impacts are as follows:



Sources: League For The Hard Of Hearing, www.lhh.org
Handbook of Noise Control, McGraw Hill, Edited byCyril Harris, 1979
Measurements by Mestre Greve Associates

Typical Noise Levels

Figure 4.9-1

Hearing loss is not a concern in community noise situations of this type. The potential for noise induced hearing loss is more commonly associated with occupational noise exposures in heavy industry or very noisy work environments. Noise levels in neighborhoods are not sufficiently loud to cause hearing loss.

- *Speech Interference* is one of the primary concerns in environmental noise problems. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. There are specific methods of describing speech interference as a function of distance between speaker and listener and voice level.

- *Sleep Interference* is a major noise concern form traffic noise. Sleep disturbance studies have identified interior noise levels that have the potential to cause sleep disturbance. Note that sleep disturbance does not necessarily mean awakening from sleep, but can refer to altering the pattern and stages of sleep.

- *Physiological Responses* are those measurable effects of noise on people that are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent is not known to which these physiological responses cause harm or are sign of harm.

- *Annoyance* is the most difficult of all noise responses to describe. Annoyance is a individual characteristic and can vary widely from person to person. What one person considers tolerable can be unbearable to another of equal hearing capability.

Noise Assessment Metrics

The description, analysis and reporting of community noise levels around communities is made difficult by the complexity of human response to noise and the myriad of noise metrics that have been developed for describing noise impacts. Each of these metrics attempts to quantify noise levels with respect to community response. Most of the metrics use the A-Weighted noise level to quantify noise impacts on humans. A-Weighting is a frequency weighting that accounts for human sensitivity to different frequencies.

Noise metrics are divided into two categories: single event and cumulative. Single-event metrics describe the noise levels from an individual event such as an aircraft fly over or a heavy equipment pass-by. Cumulative metrics average the total noise over a specific time period, typically 1 or 24-hours for community noise problems. A cumulative noise metrics were used for the proposed analysis.

Several rating scales have been developed for measurement of community noise. These include the following:

- The parameters of noise that have been shown to contribute to the effects of noise on man,
- The variety of noises found in the environment,

- The variations in noise levels that occur as a person moves through the environment, and
- The variations associated with the time of day.

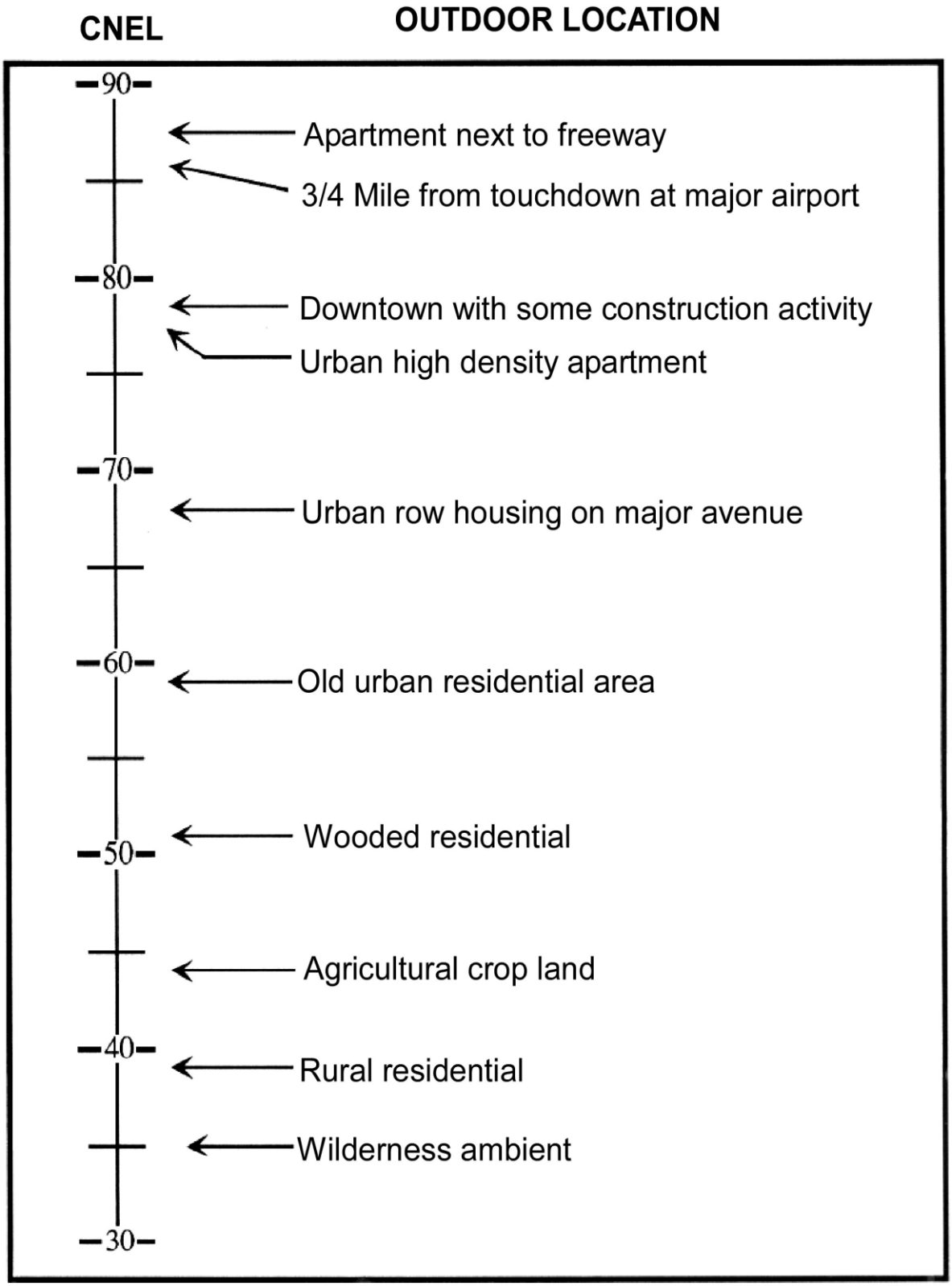
The scale was designed to account for the known health effects of noise on people. Based on these effects, the observation has been made that the potential for a noise to impact people is dependent on the total acoustical energy content of the noise. A number of noise scales have been developed to account for this observation. Two of the predominate noise scales are the: Equivalent Noise Level (LEQ) and the Community Noise Equivalent Level (CNEL). These scales are as follows:

LEQ is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. LEQ is the "energy" average noise level during the time period of the sample. LEQ can be measured for any time period, but is typically measured for 1 hour. This 1-hour noise level can also be referred to as the Hourly Noise Level (HNL). It is the energy sum of all the events and background noise levels that occur during that time period.

CNEL, Community Noise Equivalent Level, is the predominant rating scale now in use in California for land use compatibility assessment. The CNEL scale represents a time weighted 24-hour average noise level based on the A-weighted decibel. Time weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized for occurring at these times. The evening time period (7 p.m. to 10 p.m.) penalizes noises by 5 dBA, and the nighttime (10 p.m. to 7 a.m.) noises are penalized by 10 dBA. These time periods and penalties were selected to reflect people's increased sensitivity to noise during these time periods. A CNEL noise level may be reported as a "CNEL of 60 dBA," "60 dBA CNEL," or "60 CNEL." Typical noise levels in terms of the CNEL scale for different types of communities are shown in Figure 4.9-2.

Ldn, the day-night is a measure of the overall noise experienced during an entire day. The time-weighted refers to noise that occurs during certain sensitive time periods and is penalized for occurring at these times. In the Ldn scale, those noise levels that occur during the night (10 pm to 7 am) are penalized by 10 dB. This penalty was selected to attempt to account for increased human sensitivity to noise during the quieter period of a day.

L(%) is a statistical method of describing noise which accounts for variance in noise levels throughout a given measurement period. L (%) is a way of expressing the noise level exceeded for a percentage of time in a given measurement period. Therefore, as five minutes is 25% of 20 minutes, L(25) is the noise level that is equal to or exceeded for five minutes in a 20 minute measurement period. It is L(%) that is used for most Noise Ordinance standards. Therefore, most daytime County, state and City Noise Ordinances use an ordinance standard of 55 dBA for 30 minutes per hour or an L(50) level of 55 dBA. Thus, the Noise Ordinance states that no noise level should exceed 55 dBA for more than 50% of a given period.



Typical CNEL Levels

Figure 4.9-2

Existing Project Area Noise Setting

The existing noise levels in the vicinity of the LLUH Master Plan Project site were used to establish the current baseline noise levels. A noise measurement survey of the Project Site and the surrounding area was conducted in July 2013. Five sites were chosen and measured to provide coverage of the project area. The measurement sites are shown on Figure 4.9-3.

Ten short-term noise measurements were taken. Measurements were performed at each of the five sites during daytime hours, and repeated during the evening hours. All of the measurements were taken on July 15, 2013. The daytime measurements were performed between 2 p.m. and 5 p.m. The evening measurements were performed between 7:00 p.m. and 9 p.m. Prevailing weather conditions were noted, along with any other factors that might adversely affect the noise measurements. Table 1 shows the results of the measurements.

Table 4.9-1
Existing Noise Measurements (dBA)

Site	Date	Time	Leq	L_{max}	L1.7	L8.3	L25	L50	L_{min}
1	7-15-13	2:50 pm	70.4	86.2	76.0	73.0	69.0	64.5	49.0
2	7-15-13	3:58 pm	54.2	71.9	61.5	56.5	53.5	51.0	45.5
3	7-15-13	4:22 pm	52.2	62.0	56.5	54.5	53.0	51.5	44.6
4	7-15-13	3:10 pm	69.8	84.2	76.5	74.0	71.0	65.0	49.7
5	7-15-13	3:35 pm	64.2	79.1	69.5	67.0	65.0	61.5	52.3
1	7-15-13	7:00 pm	67.9	85.4	75.0	72.5	67.5	62.0	46.2
2	7-15-13	7:59 pm	55.3	70.9	62.0	59.5	54.0	50.0	45.8
3	7-15-13	8:19 pm	51.5	60.7	57.0	53.5	52.0	50.5	46.3
4	7-15-13	7:18 pm	67.9	83.5	76.0	73.0	68.0	61.0	47.9
5	7-15-13	7:39 pm	63.6	79.2	71.0	66.5	63.0	59.0	50.4

Note: Refer to page 4.9-4 for Noise Scale descriptions.
L1.7 *represents the noise level exceeded 1.7% of the time or more than 1 minute during an hour*
L8.3 *represents the noise level exceeded 8.3% of the time, or more than 5 minutes in an hour*

Information on the measurements sites are as follows:

- *Site 1: Barton Road, near west side of existing hospital*

Site 1 is located approximately 55 feet from the centerline of Barton Road. The monitoring location was on the edge of the sidewalk on the south side of Barton Road, just east of Campus Street. The primary noise source was the traffic on Barton Road. Noise from sandblasting activities at the parking structure to the northwest of the measurement site is

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N

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Miles

Aerial: GOOGLE, June, 2012.

LILBURN CORPORATION

LEGEND

Project Site

1 Noise Measurement Site Locations

NOISE MEASUREMENT LOCATIONS

LLUH MASTER PLAN PROJECT

Environmental Impact Report

City of Loma Linda, California

FIGURE 4.9-3

also included, but did not significantly affect the overall noise levels. The daytime Lmax was 86.2 dBA, which was caused by a motorcycle on Barton Road. The daytime L50 at this site measured 64.5 dBA. The evening L50 at this site measured 62.0 dBA. The evening Lmax was 85.4 dBA, which was caused by a truck on Barton Road. These noise levels are representative of a typical noise environment along a busy roadway.

- *Site 2: Parkland Street, near Stewart Street*

Site 2 is located approximately 27 feet from the centerline of Parkland Street. The monitoring location was on the edge of the sidewalk on the east side of Parkland Street, just north of Stewart Street. The primary noise source was the traffic on Stewart Street. The daytime Lmax was 71.9 dBA, which was caused by a truck on Parkland Street. The daytime L50 at this site measured 51.0 dBA. The evening L50 at this site measured 50.0 dBA. The evening Lmax was 70.9 dBA, which was caused by a train passing to the north of the site. These noise levels are representative of a typical noise environment along a smaller roadway.

- *Site 3: Anderson Street, at Elmer Digneo City Park*

Site 3 is located approximately 325 feet from the centerline of Anderson Street. The measurement site gets significant shielding from the traffic on Anderson Street due to the elevated roadway. The monitoring location was on the sidewalk of the Elmer Digneo City Park, just northwest of the restroom facility in the park. The primary noise source was the traffic on Anderson Street. Noise from a commercial jet aircraft overflight is also included, and may have influenced the Leq for this measurement. Noise from activities in the park is also included, but did not significantly affect the overall noise levels. The daytime Lmax was 62.0 dBA, which was caused by a commercial jet. The daytime L50 at this site measured 51.5 dBA. The evening L50 at this site measured 50.5 dBA. The evening Lmax was 60.7 dBA, which was caused by a car hood slam. These noise levels are representative of a typical noise environment along a busy roadway at this distance.

- *Site 4: Barton Road, near east side of existing Hospital*

Site 4 is located approximately 55 feet from the centerline of Barton Road. The monitoring location was on the edge of the sidewalk on the south side of Barton Road, just west of the entrance to the Faculty Medical Offices Parking Lot "O". The primary noise source was the traffic on Barton Drive. Noise from a military aircraft overflight is also included, and may have influenced the Leq for this measurement. The daytime Lmax was 84.2 dBA, which was caused by a truck on Barton Road. The daytime L50 at this site measured 65.0 dBA. The evening L50 at this site measured 61.0 dBA. The evening Lmax was 83.5 dBA, which was caused by a truck on Barton Road. These noise levels are representative of a typical noise environment along a busy roadway.

- *Site 5: Anderson Street, near Barton Road*

Site 5 is located approximately 34 feet from the centerline of Anderson Street. The monitoring location was on the edge of the sidewalk on the east side of Anderson Street, just

north of Barton Road. The primary noise source was the traffic on Anderson Street and Barton Road. The daytime Lmax was 79.1 dBA, which was caused by a bus on Barton Road. The daytime L50 at this site measured 61.5 dBA. The evening L50 at this site measured 59.0 dBA. The evening Lmax was 79.2 dBA, which was caused by a pair of motorcycles on Barton Road. These noise levels are representative of a typical noise environment along a busy roadway.

4.9.3 Applicable Policies, Plans and Regulations

The Noise Element of the City of Loma Linda's General Plan and Noise Ordinance contain the City's policies on noise. The noise ordinance applies to noise on one property impacting a neighboring property. Typically, it sets limits on noise levels that can be experienced at the neighboring property. The Noise Ordinance is part of the City's Municipal Code and is enforceable throughout the City. The Noise Element of the General Plan presents limits on noise levels from transportation noise sources, vehicles on public roadways, railroads and aircraft. These limits are imposed on new developments. The new developments must incorporate the measures to ensure that the limits are not exceeded. Additionally, the California Green Building Standards Code has been implemented in California and contains additional acoustic requirements. The City Noise Ordinance and Noise Element policies are presented below along with the relatively recent CalGreen requirements.

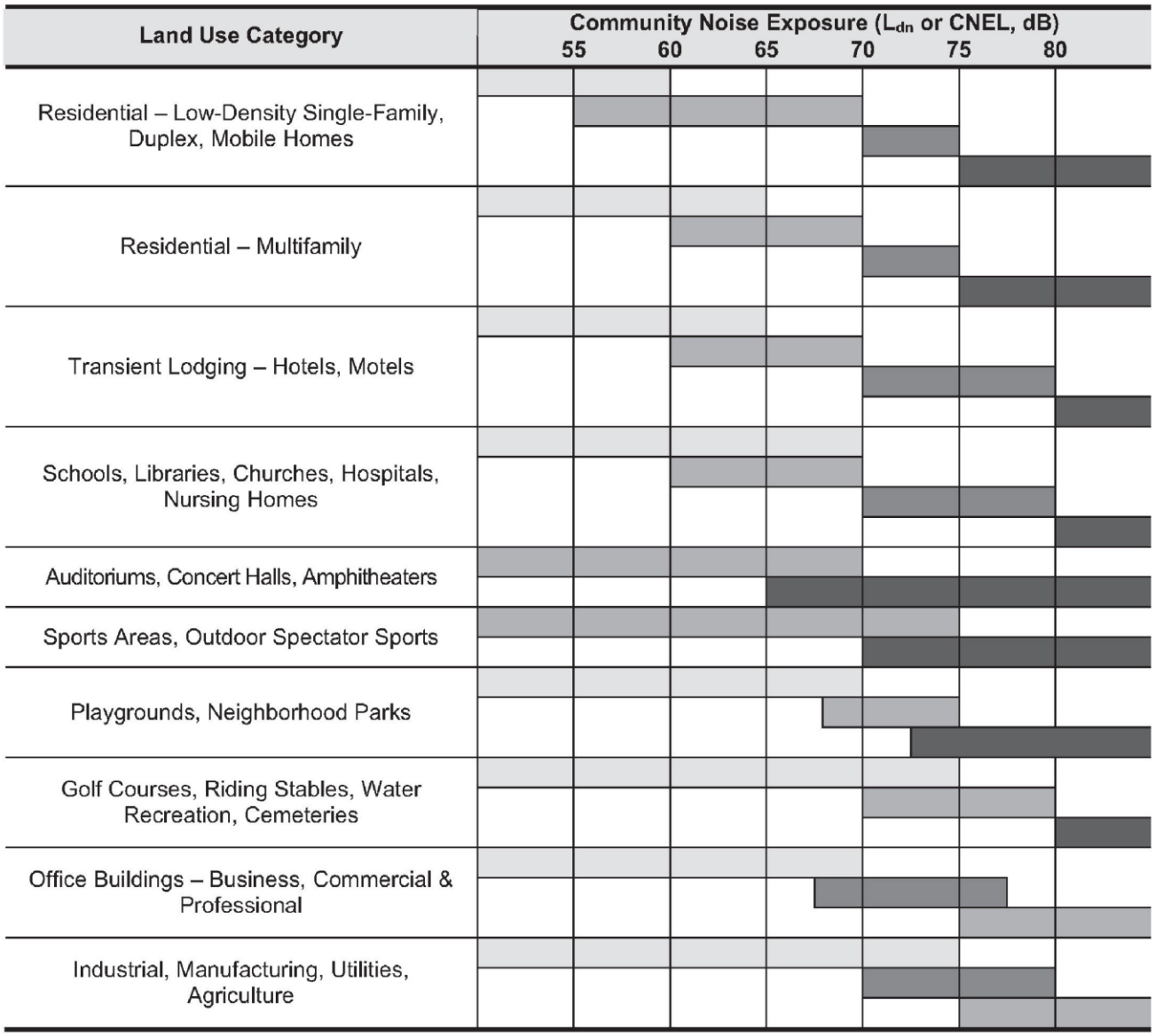
City of Loma Linda Noise Element

The City of Loma Linda General Plan Noise Element provides noise/land use compatibility guidance in terms of a compatibility matrix. The matrix is provided here as Figure 4.9-4. The guidelines present the acceptability of the noise environment as normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable. For example, hospital uses are normally acceptable in noise environments up to 70 CNEL. Between 70 and 80 CNEL hospital uses are considered normally unacceptable.

The City has translated the compatibility matrix into standards. The standards are determined to be performance guidelines and help determine what type of noises are nuisances and are unacceptable to the community. The noise level standards are taken from Table 7.C of the Noise Element and are presented here as Figure 4.9-5. The compatibility matrix and noise standards presented in the section generally apply to public sources of noise such as cars, trucks, buses, trains, and aircraft.

City of Loma Linda Noise Ordinance

The Loma Linda Noise Ordinance (Chapter 9.20 of the Municipal Code) contains requirements for noise generated on one parcel impacting another parcel. The requirements of the noise ordinance are based on the compatibility matrix contained in their Noise Element of the General Plan and presented as Figure 4.9-5. Section 9.20.030 (A) states that "It is unlawful for any person at any location to create any noise, or to allow the creation of any noise when such noise causes the noise level to exceed any noise level as specified in Section 9.20.040 (provided here as



NORMALLY – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise.

CONDITIONALLY – New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY – New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY – New construction or development should generally not be undertaken.

Source: California Department of Health, Guidelines for the Preparation and Content of Noise Elements of the General Plan, February 1976.

Loma Linda Compatibility Matrix

Figure 4.9-4

Land Use Categories	Energy Average CNEL			
	Normally Acceptable(1)	Conditionally Acceptable(2)	Normally Unacceptable(3)	Clearly Unacceptable(4)
Residential	55	70	75	76 or more
Residential (10:00 p.m. to 7:00 p.m.)	< 50	55 or more	----	----
Transient Lodging, Motels, Hotels	65	70	75	76 or more
Schools, Libraries, Churches, Hospitals, Nursing Homes	70	70	80	81 or more
Auditoriums, Concert Halls, Amphitheaters	----	80	----	90 or more
Sports Arenas, Outdoor Spectator Sports	----	80	----	90 or more
Playgrounds, Neighborhood Parks	70	----	75	76 or more
Golf Course, Riding stables, Water Recreation, Cemeteries	----	----	80	81 or more
Office Buildings, Business Commercial and Professional	70	75	76 or more	----
Industrial Manufacturing, Utilities, Agriculture	70	80	81 or more	----

Emergency type land uses, emergency response vehicles, and emergency notification measures shall be considered as Normally Acceptable measures and exempt from violations and or penalties.

Source: Chapter 9.20 Loma Linda Municipal Code

INTERPRETATION

(1) Specified land use activities that are satisfactory based upon the assumption that any land use or buildings involved are of ordinary performance standards.

(2) Activities or Actions shall be undertaken only after a detailed analysis of the noise reduction (muffling) requirements is made and noise reduction insulation features are included as a preventive measure.

(3) Noise levels exceeding the following ranges shall generally be discouraged. If new activities or actions proceed, a detailed analysis of the noise reduction requirements must be made and necessary noise insulation features included in the design.

(4) Activities shall not be undertaken or permitted.

Loma Linda Noise Standards

Figure 4.9-5

Figure 4.9-6). However, Section 9.20.040 presents a slightly different view of the noise ordinance limits, and it states:

> *These standards are established guidelines from the Loma Linda General Plan that provide a decibel range for the city manager, or designee to follow and help determine what type of noises are nuisances and are unacceptable to the community. This determination will be on a case-by-case basis at the discretion of the city manager.*

City of Loma Linda General Plan

Goals and policies pertaining noise as listed within the General Plan are as follows:

Noise Element Goals and Polices

Guiding Policy (7.8.1)

Strive to achieve an acceptable noise environment for existing and future residents of the City of Loma Linda.

Implementing Policies

a. Achieve and maintain exterior noise levels appropriate to planned land uses throughout Loma Linda as indicated below:
   - Libraries, Churches, Hospitals, Nursing Homes: 60dBA exterior noise environment at the building location.
b. Maintain a pattern of land uses that separates noise-sensitive land uses (e.g. residential, churches, schools, hospitals) from major noise sources to the extent possible, and guide noise tolerant land uses into the noisier portions of the Planning Area.
c. Require new developments to limit noise impacts on adjacent properties through acoustical site planning, which may include, but is not limited to the following actions:
   - Increased setbacks from noise sources from adjacent buildings;
   - Screen and control noise sources, such as parking, and loading facilities, outdoor activities, and mechanical equipment;
   - Use soundproofing materials and double-glazed windows;
   - Retain fences, walls, and landscaping that serve as noise buffers;
   - Orient delivery, loading docks, and outdoor work areas way from noise-sensitive areas;
   - Cluster office, commercial, or multifamily residential structures to reduce noise levels within interior open space areas.
d. Where new development (including construction and improvement roadways) is proposed in areas exceeding the noise levels identified in the General Plan, or where the development of proposed uses could result in an increase of more than 3.0 dBA above

Land Use Category and Similar Activities	Maximum Community Noise Exposure Levels	Ldn or CNEL, dBa
Residential	Normally Acceptable	55
	Conditionally Acceptable	70
	Normally Unacceptable	75
	Clearly Unacceptable	76
Residential (evening)* 10:00 p.m.—7:00 a.m.	Normally Acceptable	< 50
	Conditionally Acceptable	55 or more
Transient Lodging Motels, Hotels	Normally Acceptable	65
	Conditionally Acceptable	70
	Normally Unacceptable	75
	Clearly Unacceptable	76 or more
Schools, Libraries, Churches, Hospitals, Nursing Homes	Normally Acceptable	70
	Conditionally Acceptable	70
	Normally Unacceptable	80
	Clearly Unacceptable	81 or more
Auditoriums, Concert Halls, Amphitheaters	Conditionally Acceptable	80
	Clearly Unacceptable	90 or more
Sports Arenas, Outdoor Spectator Sports	Conditionally Acceptable	80
	Clearly Unacceptable	90 or more
Playgrounds, Neighborhood Parks	Normally Acceptable	70
	Normally Unacceptable	75
	Clearly Unacceptable	76 or more
Golf Course, Riding Stables, Water Recreation, Cemeteries	Normally Acceptable	
	Normally Unacceptable	80
	Clearly Unacceptable	81 or more
Office Buildings, Business Commercial and Professional	Normally Acceptable	70
	Conditionally Acceptable	75
	Normally Unacceptable	76 or more
Industrial, Manufacturing Utilities, Agriculture	Normally Acceptable	70
	Conditionally Acceptable	80
	Normally Unacceptable	81 or more
Emergency type land uses, emergency response vehicles, and emergency notification measures shall be considered as Normally Acceptable measures and exempt from violations and or penalties.		

Loma Linda Noise Ordinance Limits

Figure 4.9-6

existing background noise, require a detailed noise attenuation study prepared by a qualified acoustical engineer to determine and incorporate appropriate mitigation into project design and implementation to reduce potential noise levels to acceptable noise levels as identified in the General Plan.

e. Utilize site design and architectural design features to the extent feasible to mitigate impacts on residential neighborhoods and other noise-sensitive uses. In addition to sound barriers design techniques to mitigate noise impacts may include but are not limited to:
   - Increased building setbacks to increase the distance between the noise source and sensitive receptors.
   - Orienting buildings that are noise-compatible with adjacent to noise generators or in a manner that shields noise-sensitive uses.
   - Orienting delivery, loading docks, and outdoor work areas away from noise sensitive uses.
   - Placing noise tolerant activity areas (e.g., parking) between the noise source and sensitive receptors.

f. Provide double glazed and double paned windows on the side of the structure facing a major noise source, and place entries away from the noise source to the extent possible.

g. Continue enforcement of the California Noise Insulation Standards (Title 25, Section 1092, California Administrative Code).

h. Discourage new projects that have the potential to create ambient noise levels more than 5 dBA above existing background noise within 250 feet of sensitive receptors (e.g., schools, hospitals, churches, residential uses, etc.).

i. Require new noise sources to use best available control technology (BACT) to minimize noise from all sources.

j. Ensure that construction activities are regulated as to the hours of operation in order to avoid or mitigate noise impacts on adjacent noise-sensitive land uses.

k. Require proposed development adjacent to occupied noise-sensitive uses to implement a construction related noise mitigation plan that identifies the location of construction equipment storage and maintenance areas, and documents the methods that will be used to minimize impacts on adjacent noise-sensitive land uses, including, where needed, installation of temporary noise barriers.

l. Require that all construction equipment utilize noise-reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

1.3.3 CalGreen Noise Requirements

The CalGreen acoustical requirements are called out in Section 5.507.4 of the California Green Building Standards Code (CalGreen) and per the supplement effective July 1, 2012. Commercial projects that experience traffic noise that regularly exceeds 65 dBA are subject to the specific requirements called out in Section 5.507.4 of CalGreen. The following exterior building element criteria are contained in CalGreen:

- The roof must meet an STC 50 rating, the exterior walls must achieve an STC 50 rating, and the windows must have an STC 40 rating, or

- The interior noise environment attributable to exterior sources does not exceed an hourly equivalent noise level (Leq) of 50 dBA in occupied areas during any hour of operation. This approach is referred to as the "performance method" (see Section 5.507.4.2 of CalGreen).

4.9.4 Project Impact Analysis and Mitigation Measures

Although the Project would consist of a multi-phased development to construct new facilities and improvements to the existing campus, the impact analyses provided below are based on build-out of all phases of the Master Plan for determining potential impacts from noise. Since there are noise impacts specifically at the Elmer Digneo City Park, this portion of the Proposed Project is evaluated separately from the main LLUH campus.

4.9.4.1 Thresholds of Significance

Significant impacts related to noise are determined from criteria stated with the CEQA Checklist. The Checklist identifies the primary thresholds of significance relating to CEQA issues. Potential impacts from construction noise, post-construction noise and temporary helistop location, are addressed in the CEQA process to identify and evaluate possible impacts from noise that could potentially result from implementation of the Proposed Project. The Proposed Project would have a significant effect on Noise if it would:

- Exposure of persons to or generation of noise levels in excess of standards established in the City's General Plan or Development Code, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For a project located within an airport land use plan or airport influence area, would the project expose people residing or working in the project area to excessive noise levels.

4.9.4.2 Issues Identified to have No Impact or Less Than Significant Impact

The Proposed Project was determined to have the potential to result in no impacts or less than significant impacts in the issue area listed below. An explanation of the impact and a determination of no need for mitigation measures is provided.

For a project located within an airport land use plan or airport influence area, would the project expose people residing or working in the project area to excessive noise levels.

The Project Site does not occur within the San Bernardino International Airport (SBIA) Influence Area, as shown in Figure 10.4 of the City's General Plan. The Airport is located approximately 2.5 miles northeast of the Project Site. Impacts from aircraft noise would have no effect on patients, students or staff.

The existing hospital supports two permanent helistops and one emergency helistop for the transport of patients to the hospital. The permanent helistops are located on: 1) Tower A of the existing hospital and 2) the rooftop of the Children's Hospital. The emergency helistop is located on the grass area north of Medical Facility, west of Prince Hall and east of University Church. The aircraft uses of the helistops occur during the transporting of patients and flights generally average two to four per day. The noise generated by the use of helicopters on an emergency flight basis does not constitute a significant impact. Therefore, no impact is anticipated.

4.9.4.3 Issues Determined to Have Potentially Significant Impacts

Exposure of persons to or generation of noise levels in excess of standards established in the City's General Plan or Development Code, or applicable standards of other agencies.

A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Impact N-1:

Temporary construction and long-term operational activities may expose residents in the immediate area to excessive noise levels exceeding the City's noise ordinance. This is a potentially significant impact.

As previously discussed, off-site impacts from on-site activities, short-term and long-term, are measured against the City's Noise Ordinance. Additionally, the noise levels associated with the operation of the SCE substation at the Elmer Digneo City Park would be contrasted with ambient conditions. Construction activities for the Proposed Project would be required to meet the City standards. Noise generating activities associated with the operation of the project would be compared against the City's noise limits and against ambient noise levels to determine potential impacts.

When considering changes in ambient conditions, it is important to understand what constitutes a significant change. In community noise assessment, changes in noise levels greater than 3 dB are often identified as significant, while changes less than 1 dB would not be discernible to local residents. In the range of 1 to 3 dB, residents who are very sensitive to noise may perceive a slight change. In laboratory testing situations, humans are able to detect noise level changes of

slightly less than 1 dB. In a community noise situation, however, noise exposures are over a long time period, and changes in noise levels occur over years, rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become discernible is likely to be some value greater than 1 dB, and 3 dB appears to be appropriate for most people.

Four aspects of the Project have been identified with the possibility of generating noise impacts. Each of the four project aspects are analyzed separately in the following sections. These four concerns are described as:

1. New parking structure - near the corner of Barton Road and Campus Street
2. New utility plant or existing plant retrofitted
3. New SCE substation at the Elmer Digneo City Park
4. New hospital building

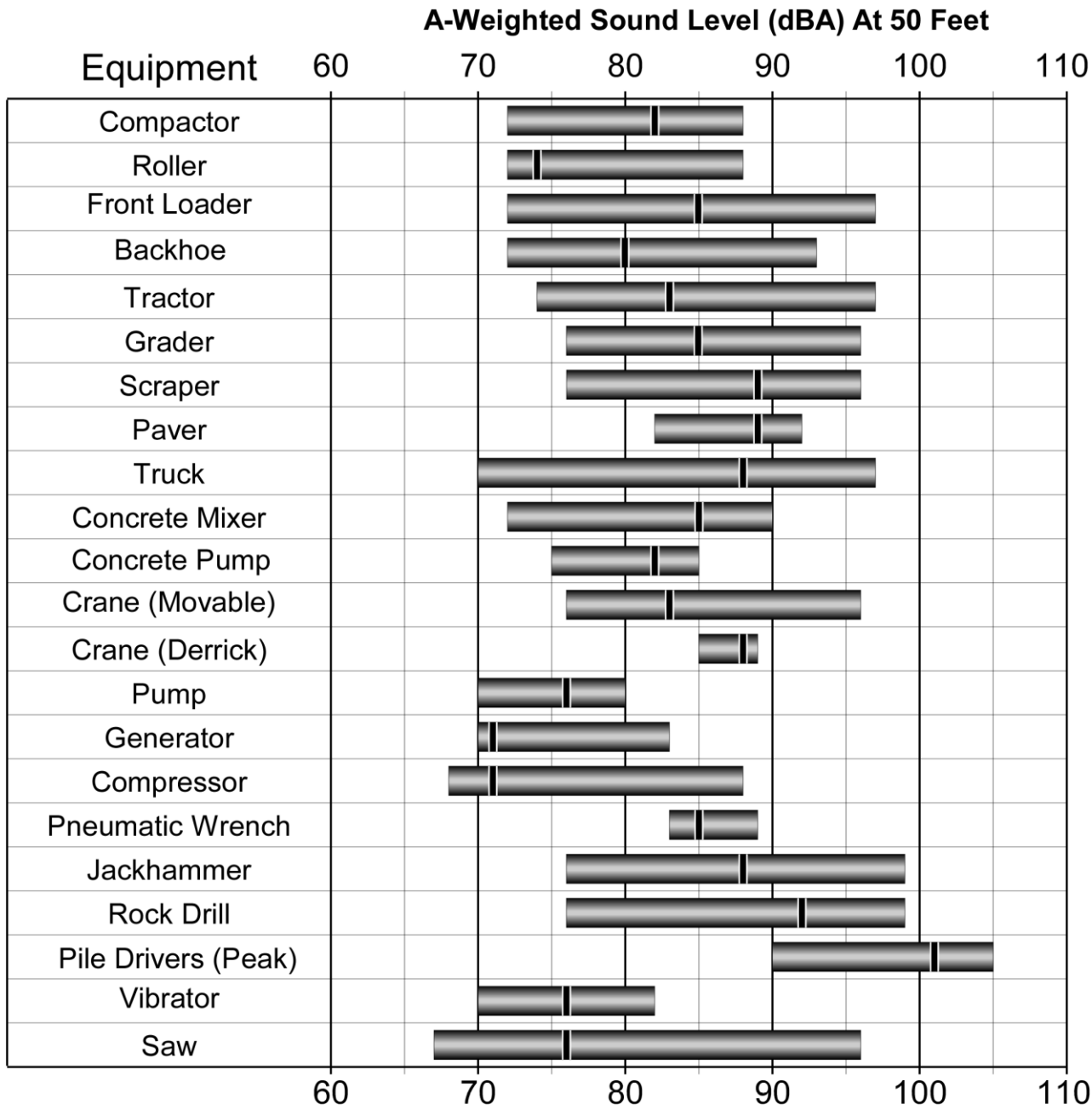
New Parking Structure

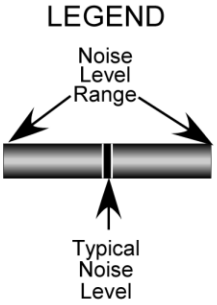
A seven-level, 760-space parking structure is proposed east of Campus Street adjacent to the existing hospital's South Tower to replace the existing surface lots on the site of the new hospital. Construction of the parking structure would require the demolition of approximately 83 surface parking stalls currently dedicated to hospital administration. Modifications to site access, circulation and various landscaping improvements are proposed. A new access point from Barton Road is also proposed for the parking structure. Construction of the parking structure would take place during Construction Years 1 through 2 (anticipated to commence in 2014).

Temporary Construction Impacts

Construction noise represents a short-term impact on ambient noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers and portable generators can reach high levels. There would also be some limited demolition of the existing structures on the Project Site (ten residential structures). Demolition and grading activities would have similar noise levels. Worst-case examples of construction noise at 50 feet are presented in Figure 4.9-7. Typical equipment that might be employed for this type of project include graders, front loaders, backhoes, trucks, concrete mixers, concrete pumps, cranes, and front loader. The peak noise level for most of the equipment that would be used during the construction is 90 to 95 dBA at a distance of 50 feet; noise levels at further distances would be less. The nearest residences are located south of the Project Site at a distance of slightly more than 200 feet. At 200 feet, the peak construction noise levels range from 78 to 83 dBA; average noise levels (Leq) are considerably less. At 50 feet, average noise levels for the same equipment will be in the 80 to 87 dBA range. These noise levels at 200 feet would be in the 68 to 75 dBA (Leq) range.

The nearest sensitive land use are the residential uses south across Barton Road as represented at Site 1. The noise measurements at this site indicate that ambient noise levels are fairly high at this location. The daytime Leq was measured at 70.4 dBA which is about the same level as projected for the Proposed Project's construction noise. Similarly, the daytime Lmax noise level





Sources: "Handbook of Noise Control," by Cyril Harris, 1979
" Transit Noise and Vibration Impact Assessment" by Federal Transit Administration, 1995

Construction Noise Levels

Figure 4.9-7

was measured at 86.2 dBA which is also consistent with the construction noise levels anticipated. Since the ambient noise levels are as high as the projected Proposed Project's construction noise levels, no additional noise mitigation is recommended for construction of the parking structure other than limiting the hours of construction. See Section 3.1 for mitigation measures addressing construction noise impacts.

Operational Noise

Traffic associated with parking lots and parking structures is not usually of sufficient volume to exceed community noise standards that are based on a time averaged scale such as the CNEL scale. However, the instantaneous maximum sound levels generated by car door slamming, engine start-up, alarm activation and car pass-bys can still be annoying to nearby residents. Tire squeal may also be a problem depending on the type of parking surface. The parking structure would be slightly more than 200 feet from existing residences. Estimates of the maximum noise levels associated with some parking lot activities are presented in Table 4.9-2. These levels are based on measurements conducted by Mestre Greve Associates. The noise levels presented are for a distance of 200 feet from the source, and are the maximum noise level generated. A range is given to reflect the variability of noise generated by various automobile types and driving styles.

Table 4.9-2
Parking Structure Noise
(dBA at 200 feet)

Event	Lmax
Door Slam	48 to 58
Car Alarm Activation	53 to 58
Engine Start-up	48 to 58
Car pass-by	43 to 58

The anticipated parking structure noise level would be well below the maximum sound levels measured at the residences both during the day and during the evening. Therefore, no noise impacts are anticipated for the operation of the parking structure and no mitigation measures are necessary.

Utility Plant

The existing campus utility plant is located west of Anderson Street and south of University Avenue and serves the campus and the existing hospital with efficient and centralized power and other utilities. The utility plant consists of three areas: the original Central Heating and Cooling Plant, a Centrifugal Chiller Plant, and the Cogeneration Plant. The three plants are adjacent to each other and are referred to herein as the "utility plant". The Central Heating and Cooling Plant includes absorption chillers, pumps, cooling towers, and a backup boiler as well as office and other administrative space. The Centrifugal Chiller Plant includes 5 chillers, pumps, and a roof-mounted cooling tower. The utility plant also provides softened, reverse osmosis, and deionized water treatment systems; and compressed air.

LLUH is currently reviewing two options to modernize and expand these services. The capacity of the cogeneration power plant would be increased in phases from the existing 10 megawatts (MW) up to a maximum of 22 MW, allowing LLUH to become less reliant in time, on power purchased from others. The capacity increases are planned to be constructed in units of 7.3 MW and the maximum buildout would be 22 MW. The two utility plant options evaluated in the EIR are:

Option 1: A new 34,000 square-foot plant is proposed in order to respond to SB 1953 mandates, modernize obsolete and antiquated utility services, avoid disruption to ongoing patient care activities, and allow for increased future capacity. Construction of a new plant would occur near the thermal energy storage tank, located east of Anderson Street and just south of the UPRR tracks. Construction activities would require the removal of the existing 10,000 square-foot Radiation Safety ("Housekeeping") Building and 40 surface parking spaces. The new single-story utilities plant would renovate and expand the current services provided on the campus. Upon completion of the new plant, the existing plant would be decommissioned.

Option 2: Expansion of the existing cogeneration plant located at 11100 Anderson would require structural upgrades to the existing building, replacement of equipment within the existing plant, a 10,000 square-foot expansion and retrofitting of the existing utility plant as well as a new 3,000 square-foot walled courtyard and new utility feeds. The new expanded plant site would be north of the existing plant site and include the current grassy knoll area at Anderson Street and University Avenue. New equipment would be provided to upgrade the existing services currently provided.

Utility Plant Construction Noise

Construction noise represents a short-term impact on ambient noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers and portable generators can reach high levels. There would also be some limited demolition of the existing structures on the Project Site (Utility Plant Option 1 demolition of Housekeeping Building). Demolition and grading activities would have similar noise levels. Typical equipment that might be employed for this type of project include graders, front loaders, backhoes, trucks, concrete mixers, concrete pumps, cranes, and front loader. The peak noise level for most of the equipment that would be used during the construction is 90 to 95 dBA at a distance of 50 feet. Noise levels at further distances would be less. No residences or hospital uses are in the vicinity of either utility plant option.

The nearest sensitive receptors are located south of the Utility Plant Option 1 at Lindsay Hall at a distance of slightly more than 300 feet. At 300 feet, the peak construction noise levels range from 75 to 80 dBA. Average noise levels (Leq) are considerably less. At 50 feet, average noise levels for the same equipment would be in the 80 to 87 dBA range. The average noise levels at 300 feet would be in the 65 to 72 dBA (Leq) range. Ambient noise measurements taken in the area are represented by Site 2 (see Figure 4.9-6). The noise measurements at this site indicate that ambient noise levels are very low at this location. (Note: The noise measurements also indicate that the existing utility plant is very quiet.) The daytime Leq was measured at 54.2 dBA which is substantially lower than the level as projected for the Proposed Project's construction noise. Similarly, the daytime Lmax noise level was measured at 71.9 dBA which is also lower

than the construction noise levels anticipated for the Proposed Project. Since the ambient noise levels are substantially lower than the projected construction noise levels, additional noise mitigation is recommended for construction of the Proposed Project's "Utility Plant Option 1".

Utility Plant Operational Noise

Based on the preliminary equipment list, the eight cooling towers represent the greatest noise generation potential. Cooling towers must be located outside to be effective and vent to the atmosphere. Therefore, unlike much of the equipment that can be located inside a building, a cooling tower is outside and does not benefit from the sound reduction provided by the building. The noise generation potential of a cooling tower varies widely and can be influenced by the design. If needed, cooling towers can be designed and installed with larger blades that turn slower, which can greatly reduce the noise potential. Therefore, a key part of the utility plant design would be to design-in noise reduction features for the equipment.

A basic calculation can give an indication of whether the utility plant would have a noise problem. In a recent project by Mestre Greve Associates, cooling tower options were considered that had noise levels ranging from 50 to 69 dBA at 25 feet. The project was for a hospital in Laguna Beach, and the single cooling tower was going to be located in relatively close proximity to a residential area. Therefore, the lower end of the noise range represents some of the quietest cooling tower options available. For this analysis, it was assumed that eight cooling towers were all operating at 69 dBA at 25 feet. Therefore, for the Proposed Project's Utility Plant Option 1, the total noise level at Lindsay Hall located 300 feet away would be 56 dBA. This noise level is slightly above the ambient noise level and therefore, would be audible at Lindsay Hall. If the quietest cooling tower option was used then the noise level would be well below ambient conditions. This example, does indicate that without proper design the utility plant could result in a significant impact. But if properly designed the utility plant could generate noise levels that are below thresholds and acceptable to the surrounding uses.

In the event Option 2 is selected and the existing utility plant is expanded, it would contain the same type of equipment as evaluated for Option 1 and produce similar noise levels (69 dBA at 25 feet). Since the nearest sensitive receptor, the Dental School, is located further than 25 feet (approximately 46 feet to the west) from the utility plant, impacts from the Utility Plant Option 2 site would also be less than significant.

SCE Substation

Two options are being considered to develop a new connection to the power grid by Southern California Edison (SCE). Option 1 would connect the campus to the north at a new 14,400 square-foot substation located on a portion of the Elmer Digneo City Park, and Option 2 would upgrade the existing SCE substation located to the south of the existing utility plant expanded onto an area of the campus currently used for surface parking. The substation would be enclosed within an approximately 8-foot high fence.

SCE Substation Construction Noise at the Elmer Digneo City Park (SCE Option 1)

Construction noise for installing transformers is usually minimal. Minimal heavy equipment is involved and the duration of construction is relatively short. Construction-related noise impacts are therefore considered temporary. In the event "SCE Option 1" is selected, no significant noise-related construction impacts are anticipated.

SCE Substation Construction Noise South of the Cooling Towers (SCE Option 2)

Similar to the conclusions stated above, construction noise for installing transformers is usually minimal. Minimal heavy equipment is involved and the duration of construction is relatively short. Construction-related noise impacts are therefore considered temporary. Therefore, in the event "SCE Option 2" is selected, no significant noise-related construction impacts are anticipated.

SCE Substation Operational Noise at the Elmer Digneo City Park (SCE Option 1)

Noise levels for substation transformers are expected to be 76 dBA (at 3 feet) when operated at full load with fans running. If two transformers are operating at the same time, the fans would not operate and the maximum total noise level would be 74 dBA. However, one transformer is designed to be a backup for the other, so the total noise level will always be less than 76 dbA. At night when the transformers may be more audible, the load drops off and the noise level will as well, with an expected level of 71 dBA. As a worst-case assumption, it was assumed that both transformers would be operating. The nearest sensitive receptors are residences to the northeast of the Elmer Digneo City Park approximately 350 feet away. There is also a walking path through the park approximately 150 feet from the transformers. The projected noise level at the residences is 35 dBA. Noise measurement at Site 3 (see Figure 4.7-6) is representative of the ambient noise levels at the Elmer Digneo City Park. During the day the average noise level was 52.2 dBA (Leq) and at night it was 51.5 dBA (Leq). The transformer noise at the nearest residences would be substantially less than the ambient noise levels and would not be audible. Similarly, the noise level projection along the walking path is 42 dBA, which would be well below ambient conditions. Therefore, no impacts are anticipated for the SCE substation noise.

SCE Substation Operational Noise South of the Cooling Towers (SCE Option 2)

There are no sensitive receptors within the vicinity of the SCE Option 2 site, therefore no significant impacts from substation noise would result.

New Hospital Building

A new hospital building is proposed that would include a 732,000 square-foot acute care hospital, with support services located in the first three levels of a shared podium, with bed towers above serving separate pediatric and adult populations. The new hospital would provide for the relocation and decommissioning of the existing acute care services that are currently in the existing hospital that will be deemed as a seismically non-compliant structure beginning in 2020. The new building would include 464 patient beds, new pediatric and adult emergency

departments, perioperative suites, imaging departments, and other support services. The total licensed capacity of the existing construction (186 patient beds) and new construction (464 patient beds) for the Medical Center would decrease from the current license of 718 beds to a total of approximately 650 beds. Construction of the new hospital building is anticipated to start in mid-2016 and would last for approximately three (3) years.

New Hospital Construction Noise

Construction noise represents a temporary impact on ambient noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers and portable generators can reach high levels. Typical equipment that might be employed for this type of project include graders, front loaders, backhoes, trucks, concrete mixers, concrete pumps, cranes, and front loader. The peak noise level for most of the equipment that would be used during the construction is 90 to 95 dBA at a distance of 50 feet. Noise levels at further distances would be less than this.

Residences are located both to the east and south of the proposed hospital site. The residences to the east are about 200 feet away, while the residences to the south are about 230 feet. At 200 feet, the peak construction noise levels range from 78 to 83 dBA. Average noise levels (Leq) are considerably less. At 50 feet, average noise levels for the same equipment would be in the 80 to 87 dBA range. The average noise levels at 200 feet would be in the 68 to 75 dBA (Leq) range. The residences located to the east are represented by noise measurement Site 5 (refer to Figure 4.9-6). Noise levels measured at Site 5 include an average noise level of 64.2 dBA (Leq) and 79.1 dBA (Lmax). The peak noise levels measured are fairly consistent with the peak construction noise levels. However, the average noise levels measured are slightly lower than the projected construction noise levels. Therefore, an impact may occur to the residences to the east unless mitigated.

For residences to the south at 230 feet, the peak construction noise levels range from 77 to 82 dBA. Average noise levels (Leq) are considerably less. At 50 feet, average noise levels for the same equipment would be in the 80 to 87 dBA range. The average noise levels at 230 feet would be in the 67 to 74 dBA (Leq) range. The residences located to the south are represented by noise measurement Site 4 (refer to Figure 4.9-6). Noise levels measured at Site 4 include a daytime average noise level of 69.8 dBA (Leq) and 84.2 dBA (Lmax). The peak noise levels measured are higher than the projected peak construction noise levels. However, the average noise levels measured are about the same as the projected construction noise levels. Therefore, no impact is anticipated for the residences to the south.

New Hospital Operational Noise

Operational noise associated with the proposed hospital include siren noise, heating ventilation and air conditioning equipment (HVAC), and a rooftop helistop. The helistop noise was determined to be less than significant as discussed in Section 4.9.4.2. Siren noise and HVAC equipment noise is addressed herein.

The new hospital would provide for the relocation and decommissioning of the existing acute care services that are currently in existing buildings. Therefore, siren noise is currently being used in the area and is part of the existing condition. Siren noise can reach high levels; up to 120 dBA at 50 feet. Generally, ambulance drivers try not to use the sirens when close (e.g., ¼ mile) to a hospital or late at night and early in the morning to avoid disturbing hospital patients. Since siren noise is already occurring in the area, no new impacts are anticipated due to sirens associated with the new hospital.

The hospital would be a maximum 13 stories in height. Typically, much of the HVAC equipment for a hospital is located on the rooftop. Exact equipment has not been selected for the hospital, and therefore, precise noise projections are not possible. Large air handlers, cooling towers, and other equipment may be located on the rooftop. Equipment of this type can often be as loud as 85 dBA at three (3) feet. However, it needs to be noted that the noise levels vary considerably depending on the model, type and size of equipment. If it is assumed that three (3) loud air handlers are located on the rooftop, each with a noise rating of 85 dBA at three (3) feet; the noise level at the nearest residence would be 53 dBA. This noise level is well below ambient conditions, and therefore, noise impacts from the HVAC equipment at the new hospital are not anticipated to be significant.

To ensure the levels of the Proposed Project's potentially significant impacts are reduced, the project proponent shall comply with the mitigation measures presented below.

Mitigation Measures

Mitigation Measure N-1:

In the event Utility Plant Option 1 site is selected, a 12-foot temporary sound barrier shall be used along the south edge of the construction site. The temporary sound barrier may be constructed of plywood with a total thickness of 1-1/2 inches, or a sound blanket wall may be used. If sound blankets are used the blanket must have a Sound Transmission Class (STC) rating of 27.

Mitigation Measure N-2:

Prior to construction, the Project Proponent shall submit to the City a noise control plan that shows that the utility plant is designed to achieve a noise level of 50 dBA (Leq) or less at a distance of 300 feet. Achieving this noise level shall insure that the utility plant noise is less than ambient conditions at Lindsay Hall and would not have an adverse noise effect on the campus.

Mitigation Measure N-3:

A 12-foot temporary sound barrier shall be used along the east boundary of the new hospital construction site. The temporary sound barrier may be constructed of plywood with a total thickness of 1-1/2 inches, or a sound blanket wall may be used. If sound blankets are used the blanket must have a Sound Transmission Class (STC) rating of 27.

Mitigation Measure N-4:

The Project Proponent and contractor shall limit grading and building construction to the hours of 7:00 am to 8:00 pm Monday through Friday, except no construction shall occur after 4:00 pm on Fridays. Heavy construction is not permitted on weekends or national holidays, unless approved by the City. During times extra work is necessary and is approved by the City to occur outside these times allowed, work shall not exceed noise levels at sensitive receptors of 100 dBA at 50 feet. All equipment must be properly equipped with standard noise muffling apparatus specifically for such equipment (i.e., exhaust mufflers).The City may require the Project Proponent to monitor and report noise levels on a daily basis.

Level of Significance After Mitigation

Implementation of Mitigation Measures N-1 through N-4 would reduce short-term construction impacts to a less than significant level.

Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

Impact N-2:

Temporary construction activities of the new hospital may expose residents, students, staff and patients in the immediate area to excessive groundborne vibration and/or significant groundborne noise levels during times of subterranean excavations. This is a potentially significant impact.

Construction of the new hospital would require excavation of soils to construct subterranean levels. There is a potential for requiring construction equipment that could generate groundborne noise and/or vibration. The Project Proponent is required to follow standard construction practices imposed for hospital facilities. Implementation of the following mitigation measure would ensure potential impacts from Project-generated ground borne vibrations and noise levels are minimized to avoid impacts to patients and surrounding residences.

Mitigation Measure N-5:

The Project Proponent shall include the following language in all construction documents for all construction occurring during the period of the Master Plan and shall provide weekly monitoring reports to the City Engineer, as required.

Design considerations:

- *Construct noise barriers, such as temporary walls between noisy activities and noise sensitive receivers.*
- *Stationary noise sources shall be located as far away from sensitive receptors as possible. They shall be muffled and enclosed within temporary sheds or insulated barriers.*

- *Reroute truck traffic away from residential streets and most sensitive medical facilities, if possible.*

Sequence of Operations:

- *Combine noisy operations to occur in the same time period. The total noise level produced will not be significantly greater than the level produced if the operations were performed separately.*
- *Avoid nighttime activities. Sensitivity to noise increases during nighttime hours.*

Alternative construction methods:

- *Select demolition methods not involving impact, where practicable.*
- *Avoid impact pile driving where possible. Drilled piles or the use of a sonic or vibratory pile driver are quieter alternatives where the geological conditions permit their use.*
- *Impact tools shall be hydraulically or electrically powered wherever possible to avoid noise from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler shall be used.*

4.10 UTILITIES AND SERVICE SYSTEMS

4.10.1 Introduction

This section of the EIR discusses the potential impacts on the local utility systems associated with the proposed development of the Loma Linda University Health Master Plan Project. The Proposed Project is located within the City of Loma Linda. The evaluation of utilities and service systems herein includes the potential impacts on the following public and private utility systems and services:

Water Service	LLUH Private System
Sewer Collection	City of Loma Linda
Wastewater Treatment	City of San Bernardino
Solid Waste Disposal	Republic Services of Southern California
Storm Drain	City of Loma Linda

Data used for this section of the EIR was provided from the following reports: 1) Preliminary Water Study Loma Linda University Medical Center Campus Transformation Project Loma Linda, California, Kettler Leweck Engineering, dated July 22, 2013 (revised); 2) Preliminary Sewer Study Loma Linda University Medical Center Campus Transformation Project Loma Linda, California, Kettler Leweck Engineering, dated September 6, 2013; 3) Preliminary Hydrology Report Loma Linda University Medical Center Campus Transformation Project Loma Linda, California, Kettler Leweck Engineering, dated July 22, 2013; 4) Preliminary Water Quality Management Plan for Loma Linda University Medical Center Campus Transformation Project, Kettler Leweck Engineering, July 22, 2013; and 5) Loma Linda University Adventist Health Sciences Center Central Plant Utility Services Planning Study, TMAD Taylor and Gaines dated April 2013. The first four listed reports are included in this EIR as Appendices F through I.

The discussion of each utility system includes the existing conditions in the City of Loma Linda and/or at the Project Site, any plans in place for long-range service capacities, and the impacts associated with the development of the Proposed Project. Mitigation measures are provided for impacts determined to be significant.

4.10.2 Environmental Setting

Water Supply and Service

Water Supply

The production and distribution of water within the City of Loma Linda is provided by the City's Department of Public Works, Water Division. The City's water service area consists of approximately 10.6 square miles, which includes the City and Sphere of Influence areas. The

source of water supply is groundwater in the Bunker Hill Basin pumped from six wells with a total production capacity of these wells totals 7,900 gallons per minute (gpm). Loma Linda's water supply meets current demands with no reliance on State Water Project water or surface water.

The City's Annual Water Quality Reports show that Loma Linda's water supply meets or exceeds all current federal and State drinking water standards. In June 2006 an arsenic removal facility was installed to treat water at the Mt. View 3 and Mt. View 5 wells. This facility was added to maintain compliance in response to the Environmental Protection Agency's decision to lower the maximum contaminant level for arsenic from 50 ppb to 10 ppb. In 2011, as part of a joint project with Lockheed Martin, Inc., two treatment facilities were installed to remove Perchlorate and Volatile Organic Chemicals from two new wells that were installed in 2010. Water storage facilities include four above-ground steel reservoirs and two in-ground pre-stressed concrete with a combined storage capacity of 14 million gallons *(City of Loma Linda website, 2013).*

The 2010 San Bernardino Valley Regional Urban Water Management Plan prepared for agencies including the City of Loma Linda projected annual water demand for the City, after accounting for water conservation programs, to increase from 5,811 acre-feet in 2015 to 6,565 acre-feet in 2035. The planning area as a whole is projected to have a surplus of supply, during multiple-dry year periods, ranging from 40,584 acre-feet in 2015 to 46,699 acre-feet in 2035. The multiple-dry year is generally the lowest annual runoff for a 3-year or more consecutive period. There are no projected periods where demands would exceed supplies (*2010 San Bernardino Valley Regional Urban Water Management Plan, pages 3-5 and 4-2*).

The LLUMC water system is supplied by two wells (Anderson 2 and Anderson 3) owned by the LLUH. The wells are approximately 1,100 feet deep with 1,100 gallon per minute (gpm) pumps on each well. The wells are capable of producing 3.16 million gallons per day (mgd), sufficient for existing domestic, irrigation and agricultural demands, and fire sprinkler requirements. The most recent water data available (2011 – 2012) indicate that the total daily water demand of the campus averages 1.24 mgd. Total demand is metered as 59% domestic, 23% irrigation, and 18% agricultural.

The County of San Bernardino Department of Public Health, Environmental Health Services permits the water system and the 2013 survey report indicates that Well #2 (Anderson 2) has nitrate levels at or above 80% of the maximum contaminant level for nitrate. Because the well occasionally experiences operational problems, a new well is anticipated to be constructed and operational by the end of 2013. This well is also expected to have a production capacity of 1,100 gpm.

Water Service

There exists both a private Loma Linda University (LLU) water system and the City's public water system on and around the campus. Both water systems are separated and the water for the campus facilities is supplied by the LLU water system. However, the two systems are connected to each other by isolation valves at three locations for emergency purposes. Domestic water and

irrigation demands, and fire flows for the existing campus buildings are provided by the private water system. The LLU water system provides water service to the Loma Linda University, Medical Center, apartments, and dormitories.

The private water facilities, as described by Loma Linda University, include 6-inch, 8-inch, 10-inch, and 16-inch diameter water mains within the adjacent public and private streets as well as on the campus. The existing private water mains (16-inch diameter main) essentially provide a connection from the two water wells to an existing 1.4 million gallon (MG) steel welded storage tank located south of the campus. In addition, there are mains that connect to the 16-inch diameter main that provide loops of water on portions of the campus. There exist fire hydrants on campus and within the adjacent public streets that are connected to the private system. A perchlorate removal water treatment system provides filtration for groundwater pumped from both wells. The utility plant also provides softened, reverse osmosis, and deionized water treatment systems.

The public water facilities, as documented on the City's website, include water mains within the public and private streets adjacent to the campus as follows: 12-inch pipe in Barton Road, 8-inch pipe in Campus Street, 12-inch and 16-inch pipes in Anderson Street, and 8-inch pipe in Prospect Avenue, Taylor Street, Taylor Court, and Anderson Street. There also exists an 8-inch public water line traversing across the campus south of Stewart Street. The existing public water mains essentially provide for a "loop" around the perimeter of the existing campus. There also exist fire hydrants on campus and within the adjacent public streets that are connected to the public system. Refer to Appendix F (*Preliminary Water Study Loma Linda University Medical Center Campus Transformation Project Loma Linda, California*, Kettler Leweck Engineering, dated July 22, 2013) for detailed descriptions and exhibits of the public and private water systems.

Loma Linda University Utility Plant

The utility plant consists of three areas: the original Central Heating and Cooling Plant, a Centrifugal Chiller Plant, and the Cogeneration Plant. The three plants are adjacent to each other and are referred to as the "utility plant." The Central Heating and Cooling Plant includes absorption chillers, pumps, cooling towers, and a backup boiler as well as office and other administrative space. The Centrifugal Chiller Plant includes five chillers, pumps, and a roof-mounted cooling tower. The utility plant also provides softened, reverse osmosis, and deionized water treatment systems; and compressed air to meet the needs of the University and the Medical Center.

Sewer Collection and Wastewater Treatment

Sewer collection at the Project Site is presently provided by on-site private facilities that convey domestic sewerage to the public sewer system owned and operated by the City of Loma Linda. The LLUMC is located within the City's Sewer Collection Zone 2, as identified in the *City of Loma Linda Final Report Sanitary Sewer System Master Plan* dated April 1998. Sewer Collection Zone 2 collects sewer from areas south and east of the campus as well as the campus itself. The land uses within Sewer Collection Zone 2 include residential, health care, and institutional. The project area of the campus consists of existing buildings, existing public streets

(i.e. Campus Street, Anderson Street, Taylor Street, Taylor Court, Prospect Avenue, University Avenue, and Stewart Street), existing private drives, and existing surface parking areas, hardscape areas, and landscape areas. Sanitary sewerage from the existing buildings is conveyed in private on-site facilities to points of connection to the public sewer facilities located on or immediately adjacent to the campus. The public sewer facilities, as documented on the City's website and as-built records and field verified, are grouped into three separate systems (see Appendix G: *Preliminary Sewer Study Loma Linda University Medical Center Campus Transformation Project Loma Linda, California*, prepared by Kettler Leweck Engineering, dated September 6, 2013).

Wastewater treatment for the Project Site and surrounding area within the City of Loma Linda's service area is currently provided by the City of San Bernardino through a Joint Powers Agreement. The City of San Bernardino operates both a secondary and a tertiary plant that discharge effluent to the Santa Ana River. Over 10 mgd of capacity exists at each of the San Bernardino plants.

Stormwater

The majority of the existing campus is comprised of impervious surfaces (i.e. existing buildings, asphalt parking areas and/or hardscape improvements) with some landscaped areas. Storm water runoff from the site is conveyed to both public and private on-site storm drain facilities. The public drainage facilities include two separate systems, one located in Anderson Street heading generally north towards the existing Union Pacific Railroad facility where it traverses west and the second located in Barton Street where it traverses north in Campus Street. The two systems join on the south side of the existing railroad facilities at the north end of Campus Street in the existing cul-de-sac before crossing under the existing railroad facility and discharging into an existing County drainage channel that drains north to San Timoteo Creek. San Timoteo Creek is a concrete lined channel that flows from the southeast to the northwest. This creek crosses under Interstate 10 and flows northwest and discharges into the Santa Ana River. The Santa Ana River flows west/southwest and eventually discharges to the Pacific Ocean. Refer to Appendix H: *Preliminary Hydrology Report Loma Linda University Medical Center Campus Transformation Project Loma Linda, California*, Kettler Leweck Engineering, dated July 22, 2013 for drainage system details and exhibits.

Solid Waste

The City contracts with Republic Services of Southern California to provide solid waste collection services. Solid waste that is not diverted to recycling or composting facilities is transported to the San Timoteo Sanitary Landfill located in the City of Redlands. The San Timoteo Sanitary Landfill is permitted to receive up to 2,000 tons per day, and has an estimated closure date of May 2016.

4.10.3 Applicable Policies, Plans and Regulations

This section discusses Federal, State, and local regulations for wastewater, stormwater, water, and solid waste.

Federal

Federal Safe Drinking Water Act

Enacted in 1974 and implemented by the United States Environmental Protection Agency (U.S. EPA), the Federal Safe Drinking Water Act imposes water quality and infrastructure standards for potable water delivery systems nation-wide. The primary standards are health based thresholds established for numerous toxic substances. Secondary standards are recommended thresholds for taste and mineral content.

Clean Water Act

The U.S. EPA established primary drinking water standards in the Clean Water Act Section 304. States are required to ensure that potable water retailed to the public meets these standards. Standards for a total of 81 individual constituents have been established under the Safe Drinking Water Act as amended in 1986. The U.S. EPA may add additional constituents in the future. State primary and secondary drinking water standards are promulgated in California Code of Regulations (CCR) Title 22 Sections 64431–64501. Secondary drinking water standards incorporate non-health risk factors including taste, odor, and appearance.

State

California Safe Drinking Water Act

Enacted in 1976, the California Safe Drinking Water Act is codified in Title 22 of the CCR. Potable water supply is managed through local agencies and water districts, the state Department of Water Resources (DWR), the Department of Health Services (DHS), the State Water Resources Control Board (SWRCB), EPA, and the U.S. Bureau of Reclamation. Water right applications are processed through the SWRCB for properties claiming riparian rights or requesting irrigation water from state or federal distribution facilities. The DWR manages the State Water Project (SWP) and compiles planning information on supply and demand within the state.

Urban Water Management Planning Act (California Water Code, Division 6, Part 2.6, Section 10610 et seq.)

The Urban Water Management Planning Act was developed due to concerns for potential water supply shortages throughout California. It requires information on water supply reliability and water use efficiency measures. Urban water suppliers are required, as part of the Act, to develop and implement Urban Water Management Plans to describe their efforts to promote efficient use and management of water resources.

California Integrated Waste Management Board

At the state level, the management of solid waste is governed by regulations established by the California Integrated Waste Management Board (CIWMB), which delegates local permitting, enforcement, and inspection responsibilities to Local Enforcement Agencies. In 1997, some of

the regulations adopted by the State Water Quality Control Board pertaining to landfills (Title 23, Chapter 15) were incorporated with CIWMB regulations (Title 14) to form Title 27 of the California Code of Regulations.

In 1989, the Legislature adopted the California Integrated Waste Management Act of 1989 (AB 939), which established an integrated waste management hierarchy that consists of the following in order of importance: source reduction, recycling, composting, and land disposal or solid waste. The law also required that each county prepare a new Integrated Waste Management Plan. The Act further required each city to prepare a Source Reduction and Recycling Element by July 1, 1991. Each source reduction element includes a plan for achieving a solid waste goal of 25 percent by January 1, 1995 and 50 percent by January 1, 2000. SB 2202 made a number of changes to the municipal solid waste diversion requirements under the Integrated Waste Management Act. These changes included a revision to the statutory requirement for 50 percent diversion of solid waste to clarify that local governments shall continue to divert 50 percent of all solid waste on and after January 1, 2000.

Local

City of Loma Linda General Plan

Applicable policies of the City's General Plan include:

Implementing Policies (wastewater collection, treatment, and disposal) **(8.8.2.1)**

a. Maintain existing levels of wastewater service by preserving and improving infrastructure, including repairing areas known to be deficient because they are undersized or structurally compromised ("hot spots") and replacing mains as necessary.
b. At a minimum, review and update the Master Plan of Sewer Facilities every three years. As part of the design of sewer systems, provide adequate capacity for average and peak conditions.
c. Encourage water conservation as a means of reducing sewage generation.
d. Investigate the use of reclaimed wastewater. Where reclaimed wastewater can be economically delivered, require the installation of dual water system supplies for irrigation purposes and industrial purposes.

Implementing Policies (Solid Waste Management) **(8.9.2.1)**

a. Continue contracting for solid waste collections and recycling.
b. Encourage yard waste collection services for businesses and residents.
c. Work with San Bernardino County Solid Waste Division to ensure capacity at the San Timoteo landfill or alternative site after May 2016.
d. Require provision of attractive, convenient recycling bins and trash enclosures in new multifamily residential and non-residential development.
e. Continue and expand public education programs involving waste reduction, recycling, composting, waste to energy, zero-waste programs, and household hazardous waste.

f. Require builders to incorporate interior and exterior storage areas for recyclables into new commercial, industrial, and public buildings.
g. Continue to follow State regulations by implementing City goals, policies and programs which include source reduction, reuse, recycling, and composting in order to achieve and maintain a 50 percent reduction in solid waste disposal.
h. Continue to participate in the waste-to-energy program.
i. Plan for the transformation or elimination of waste materials that cannot be reduced, recycled, or composted in order to eliminate the need for additional landfill space, save energy, reduce greenhouse gas emissions, reduce air and water pollution, and conserve forest

4.10.4 Project Impact Analysis and Mitigation Measures

Although the Project consists of a multi-phased development to construct new facilities and improvements to the existing campus, the impact analyses provided below are based on build-out of all phases of the Master Plan for determining ultimate demands on utility systems and whether existing infrastructure would need to be expanded or new capacity would need to be constructed. All focused studies related to water and sewer services and storm drains were prepared based on the ultimate build-out of the Master Plan. The construction in Phase I of a SCE substation on the off-site optional location that is an existing park site would not require any public water, sewer, wastewater treatment, or storm drain facilities. Therefore that optional site has not been included in the analyses as no demands or other potential impacts would occur with development at that site.

4.10.4.1 Thresholds of Significance

Significant impacts related to utilities are determined from criteria stated with the CEQA Checklist. The Checklist identifies the primary thresholds of significance relating to CEQA issues. Potential impacts to water, sewer, storm drain, and solid waste facilities addressed in the CEQA process to identify and evaluate possible impacts to utilities that could potentially result from implementation of the Proposed Project. The Proposed Project would have a significant effect on Utilities if it would:

- Exceed wastewater treatment requirements of the Santa Ana Regional Water Quality Control Board
- 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
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects

- Have insufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments
- Be served by a landfill(s) with insufficient permitted capacity to accommodate the project's solid waste disposal needs
- Not comply with federal, state, and local statues and regulations related to solid waste.

4.10.4.2 Impacts Determined to Have No Impact or Less Than Significant Impact

The Proposed Project was determined to not have the potential to result in significant impacts in the issue areas listed below. For each issue, an explanation of the impact and a determination of no need for mitigation measures is provided.

Exceed wastewater treatment requirements of the Santa Ana Regional Water Quality Control Board.

The Project Site is located within Sewer Collection Zone 2, as identified in the City of Loma Linda Final Report Sanitary Sewer System Master Plan dated April 1998. Sewer Collection Zone 2 collects sewer from areas south and east of the campus as well as the campus itself. The land uses within Sewer Collection Zone 2 include residential, health care, and institutional. The project area of the campus consists of existing buildings, existing public streets (i.e. Campus Street, Anderson Street, Taylor Street, Taylor Court, Prospect Avenue, University Avenue, and Stewart Street), existing private drives, and existing surface parking areas, hardscape areas, and landscape areas.

Sanitary sewerage from the existing buildings is conveyed in private onsite facilities to points of connection to the public sewer facilities located on or immediately adjacent to the campus. The public sewer facilities, as documented on the City's website and as-built records and field verified, are grouped into three separate systems. The City of Loma Linda's current General Plan identifies an area on the very southern portion of Collection Zone 2 as very low density residential (0-2 DU/Acre). The future development of this area would increase the amount of sewer flow in the public system that traverses through the campus in the existing public sewer mains.

In addition, the total licensed capacity of the Medical Center would decrease from 718 beds to 650 beds. Although the timing of the expansion to the maximum 650 beds is not known, the Preliminary Sewer Study prepared for the Master Plan estimated the approximate sewer flow for the buildout number of beds. The proposed new hospital would consist of acute care hospital space, some of which would remain as shell space for future build out. The facility would have shared and support services located in the first three levels of a shared podium, with two bed towers (i.e., an Adult Tower and Children's Tower) above. The new hospital would provide for the relocation and decommissioning of the existing acute care services in seismically non-compliant structures. The new building would include approximately 464 patient beds, new

Pediatric and Adult Emergency Departments, Perioperative Suites, Imaging Departments, and other support service departments. Upon completion of the new building and surrounding site, all inpatient functions would transfer to the new adjacent location. There would be no new uses and therefore the type of wastewater flow collected in the City's system would not change.

Wastewater generated in the City of Loma Linda is treated by the City of San Bernardino through a Joint Powers Agreement (JPA). The City of San Bernardino operates both a secondary and a tertiary plant that discharge effluent to the Santa Ana River. The secondary plant has a design capacity of 33 MGD and is currently treating 23 MGD. The tertiary plant, known as the Rapid Infiltration/Extraction (RI/X) facility has a design capacity of 40 MGD and is currently treating 28 MGD. The Joint Powers Agreement of 1994 and the 1965 Agreement between the City of San Bernardino and the City of Loma Linda provides that sewer collected in a sewer line owned by the City of Loma Linda is connected to the City of San Bernardino's system for conveyance to the wastewater treatment plan. This line has a maximum peak rate of flow capacity of approximately 7 MGD at three quarters full and is currently deem adequate for buildout of the City's service area. Metered flows from the City of Loma Linda in August 2013 averaged 1.65 MGD.

The Proposed Project would generate wastewater that can be discharged to a municipal system that has sufficient capacity. Land uses on-site would remain Institutional/Hospital and therefore no change to the type of wastewater discharged to the sewer collection system or the wastewater treatment plants would occur. The Proposed Project would comply with permit requirements of the Santa Ana Regional Water Quality Control Board regarding wastewater. No impacts are projected.

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.

Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed.

The water system providing domestic water and irrigation service to the campus is owned by LLUH and includes a 16-inch diameter main that provides a connection from two existing water wells to a 1.4 million-gallon storage reservoir located south of the campus. The most recent water data available (2011 – 2012) indicates that the total daily water demand of the campus averages 1.24 million mgd. The projected water demand is 1.47 mgd at buildout of the Master Plan, reflecting an estimated 15% increase in irrigation use, 10% reduction in agricultural use, and overall 18.5% increase over the year 2012-13 metered use. Water is supplied by two wells (Anderson 2 and Anderson 3) that are located north of the campus between Anderson Street and Poplar Street. The wells are approximately 1,100 feet deep with 1,100 gpm pumps on each well. The wells are capable of producing 3.16 mgd, sufficient for existing and projected domestic, irrigation and agricultural demands; and fire sprinkler requirements. However, the Anderson 2 well occasionally experiences operational problems and a new well is anticipated to be constructed and operational by the end of 2013. This well is also expected to have a production capacity of 1,100 gpm. The City of Loma Linda's public water system surrounds the campus and is connected to the campus water system at three locations. There would be no

potentially significant impacts to the existing water supplies or distribution system resulting from the Proposed Project.

Water treatment provided by the LLUMC utility plant is to meet specific needs of the medical center; the plant provides for softened, reverse osmosis, and deionized water. Water treated at the plant is included in the total current and projected water demands associated with the Master Plan. The source of water for the plant is the two existing domestic water wells which are also connected to a perchlorate removal treatment system.

Wastewater treatment services are provided to the City of Loma Linda by the City of San Bernardino under a Joint Powers Agreement. Remaining capacity in the plants is sufficient to handle the projected wastewater flow from buildout of the Master Plan, estimated at 0.475 mgd. The Proposed Project would not require the expansion of existing facilities. The LLUH is currently served by existing City of Loma Linda sewer collection lines (see Appendix G for sewer line location exhibits). The Proposed Project includes connection to the existing system. According to the Public Works Department and the 2013 Preliminary Sewer Study, sufficient capacity exists in the City's sewer line and no impacts would occur from development of the Proposed Project. However, the Preliminary Sewer Study indicates that minor improvements to the on-site and off-site facilities may be required. At worst-case approximately 380 lineal feet of an existing 8-inch main, starting at the connection to a 10-inch sewer in Campus Street would need to be upsized as well as an upsize in the next downstream reach to eliminate the reduction in pipe diameter between the impacted reach and the sewer in Campus Street. Based on the length of the pipeline replacement, this improvement would be exempt from CEQA review.

Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Proposed construction of new buildings, parking lots, and parking structures may result in an increase in the existing site's impervious surfaces. A Preliminary Hydrology Study was prepared in June 2013 by Kettler Leweck Engineering and is included as Appendix H. The Proposed Project consists of a number of new building and structures that would be constructed over a period of time. In addition to the new construction, the proposed work would also include the demolition of on-site public and private roadway improvements (i.e. Taylor Street, Taylor Court, and Prospect Avenue) and possible off-site road improvements, and demolition of the existing Radiation Safety Building and 10 residential structures along the north side of Prospect Avenue. The Proposed Project elements would be designed to include pervious surfaces greater than or equal to the existing condition to maintain consistency with the pre-developed condition. Runoff from the developed condition would also be conveyed to both public and private on-site storm drain facilities consistent with the existing condition. The Proposed Project may include changes to the existing storm drain facilities (i.e. existing private storm drains in conflict with the proposed buildings would be relocated or additional private storm drain as required to support the proposed buildings would be incorporated into the Project design). However, the City's drainage facilities are not anticipated to be changed.

The Rational Method was utilized in preparation of the Preliminary Hydrology Report to estimate peak discharges, volumes, velocities, and flow durations for the 10-year and 100-year

storm frequencies. The Project topography, reference/as-built drawings, and site visits were used to establish the limits of the existing condition drainage basins. The preliminary site plan was used along with the existing condition topography to develop drainage basins. LLUH intends to design the proposed buildings and associated site improvements consistent with the existing condition in terms of limits and characteristics of the drainage basins. The project design approach is to design the campus projects/improvements to minimize changes in the hydrology to ensure that the post-construction runoff rates and velocities do not adversely impact downstream erosion or stream habitat. The intent of the Proposed Project design is to minimize impervious surfaces and maximize the proportion of pervious surfaces, in order to allow as much infiltration as possible and consistent with the predevelopment condition. The goal of the Project Site design techniques is to achieve post development runoff rates, volumes, flow velocities, and flow durations that mimic those of the pre-development condition.

A separate Preliminary Water Quality Management Plan (WQMP) which addresses the development of the Project to minimize the detrimental effects of urbanization on the beneficial uses of the receiving waters, including effects caused by increased pollutant loads and changes in hydrology has been prepared (see Appendix I: *Preliminary Water Quality Management Plan for Loma Linda University Medical Center Campus Transformation Project, prepared by Kettler Leweck Engineering, July 22, 2013).* Based on the "Category" designation, the Project would be required to implement Site Design BMPs, Source Control BMP's, and Treatment Control BMPs. These water quality elements/BMPs would treat the runoff to the maximum extent practicable for the Project. In addition to the Water Quality Management Plan, the Project would be required to comply with the Statewide General permit for Storm Water Discharges from Construction Activity (Order No. 2009-0009-DWQ: NPDES No. CAS00000002) Storm water BMPs for construction activities.

Recognizing that the estimated redevelopment flows and volumes are less than or equal to the pre-developed condition, the pre-development and redevelopment drainage basins are generally consistent, storm runoff from the Project would be collected in the same existing drainage facilities, and there are no known issues with the existing public storm drain systems (i.e. onsite and offsite), the Proposed Project is not expected to result in hydraulic impacts on the existing adjacent City of Loma Linda storm drain facilities or hydrologic conditions of concern. Each construction or demolition project would be required to submit construction plans to the City of Loma Linda for a grading permit and/or building permit. These future permit processes would require detailed drainage studies to support the Proposed Project design. The intent is for these future drainage studies, including the detailed calculations, to follow the framework contained in the preliminary hydrology report demonstrating no increase in peak flow rates or volumes. Therefore, no potentially significant impacts would occur.

Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

As discussed above, the City of San Bernardino under a JPA, provides wastewater treatment services to the City of Loma Linda. Remaining capacity estimated in 2013 at the secondary plant is 10 MGD and remaining capacity estimated at the RI/X (tertiary) plant is 12 MGD. Total flows from the City of Loma Linda that are treated by the City of San Bernardino's facilities currently

average 1.65 MGD. Based on the LLUH Master Plan buildout projected wastewater flow of 0.475 MGD (an increase of 8.2% over current flows from the campus of 0.439 MGD), the Proposed Project would not require the expansion of existing facilities. The LLUH is currently served by existing City of Loma Linda sewer lines. The Proposed Project includes connection to the existing system. According to the Public Works Department and the 2013 Preliminary Sewer Study, sufficient capacity exists however with the worst case analysis provided in the Sewer Study, minor (less than 1,000 feet) portions of the on-site sewer system and the City's main lines may need to be upsized. The sewer pipe replacements would be considered negligible and therefore no impacts related to CEQA thresholds would occur from development of the Proposed Project

4.10.4.3 Issues Identified to Have Potentially Significant Impacts

Be served by a landfill(s) with sufficient permitted capacity to accommodate the project's solid waste disposal needs or result in non-compliance with federal, state, and local statutes and regulations related to solid waste.

Impact USS-1

The Proposed Project includes the demolition of existing structures including residential structures, roads, and parking lots that may generate substantial construction debris waste. Because the City of Loma Linda has not met its goal of diverting 50 percent of waste from landfills, this is a potentially significant impact.

The City of Loma Linda contracts with Republic Services of Southern California to provide solid waste collection services. The Proposed Project would continue to utilize the existing on-site collection system for waste disposal.

The Project is expected to generate approximately 2.5 tons per day (TPD) more than existing uses at the site (831,000 sf of new building times the generation rate for office use of 6 lbs/day per 1,000 sf). Waste collected at the campus is disposed of at the San Timoteo Landfill in Redlands. According to the information provided by San Bernardino County, as of 2013 the San Timoteo Landfill was receiving an average of approximately 600 TPD and is permitted to receive 2,000 TPD. Additional waste generated by the Proposed Project may impact existing capacity of the solid waste disposal facility.

The demolition of the existing ten residential structures for future construction staging and parking lot area would generate a one-time demand on the waste disposal system. Construction and demolition material has been targeted for diversion from landfilling by the County of San Bernardino because of the significant amounts of debris generated by the construction industry. Construction and demolition (C&D) are materials generated in the construction and demolition of buildings, roads, homes, tenant improvements, landscaping, hardscaping, and site clearing activities. This waste stream includes, but is not limited to: concrete, asphalt, gypsum, wood waste, glass, ferrous and non-ferrous metals, red clay brick, corrugated cardboard, soils, trees, and shrubs. According to the 2004 Statewide Waste Characterization Study, C&D materials

account for almost 22 percent of the waste stream. Many of these materials can be reused or recycled.

Solid waste that is not diverted to recycling or composting facilities is transported to the San Timoteo Sanitary Landfill located in the City of Redlands. The Proposed Project would not place a significant demand on solid waste services and would not be served by a landfill with insufficient permitted capacity. However, as required by Assembly Bill 939 (AB939) of the California Integrated Waste Management Act, all cities and counties within the State must divert 50 percent of their wastes from landfills by the year 2000. According to tonnage reports, the City of Loma Linda has not yet met the 50 percent diversion mandate. To achieve the State-mandated diversion goal, the City has implemented a variety of programs that seek to reduce the volume of solid waste generated, encourage reuse, and support recycling efforts. City programs include the distribution of educational materials to local schools and organizations. The City also requires all applicable projects to comply with Resolution No. 2129 Construction and Demolition Recycling/Reuse Policy as adopted by the City Council. To ensure the Proposed Project contributes towards the diversion mandate, the following mitigation measure shall be implemented:

Mitigation Measure USS-1

The Project Proponent shall comply with City-adopted policies regarding the reduction of construction and demolition (C&D) materials. Removal of vegetation shall be in accordance with application City policies.

Level of Significance After Mitigation

Impacts associated with the generation of an additional 2.5 TPD of solid waste and unknown quantities of C&D materials would be reduced to less than significant with implementation of Mitigation Measure USS-1.

5.0 OTHER CEQA REQUIRED ANALYSIS

5.1 INTRODUCTION

Section 15126 of the California Environmental Quality Act (CEQA) Guidelines requires that all aspects of a project must be considered when evaluating its impact on the environment, including planning, acquisition, development, and operation. As part of this analysis, the EIR must also identify (1) significant environmental effects of the Proposed Project, (2) significant environmental effects that cannot be avoided if the Proposed Project is implemented, (3) cumulative impacts, (4) significant irreversible environmental changes that would result from implementation of the Proposed Project, (5) growth-inducing impacts of the Proposed Project, (6) mitigation measures proposed to minimize significant effects, and (7) alternatives to the Proposed Project.

This section includes consideration and discussion of other project-related impacts that must be evaluated in an EIR as described in CEQA Guidelines Section 15126.2 and Section 15130. These potential impacts include the following:

- Cumulative Impacts must be discussed when project-related impacts are or can be mitigated to less than significant, but, when combined with other reasonably foreseeable projects, can be cumulatively considerable.

- Growth Inducing Impacts must be discussed with regard to the way in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding area.

- Significant Irreversible Environmental Changes Which Would be Involved if the Proposed Project is Implemented must be discussed when the project includes future commitments to non-renewable resources either during construction or operation. Irretrievable commitments of non-renewable resources must be evaluated to assure that the consumption can be justified. Irreversible changes may also result from environmental accidents associated with project operations.

5.2 CUMULATIVE IMPACTS

This Chapter of the EIR describes the potential cumulative impacts that may result from the implementation of the proposed LLUH Master Plan Project when evaluated in conjunction with other planned or reasonably foreseeable projects in the area. The Proposed Project's environmental impacts and required mitigation measures to incrementally reduce cumulative impacts are presented in Sections 4.1 through 4.10.

5.2.1 Introduction

California Environmental Quality Act (CEQA) Guidelines Section 15355 defines a cumulative impact as one that is created as a result of a combination of the Proposed Project together with other projects causing related impacts. The guidelines provide guidance concerning the format

and content of a cumulative impact analysis by stating that an EIR shall discuss cumulative impacts of a project when its incremental effect is cumulatively considerable. This section discusses the potential cumulative impacts to the environment that may result from the implementation of the proposed Master Plan when considered with other planned or reasonably foreseeable projects. CEQA Guidelines, Section 15130, provides the following guidance concerning the format and content of the cumulative impacts analysis:

(a) (1) …a cumulative impact consists of an impact, which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts.

(2) When the combined cumulative impact associated with the project's incremental effect and the effect of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR.

When discussing cumulative impacts:

(b) The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness. The following elements are necessary to an adequate discussion of cumulative impacts:

(1) Either:

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

B. A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified which described or evaluated regional or area-wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.

The City of Loma Linda 2009 General Plan at build-out is the basis for this cumulative analysis. This General Plan encompasses a comprehensive strategy for managing the community's future. The Loma Linda General Plan is the community's statement of what is in its interest, and is the City's most important statement regarding its ultimate physical, economic, and cultural development over the next 25 years. The General Plan is a legally binding policy document to be used by City officials, the development community, citizens, and others to guide decisions regarding the future development and management of human, land, and natural resources.

5.2.2 Applicable Policies, Plans and Regulations

The City of Loma Linda is located within western San Bernardino County approximately 60 miles east of the City of Los Angeles, California. Jurisdictions that border the City of Loma

Linda and are in some cases included within this cumulative impact analysis include: the cities of Redlands and San Bernardino to the north; the City of Redlands and unincorporated San Bernardino County to the east; unincorporated San Bernardino County to the south; and unincorporated San Bernardino County and the cities of Colton and San Bernardino to the west.

The build out projections contained within the General Plan are based upon the Southern California Association of Governments (SCAG) estimated total population, households, and employment numbers for the City. This build-out scenario is affected by the quantity of land uses for each use category including residential, commercial, institutional, industrial, and land devoted to open space, agricultural use, and recreational uses.

Residential land uses form the largest percentage of developed uses (24percent) within the City. Of the residential uses, single-family residential development occurs within 14 percent of the planning area. These single-family uses are generally located in two areas: (1) the northern portion of the city just south of Redlands Boulevard, and (2) south of Barton Road along the base of the South Hills. Other types of residential uses within the planning area include rural residential (typically adjacent to orange groves or within the hillside), multifamily residential, and mobile homes.

Commercial uses make up a small percentage of the land use within the City of Loma Linda, comprising about 3 percent of the City and its sphere of influence. Commercial uses consist of both general commercial and office commercial types of land use. Large commercial or office uses within the city include the auto dealerships south of the Interstate 10 freeway, the offices within the Corporate Business Center, and the Stater Bros. market.

Land uses that are categorized as Institutional make up 9 percent of the planning area. These uses include medical uses, university uses, schools, churches, public facilities, utilities, and utilities combined with agricultural uses. Of these sub-categories, utilities, university uses, and medical uses are the most well represented Institutional uses within the planning area. Loma Linda University (LLU) and the Loma Linda University Medical Center and Children's Hospital (LLUH) are significant institutional uses within the City.

Heavy and light industrial uses characterize approximately 31 acres or 0.5 percent of the general plan planning area. Industrial uses include self-storage facilities and the Hallmark-Southwest Corporation, located on Redlands Boulevard, which manufactures mobile homes.

Land devoted to open space, agricultural use, recreational use, or vacant land that is not developed totals approximately 3,867 acres or 63 percent of the planning area. These areas include the hills located to the south and the remaining orange groves within the city and the sphere of influence.

General Plan Build-out - Population

Population projections within the General Plan and accompanying EIR were determined by multiplying the projected number of households by average persons per household. Based on the household characteristics cited in the updated Housing Element, the average household size in the city is 2.43 persons. Based on past growth rates in the City, population increases are

anticipated to continue to average approximately 0.04 percent annually. Assuming a Southern California Association of Governments (SCAG) projected population of 27,797 persons in 2025, the build-out population of the City of Loma Linda, including its sphere of influence would be reached in 2029. Therefore, the projected 2029 population is the year in which General Plan build-out would occur under the amended General Plan and is the assumed build-out year used in the analysis. The 2006 General Plan and EIR assumed that 16,369 occupied households (applying a 5% vacancy rate) and a population of 37,649 would exist within the City and sphere of influence at build-out.

Utilizing the acreages and development densities of the amended General Plan's various land use classifications, and applying a five percent vacancy rate, 13,049 households will be located within the Planning Area at build-out of the amended General Plan. Based on the average person per household factor cited in the updated Housing Element (2.43 persons per household), the 13,049 anticipated households would yield a total population of 31,709 persons at build-out (2030). Implementation of the General Plan (as amended) would result in a population decrease of approximately 5,940 persons from that previously identified in the General Plan EIR.

General Plan Build-out - Employment

Determining the number of jobs resulting from commercial, industrial, office, or institutional uses requires the computation of net acreage, gross square footage, and permitted square footage. For commercial, industrial, and public facility uses, it was first necessary to determine the amount of land available for development. The net acres of each non-residential General Plan land use categories (i.e. commercial, industrial, and public facility) available for development was derived by subtracting from the gross acres (the total amount of land available) the amount of land required for roadways, rights-of-way, easements, and other required features. To determine the number of net square feet, the net acres are multiplied by 43,560 (the number of square feet per acre). Because the complete coverage of land by buildings is not permitted, floor-to area ratios (FARs)[1] have been developed to establish the total amount of square footage permitted on any particular parcel. To determine the permitted square footage, the net square footage is multiplied by the FAR.

The General Plan established FARs for each land use designation. Based on these FARs, the amount of land designated for various uses, the amount of commercial, industrial, and institutional square footage was identified in the certified EIR. These numbers have changed slightly for commercial land uses by 4.92 acres and are provided below in Table 5-1.

[1] The total square feet of a building divided by the total square feet of the lot the building is located on.

Table 5-1
City of Loma Linda
Build-out Projection by Land Use Type

Build-out Scenario	Acres	FAR	Building Square Footage	Employment
Commercial	172.50	0.5	3,757,051	7,210
Institutional/Office/Business Park	370.94	0.5	8,079,073	19,387
Health Care	98.91	1.0	4,308,510	11,532
Industrial	17.93	0.6	468,618	33
City Facilities	11.75	0.5	213,507	626
Recreation	40.67	0.1	77,159	204
Total	**712.73**	**—**	**7,003,918**	**38,992**

5.2.3 Project Impact Analysis and Mitigation Measures

5.2.3.1 Thresholds of Significance

CEQA Guidelines Section 15355 defines cumulative impacts as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." The Guidelines further state:

a. The individual effects may be changes resulting from a single project or a number of separate projects.
b. The cumulative impact from several projects is the change in the environment, which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects.

Within this EIR, impacts related to cumulative projects are determined from criteria stated in the CEQA Checklist. The Checklist identifies the primary thresholds of significance relating to CEQA issues. These potential impacts are addressed in the cumulative analysis by examining the Proposed Projects incremental impacts on a cumulative level to identify and evaluate possible impacts or changes to the environment resulting from a single project or a number of separate projects that could potentially result from implementation of the Proposed Project.

5.2.3.2 Issues Identified to Have No or a Less Than Significant Cumulative Impact

The Proposed Project would result in no cumulative impacts or less than significant cumulative impacts to environmental resources identified in the CEQA Checklist and as analyzed below.

Aesthetics Cumulative Impacts

The geographic context for the analysis of cumulative aesthetic impacts includes areas with views of the LLUH and Campus. The analysis accounts for all anticipated cumulative growth within this geographic area; however, the primary contributor to potential visual changes in this area of the City is the LLUH and Campus.

Would the project on a cumulative level have a substantial affect on a scenic vista?

There are no identified scenic vistas within the City of Loma Linda based upon the City's General Plan. Therefore, cumulative development within the project area would not block existing scenic vistas.

Would the project on a cumulative level substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway?

Potential impacts to scenic resources, trees, rock outcroppings, and historic buildings are site specific, and visual impacts are generally limited to the immediate vicinity of a Proposed Project, where views of the project area are more likely to be experienced. As identified in the EIR Section 4.1 (Aesthetics), a massing analysis was prepared to evaluate the visual impact of the new hospital (which would be the tallest structure on campus providing the maximum extent of potential visual impacts). Implementation of Mitigation Measures AES-1 through AES-7 effectively reduces the Proposed Project's aesthetic impact to a less than significant level; therefore, implementation of the Proposed Project would not contribute to adverse effects on scenic vista and cumulative impacts are considered less than significant.

Would the project on a cumulative level substantially degrade the existing visual character or quality of the site and its surroundings?

Cumulative development within the surrounding areas would constitute further intensification of an already urban area of the City and generally future projects would be designed to enhance the existing character of a site. Design review by the City would consider the types and placement of planned development throughout the City. Consequently, changes in land use that would substantially degrade the area would generally not be permitted to occur, thereby protecting and enhancing the visual character of these areas. Consequently, cumulative impacts are anticipated to be less than significant. Moreover, the contribution of the Proposed Project to such cumulative impacts would not be cumulatively considerable, because as described above, with implementation of Mitigation Measures AES-1 through AES-7 the Proposed Project would not have a substantial adverse effect on the visual quality of the Project area. Instead, the Proposed Project is designed to enhance the overall aesthetic character of the City by providing an enhancement of the existing hospital's landmark status by the City. Therefore, the cumulative impact of the project would be less than significant.

Would the project on a cumulative level create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?

The City of Loma Linda contains numerous existing sources of nighttime lighting. Cumulative development could result in some increase in glare, as specific building materials and configurations are uncertain. However, these potential increases are likely to be minor and consistent with the existing built environment on and near the LLUH campus due to limited development potential and existing City regulations. Further, future projects would, in most cases, be subject to CEQA review and would require mitigation for these effects, which would likely also reduce the impacts to a less-than-significant level. Consequently, cumulative glare within the surrounding area would be less than significant. As implementation of the Proposed Project would not, after Mitigation Measures AES-6 and AES-7, result in a significant glare

impact, the Proposed Project would not result in a cumulatively considerable contribution to this impact. Therefore, cumulative impacts associated with glare would not be cumulatively considerable and would be less than significant.

Air Quality Cumulative Impacts

The geographic context for the analysis of air quality impacts incorporates the City of Loma Linda and the South Coast Air Basin (SCAB). The SCAB is comprised of parts of Los Angeles, Riverside and San Bernardino counties and all of Orange County. The basin is bounded on the west by the Pacific Ocean, the San Gabriel Mountains north, the San Bernardino Mountains north and east, the San Jacinto Mountains to the southeast, and Santa Ana Mountains to the south. The basin forms a low plain and the mountains channel and confines airflow, which trap air pollutants.

***Would the project on a cumulative level c*reate objectionable odors affecting a substantial number of people?**

As discussed in EIR Section 4.2, the LLUH has been in operation since 1967. Emissions generated by the Proposed Project would be from short-term construction of all new and renovated facilities and operational emissions from the utility plant. The utility plant operational emissions is associated with the replacement of the 1985 Cogen Size 10MW plant with a new more efficient 22MW cogeneration power plant. No other operational emissions are anticipated as the improvements are associated with replacing and/or improving existing services. Objectionable odors are typically not associated with the construction or operation of the proposed improvements. Therefore, cumulative impacts from objectionable odors are not anticipated.

***Would the project on a cumulative level c*onflict with or obstruct implementation of an applicable air quality plan.**

The LLUH has been in operation since 1967. Emissions generated by the Proposed Project would be from short-term construction of all new and renovated facilities and operational emissions from the utility plant. No other operational emissions are anticipated as the improvements are associated with replacing and/or improving existing services. Buildout of the medical center campus was evaluated in the City of Loma Linda General Plan Update; the Proposed Project improvements are consistent with the City of Loma Linda General Plan which is consistent with the AQMP. Therefore, less than significant cumulative impacts are anticipated.

Would the project on a cumulative level violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Potential Cumulative Impacts related to Air Quality are analyzed on both a project and cumulative basis simultaneously. The EIR Section 4.2 analysis the potential Air Quality impacts associated with the Proposed Project. This EIR Section identifies that no air emissions will exceed the established threshold levels. The EIR Section 4.2 demonstrates that potential impacts to Air Quality both individually and cumulatively would be less than significant.

Would the project on a cumulative level 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?

Would the project on a cumulative level expose sensitive receptors to substantial pollutant concentrations?

Potential Cumulative Impacts related to Air Quality are analyzed on both a project and cumulative basis simultaneously. The EIR Section 4.2 analysis the potential Air Quality impacts associated with the Proposed Project. This EIR Section identifies that no air emissions will exceed the established threshold levels. The EIR Section 4.2 demonstrates that potential impacts to Air Quality both individually and cumulatively would be less than significant.

Cultural Resources Cumulative Impacts

The cumulative analysis for impacts on cultural resources considers a broad regional system of which the resources are a part. The cumulative context for the cultural resources analysis is the inland area of Southern California, including San Bernardino and Riverside counties, where common patterns of prehistoric and historic development have occurred. The analysis accounts for anticipated cumulative growth within the eastern San Bernardino Valley.

Would the project on a cumulative level cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5, or a substantial adverse change in the significance of an archeological resource pursuant to § 15064.5??

Based on the archaeological sensitivity and history of the project area, there is always the possibility that ground-disturbing activities during construction may uncover previously unknown archeological artifacts, deposits, or features. Adherence to existing federal, state, and local regulations as well as the implementation of the Mitigation Measures CR-1 and CR-2 recommended for the Proposed Project would ensure project impacts to archaeological resources are reduced to a less-than-significant level. Therefore, when considered in the context of regional present and reasonably foreseeable projects, the Proposed Project would not cause cumulative **impacts** to archaeological resources within the eastern San Bernardino Valley.

Would the project on a cumulative level directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Based on the geologic mapping and the paleontological sensitivity of the project area, there is always the possibility that ground-disturbing activities during construction may uncover previously unknown paleontological sites or unique geologic features. Adherence to existing federal, state, and local regulations as well as the implementation of the mitigation measures CR-4 and CR-5 recommended for the Proposed Project would ensure project impacts to paleontological resources are reduced to a less-than-significant level. Therefore, when considered in the context of regional present and reasonably foreseeable projects, the Proposed Project would not cause cumulative impacts to paleontological resources within the eastern San Bernardino Valley.

Would the project on a cumulative level disturb any human remains, including those interred outside of formal cemeteries?

There is always the possibility that ground-disturbing activities during construction may uncover previously unknown buried human remains. Treatment of human remains is covered under standard regulatory requirements as set forth in CEQA Guidelines section 15064.5(e) and PRC Section 5097.98. Adherence to existing federal, state, and local regulations as well as the implementation of Mitigation Measure CR-6 recommended for the Proposed Project would ensure project impacts to human remains from the Proposed Project will be reduced to a less-than-significant level and therefore not cause cumulative impacts to human remains within the eastern San Bernardino Valley.

Geology and Soils Cumulative Impacts

The geographic context for the analysis of impacts resulting from geologic hazards generally is site-specific, rather than cumulative in nature. Each project site has unique geologic considerations that would be subject to uniform site-development policies and construction standards imposed by the City of Loma Linda General Plan and Municipal Code. Restrictions on development would be applied in the event that geologic or soil conditions posed a risk to public safety. A regional context must be considered for the analysis of the cumulative effects of exposure of people or structures to seismic hazards other than surface rupture of a fault because the hazard generators (earthquakes) and the direct effects (groundshaking, ground failure) tend to be region wide in nature. Additionally, a watershed-wide context must be considered for the analysis of the cumulative effects of potential erosion and siltation because the direct effects (turbidity, reduction of water quality, channel-bed sedimentation) can affect all downstream reaches of a waterway system. Nonetheless, the potential for cumulative impacts to occur is considered less than significant.

Would the project on a cumulative level expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

> ***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.***
>
> ***Strong seismic ground shaking?***
>
> ***Seismic-related ground failure, including liquefaction?***
>
> ***Landslides?***

Impacts associated with potential geologic hazards related to soil or other conditions occur at individual building sites. These effects are site-specific, and impacts would not be compounded by additional development. Buildings and facilities in the City of Loma Linda would be sited and designed in accordance with the geotechnical and seismic guidelines and recommendations of Universal Building Code. Adherence to all relevant plans, codes, and regulations with respect to

project design and construction would provide adequate levels of safety, and the cumulative impact would be less than significant. Adherence by the Proposed Project to all relevant plans, codes, and regulations would ensure that the Proposed Project would not result in a cumulatively considerable contribution to cumulative impacts regarding geologic hazards, and therefore, the cumulative impact of the Proposed Project would be less than significant.

Would the project on a cumulative level result in substantial soil erosion or the loss of topsoil?

Impacts from erosion and loss of topsoil from site development and operation can be cumulative in effect within a watershed. The Santa Ana River Watershed forms the geographic context of cumulative erosion impacts. Development throughout San Bernardino County and the City of Loma Linda is subject to state and local runoff and erosion control requirements, including applicable provisions of the general construction permit, BMPs, and Phases I and II of the NPDES permit process, as well as implementation of fugitive dust control measures in accordance with SCAQMD Rule 403 (refer to Section 4.2 [Air Quality] of this EIR). These measures are implemented as conditions of approval of project development and subject to continuing enforcement. As a result, it is anticipated that cumulative impacts on the Santa Ana Watershed caused by runoff and erosion from cumulative development activity would be less than significant. The Proposed Project‘s contribution to cumulative impacts would not be cumulatively considerable and, therefore, also would be less than significant.

Would the project on a cumulative level 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?

Implementation of the Proposed Project would result in the modification of site conditions to accommodate future development and to provide a stable and safe development. Impacts associated with potential geologic hazards related to soil or other conditions occur at individual building sites. These effects are site-specific, and impacts would not be compounded by additional development. Buildings and facilities in the City of Loma Linda would be sited and designed in accordance with the geotechnical and seismic guidelines and recommendations of Universal Building Code. Adherence to all relevant plans, codes, and regulations with respect to project design and construction would provide adequate levels of safety, and the cumulative impact would be less than significant. Adherence by the Proposed Project to all relevant plans, codes, and regulations would ensure that the Proposed Project would not result in a cumulatively considerable contribution to cumulative impacts regarding geologic hazards, and therefore, the cumulative impact of the Proposed Project would be less than significant.

Would the project on a cumulative level be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Impacts associated with potential geologic hazards related to soil or other conditions occur at individual building sites. These effects are site-specific, and impacts would not be compounded by additional development. Buildings and facilities in the City of Loma Linda would be sited and designed in accordance with the geotechnical and seismic guidelines and recommendations of Universal Building Code. Adherence to all relevant plans, codes, and regulations with respect to project design and construction would provide adequate levels of safety, and the cumulative impact would be less than significant. Adherence by the Proposed Project to all relevant plans,

codes, and regulations would ensure that the Proposed Project would not result in a cumulatively considerable contribution to cumulative impacts regarding geologic hazards, and therefore, the cumulative impact of the Proposed Project would be less than significant.

Would the project on a cumulative level have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

Impacts associated with potential geologic hazards related to soil or other conditions occur at individual building sites. These effects are site-specific, and impacts would not be compounded by additional development. Buildings and facilities in the City of Loma Linda would be sited and designed in accordance with the geotechnical and seismic guidelines and recommendations of Universal Building Code. Adherence to all relevant plans, codes, and regulations with respect to project design and construction would provide adequate levels of safety, and the cumulative impact would be less than significant. Adherence by the Proposed Project to all relevant plans, codes, and regulations would ensure that the Proposed Project would not result in a cumulatively considerable contribution to cumulative impacts regarding geologic hazards, and therefore, the cumulative impact of the Proposed Project would be less than significant.

Hazards and Hazardous Materials Cumulative Impacts:

The geographic context for the cumulative analysis of hazards and hazardous materials is the City of Loma Linda, based on the geographic area that could be affected by accidental release into the environment. The cumulative context for the hazards analysis includes future development under the City of Loma Linda General Plan

Would the project on a cumulative level create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Cumulative development within City of Loma Linda would include some land uses, which could involve the use of greater quantities and variety of hazardous products. Commercial, hotel, office, retail, and residential development would also increase the use of household-type hazardous materials within the region. Hazardous materials use, storage, disposal, and transport could result in a potential foreseeable spill and/or accidents. New development in the City would be subject to hazardous materials regulations codified in Titles 8, 22, and 26 of the CCR. Furthermore, all construction and demolition activities in the City would be subject to Cal/OSHA, SCAQMD, and Cal/EPA regulations concerning the release of hazardous materials. Compliance with all state, federal and local regulations during the construction and operation of new developments in the county would ensure that cumulative impacts from the routine transportation, use, disposal, or release of hazardous materials would be less than significant. Additionally, because the Proposed Project would also be required to comply with applicable statutes and regulations, which would ensure that future development under the project would not result in significant public hazards through the routine transport, use, or disposal of hazardous materials, the project‘s contribution would not be cumulatively considerable and the cumulative impact of the Proposed Project would be less than significant.

Would the project on a cumulative level create a significant hazard to the public or the environment through reasonably foreseeable upset and accident considerations involving the release of hazardous materials into the environment?

Cumulative projects in the City and surrounding area (as identified within their respective City and County general plans build out scenarios) could result in construction and operational activities that could potentially involve the release of hazardous materials into the environment. In particular, cumulative development could occur on properties listed on hazardous materials sites or that were previously used for oil production activities, and/or the demolition of existing structures, which may contain hazardous materials. However, the individual workers potentially affected would vary from project to project. For example, if demolition of existing buildings is required, short-term increases in hazardous materials generation, due to the potential presence of lead-based paints and asbestos-containing materials in existing facilities could occur. However, projects would be required to comply with applicable federal, state, and local regulations. Adherence to applicable regulations and guidelines pertaining to abatement of, and protection from, exposure to oil, pesticides, asbestos, lead, and other hazardous materials would ensure that cumulative impacts from those activities would be less than significant. Site-specific investigations would be conducted at sites where contaminated soils could occur to minimize the exposure of workers to hazardous substances. Additionally, because the Proposed Project would also be required to comply with applicable statutes and regulations, which would ensure that the project would not result in significant public hazards as a result of the accidental release of hazardous materials, the Proposed Project‘s contribution would not be cumulatively considerable and the cumulative impact of the Proposed Project and General Plan buildout would be less than significant.

Would the project on a cumulative level emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 1/4 mile of an existing or proposed school?

Implementation of cumulative development could expose schools to hazardous emissions, depending on the specific location and type of use proposed. Various regulations and guidelines pertaining to abatement of, and protection from, exposure to asbestos and lead have been adopted for demolition activities and would apply to all new development in the county. All demolition that could result in the release of lead and/or asbestos must be conducted according to Cal/OSHA standards. In addition, all businesses that handle or transport hazardous materials would be required to comply with the provisions of the local, state, and federal regulations for hazardous wastes. Businesses that handle more than a specified amount of hazardous materials on-site are required to submit a Hazardous Materials Business Plan. Compliance with existing regulations would ensure that schools and the general public would not be exposed to any unusual or excessive risks related to hazardous materials during construction and operational activities. Therefore, the cumulative impacts associated with the exposure of schools to hazardous emissions would be less than significant. Compliance with existing regulations would similarly ensure that future development under the Proposed Project would have a less than significant impact associated with the handling of hazardous materials within proximity to school sites. Therefore, the Proposed Project would not make a cumulatively considerable contribution to this effect and cumulative impacts would be less than significant.

Would the project on a cumulative level be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Future projects in the City would be regulated to ensure that either new development would not occur on hazardous materials sites, or for project sites that are listed, impacts would be required to be mitigated by appropriate remediation prior to development. As all contaminated sites are required to be remediated prior to development, this cumulative impact would be less than significant. As the Proposed Project similarly requires appropriate site investigation and remediation activities prior to development, implementation of the LLUH Master Plan and buildout under the General Plan would not make a cumulatively considerable contribution to impacts resulting from development on hazardous materials sites. This cumulative impact would be less than significant.

Would the project on a cumulative level impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Construction and operation associated with cumulative development could result in activities that could interfere with adopted emergency response or evacuation plans, primarily by temporary construction barricades or other obstructions that could impede emergency access. It is anticipated that future development projects would undergo CEQA review of potential impacts on adopted emergency response or evacuation plans, and would be required to implement measures necessary to mitigate potential impacts. As a result, cumulative development relating to interference with adopted emergency plans would be less than significant. Because the Proposed Project would be required to implement a mitigation measure to ensure that temporary street closures would not affect emergency access in the vicinity of future development, the Proposed Project would not have a cumulatively considerable contribution to this effect. Therefore, this cumulative impact would be less than significant.

Would the project on a cumulative level expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

The City of Loma Linda is an area that is susceptible to wildland fires. Due to portions of the City being in susceptible areas, land development is governed by special state and local codes, and any future development property would be required to follow maintenance guidelines aimed at reducing spreading of wildland fire. The Project Site is located over 4,000 feet north of the nearest identified hazardous fire area. With adherence to applicable federal, state, and local regulations governing hazardous materials required of projects within fire hazard areas, the potential risks associated with wildland fire would not be cumulatively considerable; as such, cumulative impacts related to wildland fire hazards would be less than significant.

Hydrology and Water Quality Cumulative Impacts

The cumulative context for the analysis of hydrology and water quality impacts is a function of the type of impact and geographic considerations. Some cumulative impacts may have a broad, regional context, while others may be limited by site-specific conditions or location. The

cumulative context regarding flooding and drainage, water quality, and groundwater resources is described at the beginning of each analysis, below.

Would the project on a cumulative level violate any water quality standards or waste discharge requirements?

Regionally, all projects within the area and region are required to comply with local, regional, state and federal surface water and drainage regulations and management plans during construction and after completion including: NPDES, SWPPP, Hazardous Materials Business Plan, Sections 404 Permits and 404 Certification, California Fish and Wildlife Code 1600 Stream Alteration Agreements, Municipal Stormwater Management Plans and Sewer System Capacity Management and Permitting Regulations. These plans and regulatory requirements are intended to accommodate demand and prepare for capacity of regionally permitted projects prior to permitting and online demand. Cumulative impacts associated with area projects are less than significant.

Would the project on a cumulative level 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)?

The LLUH has their own water production and distribution system which is currently served from two wells (Well 2 and Well 3) located just north of the Project Site between Anderson Street and Poplar. Each well is operated with a 250 horsepower, 1,100 gallon per minute (gpm) pump. With the exception of fire flow, the City does not provide water service to the LLUH on a normal basis. The Project Site, with the exception of the Elmer Digneo City Park, is served by the LLUH. The City of Loma Linda Department of Public Works, Water Division provides production and distribution of water to the Elmer Digneo City Park. The City Water Division's main source of water for its customers is the Bunker Hill Groundwater Basin. In addition to the groundwater wells, the City has two emergency connections with the City of San Bernardino and one with the City of Redlands. These connections area available only on an as-needed basis and only if a water supply is available. There are no groundwater recharge facilities located on or near the Project Site.

To meet the future domestic and fire water requirements for the Project Site, the Applicant is currently constructing a domestic water well (Well 4) to augment the existing two wells. As stated, existing Well 2 has issues with sand, nitrates and hardness that results in the LLUH limiting its water production. Therefore Well 4 is expected, along with existing Well 3, to meet the current as well as Proposed Project's future water supply demands. The Proposed Project would not deplete groundwater supplies nor would it interfere with recharge since it is not within an area designated as a recharge basin or spreading ground. Thus, the Proposed Project's cumulative impact to local groundwater supplies is less than significant.

Would the project on a cumulative level 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 substantial erosion or siltation on- or off-site?

Alterations to rivers, streams and waterways are subject to procedures to review and approve stream alterations through both state (California Department of Fish and Wildlife 1600 Streambed Alteration Agreement) and federal (U.S. Army Corps of Engineers ACOE 404) permit processes. This includes impacts associated with on and off-site erosion and siltation. The process is designed to prevent cumulative impacts to drainage systems and prevent undue and unnecessary degradation to existing systems. Thus, the Proposed Project's cumulative impact when considered with General Plan buildout is less than significant.

Would the project on a cumulative level create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

On a regional level, development of other cumulative projects would result in an increase in impervious surfaces and increase runoff from these sites into the local and regional storm drain systems. In addition, urban pollutants associated with parking lots, roads, and landscaping, combine with stormwater that ultimately ends up in the Santa Ana River or other major watercourses. Stormwater requirements administered by the Santa Ana Regional Water Quality Control Board (SARWQCB) require individual projects to employ Best Management Practices to control urban runoff from each site during construction. The SARWQCB is also responsible for reviewing each project's Water Quality Management Plan (WQMP) for long-term operation and issuing the Waste Discharge Requirements for each project. Employing BMPs that reduce the potential for storm water discharges to affect water quality have been proven successful when implemented at construction type projects. Therefore, overall cumulative impacts from the Proposed Project and General Plan buildout will be less than significant.

Would the project on a cumulative level 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 that would result in flooding on- or off-site?

The specific on/or off-site drainage and erosion characteristics of regional or cumulative development projects are not known however each project is evaluated on its treatment of surface water containment and distribution. This would include all short-term, construction related erosion protections and long-term operational erosion mitigation. Projects are subject to the Uniform Building Code, local and regional Stormwater Management Plans, NPDES and SWPPP permits, etc. Plan adherence and compliance as directed by regulatory lead agencies should prevent adverse impacts to regional conditions. Overall cumulative impacts from the Proposed Project and General Plan buildout would be less than significant

Would the project on a cumulative level Otherwise substantially degrade water quality?

Regionally, and as discussed above, all projects within the area and region are required to comply with local, regional, state and federal surface water and drainage regulations and management plans during construction and after completion including: NPDES, SWPPP, Hazardous Materials Business Plan, Sections 404 Permits and 404 Certification, California Fish

and Game Wildlife 1600 Stream Alteration Agreements,, Municipal Stormwater Management Plans and Sewer System Capacity Management and Permitting Regulations. These plans and regulatory requirements are intended to accommodate demand and prepare for capacity of regionally permitted projects prior to permitting and online demand. Thus, the Proposed Project would not make a cumulatively considerable contribution to this impact, and the Proposed Project's cumulative impact is determined to be less than significant.

Would the project on cumulative level 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?

Regionally, nearly all cumulative projects are evaluated individually by their respective jurisdictions to ensure no habitable structures are located within a 100-year flood hazard area. To the extent that proposed projects are located in 100-year flood plains, standard conditions of approval require the installation of flood control measures to remove the site from the flood plain. Thus, the overall cumulative impact of the Proposed Project would be less than significant.

Would the project on cumulative level place within a 100-year flood hazard area structures, which would impede or redirect flood flows?

Regionally, nearly all cumulative projects are evaluated individually by their respective jurisdictions to ensure no habitable structures are located within a 100-year flood hazard area. To the extent that proposed projects are located in 100-year flood plains, standard conditions of approval require the installation of flood control measures to remove the site from the flood plain. Thus, the overall cumulative impact of the Proposed Project would be less than significant.

Would the project on cumulative level 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?

On a regional and project level, the only dam upstream of the Project Site that could potentially impact the cumulative projects near the Project Site is the Seven Oaks Dam, located east of the City of Redlands in the San Bernardino Mountain foothills. Were a catastrophic failure of the Seven Oaks Dam occur, the City of Loma Lina and the Proposed Project would not be impacted. Therefore the Proposed Project would not contribute on a cumulative level to this impact.

Inundation by seiche, tsunami, or mudflow?

On a regional and project level neither the project or adjacent cities are located near a large body of water; the nearest body, other than local reservoirs that could create a tsunami is the Pacific Ocean, approximately 65 miles to the west. Tsunamis are large waves caused by the displacement of the ocean floor, normally generated by seismic activity. Due to the elevation of 700 plus feet and the distance of approximately 65 miles from the ocean, a tsunami hazard is not present for the Project Site.

Land Use Cumulative Impacts

This cumulative impact analysis considers development of the Proposed Project, in conjunction with anticipated cumulative growth as represented by implementation of the City of Loma Linda General Plan. Generally, cumulative development within the City would result in changes to the existing land use environment through conversions and/or intensification of existing land uses (e.g., from industrial to commercial, or commercial to mixed-use), or through the conversion of vacant land to developed uses.

Would the project on a cumulative level physically divide an established community?

As identified in EIR Section 4.8 the Proposed Project does not physically divide an established community. Therefore the Proposed Project would not cumulative contribute to a community being physically divided.

Would the project on a cumulative level conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Cumulative land use impacts have the potential to occur where a number of projects have the potential to negatively change the overall land use of an area by affecting adjacent existing uses. Adherence to existing land use plans, policies, and regulations generally prevent such occurrences. Future development in the City and neighboring communities would be reviewed for consistency with adopted land use plans and policies, in accordance with the requirements of CEQA, the state Zoning and Planning Law, and the state Subdivision Map Act, all of which require findings of plan and policy consistency prior to approval of entitlements for development. It should be noted that future projects could also include General Plan amendments and/or zone changes. However, modifications to existing land use patterns that require such amendments do not necessarily represent an inherent negative effect on the environment, particularly if the proposed changes do not conflict with the policies that were specifically adopted for the purpose of avoiding or mitigating an environmental effect.

Cumulative projects primarily result in development to enhance existing land use patterns within areas of the City, and are therefore generally anticipated to be compatible with adjacent uses. However, should such analysis identify significant land use impacts, mitigation measures would be required to reduce those impacts to a less-than-significant level. Absent effective and feasible mitigation, the City may determine that the benefits derived from the proposed land use changes are sufficient to justify adoption of a Statement of Overriding Considerations, permitting the revisions and their associated projects to proceed.

Other than the Proposed Project, this type of wide-scale change is not foreseen in any other portion of the City. The Proposed Project does not represent a significant catalyst for substantial land use change within the City. The Proposed Project is consistent with the City's General Plan and is consistent with the broad vision and policies of the General Plan, the citywide General Plan build-out capacity, and the community vision for the area. Therefore, the cumulative impact

associated with conflict of future development with adopted plans and policies would not be cumulatively considerable, and would be less than significant.

Conflict with any applicable habitat conservation plan or natural community conservation plan?

Cumulative land use impacts have the potential to occur where a number of projects have the potential to negatively change the overall land use of an area by affecting adjacent existing uses. Adherence to existing land use plans, policies, and regulations generally prevent such occurrences. Future development in the City and neighboring communities would be reviewed for consistency with adopted land use plans and policies, in accordance with the requirements of CEQA, the state Zoning and Planning Law, and the state Subdivision Map Act, all of which require findings of plan and policy consistency prior to approval of entitlements for development. It should be noted that future projects could also include General Plan amendments and/or zone changes. However, modifications to existing land use patterns that require such amendments do not necessarily represent an inherent negative effect on the environment, particularly if the proposed changes do not conflict with the policies that were specifically adopted for the purpose of avoiding or mitigating an environmental effect. Cumulative projects primarily result in development to enhance existing land use patterns within areas of the City, and are therefore generally anticipated to be compatible with adjacent uses. However, should such analysis identify significant land use impacts, mitigation measures would be required to reduce those impacts to a less-than-significant level. Absent effective and feasible mitigation, the City may determine that the benefits derived from the proposed land use changes are sufficient to justify adoption of a Statement of Overriding Considerations, permitting the revisions and their associated projects to proceed. Therefore, the cumulative impact associated with conflict of future development with adopted plans and policies would not be cumulatively considerable, and would be less than significant.

Noise Cumulative Impacts

The geographic context for the analysis of cumulative noise impacts depends on the impact being analyzed. For construction impacts, only the immediate area around the specific development site would be included in the cumulative context. For operational related impacts, the context is build-out of the General Plan, including existing and future development of cumulative projects within the City of Loma Linda, as well as related projects in adjacent communities that would be potentially impacted.

Would the project on a cumulative level result in:

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?

This cumulative impact analysis considers development of the Proposed Project, in conjunction with ambient growth and other development within the vicinity of the Proposed Project in the City of Loma Linda and surrounding jurisdictions. Noise is by definition a localized phenomenon, and is significantly reduced in magnitude as distance from the source increases. Due to the location of the Proposed Project area, and that the boundaries of the Proposed Project

include Barton Road to the north Campus Street on the west and Anderson Street on the East, it is unlikely that future development would occur in close proximity to the Proposed Project area. Consequently, it is unlikely that other construction or operational noise impacts would occur in the vicinity of the Proposed Project site that would contribute noise levels similar to those generated for the Proposed Project. As such, construction and operation of the Proposed Project would not cumulatively contribute to noise impacts and no further cumulative analysis would be required.

Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?

Noise is by definition a localized phenomenon, and is significantly reduced in magnitude as distance from the source increases. Due to the location of the Proposed Project area, and that the boundaries of the Proposed Project include Barton Road to the north Campus Street on the west and Anderson Street on the East, it is unlikely that future development would occur in close proximity to the Proposed Project area at the same time project related construction is occurring. Consequently, it is unlikely that other construction or operational noise impacts would occur in the vicinity of the Proposed Project site that would contribute noise levels similar to those generated for the Proposed Project. As such, construction and operation of the Proposed Project would not cumulatively contribute to excessive ground borne vibration or ground borne noise levels and no further cumulative analysis would be required.

Utilities and Service Systems Cumulative Impacts

The geographic context for the analysis of cumulative utilities and service system impacts is the cities of Loma Linda and San Bernardino, and the unincorporated areas of the county located within the East San Bernardino Valley that utilize regional utility systems including water, wastewater, electricity generation and solid waste disposal facilities.

Would the project exceed wastewater treatment requirements of the Santa Ana Regional Water Quality Control Board?

As discussed in Section 4.10 (Utilities) of the EIR wastewater generated in the City of Loma Linda is treated by the City of San Bernardino through a Joint Powers Agreement (JPA). The City of San Bernardino operates both a secondary and a tertiary plant that discharge effluent to the Santa Ana River. Each development identified occurring within a JPA member's jurisdiction are required to pay development and user fees designed to provide funding for existing and projected wastewater treatment needs of the region. Consequently, overall impacts would be less than significant.

The Proposed Project would generate wastewater that can be discharged to a municipal system that has sufficient capacity. Land uses on-site would remain Institutional/Health Care and therefore no change to the type of wastewater discharged to the sewer collection system or the wastewater treatment plants would occur. The project would comply with permit requirements of the Santa Ana Regional Water Quality Control Board regarding wastewater. The Proposed Project would not require the expansion of existing facilities. Thus, the Project would not make a cumulatively considerable contribution to this impact, and the Proposed Project's cumulative impact is determined to be less than significant.

Would the project on a cumulative level 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?

Wastewater generated in the City of Loma Linda is treated by the City of San Bernardino through a Joint Powers Agreement (JPA). The City of San Bernardino operates both a secondary and a tertiary plant that discharge effluent to the Santa Ana River. Each development identified occurring within a JPA member's jurisdiction is required to pay development and user fees designed to provide funding for existing and projected wastewater treatment needs of the region. Consequently, overall impacts would be less than significant.

The Proposed Project would generate wastewater that can be discharged to a municipal system that has sufficient capacity. Land uses on-site would remain Institutional/Health Care and therefore no change to the type of wastewater discharged to the sewer collection system or the wastewater treatment plants would occur. The project would comply with permit requirements of the Santa Ana Regional Water Quality Control Board regarding wastewater. The Proposed Project would not require new water, wastewater treatment facilities or the expansion of existing facilities. Thus, the Project would not make a cumulatively considerable contribution to this impact, and the Proposed Project's cumulative impact is determined to be less than significant.

Would the project on a cumulative level require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

As discussed in Section 4.10 (Utilities) of the EIR the majority of the existing campus is comprised of impervious surfaces (i.e. existing buildings, asphalt parking areas and/or hardscape improvements) with some landscaped areas. Storm water runoff from the site is conveyed to both public and private on-site storm drain facilities. The public drainage facilities include two separate systems, one located in Anderson Street heading generally north towards the existing Union Pacific Railroad facility where it traverses west and the second located in Barton Street where it traverses north in Campus Street. The two systems join on the south side of the existing railroad facilities at the north end of Campus Street in the existing cul-de-sac before crossing under the existing railroad facility and discharging into an existing County drainage channel that drains north to San Timoteo Creek. San Timoteo Creek is a concrete lined channel that flows from the southeast to the northwest. This creek crosses under Interstate 10 and flows northwest and discharges into the Santa Ana River.

On a regional level, development of other projects in the East San Bernardino Valley would result in an increase in impervious surfaces and increase runoff from these projects into the local and regional storm drain systems. In addition, urban pollutants associated with parking lots, roads, and landscaping, combine with stormwater that ultimately ends up in the Santa Ana River or other major watercourses. Stormwater requirements administered by the Santa Ana Regional Water Quality Control Board (SARWQCB) require individual projects to employ Best Management Practices to control urban runoff from each site during construction. The SARWQCB is also responsible for reviewing each project's Water Quality Management Plan (WQMP) for long-term operation and issuing the Waste Discharge Requirements for each project. Employing BMPs that reduce the potential for storm water discharges to affect water

quality have been proven successful when implemented at construction type projects. Therefore, overall cumulative impacts from the Proposed Project and General Plan buildout would be less than significant.

Would the project on a cumulative level have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

The water system providing domestic water and irrigation service to the campus is owned by LLUH and includes a 16-inch diameter main that provides a connection from two existing water wells to a 1.4 million-gallon storage reservoir located south of the campus. The City of Loma Linda's public water system surrounds the campus and is connected to the campus water system at three locations. There would be no potentially significant impacts to the existing water supplies or distribution system resulting from the Proposed Project.

Regionally, the production and distribution of water within the City of Loma Linda is provided by the City's Department of Public Works, Water Division. The City's groundwater is supplied from six wells. The total production capacity of these wells totals 7,900 gallons per minute. In addition to the groundwater wells, the City has two emergency connections with the City of San Bernardino and one with the City of Redlands. The City has the ability to finance and construct required facilities necessary to obtain the water supply to meet planned growth through the collection of development fees and the use of other funding methods. However, the project is not anticipated to require any significant amount of additional water than what is currently being used at the site. No significant impacts are anticipated.

The 2010 San Bernardino Valley Regional Urban Water Management Plan prepared for agencies including the City of Loma Linda. Projected annual water demand for City of Loma Linda, after accounting for water conservation programs projected to increase from 5,811 acre-feet in 2015 to 6,565 acre-feet in 2035. The planning area as a whole is projected to have a surplus of supply, during multiple-dry year periods, ranging from 40,584 acre-feet in 2015 to 46,699 acre-feet in 2035. The multiple-dry year is generally the lowest annual runoff for a 3-year or more consecutive period. There are no projected periods where demands would exceed supplies[2]. Therefore, overall cumulative impacts from the Proposed Project and General Plan buildout will be less than significant.

Would the project on a cumulative level result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Wastewater treatment services are provided to the City of Loma Linda by the City of San Bernardino under a Joint Powers Agreement. Remaining capacity in the plants is sufficient to handle the projected wastewater flow from build-out of the Master Plan, estimated at 0.475 million gallons per day. The Proposed Project would not require the expansion of existing public facilities. The LLUH is currently served by existing City of Loma Linda sewer collection lines located along Barton Road. The Proposed Project includes connection to the existing system. According to the Public Works Department and the 2013 Preliminary Sewer Study, sufficient

[2] *2010 San Bernardino Valley Regional Urban Water Management Plan, pages 3-5 and 4-2.*

capacity exists in the Barton Road sewer line and no impacts would occur from development of the Proposed Project.

Would the project on a cumulative level be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Several private solid waste collection services are utilized in the East San Bernardino Valley for solid waste collection. Regionally, solid waste is disposed of at the San Timoteo Sanitary Landfill (Solid Waste Information System (SWIS) No. 36-AA-0087) located at 31 Refuse Road, Redlands, in the City of Redlands. Regional planning for landfill operations and capacity is carried out by the San Bernardino County Solid Waste Management Division (SWMD). The San Timoteo Sanitary Landfill is permitted to receive up to 2,000 tons per day, and when all regional solid waste generation is taken into account has an estimated site life until 2043. Therefore, overall cumulative impacts will be less than significant

Would the project on a cumulative level Comply with Federal, State, and local statutes and regulations related to solid waste?

Regionally, solid waste is disposed of at the San Timoteo Sanitary Landfill (Solid Waste Information System (SWIS) No. 36-AA-0087) located at 31 Refuse Road, Redlands, in the city of Redlands. Regional planning for landfill operations and capacity is carried out by the San Bernardino County Solid Waste Management Division (SWMD). Participation with the SWMD by the regional cities will ensure that individual projects will not create a cumulative impact. Therefore, overall cumulative impacts will be less than significant.

5.3 EFFECTS FOUND TO HAVE NO IMPACT

The following impacts were found to have no impact and were, therefore, not further analyzed in this EIR.

5.3.1 Agriculture Resources

Potential impacts to Agriculture Resources were determined to have no impact. As shown in Figure 3-2 (Existing Land Uses) in Chapter 3 (Project Description) of this EIR, there is no land designated for agricultural purposes within the Project area. The Proposed Project area is designated as Urban/Built-Up and Other Land by the California Department of Conservation, and the Proposed Project would not convert Farmland to non-agricultural uses. As such, no farmland would be at risk for conversion and no conflicts would exist with any Williamson Act contracts due to implementation of the Proposed Project. Additionally, the project area contains no forest land and implementation of the Proposed Project would not convert forest land to non-forest use. Therefore, impacts to Agriculture and Forestry Resources were not further analyzed in this EIR.

5.3.2 Biological Resources

Potential impacts to Biological Resources were determined to have no impact. The Project site does not occur within the proposed critical habitat for other species of concern or listed species.

According to Figure 9.3 of the General Plan, the site and surrounding area is developed and includes urban landscaping. No riparian habitat occurs on or near the Project Site. The Project Site is currently developed and contains no such habitats. Development of the Proposed Project would have no 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 Wildlife or U.S. Fish and Wildlife Service. Therefore, impacts to Biological Resources were not further analyzed in this EIR.

5.3.3 Mineral Resources

Potential impacts to Mineral Resources were determined to have no impact. No state-designated mines or mineral producers currently exist within the Project vicinity. The Project Site does not maintain any natural mineral resources. Mineral resources are not discussed in the Land Use Element of the General Plan. Therefore, impacts to Mineral Resources were not further analyzed in this EIR.

5.3.4 Population and Housing

Potential impacts to Population and Housing were determined to have no impact. Construction at the site would not create any new long-term construction jobs. Operation of the LLUH would not result in any new jobs. The Proposed Project would not induce population growth in an area, either directly or indirectly. Development of the Proposed Project would require the demolition of ten residential structure. However these structures are not currently used for housing by the LLUH and therefore would not reduce the number of existing housing units, displace people or necessitate the construction of replacement housing elsewhere. Therefore, impacts to Population and Housing were not further analyzed in this EIR.

5.3.5 Public Services

Potential impacts to Public Services were determined to have no impact. The Proposed Project primarily involves the redevelopment and re-use of existing facilities within the LLUH Campus. Construction at the site would not create any new long-term construction jobs and operation of the LLUH would not result in any new jobs that would result in an increase in demand for Public Services. The Proposed Project would not induce population growth in an area, either directly or indirectly that would result in an increase in demand for Public Services. The Project would not result in impacts to government facilities or require the construction of new government facilities. Service ratios, response times, or other performance objectives of public services would not be impacted as a result of the Proposed Project. Therefore, impacts to Public Services were not further analyzed in this EIR.

5.3.6 Transportation Traffic

Potential impacts to Transportation Traffic have no impact. A Traffic Impact Analysis (TIA) was prepared for the Proposed Project to review the University and related campus facilities proposed as part of the Master Plan. The report concluded that the intersections serving the Project Site at build-out would operate at a Level of Service of C for both the morning and evening peak

hour. As required by Measure V, or the Growth Management Element of the amended General Plan, which is an initiative approved by Loma Linda voters in November 2006, any location where the Level of Service is below LOS C, the Transportation Element criterion, at the time an application for development is submitted, mitigation measures shall be imposed to ensure that the level of traffic service is maintained. Additionally, build-out of the University Medical Center Campus was reviewed in the TIA prepared for the General Plan Update (amended 2009), and the need for additional parking and parking structures were included in the analysis, the Proposed Project would not cause an increase in traffic or congestion at intersections within the vicinity, and therefore a traffic analysis is not presented in Chapter 4.0 of the Program EIR. The TIA prepared for the Proposed Project concluded that no impacts would occur, is included in Appendix A of this Program EIR. Therefore, impacts to Transportation Traffic were not further analyzed in this EIR.

5.4 SIGNIFICANT EFFECTS WHICH CANNOT BE AVOIDED

CEQA Guidelines Section 15126.2(b) states significant environmental effects which cannot be avoided if a Proposed Project is implemented must describe any significant impacts, including those which can be mitigated but not reduced to a level of insignificance. Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, should be described.

EIR Section 4.7 identifies significant Greenhouse Gas/Climate Change impacts would result from the project, that can be mitigated but not reduced to a level of less than significant. This impact is significant and unavoidable.

5.5 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL EFFECTS

Section 15126.2(c) of the CEQA Guidelines requires a discussion of any significant irreversible environmental changes that would be caused by the Proposed Project. Significantly, Section 15126.2(c) states:

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 highway 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. Generally, a project would result in significant irreversible environmental changes if

- The primary and secondary impacts would generally commit future generations to similar uses
- The project would involve a large commitment of nonrenewable resources
- The project would involve uses in which irreversible damage could result from any potential environmental accidents associated with the project

- The proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy)

Development of the Proposed Project would result in the continued commitment of the majority of the Proposed Project Site to urban development, thereby precluding any other uses for the lifespan of the project. Restoration of the Project Site to pre-developed conditions would not be feasible given the degree of disturbance, the urbanization of the area, and the level of capital investment in the area. Resources that will be permanently and continually consumed by implementation of the Proposed Project include water, electricity, natural gas, and fossil fuels. However, the amount and rate of consumption of these resources would not result in the unnecessary, inefficient, or wasteful use of resources. With respect to operational activities, compliance with all applicable building codes, as well as mitigation measures, planning policies, and standard conservation features, would ensure that all natural resources are conserved to the maximum extent possible. It is also possible that new technologies or systems will emerge, or will become more cost-effective or user-friendly, to further reduce the reliance upon nonrenewable natural resources. Nonetheless, construction activities related to the Proposed Project would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels (including fuel oil), natural gas, and gasoline for automobiles and construction equipment. As required by the City's building code, build out of the Proposed Project will include lighting and other energy conservation measures and the Applicant will be required to construct all structures with up-to-date energy-saving equipment. Lighting conservation efforts in new construction include installation of occupancy sensors to automatically turn off lights when not in use, lighting reflectors, electronic ballasts, and energy-efficient lamps. Conservation efforts are also expected to involve improved HVAC systems with microprocessor-controlled energy management systems. In addition, all development shall comply with specifications contained in Table 24 of the California Code of Regulations (CCR).

The CEQA Guidelines also require a discussion of the potential for irreversible environmental damage caused by an accident associated with the Proposed Project. While the project would result in the use, transport, storage, and disposal of hazardous wastes, as described in EIR Section 4.5 (Hazards and Hazardous Materials), all activities would comply with applicable state and federal laws related to hazardous materials, which significantly reduces the likelihood and severity of accidents that could result in irreversible environmental damage. Implementation of the Proposed Project would also result in the alteration of the visual character of the site and the short-term commitment of non-renewable and/or slowly renewable natural and energy resources, such as lumber and other forest products, mineral resources, and water resources during construction activities. As previously discussed, operations associated with continued use would also consume natural gas and electrical energy. While many of these impacts can be avoided, lessened, or mitigated, some of these impacts are irreversible consequences of urban growth, and are described in detail in the appropriate sections of this EIR (see Chapter 4)

5.6 GROWTH-INDUCING IMPACTS

As required by Section 15126.2(d), an EIR must discuss ways in which a Proposed Project could foster economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment. Also, the EIR must discuss the characteristics of the

project that could encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. Growth can be induced in a number of ways, such as through (1) the elimination of obstacles to growth, (2) the establishment of policies or other precedents that directly or indirectly encourage additional growth, or (3) the provision of short- or long-term job opportunities. In general, a project may foster spatial, economic, or population growth in a geographic area if the project removes an impediment to growth (e.g., the establishment of an essential public service, the provision of the new access to an area; a change in zoning or general plan amendment approval); or economic expansion or growth occurs in an area in response to the project (e.g., changes in revenue base, employment expansion, etc). These circumstances are further described below:

Elimination of Physical or Regulatory Obstacles to Growth: This refers to the extent to which a Proposed Project removes infrastructure limitations or provides infrastructure capacity, or removes regulatory constraints that could result in growth unforeseen at the time of project approval.

Employment Effects: This refers to the extent to which a Proposed Project could result in increased short-term or long-term employment opportunities.

5.6.1 Elimination of Obstacles to Growth

Removal of Infrastructure Limitations or Provision of Capacity

The total Planning Area for the City of covers approximately 9.43 square miles. Of this area, approximately 8.0 square miles are currently within the City limits, but is not fully developed with urban uses. Therefore, due to the location of the Proposed Project with respect to adjacent development, there are no significant physical constraints that would be removed such that additional growth would be induced. Typical physical obstacles to growth include:

- Limited capacity of the roadway system
- Limited capacity of the potable water system
- Limited capacity of the recycled water system
- Limited capacity of the wastewater system
- Limited capacity of the electrical transmission system

While each of these systems would require some level of improvement to accommodate the project and/or cumulative growth, the backbone infrastructure system to provide adequate transportation and utilities services is already in place and no significant improvements are anticipated.

The Project Site is located within an urbanized area of the City that is developed. No new public services or utilities will be constructed as part of the Proposed Project that will be utilized by any entity outside of the LLUH and therefore is not considered grow inducing.

Development of the Proposed Project would generate some short-term, construction-related employment opportunities. While the magnitude of development is relatively large, the construction phases of the project would require a temporary labor force due to the short-term nature of construction employment. Given the supply of construction workers in the local work force, including those that already serve the rapidly growing Inland Empire region, it is assumed that these workers would be readily available and would not relocate to the Loma Linda area as a result of the project's short-term employment opportunities.

Development of the Proposed Project would not generate significant long-term employment opportunities, as the primary component of the Proposed Project is redevelopment/reuse of an existing hospital. The Proposed Project would provide construction of new facilities, modernization of existing facilities, and replacement of a portion of the main hospital in response to California's SB 1953 Hospital Seismic Safety Act. Any long-term employment opportunities generated by the Proposed Project are not anticipated to provide a substantial and stand-alone source of growth inducement. Instead, long-term employment opportunities are anticipated to be satisfied by existing workers in the local region.

The Proposed Project does not provide infrastructure such as new or expanded water systems, sewer systems, schools, public services, or transportation improvements that could potentially support increased growth in the region. No housing is included as a part of the Proposed Project.

The Proposed Project located within the City of Loma Linda would be consistent with the City's established land use designation and zoning designation for the project site. The Proposed Project would be consistent with the City of Loma Linda General Plan and would be constructed contiguous with existing urban areas and specifically adjacent to other health care land uses which would not result in incompatible land uses in the area.

6.0 ALTERNATIVES

6.1 INTRODUCTION

This section evaluates alternatives to the Proposed Project. The CEQA Guidelines Section 15126.6 outlines the discussion of alternatives to a Proposed Project as follows: "An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible." It further states that the lead agency is responsible for selecting a range of alternatives examined and must publically disclose its reasoning for selecting those alternatives. "There is no iron clad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason" (Citizens of Goleta Valley vs. Board of Supervisors [1990] 52 Cal. 3d 553 and Laurel Heights Improvement Association vs. Regents of the University of California [1998] 41 Cal. 3d 376). Thus, the EIR needs to evaluate those alternatives necessary to permit a reasoned choice and should not consider alternatives with effects that cannot be reasonably ascertained and whose implementation is remote and speculative.

CEQA also requires that an alternatives evaluation include sufficient information about each alternative to allow meaningful evaluation, analysis and comparison with the Proposed Project (CEQA 15126.6(d)). The analysis should identify aspects of the alternative that "substantially lessen any significant effects of the project" (CEQA 15126.6(b)). The following section presents a series of project alternatives considered, evaluated and/or rejected for the Proposed Project. The alternatives were developed based on recommendation of Lead Agency staff. However is it noted that most of the potentially significant impacts associated with the Proposed Project would be reduced to less than significant levels with mitigation; these are in the areas of aesthetics, cultural, geology and soils, hazards and hazardous materials, noise, and utilities. A potential environmental impact for Greenhouse gases would remain significant after mitigation.

The following alternatives to the Proposed Project are evaluated in Section 6.3:

- No-Project/No-Development Alternative
- Reduced Scale Alternative

The Environmentally Superior Alternative will be selected from among these alternatives and the Proposed Project. An alternative that is environmentally superior would result in the fewest or least significant environmental impacts and still be able to achieve the objectives of the planning effort.

The analysis of alternatives includes the assumption that all applicable mitigation measures associated with the Proposed Project would be implemented as appropriate for each of the alternatives. However, applicable mitigation measures may be scaled to reduce or avoid the

potential impacts of the alternative under consideration and may not precisely match those identified for the proposed project.

6.1.1 Project Description

The Proposed Project is described in detail in Chapter 3.0 of this Draft Program EIR. In summary, LLUH is proposing a Master Plan to include the renovation of its campus. The Project consists of a multi-phased development to construct new facilities and improvements to the existing campus in order to accommodate existing demand for the services provided and to meet regulatory requirements. The Proposed Project would provide construction of new facilities, modernization of existing facilities, and replacement of a portion of the main hospital in response to California's SB 1953 Hospital Seismic Safety Act. It is anticipated that the Master Plan would be built out in two phases over an estimated ten-year period.

The LLUMC is composed of a number of different structures that are connected including: the original 1967 building (round towers and buildings below them), the radiology building known as the Schuman Pavilion built in the mid 1980's, and the Children's Hospital built in the late 1980's. SB 90, an amendment to SB 1953, allows a seven-year seismic compliance extension to the year 2020 for the 1967 portion of the hospital. It is this portion of the hospital that would be vacated and a new hospital is proposed to replace existing uses. Since certain operations of the Children's Hospital occur within the 1967 structure, the new hospital would include a designated area for children as well as adults. Upon appropriate separation from the 1967 building, the current Children's Hospital would remain in compliance with SB 1953.

Proposed facilities and improvements associated with the Master Plan include: 1) a seven-story, approximately 250,000 square-foot, 760-space patient and visitor parking structure; 2) a 13-story (approximately 215 feet in height), approximately 732,000 square-foot hospital with 464 beds to replace a portion of the seismically-noncompliant existing hospital, and 80 parking spaces; 3) an approximate 34,000 square-foot new or retrofitted utility plant; 4) an approximate 14,000 square-foot Southern California Edison (SCE) substation (existing on-stie upgraded or newly constructed off-site); 5) a two-story, approximately 9,000 square-foot addition to the existing dental school; 6) a four-story approximately 90,000 square-foot research building; and 7) tenant improvements and reuse of the vacated portions of the existing hospital. Improvements and upgrades at the campus would also include potential expansion of utility lines or other infrastructure updates within streets that occur within the Project Site (i.e., Anderson Street, Taylor Drive, Loma Linda Drive, etc.).

6.1.2 Project Objectives

CEQA Guidelines Section 15124(b) requires that the project description include a statement of objectives sought by the Proposed Project. The statement of objectives will assist the Lead Agency in developing a reasonable range of alternatives for evaluation in the EIR. The objectives will also assist the Lead Agency in developing findings for a statement of overriding considerations, if required.

The following are the Proposed Projects objectives and the methods required to achieve the stated objectives. The objectives are not independent variables; rather, they work together and are intended to comply with the City's intentions in implementing the General Plan.

- Comply with California's SB 1953 Alfred E. Alquist Hospital Seismic Safety Act.
- Continue to maintain current licensing compliance and provide health care on a regional basis.
- Provide an attractively designed, mastered-planned campus that would be an amenity for the area and surrounding communities.
- Provide necessary parking needed to meet the demand of visitors, patients, physicians, students and staff.
- Continue to provide a safe and modern university for students by upgrades and creation of new facilities.
- Expand the City's economic base with medical support services, research facilities, and professional offices.
- Continue to maintain the image of the City as a university town where education, health and medical services, and recreation are important.
- Upgrade the campus's infrastructure systems by providing new and improved services and facilities.
- Provide a more self-reliant utility source in the event of an emergency
- Improve site access and safety along Barton Road, Campus Street, and Anderson Street.

6.2 ALTERNATIVES CONSIDERED AND REJECTED

CEQA Guidelines 15126.6(c) requires that an EIR identify any alternatives that were considered and rejected as infeasible, and briefly explain the reasons for rejection. Because the Project Site is an existing developed use that is proposed for upgrade to meet existing demands and regulatory mandates, only one alternative was considered and rejected. The alternative considered and rejected for this EIR is: Expansion of the Existing Heart & Surgical Hospital. This alternative is described below, including the rationale for rejecting the alternative. Reasons for elimination included failure to meet basic project objectives, infeasibility, or inability to avoid significant environmental impacts.

Expansion of the Existing Heart & Surgical Hospital Alternative: This alternative evaluates expansion of the existing Heart & Surgical Hospital located at the northeast corner of Barton Road and New Jersey Street (approximately 2.3 miles east of the Project Site). The existing Heart & Surgical Hospital, owned by LLUH, is approximately 6.3 acres in size and is currently developed with an existing 70,000 square-foot hospital that includes 24 medical beds and 11 same-day surgery beds and related parking lot. Expansion of the existing on-site facility would require expanding the existing building in height, or expanding onto the property on the east, which occurs within the City of Redlands. In addition, adequate parking would also need to be developed.

Since only a hospital and parking structure would be required to replace the LLUH non-compliant portion of the existing hospital, this alternative would yield less impacts for air quality, cultural resources, hazards and hazardous materials than the Proposed Project developed on the Project Site. However, the alternative would not meet the Project's objectives of expanding the City of Loma Linda's economic base with medical support services, research facilities and professional offices, and upgrading the campus's infrastructure systems by providing new and improved services and facilities. This is because it is not known if the expansion property would be annexed to the City of Loma Linda. Therefore, this alternative was rejected for further consideration in the analysis.

6.3 ALTERNATIVES CONSIDERED FOR EVALUATION

The intent of a Project Alternatives evaluation is to identify ways to mitigate or avoid the significant effects that a project may have on the environment (CEQA 15126.6(b) and PRC Section 21002.1). The discussion shall focus on alternatives to the project or its location that avoid or substantially lessen significant effects even if these alternatives would impede to some degree the attainment of the project objectives or would be more costly. The alternatives need to be reasonable and feasible. They should be potentially feasible, accomplish most of the basic objectives of the project, and lessen one or more of the significant effects (CEQA 15126.6(c)).

The City has incorporated this rationale in its evaluation for selecting the alternatives presented. The following alternatives were considered and are included in the analysis herein:

- **No Project Alternative:** Continuation of the Proposed Project site in its current medical/university use and no facility upgrades.

- **Reduced Scale Alternative:** This alternative would reduce the project as proposed by eliminating one or more uses, or by reducing the size of one or more of the proposed uses. Reducing the size of the proposed new hospital or parking structure could reduce LLUH's ability to provide medical care since by definition the hospital and parking structure must be of a certain size to continue to provide these services. Therefore, eliminating other uses on-site would be more realistic and feasible.

6.4 EVALUATION OF ALTERNATIVES

6.4.1 No Project Alternative

Under this alternative, the Proposed Project would not be developed. The existing 23.8-acre Project Site (including the Elmer Digneo City Park) would remain in its current state. In 2020, in accordance with California's SB 1953 Hospital Seismic Safety Act, the 1967 portion of the existing hospital would become seismically non-compliant. It is this portion of the hospital that would require vacation and there would be no replacement hospital to serve the adult and a portion of the children's population. Similarly, the No Project Alternative would not include the necessary seismic separation to allow for the continued operation of the existing Children's Hospital and therefore, it too would be non-compliant with SB 1953. By 2020, the Project Site would be composed strictly of university facilities and no hospital facilities.

The No Project Alternative independently and in comparison to the Proposed Project is addressed briefly for each of the environmental impact topics consistent with the impact analysis conducted in Chapter 4.0 of this Program EIR. The discussion of impacts with potential significance is expanded to examine the potential for mitigation and comparison to the Proposed Project impacts.

Aesthetics

The Project Site includes the existing LLUH and its entireties (i.e., Medical Center, University, Dental School, etc.) and also includes an approximate 4-acre City park site (Elmer Digneo City Park) located to the north of the LLUH that may be used for siting a Southern California Edison (SCE) substation to serve the campus. The No Project Alternative would not have an impact on aesthetics and visual quality in the sense that no changes in the characteristics of the properties would occur.

Air Quality

Under this Alternative, structures and parking lots would not be constructed; therefore, construction related air quality impacts would not be created. However, overall emissions within the air basin would increase as patients, physicians, and other medical staff travel to other hospitals within the region. Therefore, the No Project Alternative could result in a potentially significant impact to air quality. Impacts would therefore be greater than those associated with the Proposed Project.

Cultural Resources

The City of Loma Linda is located within a geographical area generally described to the Serrano, a Native American population currently associated with the San Manuel Band of Mission Indians in Highland, San Bernardino County, California. A cultural resources report prepared for the Project concluded that although no formal reporting of Native American resources has occurred to date and the archaeological sensitivity of the project area is considered to be low, mitigation measures are still required to ensure potential resources would not be significantly impacted as a result of the Proposed Project. The No Project Alternative would not result in development of the site, including the Elmer Digneo City Park and unknown buried cultural resources would not be impacted.

Geology and Soils

Under the No Project/No Development Alternative, no grading or any other soil disturbing activities would occur that could result in soil erosion or runoff. Therefore, existing geologic conditions would remain unchanged and impacts would be less as compared to the Proposed Project.

Hazardous and Hazardous Materials

Under this alternative, no new hospital would not be constructed and existing uses requiring in-patient services (e.g. hospital overnight stay) would cease at the existing hospital and Children's Hospital and therefore impacts from the storage and transport of medical waste would be

reduced. Impacts would be less than the Proposed Project, although potentially significant impacts are reduced to less than significant levels with mitigation.

Hydrology and Water Quality

This Alternative would not result in construction of or an increase in impervious surfaces and the potential increase in urban pollutants such as oil and grease. Stormwater runoff would remain unchanged, and no new sources of urban pollutants would be generated.

Noise

The No Project Alternative would not result in a new source of noise, as conditions would remain unchanged. Impacts would be less than those associated with the Proposed Project although the Proposed Project's impacts are reduced to a level of less than significant with mitigation.

Greenhouse Gases/Climate Change

Under this Alternative, operational emissions from on-site activities would not occur, therefore, the No Project Alternative would have no impacts to greenhouse gases/climate change. Impacts would be less than those associated with the Proposed Project which remain significant and adverse after mitigation due to the power plant capacity increase and increase in emissions.

Utilities

Under this Alternative, no construction of the proposed medical center and university facilities would occur, and therefore no change in the demand for utilities would result. Impacts would be less than those associated with the Proposed Project although the Proposed Project's impacts are determined to be less than significant. Mitigation measures are recommended to reduce the impact of construction and demolition waste on landfills.

Conclusions

Although the No Project Alternative would be environmentally superior to the Proposed Project as most of the significant impacts would not occur, this alternative may result in greater traffic trips as patients would travel further for hospital services and ultimately a potential increase in air emissions within the SCAQMD basin. In additional, this alternative would not meet any of the project objectives. Finally, all potentially significant impacts associated with the Proposed Project are reduced to less than significant levels with mitigation; these are in the areas of aesthetics, cultural, geology and soils, greenhouse gases, hazardous materials, noise, and utilities.

6.4.2 Reduced Scale Alternative

The Reduced Scale Alternative involves eliminating the following:

- 90,000 square-foot Research Building
- 9,000 square-foot dental school addition

- Utility Plant Option 1 or 2
- SCE substation Option 1 or 2

The existing utility plant would be upgraded as necessary however there would be no increase in power generation. Future demands for additional power would be met through the existing SCE grid system.

The Reduced Scale Alternative would include the construction and operation of the new hospital and parking structure, and proposed new campus access and entry. Seismic separation would also take place to allow for the continued use of the existing Children's Hospital, and reuse of the existing main hospital. This alternative would decrease upgrades and expansion square footage by 147,000 square feet or about 13 percent. The remainder of the site would continue to be utilized in its current developed state.

Aesthetics

The Reduced Scale Alternative would not reduce the proposed height of either the new hospital or parking structure. The elimination of the new Research Building, new or upgraded utility plant and SCE substation, and dental school addition would result in a slight decrease in the amount of light emitted from the Project Site. However, due to the location of existing residential development (south and east of the proposed new hospital and parking structure), this alternative would have a similar overall aesthetic effect which could be reduced with mitigation as recommended for the Proposed Project.

Air Quality

The Reduced Scale Alternative would involve a decrease in new or upgraded building square footage by approximately 13 percent within the Project Site. Fewer buildings being constructed and/or upgraded at the Project Site would result in lower construction emissions and thereby, a decrease in the total air emissions from less use of construction equipment and a decrease in the amount of workers traveling to and from the site. Replacing the existing power plant equipment and increasing capacity under the Proposed Project would result in less air quality emissions than those associated with the old, inefficient power plant. However, continuing use of the old plant under the Reduced Scale Alternative would not result in the need for an analysis of emissions as the existing plant is currently permitted. Under this alternative, construction emissions would be slightly less than those identified for the Proposed Project and operational emissions would still be considered less than significant.

Cultural Resources

The Reduced Scale Alternative involves eliminating 13 percent of the Proposed Project's new and upgraded facility square footage. Although construction of both the new hospital and parking structure would still take place and most of the mitigation required for the Proposed Project (CR-1, CR-2 and CR-5 and CR-6) would be required for this alternative, mitigation measures CR-3 and CR-4, which requires submittal of recordation in the event historical structures are demolished or altered, would not be required as no upgrades, demolition or expansion of these

buildings (i.e., Evans Hall, Risley Hall, Housekeeping Building) would result. Under this alternative, the impact to cultural resources would be less than the Proposed Project.

Geology and Soils

Although this Alternative involves reduction of the total building square footage by 13 percent, similar amount of soil disturbing and grading activities would occur at the Project Site to accommodate the reduced size development. Similar impacts would occur to geology and soils as assessed with the Proposed Project and as related to earth moving activities, grading, soil erosion, and site stability; impacts would be less than significant with mitigation incorporated.

Hazards and Hazardous Materials

This Alternative would result in transportation or storage of similar hazardous materials including medical wastes, which would be considered less than significant. Since the Reduced Scale Alternative would not include the demolition or remodeling of buildings constructed prior to 1968, the impact to hazards and hazardous materials would be less than the Proposed Project.

Hydrology and Water Quality

Under this alternative construction of the new hospital and parking structure would take place as would revisions to site's ingress and entry. All portions of the Project Site, with the exception of the Elmer Digneo City Park, are currently developed with structures, asphalt or other impervious surfaces. This alternative, like the Proposed Project, would be designed to include pervious surfaces greater than or equal to the existing condition to maintain consistency with the pre-developed condition. Impacts associated with stormwater runoff and water quality would be slightly less as no development (Option 1 SCE substation) would occur on Elmer Digneo City Park. However, this alternative would still require a Storm Water Pollution Prevention Plan for areas of disturbance exceeding one acre and implementation of Best Management Practices similar to the Proposed Project as new construction would still occur. Impacts for this alternative therefore are slightly less than the Proposed Project and would be less than significant with mitigation measures.

Noise

This alternative would reduce the Proposed Project's development square footage by approximately 13 percent and would include the elimination of the Research Building, new or upgraded SCE substation and new or retrofitted utility plant, and addition to the Dental School. This alternative would result in no impacts for construction noise and operation noise associated with the development of the new or retrofitted utility plant and SCE substation. No impacts for construction noise associated with the development of the Research Building and Dental School addition would result. No long-term noise associated with the Research Building and Dental School addition would result. However, temporary construction impacts and long-term operation impacts for noise would be the same as the Proposed Project for the parking structure and new hospital building. Impacts would be the less than the Proposed Project but would also be mitigated to a less than significant level.

Under this Alternative, Mitigation Measures N-1 and N-2, which would require the use of a sound barrier and submittal of a noise control plan for the construction of the new utility plant (Option 1), would not be required. Impacts from construction of the hospital would require implementation of Mitigation Measures N-3 and N-4 similar for the Proposed Project to reduce noise levels for residential units along the eastern boundaries of the Project site. With the reduction of required mitigation measures, noise impacts would be less for this Alternative as compared to the Proposed Project.

Greenhouse Gases

The Reduced Scale Alternative would involve the elimination of the new or upgraded utility plant and SCE substation, Research Building and Dental School addition. With the elimination of the new or upgraded utility plant, impacts from greenhouse gas emissions would be less than the Proposed Project because the power plant would remain at a size of 10MW. Under this alternative, the new hospital would continue to operate with the use of the existing power plant and this would in turn result in a lower total greenhouse gas emissions from operation of a smaller plant. Under this alternative, localized greenhouse gas emissions would be less than those identified for the Proposed Project which is significant even after implementation of mitigation measures.

Utilities

Under this Alternative, impacts would be the similar as for the Proposed Project as the new hospital and parking structure would not be reduced in size or eliminated under this Alternative. The reduction in impacts to utilities including water and sewer associated with the Research Building and Dental School Addition would be minimal and therefore impacts under this alternative would remain less than significant. Impacts associated with the generation of construction and demolition materials would be less than significant with mitigation incorporated as determined for the Proposed Project. Similarly to the Proposed Project, this alternative would be designed to include pervious surfaces greater than or equal to the existing condition to maintain consistency with the pre-developed condition.

Conclusions

Although the Reduced Scale Alternative would result in reduced impacts to Air Quality, Cultural Resources, Greenhouse Gases, Hazards and Hazardous Materials, Hydrology and Water Quality, and Noise, this alternative would not meet the project's objectives to the same extent as the Proposed Project for providing a safe and modern university for students by upgrades and creation of new facilities, increasing the City's economic base with medical support services, research facilities, and professional offices; upgrading the campus's infrastructure systems by providing new and improved services and facilities; and providing a more self-reliant utility source in the event of an emergency.

6.5 SUMMARY OF ALTERNATIVES ANALYSIS

Table 6-1 summarizes the impacts to each resource area for the two alternatives that were carried forward for analysis.

Table 6-1
Summary of Impacts for Each Alternative

Environmental Issues/Effects	No Project/No Development Alternative	Reduced Scale Alternative
Aesthetics	No Impact	Less Than Significant with Mitigation
Air Quality	No Impact	Less Than Significant
Cultural Resources	No Impact	Less Than Significant with Mitigation
Geology and Soils	No Impact	Less Than Significant with Mitigation
Hazards and Hazardous Material	No Impact	Less Than Significant with Mitigation
Hydrology and Water Quality	No Impact	Less Than Significant
Noise	No Impact	Less Than Significant with Mitigation
Greenhouse Gas/Climate Change	No Impact	Less Than Significant
Utilities	No Impact	Less Than Significant with Mitigation

Table 6-2 shows the impact levels of the alternatives as compared to those impacts for the Proposed Project. The two alternatives have impact levels similar to or greater than the Proposed Project and a few impacts levels are less than the Proposed Project.

Table 6-2
Impact Comparison of Proposed and Alternative Projects

Environmental Issues	Proposed Project	No-Project/ No-Development Alternative	Reduced Scale Alternative
Aesthetics	Less Than Significant with Mitigation	Less Impact	Similar Impact
Air Quality	Less Than Significant	Less Impact	Less Impact
Cultural Resources	Less Than Significant with Mitigation	Less Impact	Less Impact
Geology and Soils	Less Than Significant with Mitigation	Less Impact	Similar Impact
Hazards and Hazardous Materials	Less Than Significant with Mitigation	Less Impact	Less Impact
Hydrology and Water Quality	Less Than Significant	Less Impact	Similar Impact
Noise	Less Than Significant with Mitigation	Less Impact	Less Impact
Greenhouse Gases	Would Remain Potentially Significant after Mitigation	Less Impact	Less Impact
Utilities	Less Than Significant with Mitigation	Less Impact	Similar Impact
Overall Impact	Would Remain Potentially Significant after Mitigation	**Less Impact**	**Less Impact**

Notes:
Less than Significant – If all impacts were identified as less than significant, after mitigation, as discussed in Chapter 4.0.
No Impact – No impact would occur.
Similar to Proposed Project – Level of significance is similar to the Proposed Project.
Greater than Proposed Project – Level of significance is greater as compared to the Proposed Project.
Less than Proposed Project – Level of significance is less as compared to the Proposed Project, but not necessarily to a less-than significant level or no impact level.

6.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Based on the evaluation of the two alternatives in this section, implementation of the No Project Alternative would result in fewer impacts than the Proposed Project but would not meet project objectives. The Reduced Scale Alternative would have less impacts than the Proposed Project, and impacts would be considered either less than significant or less than significant with mitigation for the Reduced Scale Alternative. Impacts related to Greenhouse Gases, associated

with the cogeneration power plant portion of the utility plant, remain significant even after implementation of mitigation measures, thereby resulting in the need for Overriding Considerations to be adopted with project approval.

The Reduced Scale Alternative would not meet the objectives of providing a safe and modern university for students by providing upgrades and creation of new facilities, or increasing the City's economic base with new medical support services, research facilities, and professional offices. In addition, the Reduced Scale Alternative would not upgrade the campus's infrastructure systems by providing new and improved services and facilities, and it would not meet the objective of providing a more self-reliant energy source in the event of an emergency.

Based on the summary provided above, the No Project Alternative would be considered the Environmentally Superior Alternative. However, under CEQA, another alternative must be selected as Environmentally Superior if in fact the "No Project" alternative is identified as such. For the proposed LLUH Master Plan Project, the Environmentally Superior Alternative would be the Reduced Scale Alternative.

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7.1 LIST OF EIR PREPARERS

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