UCI

FINAL

TIERED INITIAL STUDY &

MITIGATED NEGATIVE DECLARATION

Middle Earth Expansion

January 2017

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1.0 PROJECT INFORMATION

1.1 Project Title

Middle Earth Expansion

1.2 Lead Agency Name and Address

University of California, Irvine
Office of Environmental Planning and Sustainability
4199 Campus Drive, Suite 380, Irvine, CA 92697-2325

1.3 Contact Person and Phone Number

Richard Demerjian, Assistant Vice Chancellor
(949) 824-7058

1.4 Project Location

The University of California, Irvine (UCI) is located in the city of Irvine, Orange County, California approximately four miles inland from the Pacific Ocean (see Exhibit 1-1). The Middle Earth student housing complex is located in the Academic Core with Ring Mall to the west, Brandywine Service Road to the north, Engineering Service Road to the south, and East Peltason Drive to the east.

1.5 Custodian of the Administrative Record

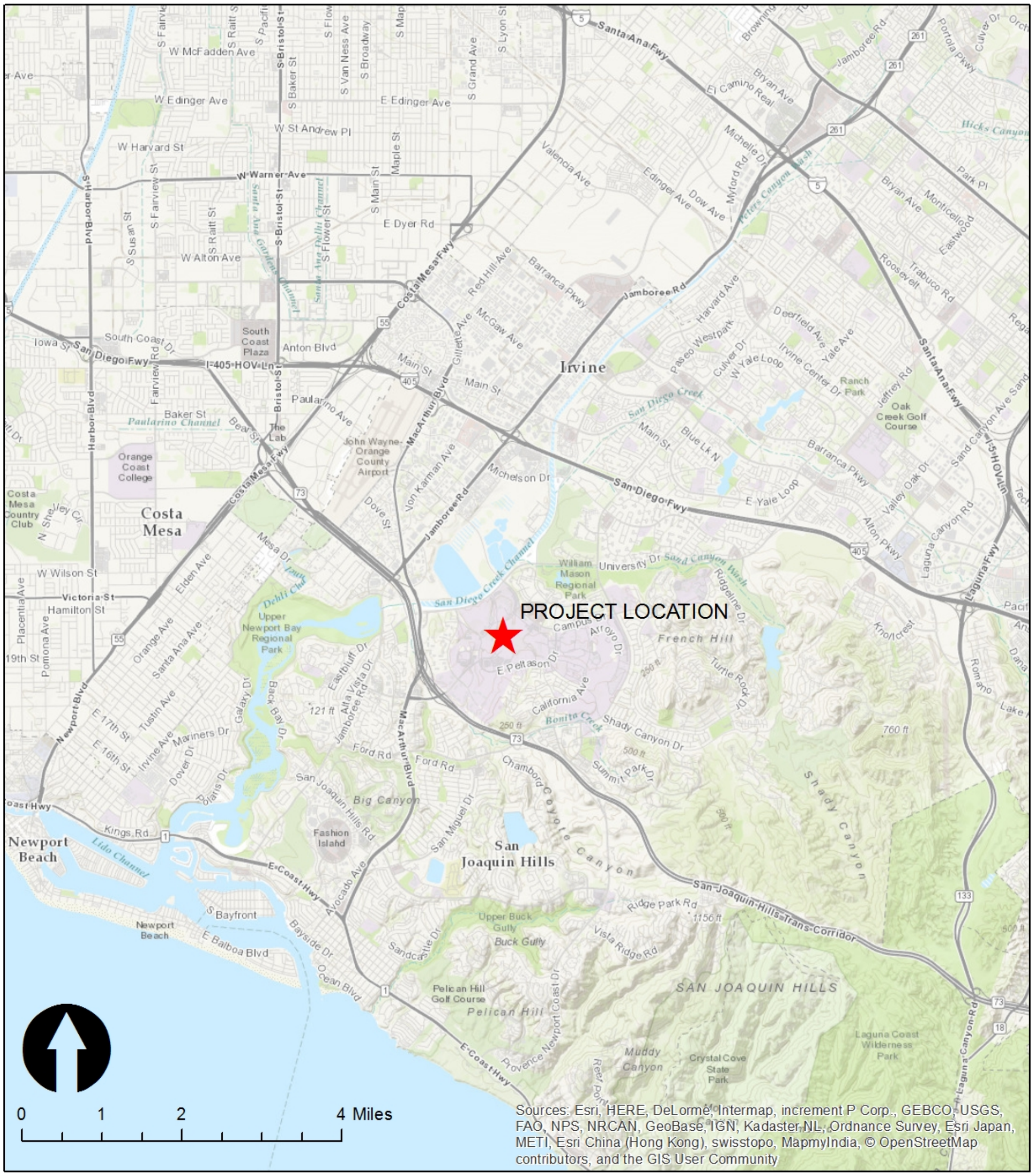
University of California, Irvine
Office of Environmental Planning and Sustainability
4199 Campus Drive, Suite 380, Irvine, CA 92697-2325

1.6 Documents Incorporated by Reference

The University of California, Irvine Long Range Development Plan (LRDP, UCI, 2007) is a comprehensive land use plan that guides campus growth based on projections through horizon year 2026. It provides policies and guidelines to support key academic and student life goals, identifies development objectives, delineates campus land uses, and estimates new building space needed to support project program expansion.

The Long Range Development Plan Environmental Impact Report (LRDP EIR, PBS&J, 2007) analyzes potential environmental impacts associated with the implementation of the 2007 LRDP pursuant to CEQA Guidelines Sections 15152 and 15168. This document is used to tier subsequent environmental analysis, including this Initial Study/Mitigated Negative Declaration (IS/MND), for campus development.

Exhibit 1-1
Regional Location



2.0 PROJECT DESCRIPTION

2.1 Environmental Setting and Surrounding Land Uses

Phases 1 and 2 of the proposed project are located in the existing Middle Earth student housing complex located in the Academic Core on the University of California, Irvine (UCI) campus. Surrounding on-campus uses from the Phase 1 project site include Social Ecology I to north; Social Science Hall and Social Science Lab to the west; Middle Earth housing to the east; and the Engineering/Information and Computer Science Quad to the south. University Extension ESL Office, D, and H lie to the north and Middle Earth housing lies to the west, east, and south of the Phase 2 project site (see Exhibits 2-1 and 2-2).

2.2 Description of Project

Phase 1 would demolish the existing 11,200-gross-square-foot (GSF) Brandywine Dining Commons and Student Center located in the existing Middle Earth student housing complex. A seven-story, approximately 240,000 GSF structure with 143,000 assignable square feet (ASF) would be constructed on the 2.2-acre site (see Exhibit 2-3). The lower two floors of the structure would include an approximately 35,000 ASF dining facility, 14,000 ASF of community facilities, and 12,000 ASF of support and ancillary space. The top five floors would include 500 student beds within double and triple occupancy rooms and associated dormitory facilities, such as lounges, laundry, kitchenettes, and bathrooms totaling approximately 82,000 ASF. Approximately 10,000 ASF of outdoor space, including 230 seats for dining and a loading dock, would also be constructed. The existing Brandywine Service Road would be modified to connect to Ring Road to increase fire access usability, and widened adjacent to the proposed loading dock to allow for a 65-foot truck turn-around for on-site deliveries (see Exhibits 2-4 and 2-5).

Phase 2 would remodel the existing 10,500 GSF Pippin Commons from a dining facility to a recreation center, which would house part of the displaced uses from the Brandywine Commons and Student Center demolition. The remaining displaced uses would be housed in the seven-story structure after completion of Phase 1.

Per Section A, Green Building Design, of the UC Sustainable Practices Policy, the proposed project would meet or exceed LEED Silver equivalency and the California Green Building Standards Code (Cal Green). The project would incorporate measures resulting in significant energy savings, construction waste reduction, recycled material use, and water conservation. Such features would include an overall energy efficiency that exceeds California Title 24 criteria by at least 20 percent. To achieve this goal, the design-build team would evaluate and explore the following measures, including, but not limited to: photovoltaics, radiant floor heating and cooling, passive and active chilled beams, energy efficient lighting, living walls, rainwater collection, greywater collection and reuse, natural cross ventilation, solar water heating, life cycle analysis of building materials, sustainable landscaping, high-performance glazing, insulation and radiant barrier, high reflectance roofing materials, energy control systems, efficient exhaust fans, and high efficiency air conditioning equipment where applicable.

Exhibit 2-1
Project Location and Adjacent Land Uses

Exhibit 2-2
Existing Project Views, Phase 1

View 1: Northwest corner of site boundary looking southeast toward existing Brandywine Dining Commons and Student Center on project site.

View 2: Western site boundary looking northwest toward Ring Road and Social Science Hall.

View 3: Southwest corner of site boundary looking southwest toward Ring Road.

View 4: Southwest corner of site boundary looking northeast toward project site.

View 5: Southeast corner of site boundary looking northwest toward project site.

View 6: Eastern site boundary looking southeast toward Lorien, an existing Middle Earth student housing structure.

View 7: Northeast corner of site boundary looking northeast toward Brandywine Service Drive.

View 8: Northern site boundary looking southwest toward project site.

View 9: Northern site boundary looking northwest toward project site, Ring Road, and Social Science Laboratory.

Exhibit 2-2 (continued)
Existing Project Views, Phase 2

View 10: Northern site boundary looking northeast toward Brandywine Service Road.

View 11: Western site boundary looking northeast toward existing Pippin Commons on project site.

View 12: Southeast corner of site boundary looking northwest toward project site.

Exhibit 2-3
Conceptual Site Plan

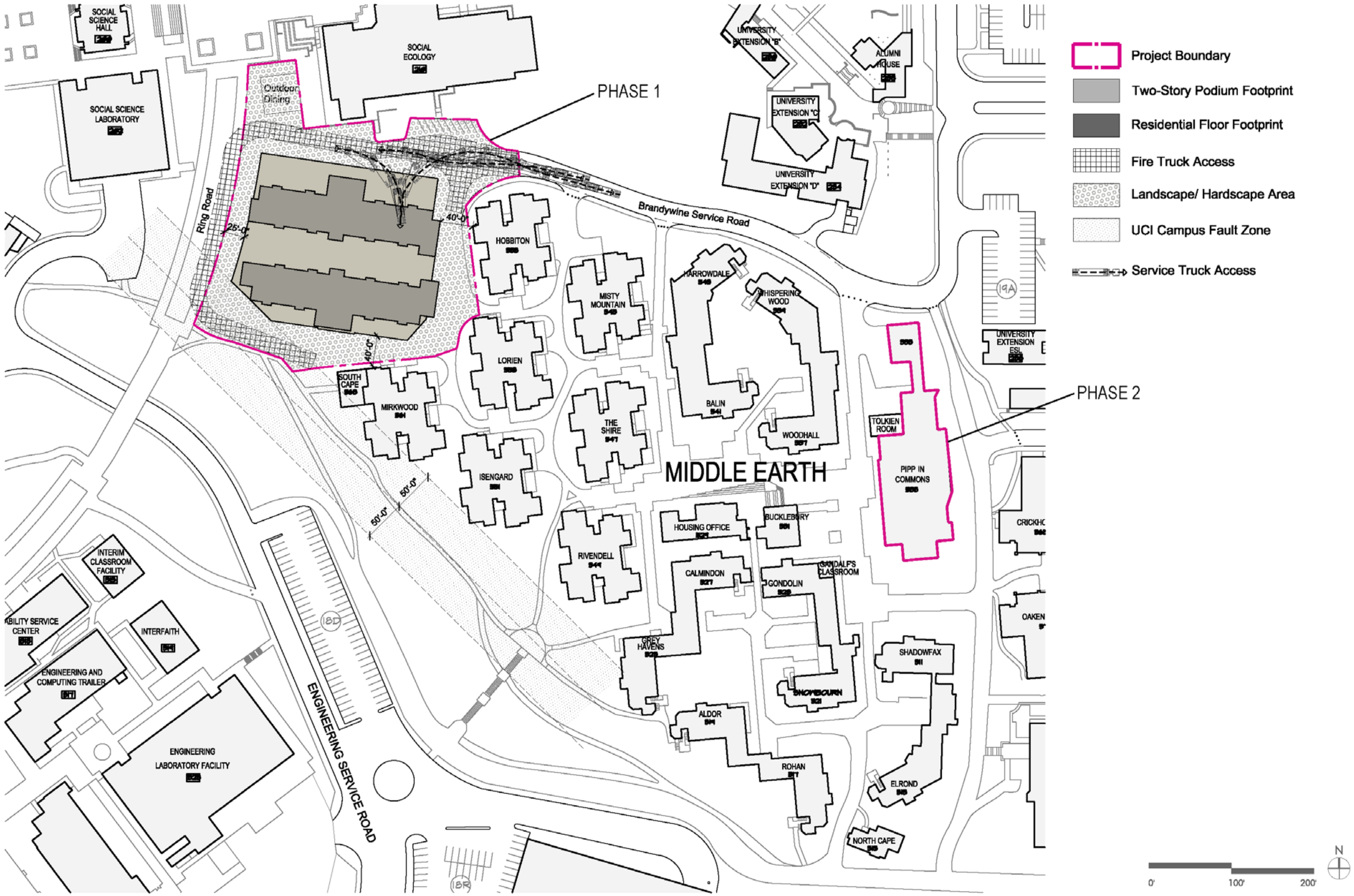


Exhibit 2-4
Conceptual Massing

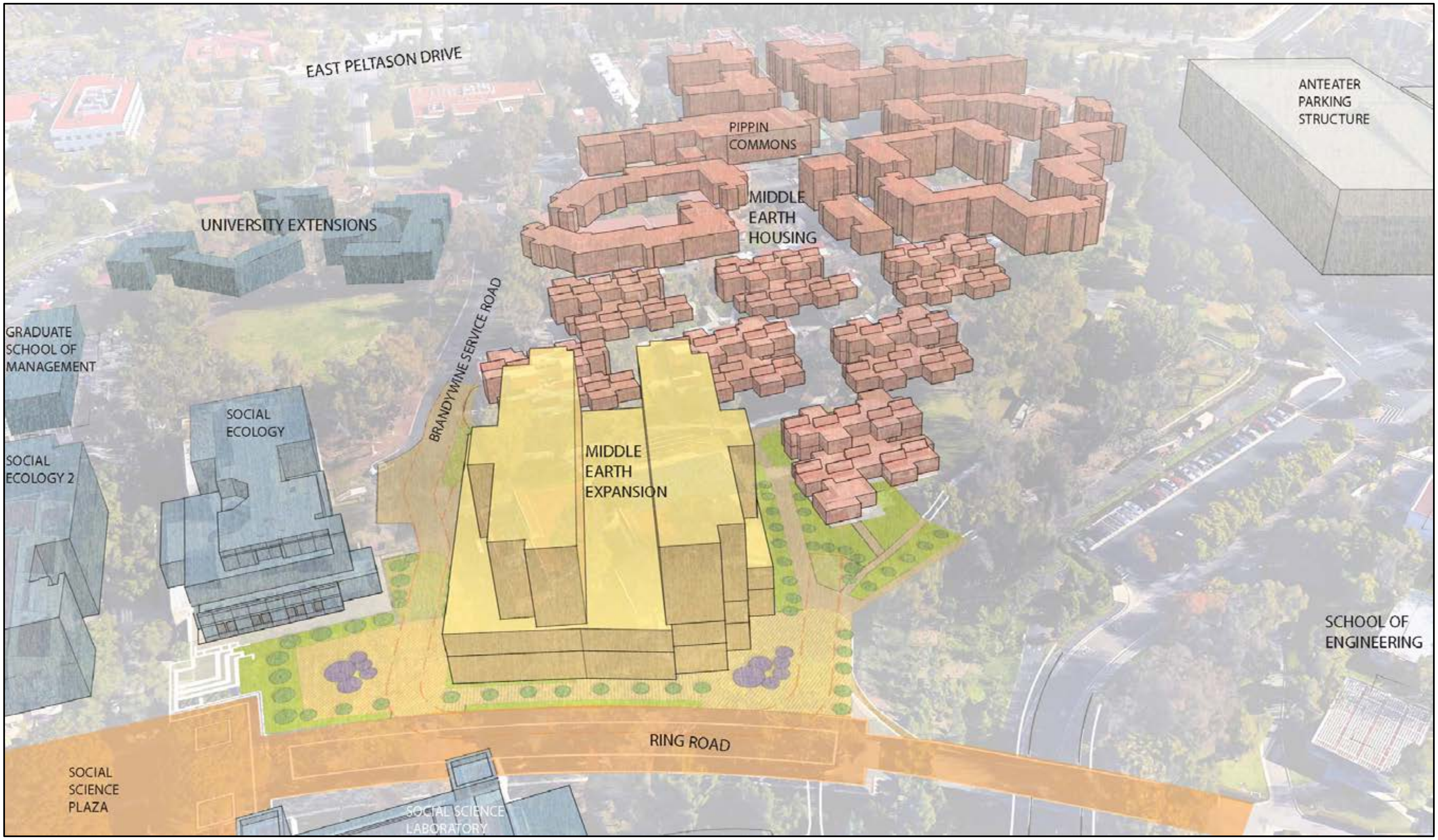


Exhibit 2-5
Conceptual Elevations

Exhibit 2-5 (continued)
Conceptual Elevations

Construction and operation of the proposed project would increase the amount of greenhouse gas emissions generated by the campus. However, as discussed further in Section 4.6, Greenhouse Gas Emissions, the project would not impede the campus' ability to reduce emissions as required by the Carbon Neutrality Initiative and Section A of the UC Sustainable Practices Policy.

Operation of the proposed dining hall would comply with Section H, Sustainable Foodservices, of the UC Sustainable Practices Policy. UCI Hospitality & Dining in conjunction with Aramark reached 26 percent sustainable food purchased in 2015, which exceeds the 2020 goal by six percent. As the new dining hall would replace the demolished Brandywine and converted Pippin Commons, changes in the sources of food would be minimal, if any.

2.2.1 Project Phasing and Site Development

Phase 1 construction is anticipated to begin in July 2017 and would occur over 25 months with an anticipated opening in Fall 2019. Demolition would occur over the first eight weeks, grading over the next eight, and construction during the final 96. Total estimated export of on-site earthwork would be approximately 1,500 cubic yards. Demolition of the project site includes the existing on-site 11,200 GSF Brandywine Dining Commons and Student Center, hardscaping, and ornamental vegetation. No pile driving or excavation of sedimentary rock other than topsoils would occur. Phase 2, interior remodeling of Pippin Commons, would begin after Phase 1 in August 2019 with an estimated completion date of February 2020.

Appropriate acoustical and visual buffers, as determined during the final design stage, would be utilized during construction to minimize potential project related aesthetic and/or noise impacts to existing sensitive receptors.

2.2.2 Access

A construction staging plan has not been completed at this time; however, staging would occur on or adjacent to the project site. Site access and haul routes during construction would be along East Peltason and Pereira Drives to the improved Brandywine Service Drive. Operational vehicle access would occur via West Peltason Drive and Mesa Road. Existing Lot 18R and Anteater Parking Structure to the south of the project site, which connects to the internal campus roadway network through East Peltason Drive, would be utilized for staff and student parking.

On-site pedestrian and bicycle access would be modified as part of the project, but connections from Ring Road to the east portion of the Middle Earth housing complex would be retained.

2.2.3 Utilities

A finalized stormwater drainage plan has not been completed at this time because the project is design-build; however, existing hydrology patterns on the site would be maintained to the extent practical as determined during the project's final design stage in compliance with the Regional Water Quality Control Board – Santa Ana Region (RWQCB) standards and the Storm Water

Pollution Prevent Plan (SWPPP). A new storm drain is anticipated to run along the western side of the structure and connect to the existing campus storm drain system.

A finalized utility plan for electrical; domestic, sanitary sewer, fire, and irrigation water; telecommunication; and gas would be completed prior to construction by the design-build team. If any existing connections conflict with the project design, the design-build team would provide alternative and/or temporary utilities to all adjacent structures during relocation.

2.3 Consistency with the LRDP

The applicable land use plan is the 2007 LRDP and the University is the only agency with land use jurisdiction over projects located on the campus. As stated above, the project sites for Phases 1 and 2 are designated Student Housing in the 2007 LRDP, which allows for residential facilities for undergraduate and graduate students, recreation facilities, meeting space, and other residential support uses. Phase 1 would construct new dormitory, dining, and community facilities and support space; Phase 2 would remodel the existing Pippin Commons into a recreational facility. Therefore, the proposed project is consistent with the 2007 LRDP.

Although the proposed project would increase the number of beds analyzed within the Academic Core for the 2007 LRDP EIR, it shifts beds that otherwise would have been constructed in the East Campus. The project is consistent with the total overall on-campus student bed count analyzed in the 2007 LRDP EIR.

2.4 Discretionary Approval Authority and Other Public Agencies Whose Approval Is Required

<u>University of California</u>

As a public agency principally responsible for approving or carrying out the proposed project, the University of California is the Lead Agency under CEQA and is responsible for reviewing and certifying the adequacy of the environmental document and approving the proposed project. The Board of Regents of the University of California (The Regents) would consider design and CEQA approval of the proposed project in January 2017.

3.0 DETERMINATION

On the basis of the initial study that follows:

	I find that the proposed project meets the criteria for the Section 15332 In-Fill Development Project Class 32 exemption and is CATEGORICALLY EXEMPT from the provisions of CEQA.
	I find that the proposed project WOULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
X	I find that although the proposed project could have a significant effect on the environment, the project impacts were adequately addressed in an earlier document or there will not be a significant effect in this case because revisions in the project have been made that will avoid or reduce any potential significant effects to a less than significant level. A MITIGATED NEGATIVE DECLARATION will be prepared.
	I find that the proposed project MAY have a significant effect on the environment. An ENVIRONMENTAL IMPACT REPORT will be prepared.

Signature: ____________________ Date: 1·10·17

Printed Name: ____________________ For: ____________________

4.0 EVALUATION OF ENVIRONMENTAL IMPACTS

The University has defined the column headings in the Initial Study checklist as follows:

- **"Potentially Significant Impact"** is appropriate if there is substantial evidence that the project's effect may be significant. If there are one or more "Potentially Significant Impacts," a Project EIR will be prepared.
- **"Project Impact Adequately Addressed in LRDP EIR"** applies where the potential impacts of the proposed project were adequately addressed in the LRDP EIR and mitigation measures identified in the LRDP EIR will mitigate any impacts of the proposed project to the extent feasible. All applicable LRDP EIR mitigation measures are incorporated into the project as proposed. The impact analysis in this document summarizes and cross-references (including section/page numbers) the relevant analysis in the LRDP EIR.
- **"Less Than Significant with Project-level Mitigation Incorporated"** applies where the incorporation of project-specific mitigation measures will reduce an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." All project-level mitigation measures must be described, including a brief explanation of how the measures reduce the effect to a less than significant level.
- **"Less Than Significant Impact"** applies where the project will not result in any significant effects. The effects may or may not have been discussed in the LRDP EIR. The project impact is less than significant without the incorporation of LRDP or project-level mitigation.
- **"No Impact"** applies where a project would not result in any impact in the category or the category does not apply. Information is provided to show that the impact does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer may be based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project specific screening analysis).

4.1 Aesthetics

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Have a substantial adverse effect on a scenic vista?					**X**
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?					**X**
c) Substantially degrade the existing visual character or quality of the site and its surroundings?					**X**
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?		**X**			

Discussion

Aesthetics issues are discussed in Section 4.1 of the 2007 LRDP EIR.

a) Scenic Vista: No Impact

There are no identified scenic vistas surrounding the project sites or anywhere else on campus (LRDP EIR, page 4.1-6). The proposed project would in-fill the existing Middle Earth student housing complex with additional dormitory and related facilities. Furthermore, the project sites are located in the Academic Core, which has been previously built-out with compatible uses consisting of academic buildings and support structures, including residential. Therefore, the proposed project would not affect a scenic vista and no impact would occur. No mitigation is required.

b) Scenic Resources within a State Scenic Highway: No Impact

The California Scenic Highway Mapping System indicates that there are no Officially Designated State Scenic Highways located within proximity to the project site.[1] The closest Eligible State Scenic Highway – Not Officially Designated, Pacific Coast Highway, is located approximately three miles southwest. Therefore, the proposed project would not affect scenic resources within a state highway and no impact would occur. No mitigation is required.

c) Visual Character: No Impact

As discussed in 4.1(a), the proposed project is located in the Academic Core, which mainly consists of academic buildings and support structures, including residential uses. The construction of infill dormitory and related uses within the Middle Earth student housing complex would be compatible with the existing use. Therefore, the proposed project would not significantly impact the surrounding visual character and no impact would occur. No mitigation is required.

d) Light or Glare: Project Impact Adequately Addressed in the LRDP EIR

The proposed project would include outdoor lighting to provide safe levels of illuminations for pedestrians and bicyclists, such as exterior building mounted fixtures. However, the project sites, which have been previously developed, already includes existing sources of light and the increase in ambient levels would be negligible. Furthermore, all outdoor surfaces would be designed in accordance with mitigation measure Aes-2A, and a lighting plan would be approved during pre-construction in accordance with mitigation measure Aes-2B. Therefore, with implementation of LRDP EIR mitigation measures Aes-2A and Aes-2B, potential impacts due to the creation of light and glare would be reduced to a less than significant level.

Mitigation Measures

Aes-2A: Prior to project design approval for future projects that implement the 2007 LRDP, UCI shall ensure that the projects include design features to minimize glare impacts. These design features shall include use of non-reflective exterior surfaces and low-reflectance glass (e.g., double or triple glazing glass, high technology glass, low-E glass, or equivalent materials with low reflectivity) on all project surfaces that could produce glare.

Aes-2B: Prior to approval of construction documents for future projects that implement the 2007 LRDP, UCI shall approve an exterior lighting plan for each project. In accordance with UCI's Campus Standards and Design Criteria for outdoor lighting, the plan shall include, but not be limited to, the following design features:

- Full-cutoff lighting fixtures to direct lighting to the specific location intended for illumination (e.g., roads, walkways, or recreation fields) and to minimize stray light

[1] http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm. Accessed October 6, 2016.

spillover into adjacent residential areas, sensitive biological habitat, and other light-sensitive receptors;

- Appropriate intensity of lighting to provide campus safety and security while minimizing light pollution and energy consumption; and
- Shielding direct lighting within parking areas, parking structures, or roadways away from adjacent residential areas, sensitive biological habitat, and other light-sensitive receptors through site configuration, grading, lighting design, or barriers such as earthen berms, walls, or landscaping.

4.2 Air Quality

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?					X
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			X		
c) 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)?			X		
d) Expose sensitive receptors to substantial pollutant concentrations?				X	
e) Create objectionable odors affecting a substantial number of people?				X	

Discussion

Air quality issues are discussed in Section 4.2 of the 2007 LRDP EIR. A project-specific Air

Quality Assessment was prepared by Michael Baker International, Inc. and is included as Appendix A.

a) Air Quality Management Plan Consistency: No Impact

On December 7, 2012, the South Coast Air Quality Management District (SCAQMD) Governing Board approved the 2012 Air Quality Management Plan (AQMP), which outlines its strategies for meeting the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM) 2.5 and ozone. The 2012 AQMP was forwarded to California Air Resources Board (CARB) for inclusion into the California State Implementation Plan (SIP) in January 2013. Subsequently, the 2012 AQMP was submitted to the Environmental Protection Agency (EPA) as the 24-hour PM2.5 SIP addressing the 2006 PM2.5 NAAQS and as a limited update to the approved 8-hour ozone SIP. The 1-hour ozone attainment demonstration and vehicle miles traveled (VMT) emissions offset demonstration was submitted through CARB to the EPA. According to the SCAQMD's 2012 AQMP, two main criteria must be addressed.

Criterion 1:

With respect to the first criterion, SCAQMD methodologies require that an air quality analysis for a project include forecasts of project emissions in relation to contributing to air quality violations and delay of attainment.

a) Would the project result in an increase in the frequency or severity of existing air quality violations?

Since the consistency criteria identified under the first criterion pertain to pollutant concentrations, rather than to total regional emissions, an analysis of a project's pollutant emissions relative to localized pollutant concentrations is used as the basis for evaluating project consistency. As discussed in 4.2(d) below, localized concentrations of CO, NOX, PM10, and PM2.5 would be less than significant during project operations. Therefore, the proposed project would not result in an increase in the frequency or severity of existing air quality violations. Because reactive organic gases (ROGs) are not a criteria pollutant, there is no ambient standard or localized threshold for ROGs. Due to the role ROG plays in ozone formation, it is classified as a precursor pollutant and only a regional emissions threshold has been established.

b) Would the project cause or contribute to new air quality violations?

As discussed in 4.2(b) below, operations of the proposed project would result in emissions that would be below the SCAQMD operational thresholds. Therefore, the proposed project would not have the potential to cause or affect a violation of the ambient air quality standards.

c) Would the project delay timely attainment of air quality standards or the interim emissions reductions specified in the AQMP?

The proposed project would result in less than significant impacts with regard to localized concentrations during project operations. Therefore, the proposed project would not delay the timely attainment of air quality standards or 2012 AQMP emissions reductions.

Criterion 2:

With respect to the second criterion for determining consistency with SCAQMD air quality policies, it is important to recognize that air quality planning within the Basin focuses on attainment of ambient air quality standards at the earliest feasible date. Projections for achieving air quality goals are based on assumptions regarding population, housing, and growth trends. Thus, the SCAQMD's second criterion for determining project consistency focuses on whether or not the proposed project exceeds the assumptions utilized in preparing the forecasts presented in the 2012 AQMP. Determining whether or not a project exceeds the assumptions reflected in the 2012 AQMP involves the evaluation of the three criteria outlined below.

a) Would the project be consistent with the population, housing, and employment growth projections utilized in the preparation of the AQMP?

In the case of the 2012 AQMP, several sources of data form the basis for the projections of air pollutant emissions including: the City of Irvine General Plan (General Plan), UCI's 2007 Long Range Development Plan (LRDP), Southern California Association of Governments (SCAG) Growth Management Chapter of the Regional Comprehensive Plan (RCP), and SCAG's 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). The RTP/SCS also provides socioeconomic forecast projections of regional population growth. The General Plan Land Use Map designates the project site as "Educational Facilities", and the LRDP designates the site as Student Housing. According to the LRDP, the Student Housing designation permits residential facilities intended to accommodate single undergraduate and graduate students, student groups (including fraternities, sororities, and academically-themed collectives), students with families, and other University affiliates. Other permitted uses include residential parking, child care and preschool facilities, recreation facilities, meeting and classroom space, food service and retail, and other residential support uses. The project proposes to expand the existing undergraduate Middle Earth student housing with the addition of an approximately 240,000 GSF, seven-story structure. The project would provide dormitories, community facilities, and a dining area for UCI undergraduate students, and therefore complies with the site's intended use. Additionally, the project would be consistent with the City's General Plan and UCI's LRDP and assumed emissions for the project site, since no change in the site's land use designation is proposed. Thus, the project is generally consistent with the types, intensity, and patterns of land use envisioned for the site vicinity in the RCP. The population, housing, and employment forecasts, which are adopted by SCAG's Regional Council, are based on the local plans and policies applicable to the cities; these are used by SCAG in all phases of implementation and review. Additionally, as SCAQMD incorporated these same projections into the 2012 AQMP, it can be concluded that the project would be consistent with the projections. As a result, the project would not exceed growth assumptions within the City's General Plan. Therefore, the project would be consistent with the

2012 AQMP and a less than significant impact would occur.

b) Would the project implement all feasible air quality mitigation measures?

Compliance with all feasible emission reduction measures identified by the SCAQMD would be required as identified in 4.2(b) and 4.2(c) below. Therefore, the proposed project would meet this AQMP consistency criterion.

c) Would the project be consistent with the land use planning strategies set forth in the AQMP?

The project is consistent with the LRDP land use designations for the site and would serve to implement various LRDP policies. Compliance with emission reduction measures identified by the SCAQMD would be required as identified in 4.2(b) and 4.2(c) below. Therefore, the proposed project meets this AQMP consistency criterion.

In conclusion, the determination of 2012 AQMP consistency is primarily concerned with the long-term influence of a project on air quality in the Basin. The proposed project would not result in a long-term impact on the region's ability to meet State and federal air quality standards. Also, the proposed project would be consistent with the goals and policies of the AQMP for control of fugitive dust. Therefore, the proposed project would also be consistent with the SCAQMD and SCAG's goals and policies and the 2012 AQMP and no impact would occur. No mitigation is required.

b) Air Quality Standards: Less Than Significant Impact with Project-level Mitigation Incorporated

Short-term Construction

Short-term air quality impacts are predicted to occur during grading and construction operations associated with implementation of the proposed project. Temporary air emissions would result from the following activities:

- Particulate (fugitive dust) emissions from grading and building construction; and
- Exhaust emissions from the construction equipment and the motor vehicles of the construction crew.

Construction activities would include site preparation, grading, building construction, paving, and architectural coating. Site grading would require approximately 1,500 cubic yards of soil export off-site. Project construction equipment would include excavators, graders, dozers, scrapers, and tractors/loaders/backhoes during grading; rough terrain forklifts, generators, tractors/loaders/backhoes, and welders during building construction; pavers, paving equipment, and rollers during paving; and air compressors during architectural coating. Emissions for each construction phase have been quantified based upon the phase durations and equipment types. The analysis of daily construction emissions has been prepared utilizing the California Emissions Estimator Model (CalEEMod) version 2016.3.1. Table 4.2-1, Short-Term (Construction) Emissions, presents the anticipated daily short-term construction emissions.

Fugitive Dust Emissions

Construction activities are a source of fugitive dust (PM10 and PM2.5) emissions that may have a substantial, temporary impact on local air quality. In addition, fugitive dust may be a nuisance to those living and working in the project area. Fugitive dust emissions are associated with land clearing, ground excavation, cut-and-fill, and truck travel on unpaved roadways (including demolition as well as construction activities). Fugitive dust emissions vary substantially from day to day, depending on the level of activity, specific operations, and weather conditions. Fugitive dust from grading and construction is expected to be short-term and would cease upon project completion. Additionally, most of this material is inert silicates, rather than the complex organic particulates released from combustion sources, which are more harmful to health.

Table 4.2-1
Short-Term (Construction) Emissions

Emissions Source	Pollutant (pounds/day) [1, 2]					
	ROG[3]	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
2017						
Unmitigated Emissions	3.22	31.53	19.70	0.03	5.59	3.34
Mitigated Emissions	3.22	31.53	19.70	0.03	2.73	1.81
SCAQMD Thresholds	75	100	550	150	150	55
Is Threshold Exceeded After Mitigation?	**No**	**No**	**No**	**No**	**No**	**No**
2018						
Unmitigated Emissions	1.67	15.60	12.06	0.03	1.60	0.94
Mitigated Emissions	1.67	15.60	12.06	0.03	1.60	0.94
SCAQMD Thresholds	75	100	550	150	150	55
Is Threshold Exceeded After Mitigation?	**No**	**No**	**No**	**No**	**No**	**No**
2019						
Unmitigated Emissions	21.43	14.17	11.56	0.03	1.50	0.84
Mitigated Emissions	21.43	14.17	11.56	0.03	1.50	0.84
SCAQMD Thresholds	75	100	550	150	150	55
Is Threshold Exceeded After Mitigation?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:
1. Emissions were calculated using CalEEMod, as recommended by the SCAQMD.

2. The reduction/credits for construction emission mitigations are based on mitigation included in CalEEMod and as typically required by the SCAQMD. The mitigation includes the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; cover stock piles with tarps; water all haul roads twice daily; and limit speeds on unpaved roads to 15 miles per hour.
3. Both ROGs and VOCs are subsets of organic gases that are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. Although they represent slightly different subsets of organic gases, they are used interchangeably for the purposes of this analysis.

Dust (larger than 10 microns) generated by such activities usually becomes more of a local nuisance than a serious health problem. Of particular health concern is the amount of PM10 (particulate matter smaller than 10 microns) generated as a part of fugitive dust emissions. PM10 poses a serious health hazard alone or in combination with other pollutants. Fine Particulate Matter (PM2.5) is mostly produced by mechanical processes. These include automobile tire wear, industrial processes such as cutting and grinding, and re-suspension of particles from the ground or road surfaces by wind and human activities such as construction or agriculture. PM2.5 is mostly derived from combustion sources, such as automobiles, trucks, and other vehicle exhaust, as well as from stationary sources. These particles are either directly emitted or are formed in the atmosphere from the combustion of gases such as NOX and SOX combining with ammonia. PM2.5 components from material in the earth's crust, such as dust, are also present, with the amount varying in different locations.

Project-specific mitigation measure AQ-1 would require the project contractor to implement construction emissions Best Management Practices (BMPs) during construction, including, but not limited to, dust control techniques (i.e., daily watering), a traffic management plan, and adherence to SCAQMD Rules 402 and 403 (which require watering of inactive and perimeter areas, track out requirements, etc.), to reduce PM10 and PM2.5 concentrations. It is noted that the BMPs required in Mitigation Measure AQ-1 are applicable measures from LRDP EIR Mitigation Measure Air-2B. These are standard dust control measures that the SCAQMD requires for all projects. As indicated in Table 4.2-1, total PM10 and PM2.5 emissions would be below the SCAQMD threshold with the implementation of project-specific mitigation measure AQ-1. Therefore, particulate matter impacts during construction would be less than significant.

ROG Emissions

In addition to gaseous and particulate emissions, the application of asphalt and surface coatings creates ROG emissions, which are O3 precursors. In accordance with the methodology prescribed by the SCAQMD, the ROG emissions associated with paving have been quantified with CalEEMod. Architectural coatings were also quantified with CalEEMod based upon the size of the buildings.

The highest concentration of ROG emissions would be generated during the application of architectural coatings on the building. As required by law, all architectural coatings for the proposed project structures would comply with SCAQMD Regulation XI, Rule 1113 – Architectural Coating. Rule 1113 provides specifications on painting practices as well as regulates the ROG content of paint. As shown in Table 4.2-1, project construction would not result in an exceedance of ROG emissions during any years of construction. Therefore, impacts would be less than significant.

Construction Equipment and Worker Vehicle Exhaust

Exhaust emissions from construction activities include emissions associated with the transport of machinery and supplies to and from the project site, emissions produced on-site as the equipment is used, and emissions from trucks transporting materials to and from the site. Standard SCAQMD regulations, such as maintaining all construction equipment in proper tune, shutting down equipment when not in use for extended periods of time, and implementing SCAQMD Rule 403 would be adhered to. As noted in Table 4.2-1, construction equipment exhaust would not exceed SCAQMD thresholds. Therefore, impacts are less than significant.

Naturally Occurring Asbestos

Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos is classified as a known human carcinogen by State, Federal, and international agencies and was identified as a toxic air contaminant by the California Air Resources Board in 1986.

Asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have been commonly used for unpaved gravel roads, landscaping, fill projects, and other improvement projects in some localities. Asbestos may be released to the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. All of these activities may have the effect of releasing potentially harmful asbestos into the air. Natural weathering and erosion processes can act on asbestos bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed. According to the Department of Conservation Division of Mines and Geology, A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos Report (August 2000), serpentinite and ultramafic rocks are not known to occur within the project area. Thus, there would be no impact.

Construction Odors

Potential odors could arise from the diesel construction equipment used on-site, as well as from architectural coatings and asphalt off-gassing. Odors generated from the referenced sources are common in the man-made environment and are not known to be substantially offensive to adjacent receptors. Additionally, odors generated during construction activities would be temporary and would decrease rapidly. Therefore, construction odors are not considered to be a significant impact.

Total Daily Construction Emissions

In accordance with the SCAQMD Guidelines, CalEEMod was utilized to model construction emissions for ROG, NOX, CO, SOX, PM10, and PM2.5. Construction would occur over an approximate two year period with the greatest emissions being generated during the initial stages of construction. Additionally, the greatest amount of ROG emissions would typically occur during the final stages of development due to the application of architectural coatings.

CalEEMod allows the user to input mitigation measures such as watering the construction area to limit fugitive dust. Mitigation measures that were input into CalEEMod allow for certain reduction credits and result in a decrease of pollutant emissions. Reduction credits are based upon studies developed by CARB, SCAQMD, and other air quality management districts throughout California, and were programmed within CalEEMod. As indicated in Table 4.2-1, CalEEMod calculates the reduction associated with recommended mitigation measures.

Long-term Operational Emissions

Mobile Source Emissions

Mobile sources are emissions from motor vehicles, including tailpipe and evaporative emissions. Depending upon the pollutant being discussed, the potential air quality impact may be of either regional or local concern. For example, ROG, NOX, SOX, PM10, and PM2.5 are all pollutants of regional concern (NOX and ROG react with sunlight to form O3 [photochemical smog], and wind currents readily transport SOX, PM10, and PM2.5). However, CO tends to be a localized pollutant, dispersing rapidly at the source.

Project-generated vehicle emissions have been estimated using CalEEMod. Trip generation rates associated with the project were based on traffic data within the Middle Earth Housing Expansion Traffic Study (Traffic Study) for the proposed project, prepared by Stantec Consulting Services (dated November 2016). The proposed project would result in approximately 112 new daily trips. Table 4.2-2, Long-Term Air Emissions, presents the anticipated mobile source emissions. Unmitigated emissions generated by vehicle traffic associated with the proposed project would not exceed established SCAQMD regional thresholds.

Table 4.2-2
Long-Term Air Emissions

Source	**Estimated Emissions (pounds/day)[1]**					
	ROG	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Area Sources	3.31	0.00	0.06	0.00	0.00	0.00
Energy Sources	0.36	3.24	2.72	0.02	0.25	0.25
Mobile Sources	0.20	0.82	2.45	0.01	0.72	0.20
Total Emissions	3.87	4.06	5.23	0.03	0.97	0.45
SCAQMD Threshold	55	55	550	150	150	55
Is Threshold Exceeded? (Significant Impact)	**No**	**No**	**No**	**No**	**No**	**No**

Notes:
1. Based on CalEEMod modeling results, worst-case seasonal emissions for area and mobile emissions have been modeled.

Area Source Emissions

Area source emissions would be generated due to an increased demand for consumer products, architectural coating, and landscaping. The proposed project would not include wood burning fireplaces or other devices per SCAQMD Rule 445 (Wood Burning Devices). As shown in Table 4.2-2, unmitigated area source emissions from the proposed project would not exceed SCAQMD thresholds for ROG, NOX, CO, SOX, PM10, or PM2.5.

Energy Source Emissions

Energy source emissions would be generated as a result of electricity and natural gas (non-hearth) usage associated with the proposed project. The primary use of electricity and natural gas by the project would be for space heating and cooling, water heating, ventilation, lighting, appliances, and electronics. As shown in Table 4.2-2, unmitigated energy source emissions from the proposed project would not exceed SCAQMD thresholds for ROG, NOX, CO, SOX, PM10, or PM2.5.

In conclusion, as indicated in Table 4.2-2, unmitigated operational emissions from the proposed project would not exceed SCAQMD thresholds. As depicted in Table 4.2-1, construction emissions would be less than significant with implementation of project-specific mitigation measure AQ-1. Therefore, with implementation of project-specific mitigation measure AQ-1, project-related impacts to air emissions would be reduced to a less than significant level.

c) Cumulatively Considerable Net Increase of Any Criteria Pollutants: Less Than Significant Impact with Project-level Mitigation Incorporated

With respect to the proposed project's construction-related air quality emissions and cumulative Basin-wide conditions, the SCAQMD has developed strategies to reduce criteria pollutant emissions outlined in the 2012 AQMP pursuant to Federal Clean Air Act mandates. As such, the proposed project would comply with SCAQMD Rule 403 requirements, and implement all feasible mitigation measures (project-specific mitigation measure AQ-1). Rule 403 requires that fugitive dust be controlled with the best available control measures in order to reduce dust so that it does not remain visible in the atmosphere beyond the property line of the proposed project. In addition, the proposed project would comply with adopted 2012 AQMP emissions control measures. Per SCAQMD rules and mandates, as well as the CEQA requirement that significant impacts be mitigated to the extent feasible, these same requirements (i.e., Rule 403 compliance, the implementation of all feasible mitigation measures, and compliance with adopted AQMP emissions control measures) would also be imposed on construction projects throughout the Basin, which would include related projects.

As discussed previously, the proposed project would not result in long-term air quality impacts, as emissions would not exceed the SCAQMD adopted operational thresholds. Additionally, adherence to SCAQMD rules and regulations would alleviate potential impacts related to cumulative conditions on a project-by-project basis. Emission reduction technology, strategies, and plans are constantly being developed. As a result, the proposed project would not contribute a cumulatively considerable net increase of any nonattainment criteria pollutant. Therefore, with implementation of project-specific mitigation measure AQ-1, cumulative operational impacts associated with the proposed project would be reduced to a less than significant level.

d) Sensitive Receptors: Less Than Significant Impact

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis.

On-campus sensitive receptors near the project site include surrounding residences adjacent to the north, east, south, and west of the project site. In order to identify impacts to sensitive receptors, the SCAQMD recommends addressing localized significance thresholds (LSTs) for construction and operations impacts (area sources only). The CO hotspot analysis following the LST analysis addresses localized mobile source impacts.

Localized Significant Thresholds (LST)

LSTs were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the Final Localized Significance Threshold Methodology (dated June 2003 [revised 2008]) for guidance.

Construction

The SCAQMD guidance on applying CalEEMod to LSTs specifies the amount of acres a particular piece of equipment would likely disturb per day. Based on the SCAQMD guidance on applying CalEEMod to LSTs, the project would disturb at most one acre of land per day. Therefore, the LST thresholds for one acre was utilized for the construction LST analysis. The closest sensitive receptors to the project site are residential uses (existing Middle Earth student housing) that adjoin the project site to the east and south. These sensitive land uses may be potentially affected by air pollutant emissions generated during on-site construction activities. LST thresholds are provided for distances to sensitive receptors of 25, 50, 100, 200, and 500 meters. As the nearest sensitive uses adjoin the project site, the lowest available LST values for 25 meters were used. Table 4.2-3, Localized Significance of Construction Emissions, shows the localized unmitigated and mitigated construction-related emissions. It is noted that the localized emissions presented in Table 4.2-3 are less than those in Table 4.2-1 because localized emissions include only on-site emissions (i.e., from construction equipment and fugitive dust), and do not include off-site emissions (i.e., from hauling activities). As seen in Table 4.2-3, mitigated on-site emissions would not exceed the LSTs for SRA 20.

Table 4.2-3
Localized Significance of Construction Emissions

Source	Pollutant (pounds/day)[1]			
	NO_X	CO	PM_{10}	$PM_{2.5}$
2017				
Total Unmitigated On-Site Emissions[2,3]	30.68	18.89	5.42	3.29
Total Mitigated On-Site Emissions[2,3]	30.68	18.89	2.56	1.72
Localized Significance Threshold[1]	92	639	4	3
Thresholds Exceeded?	**No**	**No**	**No**	**No**
2018				
Total Unmitigated On-Site Emissions[4]	12.52	8.95	0.73	0.68
Total Mitigated On-Site Emissions[4]	12.52	8.95	0.73	0.68
Localized Significance Threshold[1]	92	639	4	3
Thresholds Exceeded?	**No**	**No**	**No**	**No**
2019				
Total Unmitigated On-Site Emissions[4]	11.26	8.72	0.63	0.59
Total Mitigated On-Site Emissions[4]	11.26	8.72	0.63	0.59
Localized Significance Threshold[1]	92	639	4	3
Thresholds Exceeded?	**No**	**No**	**No**	**No**

Notes:
1. The Localized Significance Threshold was determined using Appendix C of the SCAQMD Final Localized Significant Threshold Methodology guidance document for pollutants NO_X, CO, PM_{10}, and $PM_{2.5}$. The Localized Significance Threshold was based on the anticipated daily acreage disturbance for construction, the distance to sensitive receptors, and the source receptor area (SRA 20).
2. The Demolition Phase represents the worst case scenario for NO_X and CO.
3. The Grading Phase represents the worst case scenario for PM_{10}, and $PM_{2.5}$.
4. The Building Construction Phase represents the worst case scenario for NO_x, CO, PM_{10}, and $PM_{2.5}$.

Operations

For project operations, the two acre threshold was conservatively utilized, as the project site is approximately 2.2 acres As the nearest sensitive uses are adjacent to the project site, the most conservative LST values for 25 meters were used. As seen in Table 4.2-4, Localized Significance of Operational Emissions, project-related mitigated operational area source emissions would be negligible and would be below the LSTs. The mitigated area source emissions presented in Table 4.2-4 were derived from the CalEEMod, and include the following proposed project features that would reduce operational area emissions: use low VOC paint and low VOC cleaning supplies, and no hearth. As such, operational LST impacts would be less than significant.

Table 4.2-4
Localized Significance of Operational Emissions

Source	Pollutant (pounds/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Total Unmitigated Area Source Emissions	0.00	0.06	0.00	0.00
Total Mitigated Area Source Emissions[1]	0.00	0.06	0.00	0.00
Localized Significance Threshold[2]	131	962	2	2
Thresholds Exceeded?	**No**	**No**	**No**	**No**

Note:
1. The proposed project does not include hearths.
2. The Localized Significance Threshold was determined using Appendix C of the SCAQMD Final Localized Significant Threshold Methodology guidance document for pollutants NO_X, CO, PM_{10}, and $PM_{2.5}$. The Localized Significance Threshold was based on the total acreage, the distance to sensitive receptors, and the source receptor area (SRA 20).

Carbon Monoxide Hotspots

Intersection Hotspots

CO emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. Under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels (i.e., adversely affecting residents, school children, hospital patients, the elderly, etc.).

The SCAQMD requires a quantified assessment of CO hotspots when a project increases the volume-to-capacity ratio (also called the intersection capacity utilization) by 0.02 (two percent) for any intersection with an existing level of service LOS D or worse. Because traffic congestion is highest at intersections where vehicles queue and are subject to reduced speeds, these hot spots are typically produced at intersections.

The project is located in the South Coast Air Basin (Basin), which is designated as an attainment/maintenance area for the Federal CO standards and an attainment area for State standards. There has been a decline in CO emissions even though vehicle miles traveled on U.S. urban and rural roads have increased. On-road mobile source CO emissions have declined 24 percent between 1989 and 1998, despite a 23 percent rise in motor vehicle miles traveled over the same 10 years. California trends have been consistent with national trends; CO emissions declined 20 percent in California from 1985 through 1997 while vehicle miles traveled increased 18 percent in the 1990s. CO emissions have continued to decline since this time. The Basin was re-designated as attainment in 2007, and is no longer addressed in the SCAQMD's AQMP. Three major control programs have contributed to the reduced per-vehicle CO emissions: exhaust standards, cleaner burning fuels, and motor vehicle inspection/maintenance programs.

A detailed CO analysis was conducted in the Federal Attainment Plan for Carbon Monoxide (CO Plan) for the SCAQMD's 2003 AQMP. the most recent plan that addresses CO concentrations. The locations selected for microscale modeling in the CO Plan are worst-case intersections in the

Basin and would likely experience the highest CO concentrations. Thus, CO analysis within the CO Plan is utilized in a comparison to the proposed project, since it represents a worst-case scenario with heavy traffic volumes within the Basin.

Of these locations, the Wilshire Boulevard/Veteran Avenue intersection in Los Angeles experienced the highest CO concentration (4.6 parts per million [ppm]), which is well below the 35-ppm 1-hr CO Federal standard. The Wilshire Boulevard/Veteran Avenue intersection is one of the most congested intersections in Southern California with an average daily traffic (ADT) volume of approximately 100,000 vehicles per day. As the CO hotspots were not experienced at the Wilshire Boulevard/Veteran Avenue intersection, it can be reasonably inferred that CO hotspots would not be experienced at any intersections within the vicinity of the project site due to the low volume of traffic (112 new daily trips) that would occur as a result of project implementation. Therefore, impacts would to sensitive receptors would be less than significant. No mitigation is required.

e) Objectionable Odors: Less than Significant Impact

According to the SCAQMD CEQA Air Quality Handbook, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses identified by the SCAQMD as being associated with odors.

Construction activities associated with the project may generate detectable odors from heavy-duty equipment exhaust. Construction-related odors would be short-term in nature and cease upon project completion. Therefore, any impacts to existing adjacent land uses would be short-term and are less than significant. No mitigation is required.

Mitigation Measures

AQ-1: Prior to initiating construction, UCI shall ensure that the project construction contract includes a construction emissions mitigation plan, including measures compliant with SCAQMD Rule 403 (Fugitive Dust), to be implemented and supervised by the on-site construction supervisor, which shall include, but not be limited to, the following BMPs:

i. During grading and site preparation activities, exposed soil areas shall be stabilized via frequent watering, non-toxic chemical stabilization, or equivalent measures at a rate to be determined by the on-site construction supervisor.

ii. During windy days when fugitive dust can be observed leaving the construction site, additional applications of water shall be required at a rate to be determined by the onsite construction supervisor.

iii. Disturbed areas designated for landscaping shall be prepared as soon as possible after completion of construction activities.

iv. Areas of the construction site that will remain inactive for three months or longer following clearing, grubbing and/or grading shall receive appropriate BMP treatments (e.g., revegetation, mulching, covering with tarps, etc.) to prevent fugitive dust generation.

v. All exposed soil or material stockpiles that will not be used within 3 days shall be enclosed, covered, or watered twice daily, or shall be stabilized with approved nontoxic chemical soil binders at a rate to be determined by the on-site construction supervisor.

vi. Unpaved access roads shall be stabilized via frequent watering, non-toxic chemical stabilization, temporary paving, or equivalent measures at a rate to be determined by the on-site construction supervisor.

vii. Trucks transporting materials to and from the site shall allow for at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer). Alternatively, trucks transporting materials shall be covered.

viii. Speed limit signs at 15 mph or less shall be installed on all unpaved roads within construction sites.

ix. Where visible soil material is tracked onto adjacent public paved roads, the paved roads shall be swept and debris shall be returned to the construction site or transported off site for disposal.

x. Wheel washers, dirt knock-off grates/mats, or equivalent measures shall be installed within the construction site where vehicles exit unpaved roads onto paved roads.

xi. Diesel powered construction equipment shall be maintained in accordance with manufacturer's requirements, and shall be retrofitted with diesel particulate filters where available and practicable.

xii. Heavy duty diesel trucks and gasoline powered equipment shall be turned off if idling is anticipated to last for more than 5 minutes.

xiii. Where feasible, the construction contractor shall use alternatively fueled construction equipment, such as electric or natural gas-powered equipment or biofuel.

xiv. Heavy construction equipment shall use low NOx diesel fuel to the extent that it is readily available at the time of construction.

xv. To the extent feasible, construction activities shall rely on the campus's existing electricity infrastructure rather than electrical generators powered by internal combustion engines.

xvi. The construction contractor shall develop a construction traffic management plan that includes the following:

xvii. Scheduling heavy-duty truck deliveries to avoid peak traffic periods Consolidating truck deliveries.

xviii. Where possible, the construction contractor shall provide a lunch shuttle or on-site lunch service for construction workers.

xix. The construction contractor shall, to the extent possible, use pre-coated architectural materials that do not require painting. Water-based or low VOC coatings shall be used that are compliant with SCAQMD Rule 1113. Spray equipment with high transfer efficiency, such as the high volume-low pressure spray method, or manual coatings application shall be used to reduce VOC emissions to the extent possible.

xx. Project constructions plans and specifications will include a requirement to define and implement a work program that would limit the emissions of reactive organic gases (ROG's) during the application of architectural coatings to the extent necessary to keep total daily ROG's for each project to below 75 pounds per day, or the current SCAQMD threshold, throughout that period of construction activity to the extent feasible. The specific program may include any combination of restrictions on the types of paints and coatings, application methods, and the amount of surface area coated as determined by the contractor.

xxi. The construction contractor shall maintain signage along the construction perimeter with the name and telephone number of the individual in charge of implementing the construction emissions mitigation plan, and with the telephone number of the SCAQMD's complaint line. The contractor's representative shall maintain a log of any public complaints and corrective actions taken to resolve complaints.

4.3 Biological Resources

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CA Department of Fish and Wildlife or U.S. Fish and Wildlife Service?			X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?					X
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?					X

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?					X
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?					X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other applicable habitat conservation plan?					X

Discussion

Biological resources issues are discussed in Section 4.3 of the 2007 LRDP EIR.

a) Sensitive Species: Less than Significant Impact with Project-level Mitigation Incorporated

The project sites are located within the Academic Core, a previously developed and urbanized area of the campus with no open space or native vegetation (2007 LRDP EIR, page 4.3-5). However, existing ornamental vegetation may be removed during demolition and grading. Although this vegetation is not considered sensitive, bird species may occur during the nesting season, which are protected under the Migratory Bird Treaty Act (MBTA). Therefore, compliance with project-specific mitigation measure BIO-1 would reduce potential impacts to sensitive species to a less than significant level.

b) Riparian Habitat: No Impact

c) Wetlands: No Impact

The project sites have been previously developed and is located in the built-out and urbanized Academic Core of the campus. Furthermore, biological surveys conducted for the 2007 LRDP EIR concluded that no riparian or wetland habitat exists on the project sites (page 4.3-2). Therefore, the proposed project would not affect riparian or wetland habitats and no impact would occur. No mitigation is required.

d) Wildlife Corridors: No Impact

The 2007 LRDP EIR determined that the campus is bordered by mixed use, residential uses, and roadways with limited wildlife movement corridors in the vicinity. The project sites are also located more than a mile from drainage culverts that were placed under the State Route 73 (SR-73) Toll Road to support movement between the Bonita Canyon Wetland areas, San Joaquin Hills, and the Natural Community Conservation Plan Reserve System lands on the campus (LRDP EIR, page 4.3-47). As discussed above, the project sites are located in the built-out Academic Core, which is not conducive to wildlife movement. Therefore, the proposed project would not interfere with wildlife corridors and no impact would occur. No mitigation is required.

e) Conflict with Applicable Policies: No Impact

Because the proposed project is located in the built-out and urbanized Academic Core, there are no applicable policies protecting biological resources. Therefore, the proposed project would not conflict with policies protecting biological resources and no impact would occur. No mitigation is required.

f) Conflict with a Natural Community Conservation Plan or Habitat Conservation Plan: No Impact

The Academic Core is not located within a Habitat Conservation Plan, Natural Community Conservation Plan, or any other habitat conservation plan. Therefore, no impacts would occur. No mitigation is required.

Mitigation Measures

BR-1: If construction occurs during the nesting season (February 1 through August 31), pre-constructing surveys for active nests shall be performed within 30 days prior to the commencement of any clearing or grading activities at locations within 500 feet of the approved limits of disturbance where suitable nesting habitat exists. Construction activities within 300 feet of active nests shall be monitored by a qualified biologist until the biologist determines that the nest is no longer active. Construction may encroach within the 300-foot buffer only at the discretion of the biologist.

4.4 Cultural Resources

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?					X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		X			
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X			
d) Disturb any human remains, including those interred outside of formal cemeteries?				X	
e) Cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074?				X	

Discussion

Cultural resources issues are discussed in Section 4.4 of the 2007 LRDP EIR.

a) Historical Resources: No Impact

As listed in the LRDP EIR Table 4.4-2, no historical resources exist on the project sites (page 4.4-15). The on-site demolition of Brandywine Commons, which was built in 1974, is not considered an historical resource. Therefore, impacts to historical resources would not occur. No mitigation is required.

b) Archaeological Resources: Project Impact Adequately Addressed in EIR

Recorded archaeological resources located within the UCI campus are summarized in Table 4.4-1 of the 2007 LRDP EIR. Four archaeological sites have been discovered and recorded in the Academic Core, none of which are located on or adjacent to the project sites. Data and artifacts from both have been recovered and no further archaeological testing is required. To date, with extensive grading that occurred on-site from 1973 to 1974, there has been no evidence of any archaeological resources within or adjacent to the project limits. There is some possibility, however, that unknown archaeological remains could occur beneath the ground surface (LRDP EIR, page 4.4-4). Earth moving activities could possibly uncover previously undetected archaeological remains associated with prehistoric cultures. A loss of a significant archaeological resource could result if such materials are not properly identified. Therefore, monitoring during grading by a qualified archaeologist through implementation of LRDP EIR mitigation measure Cul-1C would reduce impacts to archaeological resources to a less than significant level.

c) Paleontological Resources: Project Impact Adequately Addressed in EIR

Paleontological investigations conducted for the 1989 LRDP determined that the Topanga Formation geologic units under the campus are considered to be of high paleontological sensitivity for vertebrate and invertebrate fossils. The assessment noted that one of the most unique features on the campus is the micro-paleontological material found along Bonita Canyon Drive, consisting of microscopic fossils of single-celled animals that inhabited the sea floor. The fossils contained in these exposures are of regional and interregional significance because they provide the basis for comparisons between the depositional histories of various parts of the Los Angeles Basin (LRDP EIR, page 4.4-19). Given the geological setting and recognized high sensitivity for vertebrate and invertebrate fossils in this area of the campus, excavation operations, such as trenching and/or tunneling that cut into geologic formations, might expose fossil remains. According to the 2007 LRDP EIR, any project involving excavation into either the Topanga Formation or the terrace deposits could have an adverse effect on paleontological resources. Therefore, implementation of LRDP EIR mitigation measures Cul-4A, Cul-4B, and Cul-4C would reduce impacts to paleontological resources to a less than significant level (LRDP EIR, page 4.4-20).

d) Human Remains: Less than Significant Impact

Human remains may be uncovered during earth moving activities associated with construction of the project. In the event that human remains are discovered during construction, UCI would comply with Section 7.50.5 of the California Health and Safety Code, which requires notification of the County Coroner to determine whether the remains are of forensic interest. If the Coroner, with the aid of a supervising archeologist, determines that the remains appear to be of a Native American, s/he would contact the Native American Heritage Commission (NAHC) for further investigation and proper recovery of the remains. Therefore, compliance with the California

Health and Safety Code would reduce potential impacts to human remains to a less than significant level. No mitigation is required.

e) Tribal Cultural Resources: Less than Significant Impact

In accordance with AB 52, notification letters were mailed to the Gabrieleño Band of Mission Indians – Kizh Nation and Juaneño Band of Mission Indians – Acjachemen Nation on October 6, 2016. UCI received a letter on October 13, 2016 from the Gabrieleño Band of Mission Indians requesting that an affiliated Native American monitor be on-site during ground disturbance activities. UCI will continue to consult with the Gabrieleño Band of Mission Indians regarding their interest in an on-site tribal monitor.

As discussed in 4.4(b) above, there is no evidence of archaeological resources within or adjacent to the project site, which has been previously disturbed. For these reasons, UCI does not anticipate encountering tribal resources during construction of the project. Additionally, the implementation of LRDP EIR mitigation measure Cul-1C (hiring a qualified archaeologist to monitor ground-disturbing activities and to ensure the protection of any resources that may be discovered) would reduce any potentially significant impact to a less than significant level, as described in the LRDP EIR. Therefore, impacts to tribal resources would be less than significant. No mitigation is required.

Mitigation Measures

Cul-1C: Prior to land clearing, grading, or similar land development activities for future projects that implement the 2007 LRDP in areas of identified archaeological sensitivity, UCI shall retain a qualified archaeologist (and, if necessary, a culturally affiliated Native American) to monitor these activities. In the event of an unexpected archaeological discovery during grading, the on-site construction supervisor shall redirect work away from the location of the archaeological find. A qualified archaeologist shall oversee the evaluation and recovery of archaeological resources, in accordance with the procedures listed below, after which the on-site construction supervisor shall be notified and shall direct work to continue in the location of the archaeological find. A record of monitoring activity shall be submitted to UCI each month and at the end of monitoring. If an archaeological discovery is determined to be significant, the archaeologist shall prepare and implement a data recovery plan. The plan shall include, but not be limited to, the following measures:

a. Perform appropriate technical analyses;

b. File an resulting reports with South Coast Information Center; and

c. Provide the recovered materials to an appropriate repository for curation, in consultation with a culturally-affiliated Native American.

Cul-4A: Prior to grading or excavation for future project that implement the 2007 LRDP and would excavate sedimentary rock material other than topsoil, UCI shall retain a qualified paleontologist to monitor these activities. In the event fossils are discovered during grading, the on-site construction supervisor shall be notified and shall redirect work away from the location of the discovery. The recommendations of the paleontologist shall be implemented with respect to the evaluation and recovery of fossils, in accordance with mitigation measures Cul-4B and Cul-4C, after which the on-site construction supervisor shall be notified and shall direct work to continue in the location of the fossil discovery. A record of monitoring activity shall be submitted to UCI each month and at the end of monitoring.

Cul-4B: If the fossils are determined to be significant, then mitigation measure Cul-4C shall be implemented.

Cul-4C: For significant fossils as determined by mitigation measure Cul-4B, the paleontologist shall prepare and implement a data recovery plan. The plan shall include, but not be limited to, the following measures:

a. The paleontologist shall ensure that all significant fossils collected are cleaned, identified, catalogued, and permanently curated with an appropriate institution with a research interest in the materials (which may include UCI);

b. The paleontologist shall ensure that specialty studies are completed, as appropriate, for any significant fossil collected; and

c. The paleontologist shall ensure that curation of fossils are completed in consultation with UCI. A letter of acceptance from the curation institution shall be submitted to UCI.

4.5 Geology and Soils

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			**X**		
ii) Strong seismic ground shaking?				**X**	
iii) Seismic-related ground failure, including liquefaction?				**X**	
iv) Landslides				**X**	
b) Result in substantial soil erosion or the loss of topsoil?				**X**	

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
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?				X	
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?				X	
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?					X

Discussion

Geology and soils issues are discussed in Section 4.5 of the 2007 LRDP EIR. A project-specific preliminary geotechnical study was conducted by Ninyo & Moore and is included as Appendix B.

a) Expose People or Structures to:

i) Fault Rupture: Less than Significant Impact with Project-level Mitigation Incorporated

No active or potentially active earthquake faults have been identified on the UCI campus through the State Alquist-Priolo Earthquake Fault Zoning Act program, but a locally mapped fault trace, known as the “UCI Campus Fault,” traverses the project site. A Restricted Use Zone (RUZ) extending 50 feet beyond both sides of this fault has been established to prevent the construction of new development on the fault in case of rupture (LRDP EIR, pages 4.5-8 through 9). Because the RUZ extends into the project site as shown in Section 2.0, Project Description, a preliminary site-specific geotechnical study was conducted in order to address the requirements in the LRDP EIR (page 4.5-2). The project-specific geotechnical study investigated the UCI Campus Fault and stated that it is classified by the California Geological Survey as being pre-Quaternary or having no recognized Quaternary displacement and is not classified as active nor potentially active.

As recommended in the preliminary study and is practice by the University, a project-specific geotechnical study would be prepared during the design phase. Project-specific mitigation measure GS-1 would require that the geotechnical study include trenching to confirm the location of the fault, and that no portion of the structure would fall within the RUZ in the final design. Grading, foundation, and building structure elements would be designed to meet or exceed the California Building Code (CBC) seismic safety standards and comply with the UC Seismic Safety Policy. Therefore, with implementation of project-specific mitigation measure GS-1 and compliance with the CBC, impacts due to fault rupture would be reduced to a less than significant level.

ii) Seismic Ground Shaking: Less than Significant Impact

The entire campus, like most of southern California, is located in a seismically active area, where strong ground shaking could occur during movements along any one of several faults in the region. An earthquake of magnitude 7.5 on the Richter scale could occur along the Newport-Inglewood Fault, the nearest major fault located approximately 4.5 miles southwest of the campus. Earthquakes along the San Andreas Fault, about 35 miles northeast of the campus could generate an 8.0 magnitude level of energy, and movement along the San Jacinto Fault, about 30 miles away, could release ground motion energy estimated at 7.5 on the Richter scale (LRDP EIR, page 4.5-2).

An earthquake along any number of local or regional faults could generate strong ground motions at the subject site that could dislodge objects from walls, ceilings, and shelves or even damage and destroy buildings and other structures, and people residing in the proposed development could be exposed to these hazards. However, grading, foundation, and building structure elements would be designed to meet or exceed the CBC seismic safety standards. In addition, the University has adopted a number of programs and procedures to reduce the hazards from seismic shaking including through compliance with the UC Seismic Safety Policy. Therefore, compliance with the CBC, UC Seismic Safety Policy, and implementation of recommendations in the site-specific geotechnical study conducted during the design phase would reduce any potential hazards associated with seismic ground shaking to a less than significant level. No mitigation is required.

iii) Liquefaction: Less than Significant Impact

The 2007 LRDP FEIR indicates that a majority of soils on the UCI campus are characterized as dense terraced deposits, which are unlikely to be subject to liquefaction. As discussed in the project-specific preliminary geotechnical study, the materials encountered during exploratory boring on the project site included clayey marine terrace deposits underlain by predominantly dense to very dense formational deposits, which are not susceptible to liquefaction. Therefore, compliance with the CBC, UC Seismic Safety Policy, and implementation of recommendations in a site-specific geotechnical investigation conducted during the design phase would reduce any potential hazards associated with liquefaction or landslides to a less than significant level. No mitigation is required.

iv) Landslide: Less than Significant Impact

Landslides may occur due to earthquakes, which is due to generally weak soil and rock on sloping terrain. The project site, which has been previously graded, is located on relatively flat terrace as observed in the project-specific preliminary geotechnical study. Furthermore, the project site is not located in an area considered to be susceptible to landslides according the California Geological Survey. Therefore, impacts due to landslides would be less than significant. No mitigation is required.

b) Soil Erosion: Less than Significant Impact

As noted in the LRDP EIR, earth-disturbing activities associated with project construction would be temporary. The project would comply with the CBC, which regulates excavation and grading activities, and the National Pollutant Discharge Elimination System (NPDES) general permit for construction activities, which requires preparation of an erosion control plan and implementation of construction best management practices (BMPs) to prevent soil erosion. Such BMPs could include silt fences, watering for dust control, straw-bale check dams, and hydroseeding. The LRDP EIR concluded that with implementation of these routine control measures potential construction-related erosion impacts would be less than significant (LRDP EIR, page 4.5-10). Soil erosion may also occur due to increases in stormwater runoff due to increased impermeable surfaces. However, the project site has been previously developed and increases in permeable surfaces would be negligible. Furthermore, as discussed in Section 4.8, Hydrology and Water Quality, stormwater runoff velocities would be reduced to preexisting conditions (MM Hyd-1A). Therefore, impacts due to soil erosion would be less than significant. No mitigation is required.

c) Soil Instability: Less than Significant Impact

Although the proposed project site has been previously developed, if loose or compressible soil materials occur on site, they may be subject to settlement under increased loads. Soil instability may also occur due to an increase in moisture content from site irrigation or changes in drainage conditions. Typical measures to treat such unstable materials involve removal and replacement with properly compacted fill, compaction grouting, or deep dynamic compaction. In addition to the preliminary geotechnical study, another site-specific geotechnical investigation would be conducted during the design phase and any recommendations would be implemented in accordance with the CBC. Therefore, impacts associated with unstable materials would be reduced to a less than significant level. No mitigation is required.

d) Expansive Soils: Less than Significant Impact

Expansive topsoils are prevalent on campus and are generally a dark brown sandy clay, clayey sand, or lean clay, which can be detrimental to foundations, concrete slabs, flatwork, and pavement. Topsoil throughout the campus is highly expansive, ranging from eight to 12 percent swell with an underlying material generally consisting of non-expansive to moderately expansive terrace deposits with a swell ranging from zero to eight percent.

The CBC includes provisions for construction on expansive soils. Proper fill selection, moisture control, and compaction during construction can prevent these soils from causing significant damage. Expansive soils can be treated by removal (typically the upper three feet below finish grade) and replacement with low expansive soils, lime-treatment, and/or moisture conditioning. The geotechnical investigations and soils testing to be conducted as part of the routine final design process would determine the extent of any expansive or compressible soils that occur on the site. Therefore, adherence to the CBC and implementation of the recommendations in the project-specific geotechnical investigation conducted during the design phase would reduce impacts due to expansive soils to a less than significant level. No mitigation is required.

e) Septic Tanks or Alternative Waste Disposal Systems: No Impact

All wastewater generated by the proposed project would be conveyed via local sewers directly into the existing public sanitary sewer system maintained by the Irvine Ranch Water District (IRWD). Therefore, the proposed project would not provide a sanitary waste disposal system and no impact would occur. No mitigation is required.

Mitigation Measures

GS-1: A project-specific geotechnical investigation that includes trenching shall be prepared during the design phase to identify the location of the UCI Campus Fault in relation to the project site. No structure shall fall within the Restricted Use Zone (RUZ), 50 feet on either side of the UCI Campus Fault, in the final design.

4.6 Greenhouse Gas Emissions

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?				X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?					X

Discussion

In March 2010, the CEQA Guidelines were revised to require analysis of greenhouse gas (GHG) emissions. Because it was not required at the time the 2007 LRDP EIR was adopted, a GHG analysis was not included. GHG emissions are addressed in this section and uses a project-specific Greenhouse Gas Assessment prepared by Michael Baker International, Inc. (Appendix C).

a) Greenhouse Gas Emissions: Less than Significant Impact

Project-related GHG emissions would include emissions from direct and indirect sources. The proposed project would result in direct and indirect emissions of CO2, N2O, and CH4, and would not result in other GHGs that would facilitate a meaningful analysis. Therefore, this analysis focuses on these three forms of GHG emissions. Direct project-related GHG emissions include emissions from construction activities, area sources, and mobile sources, while indirect sources include emissions from electricity consumption, water demand, and solid waste generation. Operational GHG estimations are based on energy emissions from natural gas usage and automobile emissions. Project GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod) version 2016.3.1, which relies on trip generation data, and specific land use information to calculate emissions. As indicated in the Middle Earth Expansion Traffic Study (Traffic Study) for the proposed project, prepared by Stantec Consulting Services (dated November 2016), the proposed project would result in approximately 112 new daily trips. Table 4.6-1, Greenhouse Gas Emissions, presents the estimated CO2, N2O, and CH4 emissions of the proposed project with GHG-reducing design features and mitigation measures.

Table 4.6-1
Greenhouse Gas Emissions

Source	CO_2	CH_4		N_2O		Total Metric Tons of CO_2eq
	Metric Tons/yr[1]	Metric Tons/yr[1]	Metric Tons of CO_2eq[2]	Metric Tons/yr[1]	Metric Tons of CO_2eq[2]	
Direct Emissions						
• Construction (amortized over 30 years)	10.96	0.00	0.00	0.00	0.00	10.96
• Area Source	0.01	0.00	0.00	0.00	0.00	0.01
• Mobile Source	136.31	0.01	0.25	0.00	0.00	136.57
Total Mitigated Direct Emissions[3]	***147.28***	***0.01***	***0.25***	***0.00***	***0.00***	***147.54***
Indirect Emissions						
• Energy	1,394.46	0.04	1.00	0.02	6.00	1,401.52
• Water Demand	47.20	0.35	8.80	0.01	3.00	59.36
• Solid Waste Generation	56.03	3.31	82.80	0.00	0.00	142.14
Total Mitigated Indirect Emissions[3]	***1,497.69***	***3.70***	***92.60***	***0.03***	***9.00***	***1,603.02***
Total Mitigated Project-Related Emissions[3]	***1,750.56 $MTCO_2eq/yr$***					
Mitigated GHG Emissions Exceed Threshold?	***No***					

Notes:
1. Emissions calculated using CalEEMod.
2. CO_2 Equivalent values calculated using the EPA Website, *Greenhouse Gas Equivalencies Calculator*, http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator, accessed November 2016.
3. Totals may be slightly off due to rounding.

As the project involves a student housing infill development for UCI students, SCAQMD's 3,000 $MTCO_2eq$ per year screening threshold has been selected as the significance threshold, as it is most applicable to the proposed project. As shown in Table 4.6-1, the project's GHG emissions would be approximately 1,750.56 MTCO2eq/yr and would not exceed SCAQMD's 3,000 MTCO2eq per year GHG threshold.

Project Design Features

It is noted that Table 4.6-1 includes reduced emissions from the project's design features in compliance with the UC Sustainable Practices Policy. Such features include the use of water conservation measures, such as low-flow faucets, showers, toilets, water-efficient landscaping and irrigation systems, and use of reclaimed water and grey water. In addition, the project would meet or exceed the Leadership in Energy and Environmental Design (LEED) Silver rating, utilize high-efficiency lighting and energy efficient appliances (i.e., Energy Star dishwashers), and exceed Title 24 standards by 20 percent.

Direct Project-Related Sources of Greenhouse Gases

- *Construction Emissions*. Construction GHG emissions are typically summed and amortized over the lifetime of the project (assumed to be 30 years), then added to the operational emissions. The proposed project would result in 328.80 MTCO2eq/yr, which represents 10.96 MTCO2eq/yr when amortized over 30 years.

- *Area Source*. Area source emissions were calculated using CalEEMod and project-specific land use data. The proposed project would not result in a nominal amount of area source GHG emissions.

- *Mobile Source*. The CalEEMod model relies upon ITE trip generation data within and project specific land use data to calculate mobile source emissions. The project would directly result in 136.57 MTCO2eq/yr of mobile source-generated GHG emissions.

Indirect Project-Related Sources of Greenhouse Gases

- *Energy Consumption*. Energy consumption emissions were calculated using CalEEMod and project-specific land use data. Electricity would be provided to the project site via Southern California Edison (SCE). The project would indirectly result in 1,401.52 MTCO2eq/year due to energy consumption.

- *Water Demand*. The project operations would result in a demand of approximately 10.57 million gallons of water per year. Emissions from indirect energy impacts due to water supply would result in 59.36 MTCO2eq/year.

- *Solid Waste*. Solid waste associated with operations of the proposed project would result in 142.14 MTCO2eq/year.

Total Project-Related Sources of Greenhouse Gases

As depicted in Table 4.6-1, the project's GHG emissions would be 1.750.56 MTCO2eq/yr, which would not exceed the 3,000 MTCO2eq per year GHG threshold. Therefore, impacts due to greenhouse gas emissions would be less than significant. No mitigation is required.

b) Conflict with a Greenhouse Gas Plan, Policy, or Regulation: No Impact

The UC Sustainable Practices Policy establishes goals and policies to reduce GHG emissions from various sources at the campus. Although construction of the proposed project would increase the amount of GHG emissions generated by the campus, as discussed in Section 2.0, Project Description, the project would incorporate various sustainable project design features (e.g., water conservation measures, exceed LEED Silver rating, exceed Title 24 by 20 percent, and use energy efficient lighting, etc.) in compliance with the UC Sustainable Practices Policy. In order for the campus to reach the carbon neutrality goal of zero emissions of scope 1 and 2 sources by 2025 and scope 3 sources by 2050 as required by the Carbon Neutrality Initiative and the UC Sustainable Practices Policy, the campus is looking into a number of solutions including, but not limited to, energy efficiency projects on the campus and in the surrounding community and purchasing of offsets. Furthermore, the proposed project would not impede the campus' ability to reduce emissions as it is an infill development project and would achieve a high attainment of energy efficiency in accordance with UC policy.

In addition, UCI adopted a Climate Action Plan (CAP) in 2007, and updated in 2013, in cooperation with AB 32, and has guided an array of climate action protection strategies and projects to reduce UCI GHG emissions. The purpose of this CAP is to identify UCI's long-term vision and commitment to reduce its GHG emissions in support of University of California Sustainability Practices Policy and campus sustainability goals. These commitments include reduction of GHG emissions to 1990 levels by the year 2020, a reduction of approximately 40 percent from emissions levels or a total of 79,000 annual metric tons, and ultimately achieve climate neutrality by 2050. The CAP does not contain GHG thresholds. As discussed in 4.6(a) above, the project's GHG emissions would not exceed the SCAQMD's 3,000 MTCO2eq per year threshold in compliance with AB 32. Therefore, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs and no impact would occur. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.7 Hazards and Hazardous Materials

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				X	
b) 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?				X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?					X
d) 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?					X

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X	
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?					X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?		X			
h) 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?				X	

Discussion

Hazards and hazardous materials issues are discussed in Section 4.6 of the 2007 LRDP EIR.

a) Transport, Use, Disposal of Hazardous Materials: Less than Significant Impact

b) Release of Hazardous Materials: Less than Significant Impact

Long-term hazards would be storage, use, and disposal of minor quantities of materials typical of residential uses, such as solvents, cleaners, and paints. Implementation of the 2007 LRDP, including this project, would increase hazardous materials use and waste generation on campus. However, UCI policy implemented by the Office of Environmental Health and Safety (EH&S) requires transportation of all hazardous materials conform to all federal, State, and local requirements. Furthermore, due to the type and quantity, significant hazards from materials stored within residential uses is unlikely.

Temporary, short-term related hazards would be limited to transport, storage, use, and disposal of fuels, solvents, paints, and other coating materials used during construction. The contractor ensures responsibility, as part of the contract, that hazardous materials and waste are handled, stored, and disposed of in accordance with all applicable federal, State, and local laws and regulations and routine construction control measures (LRDP EIR, page 4.6-7). Therefore, compliance with federal, State, and local regulation would reduce potential impacts from the release of hazardous materials to a less than significant level. No mitigation is required.

c) Proximity to Schools: No Impact

There are no schools located within one-quarter mile of the project site. University High School and Turtle Rock Elementary are located approximately one mile northeast of the project site and Tarbut V'Torah and Vista Verde Elementary are located approximately one mile southeast. Furthermore, as discussed in 4.7(a) and 4.7(b) above, the proposed project would infill existing on-campus student housing, which is not a use that would generate hazardous emissions or handle large quantities of hazardous materials. Therefore, the proposed project would not emit large hazardous emissions in proximity to a school and no impact would occur. No mitigation is required.

d) Hazardous Materials Sites: No Impact

The 2007 LRDP EIR concluded that there are no recorded hazardous sites on the main campus, and no other known hazardous materials exist on-site (page 4.6-32). Furthermore, review of the State Department of Toxic Substance Control[1] confirms there are no hazardous materials sites located on or adjacent to the project site. Therefore, there are no listed hazardous materials sites and no impact would occur. No mitigation is required.

e) Airport Land Use Plan: Less than Significant Impact

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[1] http://geotracker.waterboards.ca.gov/. Accessed October 25, 2016.

The closest airport, John Wayne Airport (JWA), is located three miles northwest of the campus, and is located within JWA's planning area. The Airport Land Use Commission for Orange County has established Runway Protection Zones (RPZ) for JWA, also called Accident Potential Zones (APZ), which define the surrounding areas that are more likely to be affected if an aircraft-related accident were to occur. Those zones do not extend to the campus, including the project site, and because most aircraft accidents take place on or immediately adjacent to the runway it is unlikely that aircraft operating at JWA pose a safety threat to the campus. Additionally, as reported in the 2007 LRDP FEIR, no accidents have occurred near the campus within the past 26 years (LRDP EIR, page 4.6-33). Therefore, impacts due to the proximity to an airport or private airstrip would be less than significant. No mitigation is required.

f) Private Airstrip: No Impact

No private airstrips are located within the vicinity of the campus. Therefore, because the proposed project is not located near a private airstrip, it would not affect public safety and no impact would occur. No mitigation is required.

g) Emergency Response: Project Impact Adequately Addressed in the LRDP EIR

Temporary closures of Brandywine Service Road would occur during Phase 1 construction. Prior to the start of construction, the contractor would comply with LRDP EIR mitigation measure Haz-6A to ensure sufficient notification to the UCI Fire Marshal to allow coordination of emergency services that may be affected (LRDP EIR, page 4.6-34). Furthermore, the proposed project during both construction and operation would comply with UCI's Emergency Response Plan that addresses roles and responsibilities, communications, training, and procedures in order to respond to emergency situations. Therefore, with implementation of LRDP EIR mitigation measure Haz-6A, potential impacts to emergency response on or surrounding the campus would be reduced to a less than significant impact.

h) Wildland Fires: Less than Significant Impact

The project site is located within the previously developed Middle Earth student housing complex and is surrounded by a built-out and urbanized campus. The LRDP EIR indicated that areas prone to wildland fire are vegetation communities such as coastal sage scrub and grassland (page 4.6-35), none of which exist on or adjacent to the project site. Therefore, impacts due to wildland fire would be less than significant. No mitigation is required.

Mitigation Measures

Haz-6A: Prior to initiating on-site construction for future projects that implement the 2007 LRDP and would involve a lane or roadway closure, the construction contractor and/or UCI Design and Construction Services shall notify the UCI Fire Marshal. If determined necessary by the UCI Fire Marshal, local emergency services shall be notified of the lane or roadway closure by the Fire Marshal.

4.8 Hydrology and Water Quality

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Violate any water quality standards or waste discharge requirements?		X			
b) 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)?					X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?		X			
d) 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		X			

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
on- or off-site?					
e) 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?		X			
f) Otherwise substantially degrade water quality?				X	
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?					X
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?					X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X	
j) Inundation by seiche, tsunami, or mudflow?				X	

Discussion

Hydrology and water quality issues are discussed in Section 4.7 of the 2007 LRDP EIR.

a) Water Quality Standards: Project Impact Adequately Addressed in LRDP

EIR

Applicable water quality standards developed by the State Water Resources Control Board (SWRCB) and Regional Water Quality Control Board (RWQCB) for storm water are set forth in applicable storm water permits, including the General Construction Storm Water Permit applicable to this project, which would control pollutants contained in runoff generated from campus properties (LRDP EIR, page 4.17-19).

Potential water quality impacts during the construction would be stockpiled soils and materials stored outdoors on or adjacent to the project site during construction. Pollutants associated with these construction activities that could result in water quality impacts include soils, debris, other materials generated during site clearing and grading, fuels and other fluids associated with the equipment used for construction, paints and other hazardous materials, concrete slurries, and asphalt materials. These pollutants could impact water quality if washed, blown, or tracked off site to areas susceptible to wash off by storm water or non-storm water and could drain to one or more of the local receiving waters (LRDP EIR, page 4.7-21). Landscaping could also result in water quality impacts due to the use of fertilizers. If discharged, they could adversely affect aquatic plants and animals downstream in receiving waters through a reduction in oxygen levels and an increase in eutrophication. (LRDP EIR, page 4.7-21).

The proposed project would comply with the General Construction Storm Water Permit program, which would implement construction control measures to be specified in the project's Storm Water Pollution Prevention Plan (SWPPP) and install and maintain the post-construction BMPs to be specified in the project's Water Quality Management Plan (WQMP). Compliance with the permit would ensure that runoff from the developed site does not violate any water quality standards.

This project would not generate any point sources of wastewater or other liquid or solid water contaminants. All of the wastewater that would be generated would be discharged into a local sanitary sewer system that would convey the flows into Irvine Ranch Water District's (IRWD) regional wastewater collection and treatment system. Furthermore, potential impacts to San Diego Creek related to the project's post-construction activities would be reduced to below a level of significance with implementation of LRDP EIR mitigation measures Hyd-2A and Hyd-2B.

Therefore, in compliance with the storm water permits described above and implementation of LRDP EIR mitigation measures Hyd-2A and Hyd-2B, construction and post construction impacts would be reduced to a less than significant level.

b) Groundwater: No Impact

UCI does not use groundwater and instead is provided water by IRWD. This issue was adequately addressed in the 2007 LRDP Initial Study and further analysis in the EIR was not required (LRDP EIR, page 4.7-27). Therefore, the proposed project would not affect groundwater tables and no impact would occur. No mitigation is required.

c) Erosion On or Off-site: Project Impact Adequately Address in LRDP EIR

Features that control run-off volumes and durations to minimize or eliminate erosion and siltation would be depicted on final construction plans. All slopes would be fully landscaped and energy dissipaters and other control devices would be incorporated as needed. Drainage control measures would be implemented during rough grading to ensure that discharge volumes and durations are controlled on newly graded channels. Strategies such as desiltation basins, rip-rap, sandbag chevrons, straw waddles, etc. would be incorporated into the project's SWPPP both during and after grading. Therefore, potential erosion or siltation impacts during and following construction would be reduced to less than significant level through compliance with the conditions of the General Construction Storm Water Permit and LRDP EIR mitigation measures Hyd-2A and 2B. Therefore, impacts due to erosion would be reduced to a less than significant level.

d) Substantially Alter Drainage Pattern: Project Impact Adequately Address in LRDP EIR

The project site is located within the Academic Core, a developed and urbanized area of the campus, and would infill the existing Middle Earth student housing complex by increasing density. Because the project site has been previously developed, the amount of impervious surfaces would not increase substantially. Furthermore, the proposed storm drainage system would be designed in accordance with the drainage criteria set forth in LRDP EIR mitigation measure Hyd-1A to maintain or reducing the peak runoff from 25-year and 100-year storm events. Additional hydrological analysis would be conducted as part of the final design process to specify all primary and secondary drainage control facilities required to satisfy flood control criteria. Therefore, with implementation of Hyd-1A, impacts resulting from the alteration of the drainage pattern would be reduced to a less than significant level.

e) Drainage System Capacity/Substantial Additional Polluted Runoff: Project Impact Adequately Address in LRDP EIR

The proposed project is infill on a previously developed site, and increases of impermeable surfaces would be minimal. The project site, as shown in Exhibit 2-2 of Section 2.0, shows that a majority of the site is impermeable. Furthermore, construction of the project would include a storm water drainage system to address additional runoff due to development of the project. The on-site drainage system, as discussed in 4.8(d) above, would be designed to provide sufficient capacity to manage the level of water runoff anticipated upon completion of construction with the final plan completed during the design phase. Therefore, with implementation of Hyd-1A, impacts due to additional polluted runoff would be less than significant. No mitigation is required.

f) Substantially Degrade Water Quality: Less than Significant Impact

Refer to the previous responses to items 4.8(a) to 4.8(e). There are no other project elements that would affect the water quality of the site or its surroundings. Therefore, in compliance with the NPDES, impacts to water quality would be less than significant. No mitigation is required.

g) Place Housing with a 100-year Flood Hazard Area: No Impact

The campus, including the project site, is located in a FEMA Flood Zone X. This issue was adequately addressed in the 2007 LRDP Initial Study and further analysis in the EIR was not required (LRDP EIR, page 4.7-27). Therefore, the proposed project would not place housing within a 100-year flood hazard area no impact would occur. No mitigation is required.

h) Place Structures within a 100-year Flood Hazard Area: No Impact

Because there are no 100-year flood hazard areas on the campus, the proposed project would not place any structures in a manner that would impede or redirect flood flows. This issue was adequately addressed in the 2007 LRDP Initial Study and further analysis in the EIR was not required (LRDP EIR, page 4.7-27). Therefore, the proposed project would not place structures in a 100-year flood hazard area and no impact would occur. No mitigation is required.

i) Expose People or Structures to a Significant Risk Involving Flooding: Less than Significant Impact

Because the project site is not within a levee or dam inundation area, the proposed project would not expose people or structures to risk due to flooding. The LRDP EIR determined that it is unlikely that flooding because of dam or levee failure would have an effect on the campus due to its height above mean sea level (msl). This issue was adequately addressed in the 2007 LRDP Initial Study and further analysis in the EIR was not required (LRDP EIR, page 4.7-27). Therefore, impacts due to exposure of people or structures to flooding would be less than significant. No mitigation is required.

j) Seiche, Tsunami, or Mudflow: Less than Significant Impact

The campus is located approximately three miles from the Pacific Ocean where sufficient evacuation notice would be provided by the West Coast and Alaska Tsunami Warning Center in the occurrence of a tsunami. The site is not located in an area with potential for seiche and is relatively flat, which is not conducive for mudflows (LRDP EIR, pages 4.7-24 through 25). Therefore, impacts due to exposure of people or structures to seiche, tsunami, or mudflow would be less than significant. No mitigation is required.

Mitigation Measures

Hyd-1A: As early as possible in the planning process of future projects that implement the 2007 LRDP and would result in land disturbance of 1 acre or greater, and for all development projects occurring on the North Campus in the watershed of the San Joaquin Freshwater Marsh, a qualified engineer shall complete a drainage study. Design features and other recommendations from the drainage study shall be incorporated into project development plans and construction documents. Design features shall be consistent with UCI's Storm Water Management Program, shall be operational at the time of project occupancy, and shall be maintained by UCI. At a minimum, all drainage studies required by this mitigation measure shall include, but not be limited to, the following design features:

Site design that controls runoff discharge volumes and durations shall be utilized, where applicable and feasible, to maintain or reduce the peak runoff for the 10-year, 6-hour storm event in the post-development condition compared to the pre-development condition, or as defined by current water quality regulatory requirements.

Measures that control runoff discharge volumes and durations shall be utilized, where applicable and feasible, on manufactured slopes and newly-graded drainage channels, such as energy dissipaters, revegetation (e.g., hydroseeding and/or plantings), and slope/channel stabilizers.

Hyd-2A: Prior to initiating on-site construction for future projects that implement the 2007 LRDP, UCI shall approve an erosion control plan for project construction. The plan shall include, but not be limited to, the following applicable measures to protect downstream areas from sediment and other pollutants during site grading and construction:

- Proper storage, use, and disposal of construction materials.
- Removal of sediment from surface runoff before it leaves the site through the use of silt fences, gravel bags, fiber rolls or other similar measures around the site perimeter.
- Protection of storm drain inlets on-site or downstream of the construction site through the use of gravel bags, fiber rolls, filtration inserts, or other similar measures.
- Stabilization of cleared or graded slopes through the use of plastic sheeting, geotextile fabric, jute matting, tackifiers, hydro-mulching, revegetation (e.g., hydroseeding and/or plantings), or other similar measures.
- Protection or stabilization of stockpiled soils through the use of tarping, plastic sheeting, tackifiers, or other similar measures.
- Prevention of sediment tracked or otherwise transported onto adjacent roadways through use of gravel strips or wash facilities at exit areas (or equivalent measures).
- Removal of sediment tracked or otherwise transported onto adjacent roadways through periodic street sweeping.
- Maintenance of the above-listed sediment control, storm drain inlet protection, slope/stockpile stabilization measures.

Hyd-2B: Prior to project design approval for future projects that implement the 2007 LRDP and would result in land disturbance of 1 acre or more, the UCI shall ensure that the projects include the design features listed below, or their equivalent, in addition to those listed in mitigation measure Hyd-1A. Equivalent design features may be applied consistent with applicable MS4 permits (UCI's Storm Water Management Plan) at that time. All applicable design features shall be incorporated into project development plans and construction documents; shall be operational at the time of project occupancy; and shall be maintained by UCI.

- All new storm drain inlets and catch basins within the project site shall be marked with prohibitive language and/or graphical icons to discourage illegal dumping per UCI standards.

- Outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system shall be covered and protected by secondary containment.

- Permanent trash container areas shall be enclosed to prevent off-site transport of trash, or drainage from open trash container areas shall be directed to the sanitary sewer system.

- At least one treatment control is required for new parking areas or structures, or for any other new uses identified by UCI as having the potential to generate substantial pollutants. Treatment controls include, but are not limited to, detention basins, infiltration basins, wet ponds or wetlands, bio-swales, filtration devices/inserts at storm drain inlets, hydrodynamic separator systems, increased use of street sweepers, pervious pavement, native California plants and vegetation to minimize water usage, and climate controlled irrigation systems to minimize overflow. Treatment controls shall incorporate volumetric or flow-based design standards to mitigate (infiltrate, filter, or treat) storm water runoff, as appropriate.

4.9 Land Use and Planning

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Physically divide an established community?					X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the LRDP, general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?					X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?					X

Discussion

Land use and planning issues are discussed in Section 4.8 of the 2007 LRDP EIR.

a) Divide an Established Community: No Impact

The two project sites are designated in the 2007 LRDP as Student Housing and are surrounded by on-campus uses, both academic and residential. From the Phase 1 project site, Social Ecology I lies to north; Social Science Hall and Social Science Lab to the west; Middle Earth housing to the east; and the Engineering/Information and Computer Science Quad to the south. For the Phase 2 project site, University Extension ESL Office, D, and H lie to the north and existing Middle Earth structures lie to the west, east, and south.

The proposed project would not affect the land use pattern of the surrounding community, either on or off campus. The existing walkway used by pedestrian and cyclists between the

Brandywine Dining Commons and Student Center would be removed as part of the project. However, existing pedestrian and bicyclist routes that run on the northern and southern boundaries of the project site would be modified to improve circulation and access from Ring Road to the eastern areas of Middle Earth. No streets would be removed as part of the project. The proposed project instead would complement the existing uses by infilling and increasing the density of the Middle Earth student housing complex. Therefore, the proposed project would not divide an established community and no impact would occur. No mitigation is required.

b) Conflict with an Applicable Land Use Plan: No Impact

As discussed in Section 2.0, Project Description, the applicable land use plan is the 2007 LRDP and the University is the only agency with land use jurisdiction over projects located on the campus. As stated above, the project sites are designated Student Housing in the 2007 LRDP, which allows for residential facilities for undergraduate and graduate students, recreation facilities, meeting space, and other residential support uses. For the Phase 1 project site, proposed uses include new dormitory, dining, and community facilities and support space; the Phase 2 project site is the redevelopment of Pippin Commons, the existing residential dining hall.

Although the proposed project would increase the number of beds analyzed within the Academic Core for the 2007 LRDP EIR, it shifts beds that otherwise would have been constructed in the East Campus. The project is consistent with the total overall on-campus student bed count analyzed in the 2007 LRDP EIR. Therefore, proposed project is consistent with the LRDP land use and no impact would occur. No mitigation is required.

c) Conflict with an Applicable Conservation Plan: No Impact

The Academic Core, including the project site, is not located within a Habitat Conservation Plan, Natural Community Conservation Plan, or any other land conservation plan. Therefore, the proposed project would not conflict with an applicable conservation plan and no impact would occur. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.10 Noise

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:					
a) Exposure of persons to or generation of noise levels in excess of standards established in any applicable plan or noise ordinance, or applicable standards of other agencies?					**X**
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?		**X**			
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				**X**	
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		**X**			
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise					**X**

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
levels?					
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?					X

Discussion

Noise issues are discussed in Section 4.9 of the 2007 LRDP EIR.

a) Noise Standards: No Impact

The LRDP EIR uses the State of California Land Use Compatibility for Community Noise Environment to address potential noise impacts (page 4.9-7). The land use category of multi-family residential has a "normally acceptable" range of 50 to 65 dB CNEL; the range for schools is 50 to 65 dB CNEL. As discussed in the 2007 LRDP EIR, the primary increase in noise levels on and off campus would be through the increase in traffic (page 4.9-24). However, as discussed in Section 4.14, Transportation and Traffic, operation of the project would increase AM peak hour trips by 7 and PM peak hour trips by 9 (total of 112 average daily trips), which would not generate a significant increase in traffic noise.

Table 4.9-4 in the 2007 LRDP FEIR provides the existing traffic noise levels and estimated LRDP's implementation levels along UCI's roadway segments. The nearest roadway to the project site, East Peltason, has 66 dBA CNEL at 50 feet from the centerline. The nearest boundary of the project is located over 300 feet from the East Peltason centerline and would not be audible from either structure as both are located outside of the 60 CNEL noise contour. Therefore, due to the distance of both Phase 1 and Phase 2 from East Peltason Drive, the proposed project would not conflict with a noise standard and no impact would occur. No mitigation is required.

b) Groundborne Vibration: Project Impact Adequately Addressed in the LRDP EIR

The long-term operation of the proposed project, residential and associated facilities, would not involve railroads or substantial heavy truck operations that would generate groundborne vibration that could be felt at surrounding uses. Therefore, the proposed project would not cause long-term vibration impacts at surrounding uses and no impact would occur.

As stated in Section 2.0, Project Description, construction of the proposed project would require the use of demolition equipment; however, pile driving would not be necessary. Construction may create a nuisance level of vibration-generated noise to existing sensitive receivers in the surrounding residential facilities. Therefore, with implementation of LRDP EIR Noi-2A, which implements standard construction noise measures, impacts due to groundborne vibration would be reduced to a less than significant level.

c) Permanent Ambient Noise: Less than Significant Impact

The proposed project would infill an existing residential housing complex in the Academic Core, adjacent to existing development. Existing ambient noise sources in the immediate vicinity of the project site include occasional vehicular traffic from the existing Brandywine Service Road and pedestrian traffic.

As discussed in Section 4.14, Transportation and Traffic, the proposed project would not result in an increase in population and would only increase peak hour trips within the area by 7 in the AM and 9 during the PM. Due to the relatively small volume of traffic expected to be associated with the operation of the project, which preexists elsewhere on-campus, related traffic noise is not anticipated to result in substantial permanent increase in ambient noise levels in the project vicinity.

The noise associated with indoor activities would be similar to the existing uses surrounding the project site. Noise generated by rooftop mechanical equipment (air conditioning/heating) would not be audible beyond the project site with typical sound attenuation features to be included in the project design. Therefore, impacts to permanent ambient noise levels would less than significant. No mitigation is required.

d) Temporary Ambient Noise: Project Impact Adequately Addressed in the LRDP EIR

Project construction would require conventional construction techniques and standard equipment such as scrapers, graders, backhoes, loaders, tractors, cranes, bulldozers, forklifts, aerial lifts, and miscellaneous trucks. Specialized construction activities that generate unusually loud and repetitive noise, such as pile driving, would not be required to complete the project. A range of truck types would be required to transport machinery, supplies, and waste materials, etc. on and off-site during the project's various construction stages. The heaviest of these trucks would likely be required during the grading phase.

Construction related truck traffic would comply with the City of Irvine's Designated and Restricted Truck Routes. Sensitive uses within 500 feet of the project site include existing Middle Earth residence halls and classroom space in Social Ecology 1, Social Sciences Lab, and Social Sciences Tower.

The project would generate noise that could expose nearby receptors to elevated noise levels during construction. The magnitude of the impact would depend on the type and duration of the activity, type of construction equipment used, distance between the noise source and receiver, and intervening structures, topography, and barriers. Noise generated by the types of construction equipment listed above would range from 60 to 90dBA at 50 feet from the source and propagates as a point source that decays at a rate of 6dB per doubling of distance from the source, and project construction activities would be expected to be audible in the immediate area (LRDP EIR, page 4.9-32). Therefore, LRDP EIR mitigation measure Noi-2A would limit construction operations to daytime hours, require proper equipment maintenance and muffling devices, and place restrictions on weekend construction activities, which would reduce temporary noise impacts to a less than significant level.

e) Public Airport Noise: No Impact

As discussed in the 2007 LRDP EIR (page 4.9-33), the nearest airport, John Wayne, 60 CNEL contour does not extend to the UCI campus. Therefore, the proposed project would not be subject to aircraft noise in excess of regulatory limits and no impact would occur. No mitigation is required.

f) Private Airport Noise: No Impact

There are no private airstrips in the vicinity of the campus. Therefore, the proposed project would not be subject to excessive noise levels due to a private airport and no impact would occur. No mitigation is required.

Mitigation Measures

Noi-2A: Prior to initiating on-site construction for future projects that implement the 2007 LRDP, UCI shall approve contractor specifications that include measures to reduce construction/demolition noise to the maximum extent feasible. These measures shall include, but are not limited to, the following:

i. Noise-generating construction activities occurring Monday through Friday shall be limited to the hours of 7:00 am to 7:00 pm, except during summer, winter, or spring break at which construction may occur at the times approved by UCI.

ii. Noise-generating construction activities occurring on weekends in the vicinity of (can be heard from) off-campus land uses shall be limited to the hours of 9:00 am to 6:00 pm on Saturdays, with no construction occurring on Sundays or holidays.

iii. Noise-generating construction activities occurring on weekends in the vicinity of (can be heard from) on-campus residential housing shall be limited to the hours of 9:00 amto 6:00 pm on Saturdays, with no construction on Sundays or holidays. However, as determined by UCI, if on-campus residential housing is unoccupied (during summer, winter, or spring break, for example), or would otherwise be unaffected by construction noise, construction may occur at any time.

iv. Construction equipment shall be properly outfitted and maintained with manufacturer recommended noise-reduction devices to minimize construction-generated noise.

v. Stationary construction noise sources such as generators, pumps or compressors shall be located at least 100 feet from noise-sensitive land uses (i.e., campus housing, classrooms, libraries, and clinical facilities), as feasible.

vi. Laydown and construction vehicle staging areas shall be located at least 100 feet from noise-sensitive land uses (i.e., campus housing, classrooms, libraries, and clinical facilities), as feasible.

vii. All neighboring land uses that would be subject to construction noise shall be informed at least two weeks prior to the start of each construction project, except in an emergency situation.

viii. Loud construction activity such as jackhammering, concrete sawing, asphalt removal, pile driving, and large-scale grading operations occurring within 600 feet of a residence or an academic building shall not be scheduled during any finals week of classes. A finals schedule shall be provided to the construction contractor.

4.11 Population and Housing

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X	
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?					X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?					X

Discussion

Population and housing issues are discussed in Section 4.10 of the 2007 LRDP EIR.

a) Induce Substantial Population Growth: Less than Significant Impact

The proposed project would demolish the Brandywine Dining Commons and Student Center to expand the existing Middle Earth student housing complex by constructing a new seven-story structure and remodeling Pippin Commons. In order to operate the new seven-story structure and remodeled Pippin Commons, it is anticipated approximately ten new staff would be hired, significantly less than 0.1 percent of the existing on-campus population. By expanding housing, the University is working toward the overall goal of housing 50 percent of enrolled students on-campus that would otherwise be living in off-campus facilities in local communities, such as the cities of Irvine, Newport Beach, and Costa Mesa. The proposed project would accommodate existing campus populations and would not induce substantial population growth either on or off campus.

Although the proposed project would increase the number of beds analyzed within the Academic Core for the 2007 LRDP EIR, it shifts beds that otherwise would have been constructed in the East Campus. It is consistent with the overall student bed count and associated infrastructure analyzed within the 2007 LRDP EIR, which concluded that LRDP-induced housing construction would reduce overall physical impacts on local jurisdictions (page 4.10-13). Furthermore, infrastructure built on the campus does not service off-site uses and would not indirectly induce population growth. Therefore, the proposed project would not substantially induce population growth directly or indirectly and impacts would be less than significant. No mitigation is required.

b) Displace Existing Housing: No Impact

c) Displace a Substantial Number of People: No Impact

Associated residential facilities, Brandywine Dining Commons and Student Center, which houses fitness, recreation, dining, and student program space would be demolished; however, no housing space would be affected. Furthermore, these uses would be relocated into either the new seven-story structure or the remodeled Pippin Commons after completion. Therefore, the proposed project would not displace people or require replacement housing elsewhere and no impact would occur. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.12 Public Services

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
a) Fire protection?				X	
b) Police protection?				X	
c) Schools?				X	
d) Parks?				X	
e) Other public facilities?				X	

Discussion

Public service issues are discussed in Section 4.11 of the 2007 LRDP EIR.

a) Fire Protection: Less than Significant

Fire protection and emergency response services to the campus are provided by the Orange County Fire Authority (OCFA). The primary responder serving the campus, OCFA Fire Station #4, is located north of the campus on the corner of California and Harvard Avenues. The capacity of service for Station #4, as determined by OCFA, is approximately 3,500 calls per year of which UCI generated 668 calls or 30 percent of the station's calls during 2005. According to an analysis conducted by OCFA in November 2006, this station had adequate capacity to accommodate existing demand on the main campus. Built in 1966, the station has no current plans for its expansion. (LRDP EIR, page 4.11-6).

As discussed in Section 4.11, Population and Housing, the proposed project would increase staff population by 10, and physical impacts associated with construction of on-campus student housing was addressed in the analysis of the 2007 LRDP EIR. It concluded it would not result in a significant increased demand for fire services (page 4.11-6). Furthermore, the project site is located within a five travel minute coverage area by OCFA. Fire Station #4 has a reliability of 83 percent where a unit is on-site within seven minutes and 20 seconds.[1] This is within the standard adopted by OCFA, where a unit should be on-site within seven minutes and 20 seconds for 80 percent of emergency calls.

UCI employs a State Fire Marshal whom is responsible for the campus fire prevention practices and provides services such as plan review and construction inspections. The UCI Fire Marshal reviews and approves all development plans for each new campus project, including Middle Earth Expansion, in accordance with California building and fire codes (LRDP EIR, page 4.11-7). Therefore, the proposed project would not require the need for new fire protection facilities and impacts to services would be less than significant. No mitigation is required.

b) Police Protection: Less than Significant

The UCI Police Department (UCIPD) is located in the Public Services building on the East Campus approximately 0.1-mile northeast of the project site. The UCIPD provides all police services (all patrol, investigation, crime prevention education, and related law enforcement duties) for the campus (LRDP EIR, page 4.11-3).

As discussed in Section 4.11, Population and Housing, the proposed project would increase staff by 10 or significantly less than 0.1 percent of the campus population and would not result in an increase in demand for police services. Furthermore, there are no current plans to expand or construct additional police facilities on the campus. Therefore, the proposed project would not require the construction of new police facilities and impacts to services would be less than significant. No mitigation is required.

c) Schools: Less than Significant

The Irvine Unified School District (IUSD) provides kindergarten through grade 12 (k-12) public education services for school age children residing on or near the UCI campus. As discussed above and in Section 4.11, Population and Housing, the proposed project would not substantially increase the campus population. Therefore, the proposed project would not require the need for new off-campus educational facilities and impacts to services would be less than significant. No mitigation is required.

d) Parks: Less than Significant Impact

The proposed project would replace the demolished Brandywine Student Center by housing the uses within the newly constructed seven-story structure or the remodeled Pippin Commons, the physical effects of which have been analyzed in this IS/MND. Other recreational facilities located throughout the campus, including Aldrich Park, Crawford Athletics Complex, and the

[1] http://www.ocfa.org/Uploads/Orange%20County%20Fire%20Authority%20SOC_FINAL.pdf. Accessed November 1, 2016.

Anteater Recreation Center have sufficient capacity to support the project and would not require the construction of new park facilities. Therefore, impacts to parks would be less than significant. No mitigation is required.

e) Other Public Facilities: Less than Significant

As discussed above and in Section 4.11, Population and Housing, the proposed project would not substantially increase on-campus population. Furthermore, public facilities, such as libraries, exist on-campus and would not result in the need for the construction of new facilities within the surrounding community. Therefore, impacts to other public facilities would be less than significant. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.13 Recreation

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X	
b) Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?				X	

Discussion

Recreation issues are discussed in Section 4.12 of the 2007 LRDP EIR.

a) Physically Deteriorate Existing Facilities: Less than Significant Impact

As discussed in Section 4.11, Population and Housing, the proposed project would not substantially increase faculty, staff, or student populations on the campus nor would it trigger new demand for recreational facilities on or off campus. Furthermore, the 2007 LRDP EIR assumed that the current level of maintenance of the Anteater Recreation Center (ARC) would continue and that substantial deterioration of the facility would not occur (page 4.12-5). Therefore, impacts to recreational facilities would be less than significant. No mitigation is required.

b) Construction of Recreational Facilities: Less than Significant

During Phase 1, the proposed project would demolish the Brandywine Dining Commons and Student Center, which houses recreation space, to construct the seven-story tower. During Phase 2, remodeling of Pippin Commons would result in a change of use from a dining facility to a recreation center for the residents of Middle Earth. The dining and recreational uses demolished during Phase 1 would then be relocated into the new seven-story structure or the remodeled Pippin Commons after completion. Although new recreational facilities would be constructed as part of the project, the uses are consistent with the existing land use and, as discussed in further detail in Sections 4.1 through 4.14, no adverse physical effects on the environment are anticipated that are not mitigatable. Therefore, impacts due to the construction of recreational facilities would be less than significant. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.14 Transportation/Traffic

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?				**X**	
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?					**X**
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?					**X**

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X	
e) Result in inadequate emergency access?				X	
f) Conflict with adopted policies plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?					X

Discussion

Transportation and traffic issues are discussed in Section 4.13 of the 2007 LRDP EIR. This analysis is based on the traffic study prepared by Austin-Foust Associates, Inc. (now Stantec Consulting Services, Inc.) in 2007. In addition, a 2016 project-level study was prepared by Stantec Consulting Services, Inc. (Appendix D).

a) Performance of the Circulation System: Less than Significant Impact

As discussed in Section 4.11, Population and Housing, the anticipated population increase is ten new staff members for operations. All students to be housed are existing and would not result in direct population growth. Because Middle Earth housing is for undergraduate students, it is estimated that approximately 12 percent of student residents of the proposed project would own a vehicle on campus (i.e. 60 vehicles). Parking for residents and staff would be provided in the Anteater Parking Structure (APS) and Lot 18R.

The site is located within the Academic Core and is served by an extensive trail of pedestrian paths, sidewalks, and bike trails. It is expected that residents of the proposed project would take advantage of the opportunities to walk or bike to their destination on campus, even those who own a vehicle.

As discussed in the Section 2.0, Project Description, the 2007 LRDP EIR Traffic Study analyzes a total of 1,583 student beds in the Middle Earth TAZ (TAZ 49). As of 2016, there are 1,825 beds in Middle Earth, and the development of the proposed project would bring the total number of Middle Earth beds to 2,325, which would exceed the housing total in the Middle Earth TAZ analyzed in the LRDP EIR Traffic Study by 742 beds. However, the University is still under the overall number of beds analyzed in the 2007 LRDP EIR. Therefore, the project is consistent with the overall LRDP student bed count, but with this project the number of beds analyzed in the 2007 LRDP EIR Traffic Study has shifted from the East Campus into the Academic Core.

Trip generation rates were derived from the previous Mesa Court Expansion Project Traffic Study trip rates, assuming a 12 percent vehicle ownership factor by first-year students. Table 4.14-1 summarizes the trip generation rates per bed and the resulting total trip generation for the proposed project. The 10 full-time staff would generate approximately 10 average daily trips (ADT), and the interior remodeling of Pippin Commons would not generate any additional peak hour or daily trips. As this table shows, the project would generate a total of 112 daily vehicle trips, of which seven would occur during the AM peak hour and nine would occur during the PM peak hour.

Table 4.14-1
Proposed Project Trip Generation Summary

Land Use	Amount	AM Peak Hour			PM Peak Hour			ADT
		In	Out	Total	In	Out	Total	
Trip Generation								
Student Housing	500 Beds	1	5	6	5	3	8	102
Staff	10	1	Negl.	1	Negl.	1	1	10
Total		2	5	7	5	4	9	112
Trip Rates (MCTM)								
Single Undergrad Housing	Bed	0.001	0.011	0.012	0.009	0.006	0.015	0.204
Staff	Person	Negl.	Negl.	Negl.	Negl.	Negl.	Negl.	1
LRDP Adjustment								
Change to LRDP	742 Bed	1	8	9	7	4	11	151
Staff	10	1	Negl.	1	Negl.	1	1	10
Total LRDP Adjustment		2	8	10	7	5	12	161

The proposed project would add 742 beds above the level of student housing analyzed in the Middle Earth TAZ in the 2007 LRDP EIR Traffic Study. These beds increase the trips analyzed in the Middle Earth TAZ in the LRDP EIR Traffic Study by 161 daily trips, 10 AM peak hour trips, and 12 PM peak hour trips.

The trips generated by the project would use E. Peltason Drive and Anteater Drive to access the surrounding circulation system. Project trip distribution was determined based on ADT volumes from ITAM. Approximately 56 percent of project trips are oriented toward Campus Drive, Berkeley Avenue, and Culver Drive via E. Peltason Drive, 8 percent of project trips are oriented west on E. Peltason Drive towards Bison Avenue, and 36 percent of project trips are oriented toward Bonita Canyon Drive via Anteater Drive. From there, project trips will disperse along Campus Drive, Culver Drive, Bonita Canyon Drive, Newport Coast Drive, Shady Canyon Drive, and SR-73.

Impacts from the full project are analyzed under existing conditions. Existing-plus-project peak hour volumes were obtained by adding the project-generated peak hour trips to the existing intersection turning movement volumes at the study intersections. The existing and existing-plus-project LOS based on existing lane configurations are summarized in Table 4.14-2.

Table 4.14-2
Existing-Plus-Project Intersection LOS Summary

Intersection	Existing				Existing + Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS
ICU Methodology - Signalized Intersections								
1. E. Peltason/Berkeley & Campus	0.40	A	0.49	A	0.40	A	0.49	A
2. E. Peltason/Pereira	0.35	A	0.40	A	0.35	A	0.40	A
3. Anteater & E. Peltason	0.43	A	0.58	A	0.43	A	0.58	A
5. Anteater/Shady Cyn & Culver/Bonita Cyn	0.38	A	0.45	A	0.38	A	0.45	A
HCM Delay Methodology - Stop-Controlled Intersections								
4. Los Trancos & E. Peltason	57 sec	F	130 sec	F	57 sec	F	130 sec	F

The signalized intersections operate at LOS A during the AM and PM peak hours with the addition of the proposed project traffic based on the ICU methodology. The project would add less than 0.01 to the ICU value at the intersections, and the project has no significant impact. The stop-controlled study intersection of Los Trancos Drive and E. Peltason Drive operates at LOS F during the AM and PM peak hour; however, the addition of project-generated traffic would add no measurable increase to the average delay during the AM and PM peak hours. Therefore, the project has no significant impact on the stop-controlled intersection of Los Trancos Drive and E. Peltason Drive. Although the intersection operates at LOS F as a stop-controlled intersection, the existing peak hour volumes do not satisfy the minimum warrant for signalization of the intersection, which in this case is a minimum side street volume of 205 vehicles during the AM peak hour and 105 vehicles during the PM peak hour. The project has no significant impact on the stop-controlled intersection, and therefore no mitigation is required.

Because the proposed project would add 742 beds above the level of undergraduate student housing analyzed in Middle Earth (TAZ 49) in the 2007 LRDP EIR Traffic Study, a 2035 horizon year was analyzed and is summarized in Table 4.14-3. Based on the number of vehicles owned by the first-year student residents (12 percent), the peak hour trips generated by the project would be only slightly higher than that assumed in the LRDP Traffic Study (10 additional AM peak hour trips, 12 additional PM peak hour trips). The project would result in a negligible impact on the study intersections under LRDP buildout conditions.

Table 4.14-3
2035 with-Project Intersection LOS Summary

Intersection	2035 No-Project				2035 With-Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS	ICU/ Delay	LOS
ICU Methodology - Signalized Intersections								
1. E. Peltason/Berkeley & Campus	0.40	A	0.58	A	0.40	A	0.58	A
2. E. Peltason/Pereira	0.50	A	0.52	A	0.50	A	0.52	A
3. Anteater & E. Peltason	0.45	A	0.77	C	0.46	A	0.77	C
4. Los Trancos & E. Peltason	0.68	B	0.84	D	0.68	B	0.84	D
5. Anteater/Shady Cyn & Culver/Bonita Cyn	0.80	C	0.84	D	0.80	C	0.84	D

Therefore, impacts on the surrounding circulation system under existing and 2035 conditions would be less than significant. No mitigation is required.

b) Conflict with Congestion Management Program: No Impact

The nearest elements of the Orange County Congestion Management Plan (CMP) highways and arterials network are Jamboree Road and MacArthur Boulevard, located approximately 2.5 miles and two miles from the southeast corner of the campus (Culver Drive/Campus Drive intersection). CMP monitoring is conducted at the intersections of Jamboree Road/I-405 northbound and southbound ramps and at Jamboree Road/ MacArthur Boulevard (LRDP FEIR VI page 4.13-23). The proposed project would allow additional students to live on-campus and would not result in increased traffic at any CMP intersections, all of which are located off-campus. Therefore, it would not conflict with the CMP and no impact would occur. No mitigation is required.

c) Air Traffic Patterns: No Impact

The proposed project site is located approximately 1.5 miles southeast of JWA. The Initial Study prepared for the 2007 LRDP concluded that the campus is not situated under the preferred arrival or departure tracks associated with the airport and that future campus buildings would not penetrate the 100:1 Imaginary Surface for designated flight patterns (LRDP EIR VII page

25). Therefore, the proposed project would not affect air traffic patterns and no impact would occur. No mitigation is required.

d) Hazards Due to a Design Feature: Less than Significant Impact

All of the project's transportation network would be designed in accordance with the same standards applied to other elements of the campus transportation network and would have no unique aspects not anticipated in the LRDP EIR. The project does not require any alterations to existing streets or highways; only the modification of the preexisting Brandywine Service Road that would result in improved emergency access. The 2007 LRDP EIR determined no impacts would occur from hazards due to design features or incompatible uses, which was addressed in the LRDP Initial Study (LRDP EIR, page 4.13-61). Therefore, impacts due to potential hazards of a design feature would be less than significant. No mitigation is required.

e) Inadequate Emergency Access: Less than Significant Impact

Project construction would not require complete closure of any adjacent streets; however, the Brandywine Service Road would be widened and extended to connect to Ring Road and improve operational emergency access to the project site. Access by fire protection, ambulances, police, or other emergency vehicles would be maintained for the active construction zones and surrounding land uses. Any closures during construction would be reviewed by the UCI Fire Marshal prior to construction to ensure adequate emergency access at all times. Therefore, with review of the proposed project by the UCI Fire Marshal, impacts related to emergency access would be less than significant. No mitigation is required.

f) Public Transit, Bicycle, or Pedestrian Facilities: No Impact

UCI administers an extensive program of Transportation Demand Management (TDM) measures that encourage commuters to use alternate modes of transportation, including walking, bicycling, carpooling, vanpooling, and riding the UCI shuttle, other local shuttle systems, train, or bus. With these measures, UCI has been successful in achieving an average vehicle ridership higher than the AQMD regional goal (LRDP EIR, page 4.13-58). The proposed project would comply with the UC Sustainable Practices Policy, which requires each campus to incorporate alternative means of transportation to, from, and within each campus to improve the quality of life on campus and in the surrounding community. Also, because cars would be parked off-site in either the Anteater Parking Structure or Lot 18R, alternative modes of transportation, such as walking or bicycling, would be utilized by the residents for daily campus activities.

The existing walkway used by pedestrian and cyclists between the Brandywine Dining Commons and Student Center would be removed as part of the project. However, existing pedestrian and bicyclist routes that run on the northern and southern boundaries of the project site would be modified to improve circulation and access from Ring Road to the eastern areas of Middle Earth. Therefore, the proposed project would not conflict with alternative transportation plans, policies and programs and no impact would occur. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.15 Utilities and Service Systems

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?					X
b) 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?				X	
c) 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?				X	
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X	

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
e) 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?				X	
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				X	
g) Comply with applicable federal, state, and local statutes and regulations related to solid waste?					X

Discussion

Utilities and service systems issues are discussed in Section 4.14 of the 2007 LRDP EIR.

a) Regional Water Quality Control Board Wastewater Treatment Requirements: No Impact

Wastewater from the proposed project would be discharged to the campus' sanitary sewer network, which conveys flows to the Irvine Ranch Water District (IRWD) wastewater treatment system. Wastewater from the UCI campus is treated at the Michelson Water Reclamation Plant (MWRP), which provides a tertiary level of treatment, in accordance with the wastewater treatment standards enforced by the Santa Ana Regional Water Quality Control Board (RWQCB).

Wastewater flows from the expansion would consist of the same kinds of chemical composition found in toilets, sinks, and shower outflows that are typical of housing development uses throughout the IRWD service area. No new kinds of wastewater collection or treatment systems or processes would be required to adequately dispose of project wastewater.

Furthermore, in compliance with the General Permit for Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), the campus implements a Stormwater Management Plan and all contractors must comply with UCI's Stormwater Pollution Prevention Best Management Practices (BMPs). A project-specific Stormwater Pollution Prevention Plan (SWPPP), in compliance with the RWQCB, would be completed prior to the start of construction.

Therefore, the proposed project would not exceed wastewater treatment requirements of the Regional Water Quality Control Board and no impact would occur. No mitigation is required.

b) Construction of New Water or Wastewater Treatment Facilities or Expansion of Existing Facilities: Less than Significant Impact

Water and wastewater infrastructure would be constructed on-site to serve the proposed project. As stated in Section 2.0, Project Description, the new infrastructure would connect to existing distribution systems located in Ring Road. Potable and reclaimed water service and wastewater collection and treatment service would be provided by the IRWD.

Construction impacts would occur as part of the general site development phase while utility improvements are installed; however, no alterations to existing main line facilities would be required to provide adequate potable or irrigation water flows to this project, or to provide sufficient sanitary sewer service. Furthermore, it is estimated that by 2025 UCI would contribute to approximately 19 percent of IRWD's total treated wastewater, and would be accommodated by planned increases of wastewater treatment capacity by IRWD (LRDP EIR, page 4.14-15). Therefore, construction of these components would not result in the construction of new or expansion of water or wastewater treatment facilities and impacts would be less than significant. No mitigation is required.

c) Stormwater Drainage Facilities: Less Than Significant Impact

Because the project is design-build, a finalized stormwater drainage plan would be completed during the design phase. However, as discussed in Section 4.8, Hydrology and Water Quality, existing hydrology patterns on the site would be maintained to the extent practical as determined during the project's final design stage through the use of sheet flow, catch basins, and a new storm drain pipe to convey runoff from the project. Wastewater runoff and stormwater facilities are regulated by the MS4 requirements, including stormwater collection and treatment BMPs, which would reduce physical impacts associated with the construction of new stormwater drainage facilities. Therefore, in compliance with the MS4 permit, impacts due to stormwater drainage facilities would be less than significant. No mitigation is required.

d) Water Supplies: Less than Significant Impact

IRWD has developed an Urban Water Management Plan (UWMP, 2005) which projects district-wide water supply availability and demand through 2030. IRWD staff in consultation with UCI reviewed projected water service demand related to implementation of the 2007 LRDP for consistency with the UWMP and concluded that water supply reliability would not be compromised (LRDP EIR, page 4.14-17). Because the proposed project does not increase campus population or estimated water demand beyond what was analyzed in the 2007 LRDP EIR, the irrigation needs throughout the campus would continue to be fully met through reclaimed water supplies. Furthermore, the proposed project would not increase on-campus population.

Although implementation of the 2007 LRDP would result in less than significant impacts to water supply, UCI continues to cooperatively and continually work with IRWD to reduce domestic water demand on campus consistent with UCI sustainability goals, as follows:

- Continue to use reclaimed water for all landscape irrigation uses where feasible and permissible by law.
- Work with IRWD to identify opportunities for additional uses of reclaimed water on-campus to reduce domestic water demand including central utility plant applications, dual plumbing systems in buildings, and other applications to reduce demand for domestic water.
- Work collaboratively with IRWD to identify feasible programs, projects, and measures to reduce domestic water demand.

Therefore, because the proposed project's domestic and reclaimed water demand is consistent with the projections developed for the 2007 LRDP EIR and anticipated in the UWMP forecasts, impacts would be less than significant. No mitigation is required.

e) Wastewater Capacity: Less than Significant Impact

The MWRP currently treats up to 18 million gallons per day (mgd) of wastewater, and an additional upgrade to 33 mgd is scheduled to be completed in 2025. IRWD forecasts a total service area demand for wastewater treatment of 26.11 mgd by 2025, including the projected increase associated with full implementation of the 2007 LRDP. Because the proposed project is consistent with the LRDP EIR as discussed in Section 2.0, Project Description, the MWRP would have sufficient capacity to accommodate the anticipated wastewater generation throughout the IRWD service area. Therefore, the impact to wastewater treatment capacity would be less than significant (LRDP EIR, pages 4.14-12 through 13). No mitigation is required.

f) Landfill Capacity: Less than Significant Impact

The Frank R. Bowerman Landfill is permitted to receive a daily maximum of 11,500 tons per day and is expected to close in the year 2053. The Olinda Landfill and Prima Deshecha Landfill also serve the County of Orange, which are utilized if the Frank R. Bowerman Landfill reaches its daily capacity. Olinda Landfill permits 8,000 tons daily with an expected closure in 2030; Prima

Deshecha Landfill is scheduled to close in 2067 and permits 4,000 tons daily.

Orange County Waste & Recycling and the three landfills are in compliance with the California Integrated Waste Management Act of 1989 (AB 939), which requires each jurisdiction to maintain 15 years of solid waste disposal capacity. Therefore, based on available landfill capacity, impacts would be less than significant. No mitigation is required.

g) Solid Waste Regulations: No Impact

The University of California is not subject to Assembly Bill 939 or other local agency regulations pertaining to solid waste management. Nonetheless, the University of California has adopted the Sustainable Practices Policy that requires campuses to undertake aggressive programs to reduce solid waste generation and disposal (LRDP EIR, 4.14-20). This includes voluntary compliance with the State Agency Integrated Waste Management Plan and prioritization of waste and recycling for LEED credits, including a life cycle assessment for reuse of building materials. Furthermore, under Section F, Recycling and Waste Management, requires the ultimate goal of zero waste by 2020. As of 2016, the campus has an 81 percent diversion rate from local landfills that has been achieved through recycling, composting, and reusing. Continued outreach programs, increased sustainable purchasing options, and proper hazardous waste disposal have the campus on track to reach 95 percent, or “zero waste,” by 2020. The project would not require any unique waste collection or disposal methods or facilities and would not conflict with or obstruct any federal, State, or local programs to reduce solid waste generation. Therefore, the proposed project would not violate solid waste regulations and no impact would occur. No mitigation is required.

Mitigation Measures

No mitigation measures required.

4.16 Mandatory Findings of Significance

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				X	
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present, and probably future projects?)				X	

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?			**X**	

a) *Degrade the Environment, Reduce Habitat or Wildlife Populations, Eliminate Examples of California History: Less than Significant Impact*

As discussed under Sections 4.1 through 4.15, no significant environmental impacts were identified in the responses to questions regarding project effects. The project site does not contain, support, or connect to any sensitive biological resources nor does it adversely affect any such resources. There are no known cultural resources on the previously developed sites, and in the unexpected event that a prehistoric or archaeological resource is discovered during grading, compliance with LRDP EIR mitigation measures Cul-1C, Cul-4A, Cul-4B, and Cul-4C would reduce impacts to a less than significant level.

b) *Cumulatively Considerable Impacts: Less Than Significant Impact*

Long-term environmental consequences resulting from the cumulative effect of completing development through implementation of the 2007 LRDP were thoroughly evaluated in the 2007 LRDP EIR. As discussed in Section 2.0, Project Description, the project is consistent with the LRDP land use policies. No new or increased severity of impacts beyond what was anticipated in the 2007 LRDP EIR have been identified as a result of the analysis completed for this IS/MND. As discussed in Sections 4.1 through 4.15, project-level impacts have been determined to be less than significant, no impact, or mitigated to a less than significant level. Therefore, the proposed project would not result in cumulatively considerable impacts.

c) *Direct or Indirect Effects on Humans: Less Than Significant Impact*

No significant impacts on human beings have been identified in this IS/MND. Short-term adverse impacts involving construction phase dust, exhaust emissions, and noise would be less than significant with the incorporation and implementation of the identified routine control measures set forth in the LRDP EIR and project-specific mitigation. There is no evidence of site contamination with hazardous wastes or substances and this residential development would not emit hazardous air emissions or involve consumption, generation, transport or disposal of dangerous quantities of hazardous materials or wastes. Access to the project site by emergency vehicles would be maintained throughout construction, and the developed site would not constrain emergency access to any portion of the campus. Therefore, impacts due to direct or indirect effects on humans would be less than significant.

5.0 PREPARERS

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APPENDIX A

Air Quality Assessment

AIR QUALITY ASSESSMENT

Middle Earth Expansion

PREPARED BY:

Michael Baker INTERNATIONAL

AIR QUALITY ASSESSMENT

for the

Middle Earth Expansion Project

University of California, Irvine

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November 22, 2016

JN 156259

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SYMBOLS, ABBREVIATIONS, AND ACRONYMS

AB	Assembly Bill
AQMP	Air Quality Management Plan
Basin	South Coast Air Basin
BAU	business as usual
CAAQS	California Ambient Air Quality Standards
CAFE	corporate average fleet fuel economy
CalGreen	California Green Building Standards
CARB	California Air Resources Board
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH_4	Methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2eq	carbon dioxide equivalent
EAP	Energy Action Plan
EECAP	energy efficiency climate action plans
EPA	U.S. Environmental Protection Agency
FCAA	Federal Clean Air Act
GHG	greenhouse gas
GWP	Global Warming Potential
H_2O	water vapor
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
hp	horsepower
HPLV	high-pressure-low-volume
HVAC	heating, ventilation, and air conditioning
I-4	Environmental Justice Enhancement Initiative
IPCC	International Panel for Climate Change
lbs	pounds
LEED	Leadership in Engineering and Environmental Design
LOS	level of service
LSTs	Localized Significance Thresholds
Metro	Los Angeles County Metropolitan Transportation Authority
MMT	million metric tons
mpg	miles per gallon
MPO	metropolitan planning organization
$MTCO_2eq$	metric tons of carbon dioxide equivalents
MU-T	Mixed-Use Transit
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards

NO_2	nitrogen dioxide
NO_x	nitrogen oxides
OAL	Office of Administrative Law
O_3	ozone
OPR	Office of Planning and Research
PFCs	Perfluorocarbons
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
PST	Pacific Standard Time
RCP	Regional Comprehensive Plan
RH	relative humidity
ROG	Reactive Organic Gasses
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCS	Sustainable Community Strategy
SF_6	Sulfur hexafluoride
SGVCOG	San Gabriel Valley Council of Governments
SGVEWP	San Gabriel Valley Energy Wise Partnership
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
SRA	Source receptor Area
UNFCCC	United Nations Framework Convention on Climate Change
$\mu g/m^3$	micrograms per cubic meter
UV-B	ultraviolet B rays
VMT	vehicle miles traveled
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The purpose of this Air Quality Assessment is to evaluate potential short- and long-term air quality impacts resulting from implementation of the proposed Middle Earth Expansion Project ("project" or "proposed project") on the University of California, Irvine (UCI) campus.

Regionally, the project site is located 1.92 miles south of Interstate 405 (I-405), and one mile north of State Route 73 (SR-73). Locally, the project is located on the UCI campus, within the existing Middle Earth student housing complex, approximately 115 feet northeast of the intersection of Ring Road and Engineering Services Road.

The proposed project would expand the existing Middle Earth student housing with the addition of an approximately 240,000 square-foot, seven-story structure. The first two floors of the structure would include a 40,000 square-foot dining facility, 14,000 square feet of community facilities to be shared by the rest of the Middle Earth complex, and 12,000 square feet of support and ancillary space. The top five floors would include 500 beds and associated dormitory facilities, such as lounges, laundry, kitchenettes, and bathrooms, totaling approximately 82,000 square feet. The proposed residence tower would replace the existing dining facility and student community center. In addition to the new residence tower, the project includes the demolition of Brandywine Commons, and interior remodeling of the existing 10,000 square foot Pippin Commons. The proposed residence tower and renovated Pippin Commons is estimated to increase staff by 10.

<u>Temporary Impacts</u>. Mitigated construction emissions from project implementation would not exceed established South Coast Air Quality Management District (SCAQMD) thresholds.

<u>Long-Term Impacts</u>. The analysis has demonstrated that project implementation would result in less than significant long-term regional and localized air quality impacts. Carbon monoxide hot-spots impacts would also be less than significant. The proposed project would result in less than significant impacts for all long-term operational emissions.

<u>Cumulative Impacts</u>. The proposed project would not result in long-term air quality impacts, as emissions would not exceed the SCAQMD adopted operational thresholds. Additionally, adherence to SCAQMD rules and regulations would alleviate potential impacts related to cumulative conditions on a project-by-project basis. The project would not result in significant operational emissions of criteria pollutants.

1.0 INTRODUCTION

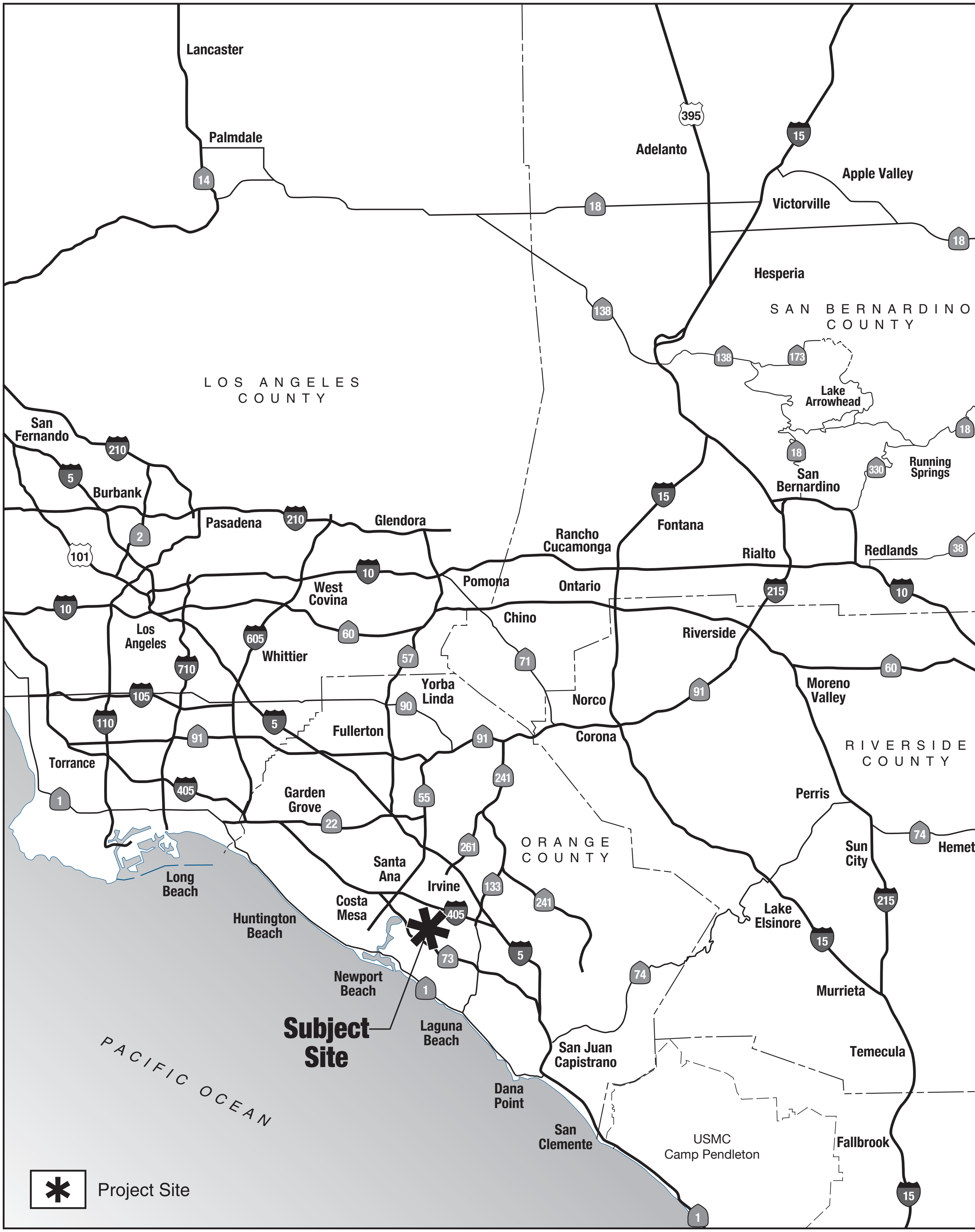
The purpose of this Air Quality Assessment is to evaluate potential short- and long-term air quality impacts resulting from implementation of the proposed Middle Earth Housing Expansion Project ("project" or "proposed project") on the University of California, Irvine (UCI) campus.

1.1 PROJECT LOCATION

The project site is located 1.92 miles south of Interstate 405 (I-405), and one mile north of State Route 73 (SR-73); refer to Exhibit 1, *Regional Vicinity*. Locally, the project is located on the UCI campus, within the existing Middle Earth student housing complex, approximately 115 feet northeast of the intersection of Ring Road and Engineering Services Road; refer to Exhibit 2, *Site Vicinity*.

1.2 PROJECT DESCRIPTION

The proposed project would expand the existing Middle Earth student housing with the addition of an approximately 240,000 square-foot, seven-story structure; refer to Exhibit 3, *Conceptual Site Plan*. The first two floors of the structure would include a 40,000 square-foot dining facility, 14,000 square feet of community facilities to be shared by the rest of the Middle Earth complex, and 12,000 square feet of support and ancillary space. The top five floors would include 500 beds and associated dormitory facilities, such as lounges, laundry, kitchenettes, and bathrooms, totaling approximately 82,000 square feet. The proposed residence tower would replace the existing dining facility and student community center. In addition to the new residence tower, the project includes the demolition of Brandywine Commons, and interior remodeling of the existing 10,000 square foot Pippin Commons. The proposed residence tower and renovated Pippin Commons is estimated to increase staff by 10.



Michael Baker INTERNATIONAL

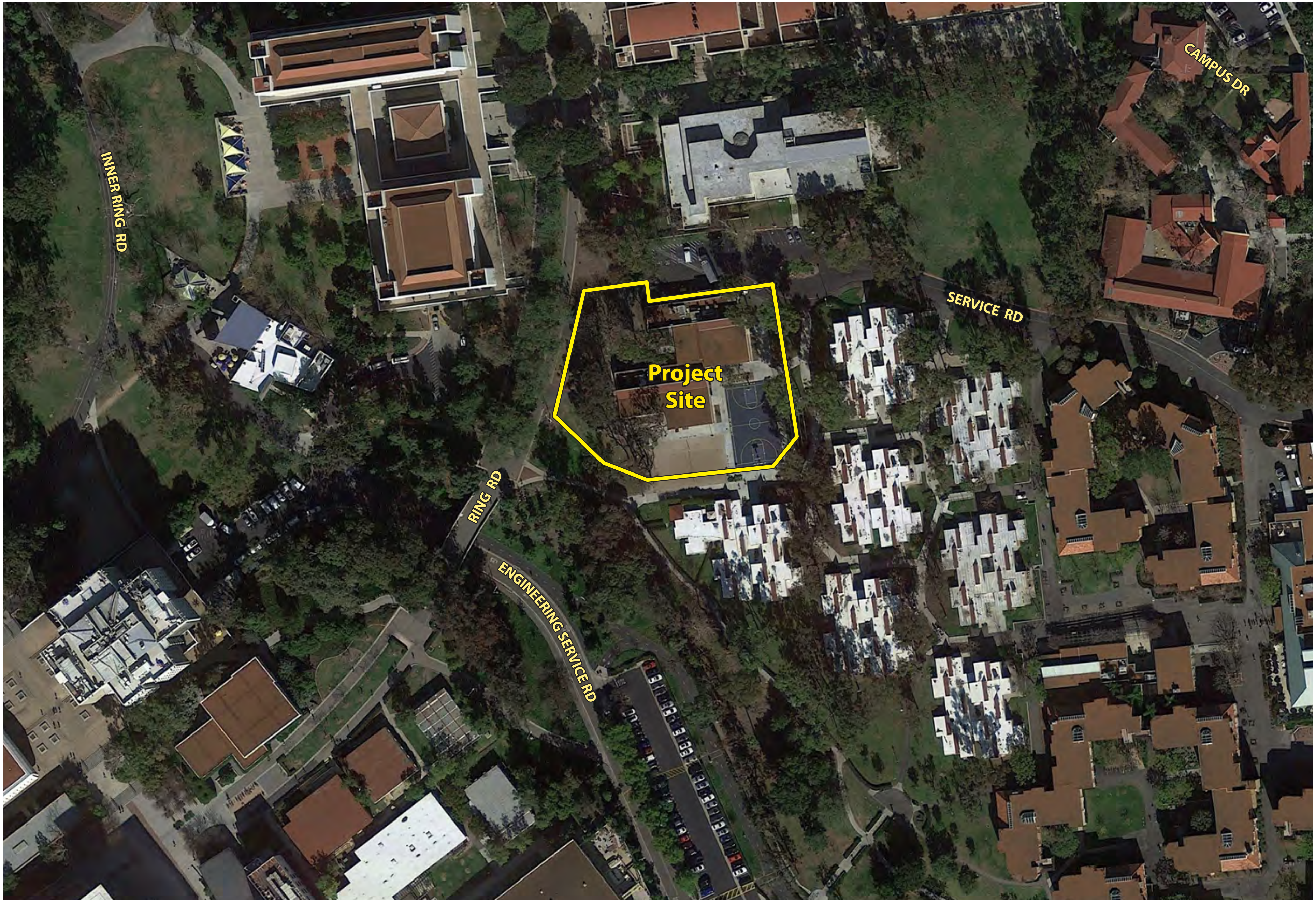
0 5 11 miles
APPROXIMATE

11/04/16 JN156259-21945 mas

MIDDLE EARTH EXPANSION
AIR QUALITY ASSESSMENT

Regional Vicinity

Exhibit 1



Source: Aerial - Google Earth Pro, November 2016

Michael Baker INTERNATIONAL

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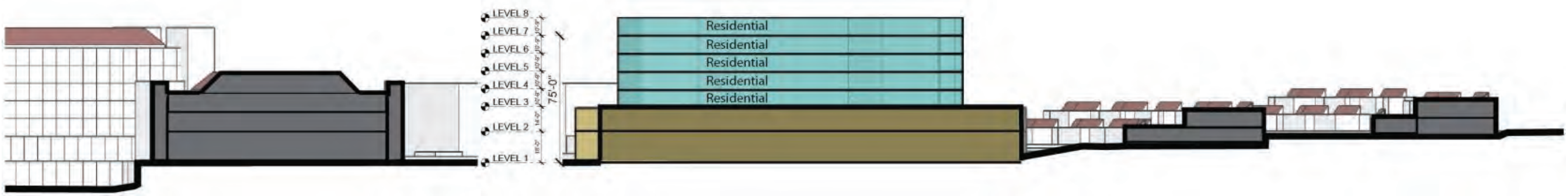
MIDDLE EARTH EXPANSION • AIR QUALITY ASSESSMENT

Site Vicinity

Exhibit 2



Source: Aerial - Google Earth Pro, November 2016

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MIDDLE EARTH EXPANSION • AIR QUALITY ASSESSMENT

Conceptual Site Plan

Exhibit 3

2.0 ENVIRONMENTAL SETTING

The California Air Resources Board (CARB) divides the State into 15 air basins that share similar meteorological and topographical features. The project site lies within the northwestern portion of the South Coast Air Basin (Basin). The Basin is a 6,600-square mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. The Basin's terrain and geographical location (i.e., a coastal plain with connecting broad valleys and low hills) determine its distinctive climate.

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. The climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

CLIMATE

The average annual temperature varies little throughout the Basin, averaging 75 degrees Fahrenheit (°F). However, with a less-pronounced oceanic influence, the eastern inland portions of the Basin show greater variability in annual minimum and maximum temperatures. All portions of the Basin have had recorded temperatures over 100°F in recent years.

Although the Basin has a semi-arid climate, the air near the surface is moist due to the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the Basin by offshore winds, the ocean effect is dominant. Periods with heavy fog are frequent, and low stratus clouds, occasionally referred to as "high fog," are a characteristic climate feature. Annual average relative humidity is 70 percent at the coast and 57 percent in the eastern part of the Basin. Precipitation in the Basin is typically nine to 14 inches annually and is rarely in the form of snow or hail due to typically warm weather. The frequency and amount of rainfall is greater in the coastal areas of the Basin.

The height of the inversion is important in determining pollutant concentration. When the inversion is approximately 2,500 feet above sea level, the sea breezes carry the pollutants inland to escape over the mountain slopes or through the passes. At a height of 1,200 feet, the terrain prevents the pollutants from entering the upper atmosphere, resulting in a settlement in the foothill communities. Below 1,200 feet, the inversion puts a tight lid on pollutants, concentrating them in a shallow layer over the entire coastal basin. Usually, inversions are lower before sunrise than during the day. Mixing heights for inversions are lower in the summer and more persistent, being partly responsible for the high levels of ozone (O_3) observed during summer months in the

Basin. Smog in southern California is generally the result of these temperature inversions combining with coastal day winds and local mountains to contain the pollutants for long periods of time, allowing them to form secondary pollutants by reacting with sunlight. The Basin has a limited ability to disperse these pollutants due to typically low wind speeds.

The area in which the project is located offers clear skies and sunshine, yet is still susceptible to air inversions. These inversions trap a layer of stagnant air near the ground, where it is then further loaded with pollutants. These inversions cause haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, furnaces, and other sources.

Irvine experiences average high temperatures of up to 83 degrees (˚) Fahrenheit (F) during the month of August, and average low temperatures of 47 ˚F during the month of December. The City experiences approximately 14.42 inches of precipitation per year, with the most precipitation occurring in the month of February.[1]

[1] U.S. Climate Data, *Climate Irvine - California*, http://www.usclimatedata.com/climate/irvine/california/united-states/usca2494, accessed on October 18, 2016.

3.0 STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS

3.1 AMBIENT AIR QUALITY STANDARDS

CARB and the U.S. Environmental Protection Agency (EPA) establish ambient air quality standards for major pollutants at thresholds intended to protect public health. The standards for some pollutants are based on other values such as protection of crops or avoidance of nuisance conditions. Table 1, *State and National Ambient Air Quality Standards and Attainment Status*, summarizes the State California Ambient Air Quality Standards (CAAQS) and the Federal National Ambient Air Quality Standards (NAAQS).

CARB designates all areas within the State as either attainment (having air quality better than the CAAQS) or nonattainment (having a pollution concentration that exceeds the CAAQS more than once in three years). Likewise, the EPA designates all areas of the U.S. as either being in attainment of the NAAQS or nonattainment if pollution concentrations exceed the NAAQS. Because attainment/nonattainment is pollutant-specific, an area may be classified as nonattainment for one pollutant and attainment for another. Similarly, because the State and national standards differ, an area could be classified as attainment for the Federal standard of a pollutant while it may be nonattainment for the State standard of the same pollutant. Some areas are unclassified, which means no monitoring data are available. Unclassified areas are considered to be in attainment. The attainment status of SCAQMD for CAAQS and NAAQS for the area where the proposed project is located is shown in Table 1 and is discussed in more detail below under "Ambient Air Monitoring."

3.2 AMBIENT AIR MONITORING

CARB monitors ambient air quality at approximately 250 air monitoring stations across the state. Air quality monitoring stations usually measure pollutant concentrations ten feet aboveground level; therefore, air quality is often referred to in terms of ground-level concentrations. The project site is located within Source Receptor Area (SRA) 20, Central Orange County Coastal. The closest air monitoring station to the project site is the Costa Mesa – Mesa Verde Drive Monitoring Station. Local air quality data from 2013 to 2015 is provided in Table 2, *Summary of Air Quality Data*. This table lists the monitored maximum concentrations and number of exceedances of Federal/State air quality standards for each year.

Ozone. Ozone (O_3) occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. The troposphere extends approximately 10 miles above ground level, where it meets the second layer, the stratosphere. The stratospheric (the "good" ozone) layer extends upward from about ten to 30 miles and protects life on earth from the sun's harmful ultraviolet rays (UV-B). "Bad" ozone is a photochemical pollutant, and needs volatile organic compounds (VOCs), Nitrogen Oxides (NO_X) and sunlight to form; therefore, VOCs and NO_X are

Table 1
State and National Ambient Air Quality Standards and Attainment Status

Pollutant	Averaging Time	California[1]		Federal[2]	
		Standard[3]	Attainment Status	Standards[3, 4]	Attainment Status
Ozone (O_3)	1 Hour	0.09 ppm (180 $\mu g/m^3$)	Nonattainment	N/A[5]	N/A[5]
	8 Hours	0.070 ppm (137 $\mu g/m^3$)	Nonattainment	0.070 ppm (137 $\mu g/m^3$)	Extreme Nonattainment
Particulate Matter (PM_{10})	24 Hours	50 $\mu g/m^3$	Nonattainment	150 $\mu g/m^3$	Serious/Maintenance
	Annual Arithmetic Mean	20 $\mu g/m^3$	Nonattainment	N/A[6]	N/A[6]
Fine Particulate Matter ($PM_{2.5}$)[7]	24 Hours	No Separate State Standard		35 $\mu g/m^3$	Moderate Nonattainment
	Annual Arithmetic Mean	12 $\mu g/m^3$	Nonattainment	12 $\mu g/m^3$	Moderate Nonattainment
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Serious/Maintenance
	8 Hours	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Serious/Maintenance
Nitrogen Dioxide (NO_2)[8]	1 Hour	0.18 ppm (339 $\mu g/m^3$)	Unclassified/Attainment	0.100 ppm (188 $\mu g/m^3$)	Unclassified/Attainment
	Annual Arithmetic Mean	0.030 ppm (57 $\mu g/m^3$)	Attainment	0.053 ppm (100 $\mu g/m^3$)	Attainment/Maintenance
Lead (Pb)[9, 10]	30 days average	1.5 $\mu g/m^3$	Attainment	N/A	N/A
	Calendar Quarter	N/A	N/A	1.5 $\mu g/m^3$	Unclassified/Attainment
	Rolling 3-Month Average	N/A	N/A	0.15 $\mu g/m^3$	Unclassified/Attainment
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 $\mu g/m^3$)	Attainment	75 ppb (196 $\mu g/m^3$)	Designation Pending (Expect Unclassified/Attainment)
	24 Hours	0.04 ppm (105 $\mu g/m^3$)	Attainment	0.14 ppm (for certain areas)[12]	Unclassified/Attainment
	Annual Arithmetic Mean	N/A	N/A	0.030 ppm (for certain areas)	Unclassified/Attainment
Visibility-Reducing Particles[12]	8 Hours (10 a.m. to 6 p.m., PST)	Extinction coefficient = 0.23 km@<70% RH	Unclassified	No Federal Standards	
Sulfates	24 Hour	25 $\mu g/m^3$	Attainment		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 $\mu g/m^3$)	Attainment		
Vinyl Chloride[9, 10]	24 Hour	0.01 ppm (26 $\mu g/m^3$)	Attainment		

$\mu g/m^3$ = micrograms per cubic meter; ppm = parts per million; ppb = parts per billion; km = kilometer(s); RH = relative humidity; PST = Pacific Standard Time; N/A = Not Applicable

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, suspended particulate matter-PM_{10} 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. In 1990, CARB identified vinyl chloride as a toxic air contaminant, but determined that there was not sufficient available scientific evidence to support the identification of a threshold exposure level. This action allows the implementation of health-protective control measures at levels below the 0.010 ppm ambient concentration specified in the 1978 standard.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. The EPA also may designate an area as attainment/unclassifiable, if: (1) it has monitored air quality data that show that the area has not violated the ozone standard over a three-year period; or (2) there is not enough information to determine the air quality in the area. 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 mg/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.
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 mm of mercury. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
5. The Federal 1-hour ozone standard was revoked on June 15, 2005 in all areas except the 14 8-hour ozone nonattainment Early Action Compact (EAC) areas.
6. The EPA revoked the annual PM_{10} standard in 2006 (effective December 16, 2006).
7. On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM_{10} standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
8. On June 2, 2010, a new 1-hour SO_2 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, 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 ppb. California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
9. CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
10. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average.
11. On June 2, 2010, a new 1-hour SO_2 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, 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 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
12. In 1989, CARB 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.

Source: California Air Resources Board, May 2016, and U.S. Environmental Protection Agency, September 2016.

Table 2
Summary of Air Quality Data

Pollutant	California Standard	Federal Primary Standard	Year	Maximum Concentration[3]	Days (Samples) State/Federal Std. Exceeded
Ozone (O_3)[1] (1-hour)	0.09 ppm for 1 hour	NA[6]	2013 2014 2015	0.095 ppm 0.096 0.099	1/0 1/0 1/0
Ozone (O_3)[1] (8-hour)	0.070 ppm for 8 hours	0.070 ppm for 8 hours	2013 2014 2015	0.084 ppm 0.080 0.080	2/1 6/4 2/1
Carbon Monoxide (CO)[1] (1-hour)	20 ppm for 1 hour	35 ppm for 1 hour	2013 2014 2015	2.44 ppm 2.68 2.98	0/0 0/0 0/0
Carbon Monoxide (CO)[1] (8-hour)	9.0 ppm for 8 hours	9.0 ppm for 8 hours	2013 2014 2015	NA NA NA	NA/NA NA/NA NA/NA
Nitrogen Dioxide (NO_2)[1]	0.18 ppm for 1 hour	0.100 ppm for 1 hour	2013 2014 2015	0.076 ppm 0.060 0.052	0/0 0/0 0/0
Fine Particulate Matter ($PM_{2.5}$)[2, 4]	No Separate Standard	35 $\mu g/m^3$ for 24 hours	2013 2014 2015	28.0 $\mu g/m^3$ 25.5 31.5	NA/[6] NA/[6] NA/[6]
Particulate Matter (PM_{10})[2, 4, 5]	50 $\mu g/m^3$ for 24 hours	150 $\mu g/m^3$ for 24 hours	2013 2014 2015	51.0 $\mu g/m^3$ 541.0 49.0	0/0 0/0 0/0

Source: Aerometric Data Analysis and Measurement System (ADAM), summaries from 2013 to 2015, https://www.arb.ca.gov/adam.

ppm = parts per million; PM_{10} = particulate matter 10 microns in diameter or less; NM = not measured; $\mu g/m^3$ = micrograms per cubic meter; $PM_{2.5}$ = particulate matter 2.5 microns in diameter or less; NA = not applicable; * = data not available.

Notes:
1. Data collected from the Costa Mesa – Mesa Verde Drive Monitoring Station located at 2850 Mesa Verde Drive, Costa Mesa, California 92626.
2. Data collected from the Mission Viejo – 2601 Via Pera Monitoring Station located at 26081 Via Pera, Mission Viejo, CA 92691.
3. Maximum concentration is measured over the same period as the California Standards.
4. PM_{10} exceedances are based on State thresholds established prior to amendments adopted on June 20, 2002.
5. PM_{10} and $PM_{2.5}$ exceedances are derived from the number of samples exceeded, not days.
6. The Federal standard was revoked in June 2005.

ozone precursors. VOCs and NO_X are emitted from various sources throughout the City. Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight.

Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems (such as forests and foothill plant communities) and damages agricultural crops and some man-made materials (such as rubber, paint, and plastics). Societal costs from ozone damage include increased healthcare costs, the loss of human and animal life, accelerated replacement of industrial equipment and reduced crop yields.

Carbon Monoxide. Carbon monoxide (CO) is an odorless, colorless toxic gas that is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. At high concentrations, CO can reduce the oxygen-carrying capacity of the blood and cause headaches, dizziness, and unconsciousness.

Nitrogen Dioxide. Nitrogen oxides (NO_X) are a family of highly reactive gases that are a primary precursor to the formation of ground-level O_3, and react in the atmosphere to form acid rain. NO_2 (often used interchangeably with NO_X) is a reddish-brown gas that can cause breathing difficulties at high levels. Peak readings of NO_2 occur in areas that have a high concentration of combustion sources (e.g., motor vehicle engines, power plants, refineries, and other industrial operations).

NO_2 can irritate and damage the lungs, and lower resistance to respiratory infections such as influenza. The health effects of short-term exposure are still unclear. However, continued or frequent exposure to NO_2 concentrations that are typically much higher than those normally found in the ambient air may increase acute respiratory illnesses in children and increase the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may aggravate eyes and mucus membranes and cause pulmonary dysfunction.

Coarse Particulate Matter (PM_{10}). PM_{10} refers to suspended particulate matter, which is smaller than ten microns or ten one-millionths of a meter. PM_{10} arises from sources such as road dust, diesel soot, combustion products, construction operations, and dust storms. PM_{10} scatters light and significantly reduces visibility. In addition, these particulates penetrate the lungs and can potentially damage the respiratory tract. On June 19, 2003, CARB adopted amendments to the statewide 24-hour particulate matter standards based upon requirements set forth in the Children's Environmental Health Protection Act (SB 25).

Fine Particulate Matter ($PM_{2.5}$). Due to increased concerns over health impacts related to fine particulate matter (particulate matter 2.5 microns in diameter or less), both State and Federal $PM_{2.5}$ standards have been created. Particulate matter impacts primarily affect infants, children, the elderly, and those with pre-existing cardiopulmonary disease. In 1997, the EPA announced new $PM_{2.5}$ standards. Industry groups challenged the new standard in court and the implementation of the standard was blocked. However, upon appeal by the EPA, the U.S. Supreme Court reversed this decision and upheld the EPA's new standards.

On June 20, 2002, CARB adopted amendments for statewide annual ambient particulate matter air quality standards. These standards were revised/established due to increasing concerns by CARB that previous standards were inadequate, as almost everyone in California is exposed to levels at or above the current State standards during some parts of the year, and the statewide potential for significant health impacts associated with particulate matter exposure was determined to be large and wide-ranging.

Reactive Organic Gases and Volatile Organic Compounds. Hydrocarbons are organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases including reactive organic gases (ROGs) and VOCs. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry cleaning solutions, and paint (via evaporation).

3.3 SENSITIVE RECEPTORS

Sensitive populations are more susceptible to the effects of air pollution than is the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics and CO are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Table 3, *Sensitive Receptors*, lists the distances and locations of sensitive receptors within the project vicinity. The distances depicted in Table 3 are based on the distance from the project site to the outdoor activity area of the closest receptor.

Table 3
Sensitive Receptors

Type	Name	Distance from Project Site (feet)[1]	Direction from Project Site	Location
Residential	Residential Uses	1,020 feet	North	Northwest corner of Campus Drive and East Peltason Drive.
		Adjoining	East South	Between Engineering Service Road and Service Road.
		960 feet	South	South of East Peltason Drive.
		2,247 feet	West	Northeast corner of the Bison Avenue and West Peltason Drive intersection.
Schools	University High School	4,680 feet	Northeast	4771 Campus Drive
	Turtle Rock Elementary School	6,138 feet	East	1 Concordia
	Montessori Schools of Irvine	1,708 feet	South	101 Russell Place
	Tarbut V'Torah Community Day School	5,145 feet	Southeast	5200 Bonita Canyon Drive
Places of Worship	Bethel Korean Church	4,535 feet	North	18700 Harvard Avenue
	Mariners Church	5,037 feet	South	5001 Newport Coast Drive
Parks/Recreational Areas	Aldrich Park	530 feet	West	Near Ring Road
	Crawford Field	2,895 feet	Northwest	North of Turtle Rock Drive
	Stanford Park	3,046 feet	North	North of Campus Drive
	Anteater Recreation Center	3,128 feet	East	East of California Avenue

Note:
1. Distances are measured from the exterior project boundary only and not from individual construction areas within the interior of the project site.

Source: Google Earth, 2016.

4.0 REGULATORY SETTING

4.1 FEDERAL

Air quality is federally protected by the Clean Air Act and its amendments. Under the Federal Clean Air Act (FCAA), the EPA developed the primary and secondary NAAQS for the criteria air pollutants including ozone, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and lead. Proposed projects in or near nonattainment areas could be subject to more stringent air-permitting requirements. The Clean Air Act requires each state to prepare a State Implementation Plan (SIP) to demonstrate how it will attain the NAAQS within the federally imposed deadlines.

The EPA can withhold certain transportation funds from states that fail to comply with the planning requirements of the Clean Air Act. If a state fails to correct these planning deficiencies within two years of Federal notification, the EPA is required to develop a Federal implementation plan for the identified nonattainment area or areas. The provisions of 40 CFR Parts 51 and 93 apply in all nonattainment and maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan. The EPA has designated enforcement of air pollution control regulations to the individual states.

4.2 STATE

In 1988, the California Clean Air Act (CCAA) was adopted and led to the establishment of CAAQS for the same major pollutants as the NAAQS and standards for visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. There are currently no NAAQS for these latter pollutants. CARB is responsible for enforcing air pollution regulations in California. The CCAA requires all air pollution control districts in California to endeavor to achieve and maintain state ambient air-quality standards by the earliest practicable date and to develop plans and regulations specifying how they will meet this goal.

4.3 REGIONAL

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

The *2012 Air Quality Management Plan* (2012 AQMP), which was adopted in December 2012, proposes policies and measures to achieve federal and state standards for improved air quality in the South Coast Air Basin and those portions of the Salton Sea Air Basin (formerly named the Southeast Desert Air Basin) that are under the South Coast Air Quality Management District's (SCAQMD's) jurisdiction. The AQMP relies on a regional and multi-level partnership of governmental agencies at the federal, state, regional, and local level. These agencies (EPA, CARB, local governments, Southern California Association of Governments [SCAG], and the SCAQMD) are the primary agencies that implement the AQMP programs. The 2012 AQMP incorporates the latest scientific and technical information and planning assumptions, including the 2012 Regional

Transportation Plan/Sustainable Communities Strategy, updated emission inventory methodologies for various source categories, and SCAG's latest growth forecasts.

The 2012 AQMP addresses several state and federal planning requirements, incorporating new scientific information, primarily in the form of updated emissions inventories, ambient measurements, and new meteorological air quality models. The 2012 AQMP highlights the reductions and the interagency planning necessary to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria pollutant standards within the timeframes allowed under Federal Clean Air Act. The primary task of the 2012 AQMP is to bring the Basin into attainment with federal health-based standards.

It is noted that the SCAQMD is currently in the process of developing the 2016 AQMP, which is a comprehensive and integrated plan primarily focused on addressing the ozone and $PM_{2.5}$ standards. The 2016 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.

4.4 LOCAL

University of California, Irvine

<u>Environmental Health and Safety Department</u>

UCI's Environmental Health and Safety (EH&S) Department is responsible for implementing UCI's Clean Air Program which assesses and facilitates UCI's compliance with air quality laws and regulations. In addition to the permitting programs required by California law and SCAQMD rules, UCI is required to implement a federal operating permit program, which meets federal EPA regulations adopted pursuant to Title V of the FCAA Amendments. Title V Program activities include assisting with SCAQMD Permit to Operate administration; monitoring, record keeping, and reporting activities; and developing regulatory programs and informational guidelines to ensure the campus remains in compliance with State and federal regulations.

Several different departments at UCI are involved with this program. Academic department chairs and directors are responsible for reporting new air emission sources to EH&S and maintaining records. Facilities Management and Design and Construction Services provide building and renovation plans to EH&S for review and also report new air emission sources to EH&S. Parking and Transportation Services, while not directly involved with the Clean Air Program, reduce air emissions by implementing the Alternative Transportation Program to reduce vehicular traffic and associated emissions.

5.0 POTENTIAL AIR QUALITY IMPACTS

CEQA THRESHOLDS

The environmental analysis in this section is patterned after the Initial Study Checklist recommended by the State *CEQA Guidelines*, as amended. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this section. Accordingly, a project may create a significant environmental impact if it causes one or more of the following to occur:

- Conflict with or obstruct implementation of the applicable air quality plan (refer to Impact Statement AQ-1);
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation (refer to Impact Statement AQ-2);
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable Federal or State ambient air quality standard (including releasing emissions that exceed quantitative thresholds for O_3 precursors) (refer to Impact Statement AQ-3);
- Expose sensitive receptors to substantial pollutant concentrations (refer to Impact Statement AQ-4);
- Create objectionable odors affecting a substantial number of people (refer to Impact Statement AQ-5);

Based on these standards and thresholds, the effects of the proposed project have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts.

AIR QUALITY THRESHOLDS

Under CEQA, the SCAQMD is an expert commenting agency on air quality within its jurisdiction or impacting its jurisdiction. Under the FCAA, the SCAQMD has adopted Federal attainment plans for O_3 and PM_{10}. The SCAQMD reviews projects to ensure that they would not: (1) cause or contribute to any new violation of any air quality standard; (2) increase the frequency or severity of any existing violation of any air quality standard; or (3) delay timely attainment of any air quality standard or any required interim emission reductions or other milestones of any Federal attainment plan.

The *CEQA Air Quality Handbook* also provides significance thresholds for both construction and operation of projects within the SCAQMD jurisdictional boundaries. If the SCAQMD thresholds are exceeded, a potentially significant impact could result. However, ultimately the lead agency determines the thresholds of significance for impacts. If a project proposes development in excess of the established thresholds, as outlined in Table 4, *South Coast Air Quality Management District Emissions Thresholds*, a significant air quality impact may occur and additional analysis is warranted to fully assess the significance of impacts.

Table 4
South Coast Air Quality Management District Emissions Thresholds

Phase	Pollutant (lbs/day)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Construction	75	100	550	150	150	55
Operational	55	55	550	150	150	55
Source: South Coast Air Quality Management District, CEQA Air Quality Handbook, November 1993.						

Local Carbon Monoxide Standards

In addition, the significance of localized project impacts depends on whether ambient CO levels in the vicinity of the project are above or below State and Federal CO standards, as follows:

- If the project causes an exceedance of either the State one-hour or eight-hour CO concentrations, the project would be considered to have a significant local impact.

- If ambient levels already exceed a State or Federal standard, then project emissions would be considered significant if they increase one-hour CO concentrations by 1.0 ppm or more, or eight-hour CO concentrations by 0.45 ppm or more.

Localized Significance Thresholds

Localized Significance Thresholds (LSTs) were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the *Final Localized Significance Threshold Methodology* (dated July 2008) for guidance. The LST methodology assists lead agencies in analyzing localized impacts associated with project-specific level proposed projects. The SCAQMD provides the LST lookup tables for one-, two-, and five-acre projects emitting CO, NO_X, or PM_{10}. The LST methodology and associated mass rates are not designed to evaluate localized impacts from mobile sources traveling over the roadways. The SCAQMD recommends that any project over five acres should perform air quality dispersion modeling to assess impacts to nearby sensitive receptors.

Cumulative Emissions Thresholds

The SCAQMD's 2012 AQMP was prepared to accommodate growth, meet State and Federal air quality standards, and minimize the fiscal impact that pollution control measures have on the local economy. According to the SCAQMD *CEQA Air Quality Handbook*, project-related emissions that fall below the established construction and operational thresholds should be considered less than significant unless there is pertinent information to the contrary. If a project exceeds these emission thresholds, the SCAQMD *CEQA Air Quality Handbook* states that the significance of a project's contribution to cumulative impacts should be determined based on whether the rate of growth in average daily trips exceeds the rate of growth in population.

AQ-1 CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE APPLICABLE AIR QUALITY PLAN?

Level of Significance Before Mitigation: *Potentially Significant Impact.*

On December 7, 2012, the SCAQMD Governing Board approved the 2012 AQMP, which outlines its strategies for meeting the NAAQS for $PM_{2.5}$ and ozone. The 2012 AQMP was forwarded to CARB for inclusion into the California State Implementation Plan (SIP) in January 2013. Subsequently, the 2012 AQMP was submitted to the EPA as the 24-hour $PM_{2.5}$ SIP addressing the 2006 $PM_{2.5}$ NAAQS and as a limited update to the approved 8-hour ozone SIP. The 1-hour ozone attainment demonstration and vehicle miles traveled (VMT) emissions offset demonstration was submitted through CARB to the EPA. According to the SCAQMD's 2012 AQMP, two main criteria must be addressed.

Criterion 1:

With respect to the first criterion, SCAQMD methodologies require that an air quality analysis for a project include forecasts of project emissions in relation to contributing to air quality violations and delay of attainment.

a) *Would the project result in an increase in the frequency or severity of existing air quality violations?*

   Since the consistency criteria identified under the first criterion pertain to pollutant concentrations, rather than to total regional emissions, an analysis of a project's pollutant emissions relative to localized pollutant concentrations is used as the basis for evaluating project consistency. As discussed in Impact Statement AQ-4, below, localized concentrations of CO, NO_X, PM_{10}, and $PM_{2.5}$ would be less than significant during project operations. Therefore, the proposed project would not result in an increase in the frequency or severity of existing air quality violations. Because reactive organic gases (ROGs) are not a criteria pollutant, there is no ambient standard or localized threshold for ROGs. Due to the role ROG plays in ozone formation, it is classified as a precursor pollutant and only a regional emissions threshold has been established.

b) *Would the project cause or contribute to new air quality violations?*

As discussed in Impact Statement AQ-2, operations of the proposed project would result in emissions that would be below the SCAQMD operational thresholds. Therefore, the proposed project would not have the potential to cause or affect a violation of the ambient air quality standards.

c) *Would the project delay timely attainment of air quality standards or the interim emissions reductions specified in the AQMP?*

The proposed project would result in less than significant impacts with regard to localized concentrations during project operations. As such, the proposed project would not delay the timely attainment of air quality standards or 2012 AQMP emissions reductions.

Criterion 2:

With respect to the second criterion for determining consistency with SCAQMD and SCAG air quality policies, it is important to recognize that air quality planning within the Basin focuses on attainment of ambient air quality standards at the earliest feasible date. Projections for achieving air quality goals are based on assumptions regarding population, housing, and growth trends. Thus, the SCAQMD's second criterion for determining project consistency focuses on whether or not the proposed project exceeds the assumptions utilized in preparing the forecasts presented in the 2012 AQMP. Determining whether or not a project exceeds the assumptions reflected in the 2012 AQMP involves the evaluation of the three criteria outlined below. The following discussion provides an analysis of each of these criteria.

a) *Would the project be consistent with the population, housing, and employment growth projections utilized in the preparation of the AQMP?*

In the case of the 2012 AQMP, several sources of data form the basis for the projections of air pollutant emissions including: the *City of Irvine General Plan* (General Plan), UCI's *2007 Long Range Development Plan* (LRDP), SCAG's *Growth Management* Chapter of the *Regional Comprehensive Plan* (RCP), and SCAG's *2012-2035 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS). The RTP/SCS also provides socioeconomic forecast projections of regional population growth. The General Plan Land Use Map designates the project site as "Educational Facilities", and the LRDP designates the site as Student Housing. According to the LRDP, the Student Housing designation permits residential facilities intended to accommodate single undergraduate and graduate students, student groups (including fraternities, sororities, and academically-themed collectives), students with families, and other University affiliates. Other permitted uses include residential parking, child care and pre-school facilities, recreation facilities, meeting and classroom space, food service and retail, and other residential support uses. The project proposes to expand the existing undergraduate Middle Earth student housing with the addition of an approximately 240,000 GSF, seven-story structure. The project would provide dormitories, community facilities, and a dining area for UCI undergraduate students, and therefore complies with the site's intended use. Additionally, the project would be consistent with the City's General Plan and UCI's LRDP and assumed emissions for the project site, since no change in the site's land use designation is proposed. Thus, the project is generally consistent with the types, intensity, and patterns of land use envisioned for the site vicinity in the RCP. The population, housing, and employment forecasts, which are adopted by SCAG's Regional Council, are based on the local plans and policies applicable to the cities; these are used by SCAG in all phases of implementation and review. Additionally, as SCAQMD incorporated these same projections into the 2012 AQMP, it can be concluded that the project would be consistent with the projections. As a result, the project would not exceed growth assumptions within the City's General Plan. Therefore, the project would be consistent with the 2012 AQMP and a less than significant impact would occur.

b) *Would the project implement all feasible air quality mitigation measures?*

Compliance with all feasible emission reduction measures identified by the SCAQMD would be required as identified in Impact Statement AQ-2 and AQ-3. As such, the proposed project would meet this AQMP consistency criterion.

c) *Would the project be consistent with the land use planning strategies set forth in the AQMP?*

The project is consistent with the LRDP land use designations for the site, and would serve to implement various LRDP policies. Compliance with emission reduction measures identified by the SCAQMD would be required as identified in Impact Statement AQ-2 and Impact Statement AQ-3. As such, the proposed project meets this AQMP consistency criterion.

In conclusion, the determination of 2012 AQMP consistency is primarily concerned with the long-term influence of a project on air quality in the Basin. The proposed project would not result in a long-term impact on the region's ability to meet State and Federal air quality standards. Also, the proposed project would be consistent with the goals and policies of the AQMP for control of fugitive dust. As discussed above, the proposed project's long-term influence would also be consistent with the SCAQMD and SCAG's goals and policies and is, therefore, considered consistent with the 2012 AQMP.

Mitigation Measures: Refer to Mitigation Measures AQ-1, below.

Level of Significance After Mitigation. *Less Than Significant Impact.*

AQ-2 VIOLATE ANY AIR QUALITY STANDARDS OR CONTRIBUTE SUBSTANTIALLY TO AN EXISTING OR PROJECTED AIR QUALITY VIOLATION?

Level of Significance Before Mitigation: *Potentially Significant Impact.*

SHORT-TERM CONSTRUCTION

Short-term air quality impacts are predicted to occur during grading and construction operations associated with implementation of the proposed project. Temporary air emissions would result from the following activities:

- Particulate (fugitive dust) emissions from grading and building construction; and
- Exhaust emissions from the construction equipment and the motor vehicles of the construction crew.

Construction activities would include site preparation, grading, building construction, paving, and architectural coating. Site grading would require approximately 1,500 cubic yards of soil export off-site. Project construction equipment would include excavators, graders, dozers, scrapers, and tractors/loaders/backhoes during grading; rough terrain forklifts, generators, tractors/loaders/backhoes, and welders during building construction; pavers, paving equipment, and rollers during paving; and air compressors during architectural coating. Emissions for each construction phase have been quantified based upon the phase durations and equipment types. The analysis of daily construction emissions has been prepared utilizing the California Emissions Estimator Model (CalEEMod) version 2016.3.1. Refer to Appendix A, *Air Quality Emissions Data*, for the CalEEMod outputs and results. Table 5, *Short-Term (Construction) Emissions*, presents the anticipated daily short-term construction emissions.

Fugitive Dust Emissions

Construction activities are a source of fugitive dust (PM_{10} and $PM_{2.5}$) emissions that may have a substantial, temporary impact on local air quality. In addition, fugitive dust may be a nuisance to those living and working in the project area. Fugitive dust emissions are associated with land clearing, ground excavation, cut-and-fill, and truck travel on unpaved roadways (including demolition as well as construction activities). Fugitive dust emissions vary substantially from day to day, depending on the level of activity, specific operations, and weather conditions. Fugitive dust from grading and construction is expected to be short-term and would cease upon project completion. Additionally, most of this material is inert silicates, rather than the complex organic particulates released from combustion sources, which are more harmful to health.

Table 5
Short-Term (Construction) Emissions

Emissions Source	Pollutant (pounds/day) [1, 2]					
	ROG[3]	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
2017						
Unmitigated Emissions	3.22	31.53	19.70	0.03	5.59	3.34
Mitigated Emissions	3.22	31.53	19.70	0.03	2.73	1.81
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Is Threshold Exceeded After Mitigation?	*No*	*No*	*No*	*No*	*No*	*No*
2018						
Unmitigated Emissions	1.67	15.60	12.06	0.03	1.60	0.94
Mitigated Emissions	1.67	15.60	12.06	0.03	1.60	0.94
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Is Threshold Exceeded After Mitigation?	*No*	*No*	*No*	*No*	*No*	*No*
2019						
Unmitigated Emissions	21.43	14.17	11.56	0.03	1.50	0.84
Mitigated Emissions	21.43	14.17	11.56	0.03	1.50	0.84
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Is Threshold Exceeded After Mitigation?	*No*	*No*	*No*	*No*	*No*	*No*

Notes:
1. Emissions were calculated using CalEEMod, as recommended by the SCAQMD.
2. The reduction/credits for construction emission mitigations are based on mitigation included in CalEEMod and as typically required by the SCAQMD. The mitigation includes the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; cover stock piles with tarps; water all haul roads twice daily; and limit speeds on unpaved roads to 15 miles per hour.
3. Both ROGs and VOCs are subsets of organic gases that are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. Although they represent slightly different subsets of organic gases, they are used interchangeably for the purposes of this analysis.

Refer to Appendix A, *Air Quality Emissions Data*, for assumptions used in this analysis.

Dust (larger than 10 microns) generated by such activities usually becomes more of a local nuisance than a serious health problem. Of particular health concern is the amount of PM_{10} (particulate matter smaller than 10 microns) generated as a part of fugitive dust emissions. PM_{10} poses a serious health hazard alone or in combination with other pollutants. Fine Particulate Matter ($PM_{2.5}$) is mostly produced by mechanical processes. These include automobile tire wear, industrial processes such as cutting and grinding, and re-suspension of particles from the ground or road surfaces by wind and human activities such as construction or agriculture. $PM_{2.5}$ is mostly derived from combustion sources, such as automobiles, trucks, and other vehicle exhaust, as well as from stationary sources. These particles are either directly emitted or are formed in the atmosphere from the combustion of gases such as NO_X and SO_X combining with ammonia. $PM_{2.5}$ components from material in the earth's crust, such as dust, are also present, with the amount varying in different locations.

Mitigation Measure AQ-1 would require the project contractor to implement construction emissions Best Management Practices (BMPs) during construction, including, but not limited to, dust control techniques (i.e., daily watering), a traffic management plan, and adherence to SCAQMD Rules 402 and 403 (which require watering of inactive and perimeter areas, track out requirements, etc.), to reduce PM_{10} and $PM_{2.5}$ concentrations. It is noted that the BMPs required in Mitigation Measure AQ-1 are applicable measures from LRDP EIR Mitigation Measure Air-2B. These are standard dust control measures that the SCAQMD requires for all projects. As indicated in Table 5, total PM_{10} and $PM_{2.5}$ emissions would be below the SCAQMD threshold with the implementation of Mitigation Measure AQ-1. Therefore, particulate matter impacts during construction would be less than significant.

ROG Emissions[2]

In addition to gaseous and particulate emissions, the application of asphalt and surface coatings creates ROG emissions, which are O_3 precursors. In accordance with the methodology prescribed by the SCAQMD, the ROG emissions associated with paving have been quantified with CalEEMod. Architectural coatings were also quantified with CalEEMod based upon the size of the buildings.

The highest concentration of ROG emissions would be generated during the application of architectural coatings on the building. As required by law, all architectural coatings for the proposed project structures would comply with SCAQMD Regulation XI, Rule 1113 – Architectural Coating.[3] Rule 1113 provides specifications on painting practices as well as regulates the ROG content of paint. As shown in Table 5, project construction would not result in an exceedance of ROG emissions during any years of construction. Therefore, impacts would be less than significant in this regard.

Construction Equipment and Worker Vehicle Exhaust

Exhaust emissions from construction activities include emissions associated with the transport of machinery and supplies to and from the project site, emissions produced on-site as the equipment is used, and emissions from trucks transporting materials to and from the site. Standard SCAQMD regulations, such as maintaining all construction equipment in proper tune, shutting down equipment when not in use for extended periods of time, and implementing SCAQMD Rule 403 would be adhered to. As noted in Table 5, construction equipment exhaust would not exceed SCAQMD thresholds. Therefore, impacts are less than significant in this regard.

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[2] ROGs and VOCs are subsets of organic gases that are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. Although they represent slightly different subsets of organic gases, they are used interchangeably for the purposes of this analysis.

[3] South Coast Air Quality Management District, *Regulation XI Source Specific Standards*, http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1113.pdf?sfvrsn=15, accessed on October 25, 2016.

Naturally Occurring Asbestos

Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos is classified as a known human carcinogen by State, Federal, and international agencies and was identified as a toxic air contaminant by the California Air Resources Board in 1986.

Asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have been commonly used for unpaved gravel roads, landscaping, fill projects, and other improvement projects in some localities. Asbestos may be released to the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. All of these activities may have the effect of releasing potentially harmful asbestos into the air. Natural weathering and erosion processes can act on asbestos bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed. According to the Department of Conservation Division of Mines and Geology, *A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos Report* (August 2000), serpentinite and ultramafic rocks are not known to occur within the project area. Thus, there would be no impact in this regard.

Construction Odors

Potential odors could arise from the diesel construction equipment used on-site, as well as from architectural coatings and asphalt off-gassing. Odors generated from the referenced sources are common in the man-made environment and are not known to be substantially offensive to adjacent receptors. Additionally, odors generated during construction activities would be temporary and would decrease rapidly. Therefore, construction odors are not considered to be a significant impact.

Total Daily Construction Emissions

In accordance with the SCAQMD Guidelines, CalEEMod was utilized to model construction emissions for ROG, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$. Construction would occur over an approximate two year period with the greatest emissions being generated during the initial stages of construction. Additionally, the greatest amount of ROG emissions would typically occur during the final stages of development due to the application of architectural coatings.

CalEEMod allows the user to input mitigation measures such as watering the construction area to limit fugitive dust. Mitigation measures that were input into CalEEMod allow for certain reduction credits and result in a decrease of pollutant emissions. Reduction credits are based upon studies developed by CARB, SCAQMD, and other air quality management districts throughout California, and were programmed within CalEEMod. As indicated in Table 5, CalEEMod calculates the reduction associated with recommended mitigation measures.

As depicted in Table 5, construction emissions would be less than significant with implementation of Mitigation Measure AQ-1. Thus, construction related air emissions would be less than significant.

LONG-TERM OPERATIONAL EMISSIONS

Mobile Source Emissions

Mobile sources are emissions from motor vehicles, including tailpipe and evaporative emissions. Depending upon the pollutant being discussed, the potential air quality impact may be of either regional or local concern. For example, ROG, NO_X, SO_X, PM_{10}, and $PM_{2.5}$ are all pollutants of regional concern (NO_X and ROG react with sunlight to form O_3 [photochemical smog], and wind currents readily transport SO_X, PM_{10}, and $PM_{2.5}$). However, CO tends to be a localized pollutant, dispersing rapidly at the source.

Project-generated vehicle emissions have been estimated using CalEEMod. Trip generation rates associated with the project were based on traffic data within the *Middle Earth Housing Expansion Traffic Study* (Traffic Study) for the proposed project, prepared by Stantec Consulting Services (dated October 2016). The proposed project would result in approximately 112 new daily trips. Table 6, *Long-Term Air Emissions*, presents the anticipated mobile source emissions. As shown in Table 6, unmitigated emissions generated by vehicle traffic associated with the proposed project would not exceed established SCAQMD regional thresholds.

Table 6
Long-Term Air Emissions

Source	Estimated Emissions (pounds/day) [1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Area Sources	3.31	0.00	0.06	0.00	0.00	0.00
Energy Sources	0.36	3.24	2.72	0.02	0.25	0.25
Mobile Sources	0.20	0.82	2.45	0.01	0.72	0.20
Total Emissions	*3.87*	*4.06*	*5.23*	*0.03*	*0.97*	*0.45*
SCAQMD Threshold	*55*	*55*	*550*	*150*	*150*	*55*
Is Threshold Exceeded? (Significant Impact)	No	No	No	No	No	No

Notes:
1. Based on CalEEMod modeling results, worst-case seasonal emissions for area and mobile emissions have been modeled.

Source: Refer to Appendix A, *Air Quality Emissions Data*, for assumptions used in this analysis.

Area Source Emissions

Area source emissions would be generated due to an increased demand for consumer products, architectural coating, and landscaping. The proposed project would not include wood burning fireplaces or other devices per SCAQMD Rule 445 (Wood Burning Devices). As shown in Table

6, unmitigated area source emissions from the proposed project would not exceed SCAQMD thresholds for ROG, NO_X, CO, SO_X, PM_{10}, or $PM_{2.5}$.

Energy Source Emissions

Energy source emissions would be generated as a result of electricity and natural gas (non-hearth) usage associated with the proposed project. The primary use of electricity and natural gas by the project would be for space heating and cooling, water heating, ventilation, lighting, appliances, and electronics. As shown in Table 6, unmitigated energy source emissions from the proposed project would not exceed SCAQMD thresholds for ROG, NO_X, CO, SO_X, PM_{10}, or $PM_{2.5}$.

Conclusion

As indicated in Table 6, unmitigated operational emissions from the proposed project would not exceed SCAQMD thresholds. If stationary sources, such as backup generators, are installed on-site, they would be required to obtain the applicable permits from SCAQMD for operation of such equipment. The SCAQMD is responsible for issuing permits for the operation of stationary sources in order to reduce air pollution, and to attain and maintain the national and California ambient air quality standards in the Basin. Backup generators would be used only in emergency situations, and would not contribute a substantial amount of emissions capable of exceeding SCAQMD thresholds. Thus, operational air quality impacts would be less than significant.

Mitigation Measures:

AQ-1 Prior to initiating construction, UCI shall ensure that the project construction contract includes a construction emissions mitigation plan, including measures compliant with SCAQMD Rule 403 (Fugitive Dust), to be implemented and supervised by the on-site construction supervisor, which shall include, but not be limited to, the following BMPs:

i. During grading and site preparation activities, exposed soil areas shall be stabilized via frequent watering, non-toxic chemical stabilization, or equivalent measures at a rate to be determined by the on-site construction supervisor.

ii. During windy days when fugitive dust can be observed leaving the construction site, additional applications of water shall be required at a rate to be determined by the onsite construction supervisor.

iii. Disturbed areas designated for landscaping shall be prepared as soon as possible after completion of construction activities.

iv. Areas of the construction site that will remain inactive for three months or longer following clearing, grubbing and/or grading shall receive appropriate BMP treatments (e.g., revegetation, mulching, covering with tarps, etc.) to prevent fugitive dust generation.

v. All exposed soil or material stockpiles that will not be used within 3 days shall be enclosed, covered, or watered twice daily, or shall be stabilized with approved nontoxic chemical soil binders at a rate to be determined by the on-site construction supervisor.

vi. Unpaved access roads shall be stabilized via frequent watering, non-toxic chemical stabilization, temporary paving, or equivalent measures at a rate to be determined by the on-site construction supervisor.

vii. Trucks transporting materials to and from the site shall allow for at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer). Alternatively, trucks transporting materials shall be covered.

viii. Speed limit signs at 15 mph or less shall be installed on all unpaved roads within construction sites.

ix. Where visible soil material is tracked onto adjacent public paved roads, the paved roads shall be swept and debris shall be returned to the construction site or transported off site for disposal.

x. Wheel washers, dirt knock-off grates/mats, or equivalent measures shall be installed within the construction site where vehicles exit unpaved roads onto paved roads.

xi. Diesel powered construction equipment shall be maintained in accordance with manufacturer's requirements, and shall be retrofitted with diesel particulate filters where available and practicable.

xii. Heavy duty diesel trucks and gasoline powered equipment shall be turned off if idling is anticipated to last for more than 5 minutes.

xiii. Where feasible, the construction contractor shall use alternatively fueled construction equipment, such as electric or natural gas-powered equipment or biofuel.

xiv. Heavy construction equipment shall use low NOx diesel fuel to the extent that it is readily available at the time of construction.

xv. To the extent feasible, construction activities shall rely on the campus's existing electricity infrastructure rather than electrical generators powered by internal combustion engines.

xvi. The construction contractor shall develop a construction traffic management plan that includes the following:

- Scheduling heavy-duty truck deliveries to avoid peak traffic periods Consolidating truck deliveries.

xvii. Where possible, the construction contractor shall provide a lunch shuttle or on-site lunch service for construction workers.

xviii. xviii. The construction contractor shall, to the extent possible, use pre-coated architectural materials that do not require painting. Water-based or low VOC coatings shall be used that are compliant with SCAQMD Rule 1113. Spray equipment with high transfer efficiency, such as the high volume-low pressure spray method, or manual coatings application shall be used to reduce VOC emissions to the extent possible.

xix. Project constructions plans and specifications will include a requirement to define and implement a work program that would limit the emissions of reactive organic gases (ROG's) during the application of architectural coatings to the extent necessary to keep total daily ROG's for each project to below 75 pounds per day, or the current SCAQMD threshold, throughout that period of construction activity to the extent feasible. The specific program may include any combination of restrictions on the types of paints and coatings, application methods, and the amount of surface area coated as determined by the contractor.

xx. The construction contractor shall maintain signage along the construction perimeter with the name and telephone number of the individual in charge of implementing the construction emissions mitigation plan, and with the telephone number of the SCAQMD's complaint line. The contractor's representative shall maintain a log of any public complaints and corrective actions taken to resolve complaints.

(Mitigation Measure AQ-1 correlates with Mitigation Measure Air-2B in the 2007 LRDP EIR).

Level of Significance After Mitigation. *Less than Significant Impact.*

AQ-3 RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE OF ANY CRITERIA POLLUTANT FOR WHICH THE REGION IS NONATTAINMENT FOR FEDERAL OR STATE STANDARDS?

Level of Significance Before Mitigation: *Potentially Significant Impact.*

With respect to the proposed project's construction-related air quality emissions and cumulative Basin-wide conditions, the SCAQMD has developed strategies to reduce criteria pollutant emissions outlined in the 2012 AQMP pursuant to Federal Clean Air Act mandates. As such, the proposed project would comply with SCAQMD Rule 403 requirements, and implement all feasible mitigation measures (Mitigation Measure AQ-1). Rule 403 requires that fugitive dust be controlled with the best available control measures in order to reduce dust so that it does not remain visible in the atmosphere beyond the property line of the proposed project. In addition, the proposed project would comply with adopted 2012 AQMP emissions control measures. Per SCAQMD rules and mandates, as well as the CEQA requirement that significant impacts be mitigated to the extent feasible, these same requirements (i.e., Rule 403 compliance, the implementation of all feasible mitigation measures, and compliance with adopted AQMP emissions control measures) would also be imposed on construction projects throughout the Basin, which would include related projects.

As discussed previously, the proposed project would not result in long-term air quality impacts, as emissions would not exceed the SCAQMD adopted operational thresholds. Additionally, adherence to SCAQMD rules and regulations would alleviate potential impacts related to cumulative conditions on a project-by-project basis. Emission reduction technology, strategies, and plans are constantly being developed. As a result, the proposed project would not contribute a cumulatively considerable net increase of any nonattainment criteria pollutant. Therefore, cumulative operational impacts associated with implementation of the proposed project would be less than significant.

Mitigation Measures: Refer to Mitigation Measure AQ-1.

Level of Significance After Mitigation. *Less Than Significant Impact.*

AQ-4 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS?

Level of Significance Before Mitigation: *Potentially Significant Impact.*

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis.

On-campus sensitive receptors near the project site include surrounding residences adjacent to the north, east, south, and west of the project site. In order to identify impacts to sensitive receptors, the SCAQMD recommends addressing localized significance thresholds (LSTs) for construction and operations impacts (area sources only). The CO hotspot analysis following the LST analysis addresses localized mobile source impacts.

LOCALIZED SIGNIFICANCE THRESHOLDS (LST)

LSTs were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the *Final Localized Significance Threshold Methodology* (dated June 2003 [revised 2008]) for guidance. The LST methodology assists lead agencies in analyzing localized air quality impacts. The SCAQMD provides the LST screening lookup tables for one, two, and five acre projects emitting CO, NO_X, $PM_{2.5}$, or PM_{10}. The LST methodology and associated mass rates are not designed to evaluate localized impacts from mobile sources traveling over the roadways. The SCAQMD recommends that any project over five acres should perform air quality dispersion modeling to assess impacts to nearby sensitive receptors. The project is located within Source Receptor Area (SRA) 20, Central Orange County Coastal.

Construction

The SCAQMD guidance on applying CalEEMod to LSTs specifies the amount of acres a particular piece of equipment would likely disturb per day. Based on the SCAQMD guidance on applying CalEEMod to LSTs, the project would disturb at most one acre of land per day. Therefore, the LST thresholds for one acre was utilized for the construction LST analysis. The closest sensitive receptors to the project site are residential uses (existing Middle Earth student housing) that adjoin the project site to the east and south. These sensitive land uses may be potentially affected by air pollutant emissions generated during on-site construction activities. LST thresholds are provided for distances to sensitive receptors of 25, 50, 100, 200, and 500 meters. As the nearest sensitive uses adjoin the project site, the lowest available LST values for 25 meters were used. Table 7, *Localized Significance of Construction Emissions*, shows the localized unmitigated and mitigated construction-related emissions. It is noted that the localized emissions presented in Table 7 are less than those in Table 5 because localized emissions include only on-site emissions (i.e., from construction equipment and fugitive dust), and do not include off-site emissions (i.e., from hauling activities). As seen in Table 7, mitigated on-site emissions would not exceed the LSTs for SRA 20.

Operations

For project operations, the two acre threshold was conservatively utilized, as the project site is approximately 2.2 acres As the nearest sensitive uses are adjacent to the project site, the most conservative LST values for 25 meters were used. As seen in Table 8, *Localized Significance of Operational Emissions*, project-related mitigated operational area source emissions would be negligible and would be below the LSTs. The mitigated area source emissions presented in Table 8 were derived from the CalEEMod, and include the following proposed project features that would reduce operational area emissions: use low VOC paint and low VOC cleaning supplies, and no hearth. As such, operational LST impacts would be less than significant in this regard.

Table 7
Localized Significance of Construction Emissions

Source	Pollutant (pounds/day)[1]			
	NO_X	CO	PM_{10}	$PM_{2.5}$
2017				
Total Unmitigated On-Site Emissions[2,3]	30.68	18.89	5.42	3.29
Total Mitigated On-Site Emissions[2,3]	30.68	18.89	2.56	1.72
Localized Significance Threshold[1]	*92*	*639*	*4*	*3*
Thresholds Exceeded?	*No*	*No*	*No*	*No*
2018				
Total Unmitigated On-Site Emissions[4]	12.52	8.95	0.73	0.68
Total Mitigated On-Site Emissions[4]	12.52	8.95	0.73	0.68
Localized Significance Threshold[1]	*92*	*639*	*4*	*3*
Thresholds Exceeded?	*No*	*No*	*No*	*No*
2019				
Total Unmitigated On-Site Emissions[4]	11.26	8.72	0.63	0.59
Total Mitigated On-Site Emissions[4]	11.26	8.72	0.63	0.59
Localized Significance Threshold[1]	*92*	*639*	*4*	*3*
Thresholds Exceeded?	*No*	*No*	*No*	*No*

Notes:
1. The Localized Significance Threshold was determined using Appendix C of the SCAQMD Final Localized Significant Threshold Methodology guidance document for pollutants NO_X, CO, PM_{10}, and $PM_{2.5}$. The Localized Significance Threshold was based on the anticipated daily acreage disturbance for construction, the distance to sensitive receptors, and the source receptor area (SRA 20).
2. The Demolition Phase represents the worst case scenario for NO_X and CO.
3. The Grading Phase represents the worst case scenario for PM_{10}, and $PM_{2.5}$.
4. The Building Construction Phase represents the worst case scenario for NO_x, CO, PM_{10}, and $PM_{2.5}$.

Table 8
Localized Significance of Operational Emissions

Source	Pollutant (pounds/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Total Unmitigated Area Source Emissions	0.00	0.06	0.00	0.00
Total Mitigated Area Source Emissions[1]	0.00	0.06	0.00	0.00
Localized Significance Threshold[2]	*131*	*962*	*2*	*2*
Thresholds Exceeded?	*No*	*No*	*No*	*No*

Note:
1. The proposed project does not include hearths.
2. The Localized Significance Threshold was determined using Appendix C of the SCAQMD Final Localized Significant Threshold Methodology guidance document for pollutants NO_X, CO, PM_{10}, and $PM_{2.5}$. The Localized Significance Threshold was based on the total acreage, the distance to sensitive receptors, and the source receptor area (SRA 20).

CARBON MONOXIDE HOTSPOTS

Intersection Hotspots

CO emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. Under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels (i.e., adversely affecting residents, school children, hospital patients, the elderly, etc.).

The SCAQMD requires a quantified assessment of CO hotspots when a project increases the volume-to-capacity ratio (also called the intersection capacity utilization) by 0.02 (two percent) for any intersection with an existing level of service LOS D or worse. Because traffic congestion is highest at intersections where vehicles queue and are subject to reduced speeds, these hot spots are typically produced at intersections.

The project is located in the South Coast Air Basin (Basin), which is designated as an attainment/maintenance area for the Federal CO standards and an attainment area for State standards. There has been a decline in CO emissions even though vehicle miles traveled on U.S. urban and rural roads have increased. On-road mobile source CO emissions have declined 24 percent between 1989 and 1998, despite a 23 percent rise in motor vehicle miles traveled over the same 10 years. California trends have been consistent with national trends; CO emissions declined 20 percent in California from 1985 through 1997 while vehicle miles traveled increased 18 percent in the 1990s. CO emissions have continued to decline since this time. The Basin was re-designated as attainment in 2007, and is no longer addressed in the SCAQMD's AQMP. Three major control programs have contributed to the reduced per-vehicle CO emissions: exhaust standards, cleaner burning fuels, and motor vehicle inspection/maintenance programs.

A detailed CO analysis was conducted in the *Federal Attainment Plan for Carbon Monoxide* (CO Plan) for the SCAQMD's 2003 Air Quality Management Plan. The 2003 *Air Quality Management Plan* is the most recent AQMP that addresses CO concentrations. The locations selected for microscale modeling in the CO Plan are worst-case intersections in the Basin, and would likely experience the highest CO concentrations. Thus, CO analysis within the CO Plan is utilized in a comparison to the proposed project, since it represents a worst-case scenario with heavy traffic volumes within the Basin.

Of these locations, the Wilshire Boulevard/Veteran Avenue intersection in Los Angeles experienced the highest CO concentration (4.6 parts per million [ppm]), which is well below the 35-ppm 1-hr CO Federal standard. The Wilshire Boulevard/Veteran Avenue intersection is one of the most congested intersections in Southern California with an average daily traffic (ADT) volume of approximately 100,000 vehicles per day. As the CO hotspots were not experienced at the Wilshire Boulevard/Veteran Avenue intersection, it can be reasonably inferred that CO hotspots would not be experienced at any intersections within the vicinity of the project site due to the low volume of traffic (112 new daily trips) that would occur as a result of project implementation. Therefore, impacts would be less than significant in this regard.

Mitigation Measures: Refer to Mitigation Measure AQ-1.

Level of Significance After Mitigation. *Less Than Significant Impact.*

AQ-5 CREATE OBJECTIONABLE ODORS AFFECTING A SUBSTANTIAL NUMBER OF PEOPLE?

Level of Significance Before Mitigation: *Less Than Significant Impact.*

According to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses identified by the SCAQMD as being associated with odors.

Construction activities associated with the project may generate detectable odors from heavy-duty equipment exhaust. Construction-related odors would be short-term in nature, dissipate rapidly, and cease upon project completion. Any impacts to existing adjacent land uses would be short-term and are less than significant.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation. *Less Than Significant Impact.*

6.0 REFERENCES

6.1 LIST OF PREPARERS

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Eddie Torres, INCE, Environmental Sciences Manager
Achilles Malisos, Manager of Air and Noise Studies
Ryan Chiene, Environmental Analyst
Faye Stroud, Graphics

6.2 DOCUMENTS

1. City of Irvine, *City of Irvine General Plan*, Supp. No. 9, July 2015.

2. City of Irvine, *Municipal Code*, codified through Ordinance No. 15-02, adopted April 28, 2015.

3. City of Irvine, *CEQA Manual*, May 2012.

4. South Coast Air Quality Management District, *2012 Air Quality Management Plan*, December 7, 2012.

5. South Coast Air Quality Management District, *CEQA Air Quality Handbook*, November 1993.

6. South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, July 2008.

7. South Coast Air Quality Management District, *Regulation XI Source Specific Standards*, http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1113.pdf?sfvrsn=15, accessed on October 25, 2016.

8. Stantec Consulting Services, *Middle Earth Housing Expansion Traffic Study*, November 14, 2016.

9. U.S. Climate Data, *Climate Irvine - California*, http://www.usclimatedata.com/climate/irvine/california/united-states/usca2494, accessed on October 18, 2016.

6.3 WEB SITES/PROGRAMS

California Air Resources Board, *Aerometric Data Analysis and Measurement System (ADAM)*, summaries from 2013 to 2015, http://www.arb.ca.gov/adam.

Environ International Corporation and the South Coast Air Quality Management District, *California Emissions Estimator Model (CalEEMod) Version 2016.3.1*, 2016.

APPENDIX A: AIR QUALITY EMISSIONS DATA

UCI - Middle Earth Housing Expansion

Orange County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	500.00	Student	1.10	108,000.00	0
Fast Food Restaurant w/o Drive Thru	40.00	1000sqft	1.10	40,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 30

Climate Zone 8 **Operational Year** 2019

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 702.44 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project characteristics

Land Use - Per Project Characteristics: 495 students, 10 staff. Dorms, community facilities, and ancillary space grouped together. Lot acreage is approximately 2.2 acres.

Construction Phase - Per AQ Construction Questionnaire

Off-road Equipment -

Off-road Equipment - Per AQ Construction Questionnaire

Off-road Equipment - Per AQ Construction Questionnaire

Off-road Equipment - Per AQ Construction Questionnaire

Demolition - Per AQ Construction Questionnaire

Grading - Approximately 1 acre of grading.

Vehicle Trips - Per Trip Gen Memo

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Energy Use -

Construction Off-road Equipment Mitigation - per SCAQMD Rule 403

Mobile Land Use Mitigation -

Mobile Commute Mitigation -

Area Mitigation -

Energy Mitigation - Energy efficiency mitigation measures include 20% over Title 24 (LEED building).

Water Mitigation -

Waste Mitigation -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	26
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstructionPhase	NumDays	10.00	65.00
tblConstructionPhase	NumDays	220.00	544.00
tblConstructionPhase	NumDays	20.00	43.00
tblConstructionPhase	NumDays	6.00	43.00
tblGrading	AcresOfGrading	16.13	1.00
tblGrading	MaterialExported	0.00	1,500.00
tblLandUse	BuildingSpaceSquareFeet	91,898.73	108,000.00
tblLandUse	LandUseSquareFeet	91,898.73	108,000.00
tblLandUse	LotAcreage	2.11	1.10
tblLandUse	LotAcreage	0.92	1.10
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00

tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblVehicleTrips	ST_TR	696.00	0.00
tblVehicleTrips	ST_TR	1.30	0.22
tblVehicleTrips	SU_TR	500.00	0.00
tblVehicleTrips	SU_TR	0.00	0.22
tblVehicleTrips	WD_TR	716.00	0.00
tblVehicleTrips	WD_TR	1.71	0.22

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	3.2134	31.5133	19.7295	0.0329	4.7107	1.8459	5.5935	2.5305	1.7230	3.3429	0.0000	3,330.4160	3,330.4160	0.8007	0.0000	3,350.4326
2018	1.6313	15.5734	12.1548	0.0277	0.8464	0.7554	1.6018	0.2279	0.7078	0.9357	0.0000	2,811.1032	2,811.1032	0.4622	0.0000	2,822.6573
2019	21.4230	14.1484	11.6503	0.0275	0.8464	0.6509	1.4972	0.2279	0.6098	0.8377	0.0000	2,770.1757	2,770.1757	0.4555	0.0000	2,781.5624
Maximum	**21.4230**	**31.5133**	**19.7295**	**0.0329**	**4.7107**	**1.8459**	**5.5935**	**2.5305**	**1.7230**	**3.3429**	**0.0000**	**3,330.4160**	**3,330.4160**	**0.8007**	**0.0000**	**3,350.4326**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	3.2134	31.5133	19.7295	0.0329	1.8496	1.8459	2.7323	0.9656	1.7230	1.8063	0.0000	3,330.4160	3,330.4160	0.8007	0.0000	3,350.4326
2018	1.6313	15.5734	12.1548	0.0277	0.8464	0.7554	1.6018	0.2279	0.7078	0.9357	0.0000	2,811.1032	2,811.1032	0.4622	0.0000	2,822.6573
2019	21.4230	14.1484	11.6503	0.0275	0.8464	0.6509	1.4972	0.2279	0.6098	0.8377	0.0000	2,770.1757	2,770.1757	0.4555	0.0000	2,781.5624
Maximum	**21.4230**	**31.5133**	**19.7295**	**0.0329**	**1.8496**	**1.8459**	**2.7323**	**0.9656**	**1.7230**	**1.8063**	**0.0000**	**3,330.4160**	**3,330.4160**	**0.8007**	**0.0000**	**3,350.4326**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**44.68**	**0.00**	**32.92**	**52.40**	**0.00**	**30.03**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.3116	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262
Energy	0.3560	3.2365	2.7187	0.0194		0.2460	0.2460		0.2460	0.2460		3,883.7841	3,883.7841	0.0744	0.0712	3,906.8634
Mobile	0.1978	0.7903	2.5507	8.6000e-003	0.7136	9.5000e-003	0.7231	0.1908	8.9400e-003	0.1998		870.5917	870.5917	0.0383		871.5481
Total	**3.8653**	**4.0273**	**5.3250**	**0.0280**	**0.7136**	**0.2557**	**0.9692**	**0.1908**	**0.2551**	**0.4459**		**4,754.4940**	**4,754.4940**	**0.1130**	**0.0712**	**4,778.5377**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Area	3.3116	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262
Energy	0.3309	3.0078	2.5266	0.0181		0.2286	0.2286		0.2286	0.2286		3,609.4015	3,609.4015	0.0692	0.0662	3,630.8503
Mobile	0.1962	0.7801	2.5088	8.4300e-003	0.6993	9.3200e-003	0.7086	0.1870	8.7700e-003	0.1958		853.9033	853.9033	0.0376		854.8436
Total	**3.8386**	**3.7885**	**5.0911**	**0.0265**	**0.6993**	**0.2381**	**0.9374**	**0.1870**	**0.2376**	**0.4246**		**4,463.4230**	**4,463.4230**	**0.1071**	**0.0662**	**4,485.8201**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.69**	**5.93**	**4.39**	**5.50**	**2.00**	**6.86**	**3.28**	**2.00**	**6.88**	**4.79**	**0.00**	**6.12**	**6.12**	**5.22**	**7.06**	**6.13**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/1/2017	5/31/2017	5	43	
2	Grading	Grading	6/1/2017	7/31/2017	5	43	
3	Building Construction	Building Construction	8/1/2017	8/30/2019	5	544	
4	Architectural Coating	Architectural Coating	8/31/2019	11/29/2019	5	65	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 222,000; Non-Residential Outdoor: 74,000; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	1	8.00	158	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Aerial Lifts	2	6.00	63	0.31
Building Construction	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	99.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	188.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	62.00	24.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	12.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.4968	0.0000	0.4968	0.0752	0.0000	0.0752			0.0000			0.0000
Off-Road	3.1157	30.6771	18.8939	0.0293		1.8404	1.8404		1.7177	1.7177		2,949.3202	2,949.3202	0.7742		2,968.6756
Total	**3.1157**	**30.6771**	**18.8939**	**0.0293**	**0.4968**	**1.8404**	**2.3372**	**0.0752**	**1.7177**	**1.7929**		**2,949.3202**	**2,949.3202**	**0.7742**		**2,968.6756**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0232	0.7841	0.1738	1.8300e-003	0.0401	4.4200e-003	0.0445	0.0110	4.2300e-003	0.0152		202.3893	202.3893	0.0213		202.9206
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0744	0.0521	0.6618	1.7900e-003	0.1677	1.1200e-003	0.1688	0.0445	1.0300e-003	0.0455		178.7065	178.7065	5.2000e-003		178.8364
Total	**0.0977**	**0.8362**	**0.8356**	**3.6200e-003**	**0.2078**	**5.5400e-003**	**0.2133**	**0.0555**	**5.2600e-003**	**0.0607**		**381.0958**	**381.0958**	**0.0265**		**381.7569**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1841	0.0000	0.1841	0.0279	0.0000	0.0279			0.0000			0.0000
Off-Road	3.1157	30.6771	18.8939	0.0293		1.8404	1.8404		1.7177	1.7177	0.0000	2,949.320 2	2,949.320 2	0.7742		2,968.675 6
Total	**3.1157**	**30.6771**	**18.8939**	**0.0293**	**0.1841**	**1.8404**	**2.0245**	**0.0279**	**1.7177**	**1.7456**	**0.0000**	**2,949.320 2**	**2,949.320 2**	**0.7742**		**2,968.675 6**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0232	0.7841	0.1738	1.8300e-003	0.0401	4.4200e-003	0.0445	0.0110	4.2300e-003	0.0152		202.3893	202.3893	0.0213		202.9206
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0744	0.0521	0.6618	1.7900e-003	0.1677	1.1200e-003	0.1688	0.0445	1.0300e-003	0.0455		178.7065	178.7065	5.2000e-003		178.8364
Total	**0.0977**	**0.8362**	**0.8356**	**3.6200e-003**	**0.2078**	**5.5400e-003**	**0.2133**	**0.0555**	**5.2600e-003**	**0.0607**		**381.0958**	**381.0958**	**0.0265**		**381.7569**

3.3 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.5452	0.0000	4.5452	2.4859	0.0000	2.4859			0.0000			0.0000
Off-Road	1.6023	18.2915	7.0342	0.0141		0.8738	0.8738		0.8039	0.8039		1,444.8958	1,444.8958	0.4427		1,455.9636
Total	**1.6023**	**18.2915**	**7.0342**	**0.0141**	**4.5452**	**0.8738**	**5.4189**	**2.4859**	**0.8039**	**3.2898**		**1,444.8958**	**1,444.8958**	**0.4427**		**1,455.9636**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0441	1.4890	0.3300	3.4800e-003	0.0762	8.4000e-003	0.0845	0.0209	8.0300e-003	0.0289		384.3353	384.3353	0.0404		385.3441
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0397	0.0278	0.3530	9.6000e-004	0.0894	5.9000e-004	0.0900	0.0237	5.5000e-004	0.0243		95.3101	95.3101	2.7700e-003		95.3794
Total	**0.0838**	**1.5167**	**0.6830**	**4.4400e-003**	**0.1656**	**8.9900e-003**	**0.1746**	**0.0446**	**8.5800e-003**	**0.0531**		**479.6454**	**479.6454**	**0.0431**		**480.7235**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.6840	0.0000	1.6840	0.9210	0.0000	0.9210			0.0000			0.0000
Off-Road	1.6023	18.2915	7.0342	0.0141		0.8738	0.8738		0.8039	0.8039	0.0000	1,444.895 8	1,444.895 8	0.4427		1,455.963 6
Total	**1.6023**	**18.2915**	**7.0342**	**0.0141**	**1.6840**	**0.8738**	**2.5577**	**0.9210**	**0.8039**	**1.7249**	**0.0000**	**1,444.895 8**	**1,444.895 8**	**0.4427**		**1,455.963 6**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0441	1.4890	0.3300	3.4800e-003	0.0762	8.4000e-003	0.0845	0.0209	8.0300e-003	0.0289		384.3353	384.3353	0.0404		385.3441
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0397	0.0278	0.3530	9.6000e-004	0.0894	5.9000e-004	0.0900	0.0237	5.5000e-004	0.0243		95.3101	95.3101	2.7700e-003		95.3794
Total	**0.0838**	**1.5167**	**0.6830**	**4.4400e-003**	**0.1656**	**8.9900e-003**	**0.1746**	**0.0446**	**8.5800e-003**	**0.0531**		**479.6454**	**479.6454**	**0.0431**		**480.7235**

3.4 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4568	14.3262	9.2953	0.0144		0.8771	0.8771		0.8208	0.8208		1,454.516 9	1,454.516 9	0.3891		1,464.245 4
Total	**1.4568**	**14.3262**	**9.2953**	**0.0144**		**0.8771**	**0.8771**		**0.8208**	**0.8208**		**1,454.516 9**	**1,454.516 9**	**0.3891**		**1,464.245 4**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1109	3.0536	0.8444	6.1100e-003	0.1534	0.0266	0.1800	0.0441	0.0255	0.0696		661.1832	661.1832	0.0596		662.6728
Worker	0.3076	0.2152	2.7356	7.4200e-003	0.6930	4.6100e-003	0.6976	0.1838	4.2500e-003	0.1880		738.6533	738.6533	0.0215		739.1903
Total	**0.4185**	**3.2688**	**3.5799**	**0.0135**	**0.8464**	**0.0312**	**0.8776**	**0.2279**	**0.0297**	**0.2576**		**1,399.836 6**	**1,399.836 6**	**0.0811**		**1,401.863 1**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	1.4568	14.3262	9.2953	0.0144		0.8771	0.8771		0.8208	0.8208	0.0000	1,454.5169	1,454.5169	0.3891		1,464.2454
Total	**1.4568**	**14.3262**	**9.2953**	**0.0144**		**0.8771**	**0.8771**		**0.8208**	**0.8208**	**0.0000**	**1,454.5169**	**1,454.5169**	**0.3891**		**1,464.2454**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1109	3.0536	0.8444	6.1100e-003	0.1534	0.0266	0.1800	0.0441	0.0255	0.0696		661.1832	661.1832	0.0596		662.6728
Worker	0.3076	0.2152	2.7356	7.4200e-003	0.6930	4.6100e-003	0.6976	0.1838	4.2500e-003	0.1880		738.6533	738.6533	0.0215		739.1903
Total	**0.4185**	**3.2688**	**3.5799**	**0.0135**	**0.8464**	**0.0312**	**0.8776**	**0.2279**	**0.0297**	**0.2576**		**1,399.8366**	**1,399.8366**	**0.0811**		**1,401.8631**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	1.2565	12.5216	8.9512	0.0144		0.7297	0.7297		0.6833	0.6833		1,435.5763	1,435.5763	0.3860		1,445.2272
Total	**1.2565**	**12.5216**	**8.9512**	**0.0144**		**0.7297**	**0.7297**		**0.6833**	**0.6833**		**1,435.5763**	**1,435.5763**	**0.3860**		**1,445.2272**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0972	2.8631	0.7682	6.0700e-003	0.1534	0.0212	0.1745	0.0441	0.0203	0.0644		658.3880	658.3880	0.0571		659.8164
Worker	0.2776	0.1887	2.4354	7.2000e-003	0.6930	4.5800e-003	0.6976	0.1838	4.2200e-003	0.1880		717.1389	717.1389	0.0190		717.6137
Total	**0.3748**	**3.0518**	**3.2035**	**0.0133**	**0.8464**	**0.0258**	**0.8721**	**0.2279**	**0.0245**	**0.2524**		**1,375.5269**	**1,375.5269**	**0.0761**		**1,377.4300**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2565	12.5216	8.9512	0.0144		0.7297	0.7297		0.6833	0.6833	0.0000	1,435.5763	1,435.5763	0.3860		1,445.2272
Total	**1.2565**	**12.5216**	**8.9512**	**0.0144**		**0.7297**	**0.7297**		**0.6833**	**0.6833**	**0.0000**	**1,435.5763**	**1,435.5763**	**0.3860**		**1,445.2272**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0972	2.8631	0.7682	6.0700e-003	0.1534	0.0212	0.1745	0.0441	0.0203	0.0644		658.3880	658.3880	0.0571		659.8164
Worker	0.2776	0.1887	2.4354	7.2000e-003	0.6930	4.5800e-003	0.6976	0.1838	4.2200e-003	0.1880		717.1389	717.1389	0.0190		717.6137
Total	**0.3748**	**3.0518**	**3.2035**	**0.0133**	**0.8464**	**0.0258**	**0.8721**	**0.2279**	**0.0245**	**0.2524**		**1,375.5269**	**1,375.5269**	**0.0761**		**1,377.4300**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1201	11.2574	8.7186	0.0144		0.6278	0.6278		0.5879	0.5879		1,416.8434	1,416.8434	0.3830		1,426.4184
Total	**1.1201**	**11.2574**	**8.7186**	**0.0144**		**0.6278**	**0.6278**		**0.5879**	**0.5879**		**1,416.8434**	**1,416.8434**	**0.3830**		**1,426.4184**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0900	2.7235	0.7200	6.0300e-003	0.1534	0.0184	0.1718	0.0441	0.0176	0.0617		655.1253	655.1253	0.0553		656.5079
Worker	0.2555	0.1675	2.2118	7.0000e-003	0.6930	4.6300e-003	0.6976	0.1838	4.2600e-003	0.1881		698.2070	698.2070	0.0172		698.6361
Total	**0.3455**	**2.8911**	**2.9318**	**0.0130**	**0.8464**	**0.0230**	**0.8694**	**0.2279**	**0.0219**	**0.2498**		**1,353.3323**	**1,353.3323**	**0.0725**		**1,355.1441**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1201	11.2574	8.7186	0.0144		0.6278	0.6278		0.5879	0.5879	0.0000	1,416.8434	1,416.8434	0.3830		1,426.4184
Total	**1.1201**	**11.2574**	**8.7186**	**0.0144**		**0.6278**	**0.6278**		**0.5879**	**0.5879**	**0.0000**	**1,416.8434**	**1,416.8434**	**0.3830**		**1,426.4184**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0900	2.7235	0.7200	6.0300e-003	0.1534	0.0184	0.1718	0.0441	0.0176	0.0617		655.1253	655.1253	0.0553		656.5079
Worker	0.2555	0.1675	2.2118	7.0000e-003	0.6930	4.6300e-003	0.6976	0.1838	4.2600e-003	0.1881		698.2070	698.2070	0.0172		698.6361
Total	**0.3455**	**2.8911**	**2.9318**	**0.0130**	**0.8464**	**0.0230**	**0.8694**	**0.2279**	**0.0219**	**0.2498**		**1,353.3323**	**1,353.3323**	**0.0725**		**1,355.1441**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	21.1071					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**21.3735**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0495	0.0324	0.4281	1.3600e-003	0.1341	9.0000e-004	0.1350	0.0356	8.3000e-004	0.0364		135.1368	135.1368	3.3200e-003		135.2199
Total	**0.0495**	**0.0324**	**0.4281**	**1.3600e-003**	**0.1341**	**9.0000e-004**	**0.1350**	**0.0356**	**8.3000e-004**	**0.0364**		**135.1368**	**135.1368**	**3.3200e-003**		**135.2199**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	21.1071					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**21.3735**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0495	0.0324	0.4281	1.3600e-003	0.1341	9.0000e-004	0.1350	0.0356	8.3000e-004	0.0364		135.1368	135.1368	3.3200e-003		135.2199
Total	**0.0495**	**0.0324**	**0.4281**	**1.3600e-003**	**0.1341**	**9.0000e-004**	**0.1350**	**0.0356**	**8.3000e-004**	**0.0364**		**135.1368**	**135.1368**	**3.3200e-003**		**135.2199**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	0.1962	0.7801	2.5088	8.4300e-003	0.6993	9.3200e-003	0.7086	0.1870	8.7700e-003	0.1958		853.9033	853.9033	0.0376		854.8436
Unmitigated	0.1978	0.7903	2.5507	8.6000e-003	0.7136	9.5000e-003	0.7231	0.1908	8.9400e-003	0.1998		870.5917	870.5917	0.0383		871.5481

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Fast Food Restaurant w/o Drive Thru	0.00	0.00	0.00		
University/College (4Yr)	112.00	112.00	112.00	336,435	329,707
Total	112.00	112.00	112.00	336,435	329,707

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Fast Food Restaurant w/o Drive Thru	16.60	8.40	6.90	1.50	79.50	19.00	51	37	12
University/College (4Yr)	16.60	8.40	6.90	6.40	88.60	5.00	91	9	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4Yr)	0.552373	0.044229	0.211123	0.119112	0.017503	0.005797	0.024455	0.015685	0.001637	0.001633	0.004830	0.000583	0.001041
Fast Food Restaurant w/o Drive Thru	0.552373	0.044229	0.211123	0.119112	0.017503	0.005797	0.024455	0.015685	0.001637	0.001633	0.004830	0.000583	0.001041

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
NaturalGas Mitigated	0.3309	3.0078	2.5266	0.0181		0.2286	0.2286		0.2286	0.2286		3,609.4015	3,609.4015	0.0692	0.0662	3,630.8503
NaturalGas Unmitigated	0.3560	3.2365	2.7187	0.0194		0.2460	0.2460		0.2460	0.2460		3,883.7841	3,883.7841	0.0744	0.0712	3,906.8634

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant w/o Drive Thru	28461.4	0.3069	2.7903	2.3439	0.0167		0.2121	0.2121		0.2121	0.2121		3,348.3965	3,348.3965	0.0642	0.0614	3,368.2943
University/College (4Yr)	4550.79	0.0491	0.4462	0.3748	2.6800e-003		0.0339	0.0339		0.0339	0.0339		535.3876	535.3876	0.0103	9.8200e-003	538.5691
Total		**0.3560**	**3.2365**	**2.7187**	**0.0194**		**0.2460**	**0.2460**		**0.2460**	**0.2460**		**3,883.7840**	**3,883.7840**	**0.0744**	**0.0712**	**3,906.8634**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant w/o Drive Thru	26.731	0.2883	2.6207	2.2014	0.0157		0.1992	0.1992		0.1992	0.1992		3,144.8187	3,144.8187	0.0603	0.0577	3,163.5068
University/College (4Yr)	3.94895	0.0426	0.3872	0.3252	2.3200e-003		0.0294	0.0294		0.0294	0.0294		464.5828	464.5828	8.9000e-003	8.5200e-003	467.3435
Total		**0.3309**	**3.0078**	**2.5266**	**0.0180**		**0.2286**	**0.2286**		**0.2286**	**0.2286**		**3,609.4015**	**3,609.4015**	**0.0692**	**0.0662**	**3,630.8503**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.3116	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262
Unmitigated	3.3116	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3759					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9304					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.2800e-003	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262
Total	**3.3116**	**5.2000e-004**	**0.0557**	**0.0000**		**2.0000e-004**	**2.0000e-004**		**2.0000e-004**	**2.0000e-004**		**0.1182**	**0.1182**	**3.2000e-004**		**0.1262**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3759					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9304					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.2800e-003	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262
Total	**3.3116**	**5.2000e-004**	**0.0557**	**0.0000**		**2.0000e-004**	**2.0000e-004**		**2.0000e-004**	**2.0000e-004**		**0.1182**	**0.1182**	**3.2000e-004**		**0.1262**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Use Grey Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

UCI - Middle Earth Housing Expansion
Orange County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	500.00	Student	1.10	108,000.00	0
Fast Food Restaurant w/o Drive Thru	40.00	1000sqft	1.10	40,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 30

Climate Zone 8 **Operational Year** 2019

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 702.44 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project characteristics

Land Use - Per Project Characteristics: 495 students, 10 staff. Dorms, community facilities, and ancillary space grouped together. Lot acreage is approximately 2.2 acres

Construction Phase - Per AQ Construction Questionnaire

Off-road Equipment -

Off-road Equipment - Per AQ Construction Questionnaire

Off-road Equipment - Per AQ Construction Questionnaire

Off-road Equipment - Per AQ Construction Questionnaire

Demolition - Per AQ Construction Questionnaire

Grading - Approximately 1 acre of grading.

Vehicle Trips - Per Trip Gen Memo

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Energy Use -

Construction Off-road Equipment Mitigation - per SCAQMD Rule 403

Mobile Land Use Mitigation -

Mobile Commute Mitigation -

Area Mitigation -

Energy Mitigation - Energy efficiency mitigation measures include 20% over Title 24 (LEED building).

Water Mitigation -

Waste Mitigation -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	26
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstructionPhase	NumDays	10.00	65.00
tblConstructionPhase	NumDays	220.00	544.00
tblConstructionPhase	NumDays	20.00	43.00
tblConstructionPhase	NumDays	6.00	43.00
tblGrading	AcresOfGrading	16.13	1.00
tblGrading	MaterialExported	0.00	1,500.00
tblLandUse	BuildingSpaceSquareFeet	91,898.73	108,000.00
tblLandUse	LandUseSquareFeet	91,898.73	108,000.00
tblLandUse	LotAcreage	2.11	1.10
tblLandUse	LotAcreage	0.92	1.10
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00

tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblVehicleTrips	ST_TR	696.00	0.00
tblVehicleTrips	ST_TR	1.30	0.22
tblVehicleTrips	SU_TR	500.00	0.00
tblVehicleTrips	SU_TR	0.00	0.22
tblVehicleTrips	WD_TR	716.00	0.00
tblVehicleTrips	WD_TR	1.71	0.22

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	3.2233	31.5299	19.6957	0.0328	4.7107	1.8460	5.5936	2.5305	1.7230	3.3431	0.0000	3,317.9941	3,317.9941	0.8010	0.0000	3,338.0196
2018	1.6706	15.5967	12.0557	0.0272	0.8464	0.7558	1.6022	0.2279	0.7082	0.9361	0.0000	2,756.8660	2,756.8660	0.4643	0.0000	2,768.4738
2019	21.4293	14.1679	11.5568	0.0270	0.8464	0.6512	1.4976	0.2279	0.6101	0.8380	0.0000	2,716.8754	2,716.8754	0.4575	0.0000	2,728.3130
Maximum	**21.4293**	**31.5299**	**19.6957**	**0.0328**	**4.7107**	**1.8460**	**5.5936**	**2.5305**	**1.7230**	**3.3431**	**0.0000**	**3,317.9941**	**3,317.9941**	**0.8010**	**0.0000**	**3,338.0196**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	3.2233	31.5299	19.6957	0.0328	1.8496	1.8460	2.7325	0.9656	1.7230	1.8064	0.0000	3,317.994 1	3,317.994 1	0.8010	0.0000	3,338.019 6
2018	1.6706	15.5967	12.0557	0.0272	0.8464	0.7558	1.6022	0.2279	0.7082	0.9361	0.0000	2,756.866 0	2,756.866 0	0.4643	0.0000	2,768.473 8
2019	21.4293	14.1679	11.5568	0.0270	0.8464	0.6512	1.4976	0.2279	0.6101	0.8380	0.0000	2,716.875 4	2,716.875 4	0.4575	0.0000	2,728.313 0
Maximum	**21.4293**	**31.5299**	**19.6957**	**0.0328**	**1.8496**	**1.8460**	**2.7325**	**0.9656**	**1.7230**	**1.8064**	**0.0000**	**3,317.994 1**	**3,317.994 1**	**0.8010**	**0.0000**	**3,338.019 6**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**44.68**	**0.00**	**32.91**	**52.40**	**0.00**	**30.03**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.3116	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262
Energy	0.3560	3.2365	2.7187	0.0194		0.2460	0.2460		0.2460	0.2460		3,883.784 1	3,883.784 1	0.0744	0.0712	3,906.863 4
Mobile	0.1953	0.8153	2.4535	8.2100e-003	0.7136	9.5500e-003	0.7231	0.1908	8.9900e-003	0.1998		831.4157	831.4157	0.0381		832.3687
Total	**3.8628**	**4.0523**	**5.2278**	**0.0276**	**0.7136**	**0.2557**	**0.9693**	**0.1908**	**0.2552**	**0.4460**		**4,715.317 9**	**4,715.317 9**	**0.1129**	**0.0712**	**4,739.358 3**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.3116	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262
Energy	0.3309	3.0078	2.5266	0.0181		0.2286	0.2286		0.2286	0.2286		3,609.4015	3,609.4015	0.0692	0.0662	3,630.8503
Mobile	0.1938	0.8045	2.4152	8.0500e-003	0.6993	9.3800e-003	0.7087	0.1870	8.8200e-003	0.1958		815.4630	815.4630	0.0375		816.4003
Total	**3.8362**	**3.8129**	**4.9975**	**0.0261**	**0.6993**	**0.2382**	**0.9375**	**0.1870**	**0.2376**	**0.4246**		**4,424.9827**	**4,424.9827**	**0.1070**	**0.0662**	**4,447.3768**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.69**	**5.91**	**4.41**	**5.54**	**2.00**	**6.86**	**3.28**	**2.00**	**6.87**	**4.79**	**0.00**	**6.16**	**6.16**	**5.22**	**7.06**	**6.16**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/1/2017	5/31/2017	5	43	
2	Grading	Grading	6/1/2017	7/31/2017	5	43	
3	Building Construction	Building Construction	8/1/2017	8/30/2019	5	544	
4	Architectural Coating	Architectural Coating	8/31/2019	11/29/2019	5	65	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 222,000; Non-Residential Outdoor: 74,000; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	1	8.00	158	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Aerial Lifts	2	6.00	63	0.31
Building Construction	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	99.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	188.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	62.00	24.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	12.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.4968	0.0000	0.4968	0.0752	0.0000	0.0752			0.0000			0.0000
Off-Road	3.1157	30.6771	18.8939	0.0293		1.8404	1.8404		1.7177	1.7177		2,949.3202	2,949.3202	0.7742		2,968.6756
Total	**3.1157**	**30.6771**	**18.8939**	**0.0293**	**0.4968**	**1.8404**	**2.3372**	**0.0752**	**1.7177**	**1.7929**		**2,949.3202**	**2,949.3202**	**0.7742**		**2,968.6756**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0239	0.7955	0.1850	1.8100e-003	0.0401	4.5000e-003	0.0446	0.0110	4.3100e-003	0.0153		199.5172	199.5172	0.0219		200.0635
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0837	0.0573	0.6168	1.7000e-003	0.1677	1.1200e-003	0.1688	0.0445	1.0300e-003	0.0455		169.1567	169.1567	4.9500e-003		169.2805
Total	**0.1076**	**0.8528**	**0.8017**	**3.5100e-003**	**0.2078**	**5.6200e-003**	**0.2134**	**0.0555**	**5.3400e-003**	**0.0608**		**368.6739**	**368.6739**	**0.0268**		**369.3440**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1841	0.0000	0.1841	0.0279	0.0000	0.0279			0.0000			0.0000
Off-Road	3.1157	30.6771	18.8939	0.0293		1.8404	1.8404		1.7177	1.7177	0.0000	2,949.3202	2,949.3202	0.7742		2,968.6756
Total	**3.1157**	**30.6771**	**18.8939**	**0.0293**	**0.1841**	**1.8404**	**2.0245**	**0.0279**	**1.7177**	**1.7456**	**0.0000**	**2,949.3202**	**2,949.3202**	**0.7742**		**2,968.6756**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0239	0.7955	0.1850	1.8100e-003	0.0401	4.5000e-003	0.0446	0.0110	4.3100e-003	0.0153		199.5172	199.5172	0.0219		200.0635
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0837	0.0573	0.6168	1.7000e-003	0.1677	1.1200e-003	0.1688	0.0445	1.0300e-003	0.0455		169.1567	169.1567	4.9500e-003		169.2805
Total	**0.1076**	**0.8528**	**0.8017**	**3.5100e-003**	**0.2078**	**5.6200e-003**	**0.2134**	**0.0555**	**5.3400e-003**	**0.0608**		**368.6739**	**368.6739**	**0.0268**		**369.3440**

3.3 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.5452	0.0000	4.5452	2.4859	0.0000	2.4859			0.0000			0.0000
Off-Road	1.6023	18.2915	7.0342	0.0141		0.8738	0.8738		0.8039	0.8039		1,444.8958	1,444.8958	0.4427		1,455.9636
Total	**1.6023**	**18.2915**	**7.0342**	**0.0141**	**4.5452**	**0.8738**	**5.4189**	**2.4859**	**0.8039**	**3.2898**		**1,444.8958**	**1,444.8958**	**0.4427**		**1,455.9636**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0453	1.5107	0.3512	3.4300e-003	0.0762	8.5500e-003	0.0847	0.0209	8.1800e-003	0.0290		378.8811	378.8811	0.0415		379.9186
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0447	0.0305	0.3290	9.1000e-004	0.0894	5.9000e-004	0.0900	0.0237	5.5000e-004	0.0243		90.2169	90.2169	2.6400e-003		90.2829
Total	**0.0899**	**1.5412**	**0.6802**	**4.3400e-003**	**0.1656**	**9.1400e-003**	**0.1747**	**0.0446**	**8.7300e-003**	**0.0533**		**469.0981**	**469.0981**	**0.0441**		**470.2015**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.6840	0.0000	1.6840	0.9210	0.0000	0.9210			0.0000			0.0000
Off-Road	1.6023	18.2915	7.0342	0.0141		0.8738	0.8738		0.8039	0.8039	0.0000	1,444.8958	1,444.8958	0.4427		1,455.9636
Total	**1.6023**	**18.2915**	**7.0342**	**0.0141**	**1.6840**	**0.8738**	**2.5577**	**0.9210**	**0.8039**	**1.7249**	**0.0000**	**1,444.8958**	**1,444.8958**	**0.4427**		**1,455.9636**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0453	1.5107	0.3512	3.4300e-003	0.0762	8.5500e-003	0.0847	0.0209	8.1800e-003	0.0290		378.8811	378.8811	0.0415		379.9186
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0447	0.0305	0.3290	9.1000e-004	0.0894	5.9000e-004	0.0900	0.0237	5.5000e-004	0.0243		90.2169	90.2169	2.6400e-003		90.2829
Total	**0.0899**	**1.5412**	**0.6802**	**4.3400e-003**	**0.1656**	**9.1400e-003**	**0.1747**	**0.0446**	**8.7300e-003**	**0.0533**		**469.0981**	**469.0981**	**0.0441**		**470.2015**

3.4 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4568	14.3262	9.2953	0.0144		0.8771	0.8771		0.8208	0.8208		1,454.5169	1,454.5169	0.3891		1,464.2454
Total	**1.4568**	**14.3262**	**9.2953**	**0.0144**		**0.8771**	**0.8771**		**0.8208**	**0.8208**		**1,454.5169**	**1,454.5169**	**0.3891**		**1,464.2454**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1156	3.0623	0.9251	5.9700e-003	0.1534	0.0271	0.1804	0.0441	0.0259	0.0700		645.6968	645.6968	0.0629		647.2685
Worker	0.3461	0.2366	2.5494	7.0200e-003	0.6930	4.6100e-003	0.6976	0.1838	4.2500e-003	0.1880		699.1811	699.1811	0.0205		699.6926
Total	**0.4616**	**3.2990**	**3.4745**	**0.0130**	**0.8464**	**0.0317**	**0.8781**	**0.2279**	**0.0302**	**0.2581**		**1,344.8779**	**1,344.8779**	**0.0833**		**1,346.9611**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4568	14.3262	9.2953	0.0144		0.8771	0.8771		0.8208	0.8208	0.0000	1,454.5169	1,454.5169	0.3891		1,464.2454
Total	**1.4568**	**14.3262**	**9.2953**	**0.0144**		**0.8771**	**0.8771**		**0.8208**	**0.8208**	**0.0000**	**1,454.5169**	**1,454.5169**	**0.3891**		**1,464.2454**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1156	3.0623	0.9251	5.9700e-003	0.1534	0.0271	0.1804	0.0441	0.0259	0.0700		645.6968	645.6968	0.0629		647.2685
Worker	0.3461	0.2366	2.5494	7.0200e-003	0.6930	4.6100e-003	0.6976	0.1838	4.2500e-003	0.1880		699.1811	699.1811	0.0205		699.6926
Total	**0.4616**	**3.2990**	**3.4745**	**0.0130**	**0.8464**	**0.0317**	**0.8781**	**0.2279**	**0.0302**	**0.2581**		**1,344.8779**	**1,344.8779**	**0.0833**		**1,346.9611**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2565	12.5216	8.9512	0.0144		0.7297	0.7297		0.6833	0.6833		1,435.5763	1,435.5763	0.3860		1,445.2272
Total	**1.2565**	**12.5216**	**8.9512**	**0.0144**		**0.7297**	**0.7297**		**0.6833**	**0.6833**		**1,435.5763**	**1,435.5763**	**0.3860**		**1,445.2272**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1014	2.8676	0.8432	5.9300e-003	0.1534	0.0216	0.1749	0.0441	0.0206	0.0648		642.5154	642.5154	0.0602		644.0211
Worker	0.3127	0.2075	2.2613	6.8100e-003	0.6930	4.5800e-003	0.6976	0.1838	4.2200e-003	0.1880		678.7744	678.7744	0.0181		679.2255
Total	**0.4142**	**3.0751**	**3.1044**	**0.0127**	**0.8464**	**0.0262**	**0.8725**	**0.2279**	**0.0249**	**0.2528**		**1,321.2897**	**1,321.2897**	**0.0783**		**1,323.2466**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2565	12.5216	8.9512	0.0144		0.7297	0.7297		0.6833	0.6833	0.0000	1,435.576 3	1,435.576 3	0.3860		1,445.227 2
Total	**1.2565**	**12.5216**	**8.9512**	**0.0144**		**0.7297**	**0.7297**		**0.6833**	**0.6833**	**0.0000**	**1,435.576 3**	**1,435.576 3**	**0.3860**		**1,445.227 2**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1014	2.8676	0.8432	5.9300e-003	0.1534	0.0216	0.1749	0.0441	0.0206	0.0648		642.5154	642.5154	0.0602		644.0211
Worker	0.3127	0.2075	2.2613	6.8100e-003	0.6930	4.5800e-003	0.6976	0.1838	4.2200e-003	0.1880		678.7744	678.7744	0.0181		679.2255
Total	**0.4142**	**3.0751**	**3.1044**	**0.0127**	**0.8464**	**0.0262**	**0.8725**	**0.2279**	**0.0249**	**0.2528**		**1,321.289 7**	**1,321.289 7**	**0.0783**		**1,323.246 6**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1201	11.2574	8.7186	0.0144		0.6278	0.6278		0.5879	0.5879		1,416.8434	1,416.8434	0.3830		1,426.4184
Total	**1.1201**	**11.2574**	**8.7186**	**0.0144**		**0.6278**	**0.6278**		**0.5879**	**0.5879**		**1,416.8434**	**1,416.8434**	**0.3830**		**1,426.4184**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0938	2.7264	0.7905	5.8900e-003	0.1534	0.0187	0.1721	0.0441	0.0179	0.0621		639.2523	639.2523	0.0582		640.7079
Worker	0.2883	0.1842	2.0477	6.6300e-003	0.6930	4.6300e-003	0.6976	0.1838	4.2600e-003	0.1881		660.7797	660.7797	0.0163		661.1867
Total	**0.3821**	**2.9105**	**2.8382**	**0.0125**	**0.8464**	**0.0234**	**0.8697**	**0.2279**	**0.0222**	**0.2501**		**1,300.0320**	**1,300.0320**	**0.0745**		**1,301.8946**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1201	11.2574	8.7186	0.0144		0.6278	0.6278		0.5879	0.5879	0.0000	1,416.8434	1,416.8434	0.3830		1,426.4184
Total	**1.1201**	**11.2574**	**8.7186**	**0.0144**		**0.6278**	**0.6278**		**0.5879**	**0.5879**	**0.0000**	**1,416.8434**	**1,416.8434**	**0.3830**		**1,426.4184**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0938	2.7264	0.7905	5.8900e-003	0.1534	0.0187	0.1721	0.0441	0.0179	0.0621		639.2523	639.2523	0.0582		640.7079
Worker	0.2883	0.1842	2.0477	6.6300e-003	0.6930	4.6300e-003	0.6976	0.1838	4.2600e-003	0.1881		660.7797	660.7797	0.0163		661.1867
Total	**0.3821**	**2.9105**	**2.8382**	**0.0125**	**0.8464**	**0.0234**	**0.8697**	**0.2279**	**0.0222**	**0.2501**		**1,300.0320**	**1,300.0320**	**0.0745**		**1,301.8946**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	21.1071					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**21.3735**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0558	0.0356	0.3963	1.2800e-003	0.1341	9.0000e-004	0.1350	0.0356	8.3000e-004	0.0364		127.8928	127.8928	3.1500e-003		127.9716
Total	**0.0558**	**0.0356**	**0.3963**	**1.2800e-003**	**0.1341**	**9.0000e-004**	**0.1350**	**0.0356**	**8.3000e-004**	**0.0364**		**127.8928**	**127.8928**	**3.1500e-003**		**127.9716**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	21.1071					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**21.3735**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0558	0.0356	0.3963	1.2800e-003	0.1341	9.0000e-004	0.1350	0.0356	8.3000e-004	0.0364		127.8928	127.8928	3.1500e-003		127.9716
Total	**0.0558**	**0.0356**	**0.3963**	**1.2800e-003**	**0.1341**	**9.0000e-004**	**0.1350**	**0.0356**	**8.3000e-004**	**0.0364**		**127.8928**	**127.8928**	**3.1500e-003**		**127.9716**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1938	0.8045	2.4152	8.0500e-003	0.6993	9.3800e-003	0.7087	0.1870	8.8200e-003	0.1958		815.4630	815.4630	0.0375		816.4003
Unmitigated	0.1953	0.8153	2.4535	8.2100e-003	0.7136	9.5500e-003	0.7231	0.1908	8.9900e-003	0.1998		831.4157	831.4157	0.0381		832.3687

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Fast Food Restaurant w/o Drive Thru	0.00	0.00	0.00		
University/College (4Yr)	112.00	112.00	112.00	336,435	329,707
Total	112.00	112.00	112.00	336,435	329,707

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Fast Food Restaurant w/o Drive Thru	16.60	8.40	6.90	1.50	79.50	19.00	51	37	12
University/College (4Yr)	16.60	8.40	6.90	6.40	88.60	5.00	91	9	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4Yr)	0.552373	0.044229	0.211123	0.119112	0.017503	0.005797	0.024455	0.015685	0.001637	0.001633	0.004830	0.000583	0.001041
Fast Food Restaurant w/o Drive Thru	0.552373	0.044229	0.211123	0.119112	0.017503	0.005797	0.024455	0.015685	0.001637	0.001633	0.004830	0.000583	0.001041

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.3309	3.0078	2.5266	0.0181		0.2286	0.2286		0.2286	0.2286		3,609.4015	3,609.4015	0.0692	0.0662	3,630.8503
NaturalGas Unmitigated	0.3560	3.2365	2.7187	0.0194		0.2460	0.2460		0.2460	0.2460		3,883.7841	3,883.7841	0.0744	0.0712	3,906.8634

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant w/o Drive Thru	28461.4	0.3069	2.7903	2.3439	0.0167		0.2121	0.2121		0.2121	0.2121		3,348.3965	3,348.3965	0.0642	0.0614	3,368.2943
University/College (4Yr)	4550.79	0.0491	0.4462	0.3748	2.6800e-003		0.0339	0.0339		0.0339	0.0339		535.3876	535.3876	0.0103	9.8200e-003	538.5691
Total		**0.3560**	**3.2365**	**2.7187**	**0.0194**		**0.2460**	**0.2460**		**0.2460**	**0.2460**		**3,883.7840**	**3,883.7840**	**0.0744**	**0.0712**	**3,906.8634**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Fast Food Restaurant w/o Drive Thru	26.731	0.2883	2.6207	2.2014	0.0157		0.1992	0.1992		0.1992	0.1992		3,144.8187	3,144.8187	0.0603	0.0577	3,163.5068
University/College (4Yr)	3.94895	0.0426	0.3872	0.3252	2.3200e-003		0.0294	0.0294		0.0294	0.0294		464.5828	464.5828	8.9000e-003	8.5200e-003	467.3435
Total		**0.3309**	**3.0078**	**2.5266**	**0.0180**		**0.2286**	**0.2286**		**0.2286**	**0.2286**		**3,609.4015**	**3,609.4015**	**0.0692**	**0.0662**	**3,630.8503**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.3116	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262
Unmitigated	3.3116	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3759					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9304					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.2800e-003	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262
Total	**3.3116**	**5.2000e-004**	**0.0557**	**0.0000**		**2.0000e-004**	**2.0000e-004**		**2.0000e-004**	**2.0000e-004**		**0.1182**	**0.1182**	**3.2000e-004**		**0.1262**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3759					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.9304					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.2800e-003	5.2000e-004	0.0557	0.0000		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004		0.1182	0.1182	3.2000e-004		0.1262
Total	**3.3116**	**5.2000e-004**	**0.0557**	**0.0000**		**2.0000e-004**	**2.0000e-004**		**2.0000e-004**	**2.0000e-004**		**0.1182**	**0.1182**	**3.2000e-004**		**0.1262**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Use Grey Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

UCI - Middle Earth Housing Expansion

Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	500.00	Student	1.10	108,000.00	0
Fast Food Restaurant w/o Drive Thru	40.00	1000sqft	1.10	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project characteristics

Land Use - Per Project Characteristics: 495 students, 10 staff. Dorms, community facilities, and ancillary space grouped together. Lot acreage is approximately 2.2 acres

Construction Phase - Per AQ Construction Questionnaire

Off-road Equipment -

Off-road Equipment - Per AQ Construction Questionnaire

Off-road Equipment - Per AQ Construction Questionnaire

Off-road Equipment - Per AQ Construction Questionnaire

Demolition - Per AQ Construction Questionnaire

Grading - Approximately 1 acre of grading.

Vehicle Trips - Per Trip Gen Memo

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Energy Use -

Construction Off-road Equipment Mitigation - per SCAQMD Rule 403

Mobile Land Use Mitigation -

Mobile Commute Mitigation -

Area Mitigation -

Energy Mitigation - Energy efficiency mitigation measures include 20% over Title 24 (LEED building).

Water Mitigation -

Waste Mitigation -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	26
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstructionPhase	NumDays	10.00	65.00
tblConstructionPhase	NumDays	220.00	544.00
tblConstructionPhase	NumDays	20.00	43.00
tblConstructionPhase	NumDays	6.00	43.00
tblGrading	AcresOfGrading	16.13	1.00
tblGrading	MaterialExported	0.00	1,500.00
tblLandUse	BuildingSpaceSquareFeet	91,898.73	108,000.00
tblLandUse	LandUseSquareFeet	91,898.73	108,000.00
tblLandUse	LotAcreage	2.11	1.10
tblLandUse	LotAcreage	0.92	1.10
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00

tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblVehicleTrips	ST_TR	696.00	0.00
tblVehicleTrips	ST_TR	1.30	0.22
tblVehicleTrips	SU_TR	500.00	0.00
tblVehicleTrips	SU_TR	0.00	0.22
tblVehicleTrips	WD_TR	716.00	0.00
tblVehicleTrips	WD_TR	1.71	0.22

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.2079	2.0694	1.2864	2.6100e-003	0.1616	0.1082	0.2698	0.0694	0.1009	0.1703	0.0000	241.5951	241.5951	0.0484	0.0000	242.8048
2018	0.2136	2.0432	1.5754	3.5700e-003	0.1085	0.0986	0.2071	0.0293	0.0924	0.1217	0.0000	328.6932	328.6932	0.0548	0.0000	330.0631
2019	0.8242	1.2983	1.0798	2.5000e-003	0.0766	0.0609	0.1375	0.0207	0.0573	0.0779	0.0000	228.0790	228.0790	0.0368	0.0000	228.9989
Maximum	**0.8242**	**2.0694**	**1.5754**	**3.5700e-003**	**0.1616**	**0.1082**	**0.2698**	**0.0694**	**0.1009**	**0.1703**	**0.0000**	**328.6932**	**328.6932**	**0.0548**	**0.0000**	**330.0631**

Mitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
2017	0.2079	2.0694	1.2864	2.6100e-003	0.0934	0.1082	0.2016	0.0347	0.1009	0.1356	0.0000	241.5949	241.5949	0.0484	0.0000	242.8046
2018	0.2136	2.0432	1.5754	3.5700e-003	0.1085	0.0986	0.2071	0.0293	0.0924	0.1217	0.0000	328.6929	328.6929	0.0548	0.0000	330.0629
2019	0.8242	1.2983	1.0798	2.5000e-003	0.0766	0.0609	0.1375	0.0207	0.0573	0.0779	0.0000	228.0789	228.0789	0.0368	0.0000	228.9988
Maximum	**0.8242**	**2.0694**	**1.5754**	**3.5700e-003**	**0.1085**	**0.1082**	**0.2071**	**0.0347**	**0.1009**	**0.1356**	**0.0000**	**328.6929**	**328.6929**	**0.0548**	**0.0000**	**330.0629**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**19.68**	**0.00**	**11.11**	**29.05**	**0.00**	**9.37**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
1	**4-1-2017**	**6-30-2017**	0.9868	0.9868
2	**7-1-2017**	**9-30-2017**	0.6621	0.6621
3	**10-1-2017**	**12-31-2017**	0.6421	0.6421
4	**1-1-2018**	**3-31-2018**	0.5550	0.5550
5	**4-1-2018**	**6-30-2018**	0.5592	0.5592
6	**7-1-2018**	**9-30-2018**	0.5653	0.5653
7	**10-1-2018**	**12-31-2018**	0.5674	0.5674
8	**1-1-2019**	**3-31-2019**	0.5037	0.5037
9	**4-1-2019**	**6-30-2019**	0.5075	0.5075
10	**7-1-2019**	**9-30-2019**	0.5980	0.5980
		Highest	0.9868	0.9868

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6041	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143
Energy	0.0650	0.5907	0.4962	3.5400e-003		0.0449	0.0449		0.0449	0.0449	0.0000	1,552.9868	1,552.9868	0.0499	0.0196	1,560.0633
Mobile	0.0345	0.1510	0.4520	1.5100e-003	0.1276	1.7300e-003	0.1293	0.0342	1.6300e-003	0.0358	0.0000	138.9739	138.9739	6.2800e-003	0.0000	139.1309
Waste						0.0000	0.0000		0.0000	0.0000	112.0530	0.0000	112.0530	6.6222	0.0000	277.6067
Water						0.0000	0.0000		0.0000	0.0000	4.1915	63.4838	67.6754	0.4331	0.0107	81.6945
Total	**0.7035**	**0.7417**	**0.9551**	**5.0500e-003**	**0.1276**	**0.0466**	**0.1742**	**0.0342**	**0.0465**	**0.0807**	**116.2446**	**1,755.4580**	**1,871.7025**	**7.1115**	**0.0303**	**2,058.5097**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6041	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143
Energy	0.0604	0.5489	0.4611	3.2900e-003		0.0417	0.0417		0.0417	0.0417	0.0000	1,394.4586	1,394.4586	0.0444	0.0178	1,400.8606
Mobile	0.0342	0.1490	0.4448	1.4800e-003	0.1250	1.7000e-003	0.1267	0.0335	1.6000e-003	0.0351	0.0000	136.3105	136.3105	6.1700e-003	0.0000	136.4648
Waste						0.0000	0.0000		0.0000	0.0000	56.0265	0.0000	56.0265	3.3111	0.0000	138.8033
Water						0.0000	0.0000		0.0000	0.0000	3.3532	43.8505	47.2037	0.3462	8.5100e-003	58.3942
Total	**0.6986**	**0.6980**	**0.9129**	**4.7700e-003**	**0.1250**	**0.0434**	**0.1685**	**0.0335**	**0.0433**	**0.0768**	**59.3797**	**1,574.6330**	**1,634.0127**	**3.7079**	**0.0263**	**1,734.5372**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.69	5.89	4.42	5.54	2.00	6.86	3.30	2.02	6.88	4.82	48.92	10.30	12.70	47.86	13.21	15.74

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/1/2017	5/31/2017	5	43	
2	Grading	Grading	6/1/2017	7/31/2017	5	43	
3	Building Construction	Building Construction	8/1/2017	8/30/2019	5	544	
4	Architectural Coating	Architectural Coating	8/31/2019	11/29/2019	5	65	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 222,000; Non-Residential Outdoor: 74,000; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	1	8.00	158	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Aerial Lifts	2	6.00	63	0.31
Building Construction	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20

Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	99.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	188.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	62.00	24.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	12.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0107	0.0000	0.0107	1.6200e-003	0.0000	1.6200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0670	0.6596	0.4062	6.3000e-004		0.0396	0.0396		0.0369	0.0369	0.0000	57.5249	57.5249	0.0151	0.0000	57.9025
Total	**0.0670**	**0.6596**	**0.4062**	**6.3000e-004**	**0.0107**	**0.0396**	**0.0503**	**1.6200e-003**	**0.0369**	**0.0386**	**0.0000**	**57.5249**	**57.5249**	**0.0151**	**0.0000**	**57.9025**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.1000e-004	0.0174	3.8400e-003	4.0000e-005	8.5000e-004	1.0000e-004	9.4000e-004	2.3000e-004	9.0000e-005	3.2000e-004	0.0000	3.9240	3.9240	4.2000e-004	0.0000	3.9345
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6200e-003	1.2600e-003	0.0136	4.0000e-005	3.5400e-003	2.0000e-005	3.5600e-003	9.4000e-004	2.0000e-005	9.6000e-004	0.0000	3.3495	3.3495	1.0000e-004	0.0000	3.3520
Total	**2.1300e-003**	**0.0187**	**0.0174**	**8.0000e-005**	**4.3900e-003**	**1.2000e-004**	**4.5000e-003**	**1.1700e-003**	**1.1000e-004**	**1.2800e-003**	**0.0000**	**7.2735**	**7.2735**	**5.2000e-004**	**0.0000**	**7.2864**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.9600e-003	0.0000	3.9600e-003	6.0000e-004	0.0000	6.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0670	0.6596	0.4062	6.3000e-004		0.0396	0.0396		0.0369	0.0369	0.0000	57.5249	57.5249	0.0151	0.0000	57.9024
Total	**0.0670**	**0.6596**	**0.4062**	**6.3000e-004**	**3.9600e-003**	**0.0396**	**0.0435**	**6.0000e-004**	**0.0369**	**0.0375**	**0.0000**	**57.5249**	**57.5249**	**0.0151**	**0.0000**	**57.9024**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.1000e-004	0.0174	3.8400e-003	4.0000e-005	8.5000e-004	1.0000e-004	9.4000e-004	2.3000e-004	9.0000e-005	3.2000e-004	0.0000	3.9240	3.9240	4.2000e-004	0.0000	3.9345
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6200e-003	1.2600e-003	0.0136	4.0000e-005	3.5400e-003	2.0000e-005	3.5600e-003	9.4000e-004	2.0000e-005	9.6000e-004	0.0000	3.3495	3.3495	1.0000e-004	0.0000	3.3520
Total	**2.1300e-003**	**0.0187**	**0.0174**	**8.0000e-005**	**4.3900e-003**	**1.2000e-004**	**4.5000e-003**	**1.1700e-003**	**1.1000e-004**	**1.2800e-003**	**0.0000**	**7.2735**	**7.2735**	**5.2000e-004**	**0.0000**	**7.2864**

3.3 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0977	0.0000	0.0977	0.0535	0.0000	0.0535	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0345	0.3933	0.1512	3.0000e-004		0.0188	0.0188		0.0173	0.0173	0.0000	28.1819	28.1819	8.6300e-003	0.0000	28.3978
Total	**0.0345**	**0.3933**	**0.1512**	**3.0000e-004**	**0.0977**	**0.0188**	**0.1165**	**0.0535**	**0.0173**	**0.0707**	**0.0000**	**28.1819**	**28.1819**	**8.6300e-003**	**0.0000**	**28.3978**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.6000e-004	0.0331	7.3000e-003	7.0000e-005	1.6100e-003	1.8000e-004	1.7900e-003	4.4000e-004	1.7000e-004	6.2000e-004	0.0000	7.4516	7.4516	8.0000e-004	0.0000	7.4715
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.7000e-004	6.7000e-004	7.2300e-003	2.0000e-005	1.8900e-003	1.0000e-005	1.9000e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.7864	1.7864	5.0000e-005	0.0000	1.7877
Total	**1.8300e-003**	**0.0338**	**0.0145**	**9.0000e-005**	**3.5000e-003**	**1.9000e-004**	**3.6900e-003**	**9.4000e-004**	**1.8000e-004**	**1.1300e-003**	**0.0000**	**9.2380**	**9.2380**	**8.5000e-004**	**0.0000**	**9.2592**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0362	0.0000	0.0362	0.0198	0.0000	0.0198	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0345	0.3933	0.1512	3.0000e-004		0.0188	0.0188		0.0173	0.0173	0.0000	28.1819	28.1819	8.6300e-003	0.0000	28.3978
Total	**0.0345**	**0.3933**	**0.1512**	**3.0000e-004**	**0.0362**	**0.0188**	**0.0550**	**0.0198**	**0.0173**	**0.0371**	**0.0000**	**28.1819**	**28.1819**	**8.6300e-003**	**0.0000**	**28.3978**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.6000e-004	0.0331	7.3000e-003	7.0000e-005	1.6100e-003	1.8000e-004	1.7900e-003	4.4000e-004	1.7000e-004	6.2000e-004	0.0000	7.4516	7.4516	8.0000e-004	0.0000	7.4715
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.7000e-004	6.7000e-004	7.2300e-003	2.0000e-005	1.8900e-003	1.0000e-005	1.9000e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.7864	1.7864	5.0000e-005	0.0000	1.7877
Total	**1.8300e-003**	**0.0338**	**0.0145**	**9.0000e-005**	**3.5000e-003**	**1.9000e-004**	**3.6900e-003**	**9.4000e-004**	**1.8000e-004**	**1.1300e-003**	**0.0000**	**9.2380**	**9.2380**	**8.5000e-004**	**0.0000**	**9.2592**

3.4 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0794	0.7808	0.5066	7.9000e-004		0.0478	0.0478		0.0447	0.0447	0.0000	71.9136	71.9136	0.0192	0.0000	72.3946
Total	**0.0794**	**0.7808**	**0.5066**	**7.9000e-004**		**0.0478**	**0.0478**		**0.0447**	**0.0447**	**0.0000**	**71.9136**	**71.9136**	**0.0192**	**0.0000**	**72.3946**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.1600e-003	0.1701	0.0483	3.3000e-004	8.2400e-003	1.4600e-003	9.7000e-003	2.3800e-003	1.4000e-003	3.7700e-003	0.0000	32.3684	32.3684	3.0200e-003	0.0000	32.4439
Worker	0.0170	0.0132	0.1421	3.9000e-004	0.0371	2.5000e-004	0.0374	9.8500e-003	2.3000e-004	0.0101	0.0000	35.0947	35.0947	1.0300e-003	0.0000	35.1204
Total	**0.0232**	**0.1833**	**0.1904**	**7.2000e-004**	**0.0453**	**1.7100e-003**	**0.0471**	**0.0122**	**1.6300e-003**	**0.0139**	**0.0000**	**67.4631**	**67.4631**	**4.0500e-003**	**0.0000**	**67.5642**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0794	0.7808	0.5066	7.9000e-004		0.0478	0.0478		0.0447	0.0447	0.0000	71.9135	71.9135	0.0192	0.0000	72.3945
Total	**0.0794**	**0.7808**	**0.5066**	**7.9000e-004**		**0.0478**	**0.0478**		**0.0447**	**0.0447**	**0.0000**	**71.9135**	**71.9135**	**0.0192**	**0.0000**	**72.3945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.1600e-003	0.1701	0.0483	3.3000e-004	8.2400e-003	1.4600e-003	9.7000e-003	2.3800e-003	1.4000e-003	3.7700e-003	0.0000	32.3684	32.3684	3.0200e-003	0.0000	32.4439
Worker	0.0170	0.0132	0.1421	3.9000e-004	0.0371	2.5000e-004	0.0374	9.8500e-003	2.3000e-004	0.0101	0.0000	35.0947	35.0947	1.0300e-003	0.0000	35.1204
Total	**0.0232**	**0.1833**	**0.1904**	**7.2000e-004**	**0.0453**	**1.7100e-003**	**0.0471**	**0.0122**	**1.6300e-003**	**0.0139**	**0.0000**	**67.4631**	**67.4631**	**4.0500e-003**	**0.0000**	**67.5642**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1640	1.6341	1.1681	1.8800e-003		0.0952	0.0952		0.0892	0.0892	0.0000	169.9544	169.9544	0.0457	0.0000	171.0970
Total	**0.1640**	**1.6341**	**1.1681**	**1.8800e-003**		**0.0952**	**0.0952**		**0.0892**	**0.0892**	**0.0000**	**169.9544**	**169.9544**	**0.0457**	**0.0000**	**171.0970**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0129	0.3814	0.1052	7.8000e-004	0.0197	2.7900e-003	0.0225	5.6900e-003	2.6600e-003	8.3500e-003	0.0000	77.1558	77.1558	6.9300e-003	0.0000	77.3290
Worker	0.0367	0.0278	0.3020	9.0000e-004	0.0888	6.0000e-004	0.0894	0.0236	5.5000e-004	0.0241	0.0000	81.5829	81.5829	2.1700e-003	0.0000	81.6371
Total	**0.0497**	**0.4091**	**0.4073**	**1.6800e-003**	**0.1085**	**3.3900e-003**	**0.1119**	**0.0293**	**3.2100e-003**	**0.0325**	**0.0000**	**158.7387**	**158.7387**	**9.1000e-003**	**0.0000**	**158.9661**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1640	1.6341	1.1681	1.8800e-003		0.0952	0.0952		0.0892	0.0892	0.0000	169.9542	169.9542	0.0457	0.0000	171.0968
Total	**0.1640**	**1.6341**	**1.1681**	**1.8800e-003**		**0.0952**	**0.0952**		**0.0892**	**0.0892**	**0.0000**	**169.9542**	**169.9542**	**0.0457**	**0.0000**	**171.0968**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0129	0.3814	0.1052	7.8000e-004	0.0197	2.7900e-003	0.0225	5.6900e-003	2.6600e-003	8.3500e-003	0.0000	77.1558	77.1558	6.9300e-003	0.0000	77.3290
Worker	0.0367	0.0278	0.3020	9.0000e-004	0.0888	6.0000e-004	0.0894	0.0236	5.5000e-004	0.0241	0.0000	81.5829	81.5829	2.1700e-003	0.0000	81.6371
Total	**0.0497**	**0.4091**	**0.4073**	**1.6800e-003**	**0.1085**	**3.3900e-003**	**0.1119**	**0.0293**	**3.2100e-003**	**0.0325**	**0.0000**	**158.7387**	**158.7387**	**9.1000e-003**	**0.0000**	**158.9661**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0975	0.9794	0.7585	1.2600e-003		0.0546	0.0546		0.0512	0.0512	0.0000	111.8245	111.8245	0.0302	0.0000	112.5802
Total	**0.0975**	**0.9794**	**0.7585**	**1.2600e-003**		**0.0546**	**0.0546**		**0.0512**	**0.0512**	**0.0000**	**111.8245**	**111.8245**	**0.0302**	**0.0000**	**112.5802**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.9800e-003	0.2417	0.0658	5.2000e-004	0.0132	1.6100e-003	0.0148	3.7900e-003	1.5400e-003	5.3300e-003	0.0000	51.1797	51.1797	4.4700e-003	0.0000	51.2914
Worker	0.0225	0.0164	0.1825	5.9000e-004	0.0592	4.0000e-004	0.0596	0.0157	3.7000e-004	0.0161	0.0000	52.9485	52.9485	1.3000e-003	0.0000	52.9811
Total	**0.0305**	**0.2581**	**0.2482**	**1.1100e-003**	**0.0724**	**2.0100e-003**	**0.0744**	**0.0195**	**1.9100e-003**	**0.0214**	**0.0000**	**104.1282**	**104.1282**	**5.7700e-003**	**0.0000**	**104.2725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0975	0.9794	0.7585	1.2600e-003		0.0546	0.0546		0.0512	0.0512	0.0000	111.8243	111.8243	0.0302	0.0000	112.5800
Total	**0.0975**	**0.9794**	**0.7585**	**1.2600e-003**		**0.0546**	**0.0546**		**0.0512**	**0.0512**	**0.0000**	**111.8243**	**111.8243**	**0.0302**	**0.0000**	**112.5800**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.9800e-003	0.2417	0.0658	5.2000e-004	0.0132	1.6100e-003	0.0148	3.7900e-003	1.5400e-003	5.3300e-003	0.0000	51.1797	51.1797	4.4700e-003	0.0000	51.2914
Worker	0.0225	0.0164	0.1825	5.9000e-004	0.0592	4.0000e-004	0.0596	0.0157	3.7000e-004	0.0161	0.0000	52.9485	52.9485	1.3000e-003	0.0000	52.9811
Total	**0.0305**	**0.2581**	**0.2482**	**1.1100e-003**	**0.0724**	**2.0100e-003**	**0.0744**	**0.0195**	**1.9100e-003**	**0.0214**	**0.0000**	**104.1282**	**104.1282**	**5.7700e-003**	**0.0000**	**104.2725**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Archit. Coating	0.6860					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.6600e-003	0.0597	0.0598	1.0000e-004		4.1800e-003	4.1800e-003		4.1800e-003	4.1800e-003	0.0000	8.2981	8.2981	7.0000e-004	0.0000	8.3156
Total	**0.6946**	**0.0597**	**0.0598**	**1.0000e-004**		**4.1800e-003**	**4.1800e-003**		**4.1800e-003**	**4.1800e-003**	**0.0000**	**8.2981**	**8.2981**	**7.0000e-004**	**0.0000**	**8.3156**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6300e-003	1.1900e-003	0.0132	4.0000e-005	4.2800e-003	3.0000e-005	4.3100e-003	1.1400e-003	3.0000e-005	1.1600e-003	0.0000	3.8283	3.8283	9.0000e-005	0.0000	3.8307
Total	**1.6300e-003**	**1.1900e-003**	**0.0132**	**4.0000e-005**	**4.2800e-003**	**3.0000e-005**	**4.3100e-003**	**1.1400e-003**	**3.0000e-005**	**1.1600e-003**	**0.0000**	**3.8283**	**3.8283**	**9.0000e-005**	**0.0000**	**3.8307**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6860					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.6600e-003	0.0597	0.0598	1.0000e-004		4.1800e-003	4.1800e-003		4.1800e-003	4.1800e-003	0.0000	8.2981	8.2981	7.0000e-004	0.0000	8.3156
Total	**0.6946**	**0.0597**	**0.0598**	**1.0000e-004**		**4.1800e-003**	**4.1800e-003**		**4.1800e-003**	**4.1800e-003**	**0.0000**	**8.2981**	**8.2981**	**7.0000e-004**	**0.0000**	**8.3156**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6300e-003	1.1900e-003	0.0132	4.0000e-005	4.2800e-003	3.0000e-005	4.3100e-003	1.1400e-003	3.0000e-005	1.1600e-003	0.0000	3.8283	3.8283	9.0000e-005	0.0000	3.8307
Total	**1.6300e-003**	**1.1900e-003**	**0.0132**	**4.0000e-005**	**4.2800e-003**	**3.0000e-005**	**4.3100e-003**	**1.1400e-003**	**3.0000e-005**	**1.1600e-003**	**0.0000**	**3.8283**	**3.8283**	**9.0000e-005**	**0.0000**	**3.8307**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0342	0.1490	0.4448	1.4800e-003	0.1250	1.7000e-003	0.1267	0.0335	1.6000e-003	0.0351	0.0000	136.3105	136.3105	6.1700e-003	0.0000	136.4648
Unmitigated	0.0345	0.1510	0.4520	1.5100e-003	0.1276	1.7300e-003	0.1293	0.0342	1.6300e-003	0.0358	0.0000	138.9739	138.9739	6.2800e-003	0.0000	139.1309

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Fast Food Restaurant w/o Drive Thru	0.00	0.00	0.00		
University/College (4Yr)	112.00	112.00	112.00	336,435	329,707
Total	112.00	112.00	112.00	336,435	329,707

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Fast Food Restaurant w/o Drive Thru	16.60	8.40	6.90	1.50	79.50	19.00	51	37	12
University/College (4Yr)	16.60	8.40	6.90	6.40	88.60	5.00	91	9	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4Yr)	0.552373	0.044229	0.211123	0.119112	0.017503	0.005797	0.024455	0.015685	0.001637	0.001633	0.004830	0.000583	0.001041
Fast Food Restaurant w/o Drive Thru	0.552373	0.044229	0.211123	0.119112	0.017503	0.005797	0.024455	0.015685	0.001637	0.001633	0.004830	0.000583	0.001041

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	796.8817	796.8817	0.0329	6.8100e-003	799.7326
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	909.9828	909.9828	0.0376	7.7700e-003	913.2383
NaturalGas Mitigated	0.0604	0.5489	0.4611	3.2900e-003		0.0417	0.0417		0.0417	0.0417	0.0000	597.5769	597.5769	0.0115	0.0110	601.1280
NaturalGas Unmitigated	0.0650	0.5907	0.4962	3.5400e-003		0.0449	0.0449		0.0449	0.0449	0.0000	643.0040	643.0040	0.0123	0.0118	646.8251

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Fast Food Restaurant w/o Drive Thru	1.03884e+007	0.0560	0.5092	0.4278	3.0600e-003		0.0387	0.0387		0.0387	0.0387	0.0000	554.3646	554.3646	0.0106	0.0102	557.6589
University/College (4Yr)	1.66104e+006	8.9600e-003	0.0814	0.0684	4.9000e-004		6.1900e-003	6.1900e-003		6.1900e-003	6.1900e-003	0.0000	88.6394	88.6394	1.7000e-003	1.6300e-003	89.1662
Total		**0.0650**	**0.5907**	**0.4962**	**3.5500e-003**		**0.0449**	**0.0449**		**0.0449**	**0.0449**	**0.0000**	**643.0040**	**643.0040**	**0.0123**	**0.0118**	**646.8251**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Fast Food Restaurant w/o Drive Thru	9.7568e+006	0.0526	0.4783	0.4018	2.8700e-003		0.0364	0.0364		0.0364	0.0364	0.0000	520.6600	520.6600	9.9800e-003	9.5500e-003	523.7540
University/College (4Yr)	1.44137e+006	7.7700e-003	0.0707	0.0594	4.2000e-004		5.3700e-003	5.3700e-003		5.3700e-003	5.3700e-003	0.0000	76.9169	76.9169	1.4700e-003	1.4100e-003	77.3740
Total		**0.0604**	**0.5489**	**0.4611**	**3.2900e-003**		**0.0417**	**0.0417**		**0.0417**	**0.0417**	**0.0000**	**597.5769**	**597.5769**	**0.0115**	**0.0110**	**601.1280**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Fast Food Restaurant w/o Drive Thru	1.4844e+006	472.9616	0.0195	4.0400e-003	474.6537
University/College (4Yr)	1.3716e+006	437.0212	0.0180	3.7300e-003	438.5846
Total		**909.9828**	**0.0376**	**7.7700e-003**	**913.2383**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Fast Food Restaurant w/o Drive Thru	1.3484e+006	429.6291	0.0177	3.6700e-003	431.1661
University/College (4Yr)	1.15263e+006	367.2526	0.0152	3.1400e-003	368.5665
Total		**796.8817**	**0.0329**	**6.8100e-003**	**799.7326**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6041	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143
Unmitigated	0.6041	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0686					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5348					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	6.6000e-004	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143
Total	**0.6041**	**6.0000e-005**	**6.9600e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0134**	**0.0134**	**4.0000e-005**	**0.0000**	**0.0143**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0686					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5348					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	6.6000e-004	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143
Total	**0.6041**	**6.0000e-005**	**6.9600e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0134**	**0.0134**	**4.0000e-005**	**0.0000**	**0.0143**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Use Grey Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	47.2037	0.3462	8.5100e-003	58.3942
Unmitigated	67.6754	0.4331	0.0107	81.6945

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Fast Food Restaurant w/o Drive Thru	12.1413 / 0.77498	56.9669	0.3978	9.8000e-003	69.8314
University/College (4Yr)	1.07055 / 1.67445	10.7085	0.0353	9.1000e-004	11.8631
Total		**67.6754**	**0.4331**	**0.0107**	**81.6945**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Fast Food Restaurant w/o Drive Thru	9.71308 / 0	43.3788	0.3182	7.8200e-003	53.6626
University/College (4Yr)	0.85644 / 0	3.8249	0.0281	6.9000e-004	4.7316
Total		**47.2037**	**0.3462**	**8.5100e-003**	**58.3942**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	56.0265	3.3111	0.0000	138.8033
Unmitigated	112.0530	6.6222	0.0000	277.6067

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Fast Food Restaurant w/o Drive Thru	460.76	93.5301	5.5275	0.0000	231.7169
University/College (4Yr)	91.25	18.5229	1.0947	0.0000	45.8898
Total		**112.0531**	**6.6221**	**0.0000**	**277.6067**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Fast Food Restaurant w/o Drive Thru	230.38	46.7651	2.7637	0.0000	115.8585
University/College (4Yr)	45.625	9.2615	0.5473	0.0000	22.9449
Total		**56.0265**	**3.3111**	**0.0000**	**138.8033**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B

Geotechnical Data Report

GEOTECHNICAL DATA REPORT
MIDDLE EARTH HOUSING EXPANSION
UNIVERSITY OF CALIFORNIA, IRVINE
529 EAST PELTASON DRIVE
IRVINE, CALIFORNIA

PREPARED FOR:
University of California, Irvine
Design and Construction Services
101 Academy Drive, Suite 200
Irvine, California 92697

PREPARED BY:
Ninyo & Moore
Geotechnical and Environmental Sciences Consultants
475 Goddard, Suite 200
Irvine, California 92618

October 7, 2016
Project No. 209570003

October 7, 2016
Project No. 209570003

Mr. Michael Morrell
University of California, Irvine
Design and Construction Services
101 Academy Drive
Irvine, California 92697

Subject: Geotechnical Data Report
Middle Earth Housing Expansion
University of California, Irvine
529 East Peltason Drive
Irvine, California

Dear Mr. Stokes:

In accordance with your request and authorization, we have prepared this geotechnical data report for the proposed Middle Earth Housing Expansion project at the University of California, Irvine campus. Our study was conducted in general accordance with the scope of services presented in our proposal dated June 23, 2016, and supplemental proposal dated July 25, 2016. The purpose of our geotechnical services was to develop preliminary information regarding the soil and geologic conditions at the site for use by the design-build team. This report presents a summary of our findings and includes boring logs from our subsurface exploration, field test data, and the results of laboratory testing.

We appreciate this opportunity to be of service on this project.

Respectfully submitted,
NINYO & MOORE

Registered Professional Engineer
Spencer Marcinek
No. PE82775
Exp. 09/30/18
Civil
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Ronald Hallum, PG, CEG
Principal Geologist

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Soumitra Guha
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Principal Engineer

SCM/RDH/SG/KSY/mlc

TABLE OF CONTENTS

1. INTRODUCTION

In accordance with your request and authorization, we have performed a preliminary geotechnical evaluation for the proposed Middle Earth Housing Expansion project located at the University of California, Irvine (Figure 1). The purpose of our geotechnical services was to develop data regarding the soil and geologic conditions at the site for use by the design-build team as initial geotechnical data. The design-build team selected will be responsible for design and construction of the proposed improvements based on their evaluation of the geotechnical and geotechnical and geologic site conditions. This report presents a summary of our findings from our subsurface exploration and includes our boring logs, field test data, and laboratory test results.

2. SCOPE OF SERVICES

The scope of our geotechnical services included the following:

- Review of readily available background materials, including published topographic maps, geologic maps, fault and seismic hazard maps, groundwater data, stereoscopic aerial photographs, and project related plans.
- Reconnaissance of the site to observe the existing surface conditions from a geotechnical perspective and mark the proposed boring locations for utility clearance by Underground Service Alert.
- Subsurface exploration consisting of the drilling, sampling, and logging of five small-diameter borings to depths ranging from approximately 11 to 31½ feet below the ground surface. The borings were logged by a representative of our firm, and bulk and relatively undisturbed soil and bedrock samples were collected at selected intervals for laboratory testing.
- Percolation testing in general accordance with the Double-Ring Infiltrometer Test (ASTM International [ASTM] D3385).
- Geotechnical laboratory testing to evaluate in-situ moisture and dry density, gradation, percentage of particles finer than the No. 200 sieve, Atterberg limits, consolidation, direct shear strength, expansion index, and soil corrosivity.
- Geotechnical analysis of the field and laboratory data.
- Preparation of this geotechnical data report presenting our findings for the project.

3. SITE DESCRIPTION AND PROPOSED CONSTRUCTION

The site is located at the northwest end of the Middle Earth Housing dormitories at 529 East Peltason Drive at the University of California, Irvine (Figure 2). The project area extends through the existing Brandywine Commons, Brandywine Student Center, and a portion of Mirkwood, Lorien, and Hobbiton. The approximate site latitude is 33.6454 degrees north and longitude -117.8391 degrees west. The site is bounded by Brandywine Service Road to the north, Ring Road to the west, and other dormitories to the south and east. Additional improvements at the site include outdoor volleyball and basketball athletic courts, outdoor seating, vegetation including trees and landscaped grass areas, and hardscapes including asphalt and concrete pavements. Topographically, the site is situated on relatively flat terrace with elevations ranging from approximately 112 to 115 feet above mean sea level. An approximately 25 feet high, 3:1 (horizontal:vertical) slope descends to Engineering Service Road to the southwest (UCI, 2016).

We understand the project will generally include the construction of a new dormitory building up to approximately 8 stories high. The residences will be constructed on a tower situated on a podium and the footprint will vary from approximately 40,000 to 50,000 square feet. The planned dormitory building facility will include approximately 510 beds for freshmen student housing, a new dining facility, and ancillary spaces for study rooms, computer labs, and laundry facilities. Demolition of the existing Brandywine Student Center and outdoor athletic courts are expected. On-site infiltration of storm water runoff will also be considered for the site.

4. SUBSURFACE EXPLORATION AND LABORATORY TESTING

Our subsurface evaluation was performed on August 26, 2016, and consisted of the drilling, logging, and sampling of five small-diameter borings (B-1 through B-5) using a truck-mounted drill rig with 8-inch-diameter hollow-stem augers. The borings were drilled to depths ranging from approximately 11 feet to 31½ feet below the ground surface. Refusal was encountered in borings B-2 and B-5 at approximately 11 and 21 feet, respectively. The borings were logged by a representative from our firm and bulk and relatively undisturbed soil and bedrock samples were obtained at selected depths from the borings for laboratory testing. The approximate locations of the exploratory borings are shown on Figure 2. The logs of the borings are provided in Appendix A.

Percolation testing was performed on August 29, 2016, in the grassy area between borings B-3 and B-4 as shown on Figure 2, to evaluate the infiltration rate of the on-site soils. Details regarding the percolation testing are provided in Section 8 of this report.

Geotechnical laboratory testing was performed on representative samples to evaluate the in-situ moisture and dry density, gradation, percentage of particles finer than the No. 200 sieve, Atterberg limits, consolidation, direct shear strength, expansion index, and soil corrosivity. The results of our in-situ moisture content and dry density tests are presented on the boring logs in Appendix A and the remaining geotechnical laboratory testing results are presented in Appendix B.

5. GEOLOGY AND SUBSURFACE CONDITIONS

5.1. Geologic Setting

The project site is situated along the northern portion of the San Joaquin Hills, within the Peninsular Ranges Geomorphic Province of California (Norris and Webb, 1990). The San Joaquin Hills consist of a series of generally northwest-trending hills bounded by the Los Angeles Basin on the north, the Pacific Ocean on the southwest, and the Santa Ana Mountains and San Juan Creek on the east and south. The San Joaquin Hills are generally underlain by Paleocene through early Pliocene marine and non-marine sedimentary deposits. Recent research suggests the San Joaquin Hills may have been formed by folding and uplift in association with ongoing movement along a blind thrust fault in the southern Los Angeles basin.

Regional geologic mapping data (Miller and Tan, 1976) indicate the site and vicinity are located in a developed area with undelineated artificial cuts and fills. The site is underlain by late Pleistocene-age marine terrace deposits and the Miocene-age Topanga Formation (Figure 3). The southwest side of the site is mapped as the Paularino member of the Topanga Formation and the northeast side of the site is mapped as the Los Trancos Member of the

Topanga Formation. The marine terrace deposits are described as containing silt, sand, and gravel. The Paularino and Los Trancos Members of the Topanga Formation are generally described as interbedded marine sandstone, siltstone, and shale, but also contain areas of non-marine sedimentary breccia, andesite flows, and flow breccia. Bedding in the site vicinity generally dips at approximately 15 to 25 degrees to the northwest.

5.2. Site Geology

Based on our subsurface exploration, the site is underlain by shallow fill soils, marine terrace deposits, and Topanga Formation. Fill was encountered in borings B-1, B-3, and B-4 on the western side of the project area. The fill observed in our borings ranged from approximately 1 to 5 feet deep and generally consisted of moist, stiff to hard, sandy clay and organic silt, and medium dense, clayey sand. The fill contained various layers of gravel and cobbles. Concrete and metal debris were encountered in boring B-4.

Marine terrace deposits were encountered at the ground surface in borings B-2 and B-5 on the eastern side of the site and ranged in thickness from about 1 to 2 feet. On the western side of the site, marine terrace deposits were encountered below the fill materials in borings B-1 and B-4 to the depth explored of approximately 31½ feet, and in boring B-3 to a depth of approximately 22½ feet. These materials generally consisted of moist, stiff to hard, sandy clay and silt, and dense, clayey sand.

Bedrock materials of the Topanga Formation were encountered beneath the marine terrace deposits in borings B-2, B-3, and B-5 to the depths explored of approximately 31½ feet below the ground surface. The Topanga Formation encountered in our borings generally consisted of soft, friable to weakly cemented, weathered, interbedded fine to coarse-grained silty sandstone and clayey sandstone with gravel and cobble layers. Difficult drilling conditions were encountered within the bedrock materials at the site and refusal was encountered in borings B-2 and B-5 at about 11 and 21 feet, respectively.

6. GROUNDWATER

Groundwater was not encountered in the exploratory borings at the time of drilling. Regional maps indicate that the historic high groundwater at the site is approximately 10 feet or below the ground surface (California Geological Survey [CGS], 2001). Geobase Inc. conducted a geotechnical investigation within the Middle Earth Housing complex approximately 0.1 to 0.2 mile southeast of the project area in 1998 and encountered groundwater at depths ranging from approximately 24 to 36 feet below the ground surface. Fluctuations in groundwater levels will occur due to variations in precipitation, ground surface topography, subsurface stratification, irrigation, groundwater pumping, and other factors that may not have been evident at the time of our field evaluation.

7. FLOOD HAZARDS

Based on our review of flood insurance rate maps for the project area (Federal Emergency Management Agency [FEMA], 2009), the project site is not located in the 100-year Flood Hazard Zone, A99. Zone A99 includes areas to be protected from a 100-year flood by the Federal Flood Protection System under construction at the time of publication of the FEMA map; no base flood elevations are given. The site is located within Other Flood Areas - Zone X, which includes areas of 500-year floods and areas of 100-year floods with average depths of less than one foot and areas protected by levees from 100-year floods.

8. FIELD PERCOLATION TESTING

Percolation testing was performed on August 29, 2016, in the grassy area between borings B-3 and B-4 as shown on Figure 2, to evaluate the infiltration rate of the on-site soils in general accordance with the Double-Ring Infiltrometer Test (ASTM D3385). The testing was performed at a depth interval from approximately 0 to 6 inches. A 24-inch-diameter stainless steel outer ring and a 12-inch-diameter stainless steel inner ring were driven with minimal disturbance into the ground to a depth of approximately 6 inches. The purpose of having an outer and inner ring was to measure the infiltration rate of the inner ring in a one-dimensional vertical steady state flow condition. Percolation testing was performed under a constant head condition where the water level in the outer and inner rings was maintained at constant level by filling up the rings with water through separate reservoirs. The drop of the water level was measured at 10-minute intervals, which was based on the infiltration observed. Testing was repeated until the rate of infiltration reached an equilibrium value. The percolation rate at the testing location was measured to be approximately 1.6 inches per hour.

9. FAULTING AND SEISMICITY

The site is located in a seismically active area, as is the majority of southern California. The numerous faults in southern California include active, potentially active, and inactive faults. As defined by CGS, active faults are faults that have ruptured within Holocene time (approximately the last 11,000 years). Potentially active faults are those that show evidence of movement during Quaternary time (approximately the last 1.6 million years), but for which evidence of Holocene movement has not been established. Inactive faults have not ruptured in the last approximately 1.6 million years.

The approximate locations of major faults in the project area and their geographic relationship to the project are shown on Figure 4. The site is not located within a State of California Earthquake Fault Zone (formerly known as an Alquist-Priolo Special Studies Zone) (Hart and Bryant, 1997). However, an unnamed, inferred fault is mapped as crossing through the site (Miller and Tan, 1976). Geobase Inc. reported this fault as the UCI Campus Fault as part of their 1998 geotechnical evaluation within the Middle Earth Housing complex. An investigation of the UC Irvine Campus fault was conducted in 1992 by others and was found to be comprised of a northwest projecting eighty-foot wide zone containing reverse faults with up to 12 feet of vertical displacement (Geobase Inc., 1998).

Table 1 lists selected principal known active faults that may affect the project area, the approximate fault-to-site distances, and the maximum moment magnitudes (M_{max}) of the faults (USGS, 2008). The active San Joaquin Hills blind thrust fault is mapped approximately 3 miles north of the site (USGS, 2008). Blind thrust faults are low-angle faults at depth that do not break the surface and are, therefore, not shown on Figure 4. Although blind thrusts do not have a surface trace, they can be capable of generating damaging earthquakes and are included in Table 1.

Table 1 – Principal Active Faults

Fault	Approximate Fault-to-Site Distance miles (kilometers)	Maximum Moment Magnitude (M_{max})
San Joaquin Hills	3.0 (4.8)	7.1
Newport-Inglewood (Offshore)	5.7 (9.1)	7.0
Newport-Inglewood (Los Angeles Basin)	6.0 (9.6)	7.5
Puente Hills Blind Thrust	16.3 (26.2)	6.9
Elsinore	17.2 (27.7)	7.9
Palos Verdes	17.6 (28.3)	7.7
Chino	19.9 (32.0)	6.8
Coronado Bank	25.6 (41.2)	7.4
San Jose	27.3 (43.9)	6.7
San Andreas	48.0 (77.3)	8.2

The principal seismic hazard considerations at the site are ground motion, surface fault rupture, seismically-induced liquefaction, landsliding, and tsunamis and seiches. A brief description of the hazards and the potential for their occurrence on site are presented below.

9.1. Ground Motion and Seismic Design Parameters

The 2013 California Building Code (CBC) specifies that the Risk-Targeted, Maximum Considered Earthquake (MCE_R) ground motion response accelerations be used to evaluate seismic loads for design of buildings and other structures. The MCE_R ground motion response accelerations are based on the spectral response accelerations for 5 percent damping in the direction of maximum horizontal response and incorporate a target risk for structural collapse equivalent to 1 percent in 50 years with deterministic limits for near-source effects. The horizontal peak ground acceleration (PGA) that corresponds to the MCE_R for the site was calculated as 0.63g using the USGS (USGS, 2014) seismic design tool (web-based).

Design of the proposed improvements should be performed in accordance with the requirements of governing jurisdictions and applicable building codes. Table 2 presents the seismic design parameters for the site in accordance with the CBC (2013) guidelines and adjusted MCE_R spectral response acceleration parameters (USGS, 2014).

Table 2 – 2013 California Building Code Seismic Design Criteria

Site Coefficients and Spectral Response Acceleration Parameters	Values
Site Class	D
Site Coefficient, Fa	1.0
Site Coefficient, Fv	1.5
Mapped Spectral Response Acceleration at 0.2-second Period, S_s	1.585 g
Mapped Spectral Response Acceleration at 1.0-second Period, S_1	0.579 g
Spectral Response Acceleration at 0.2-second Period Adjusted for Site Class, S_{MS}	1.585 g
Spectral Response Acceleration at 1.0-second Period Adjusted for Site Class, S_{M1}	0.868 g
Design Spectral Response Acceleration at 0.2-second Period, S_{DS}	1.056 g
Design Spectral Response Acceleration at 1.0-second Period, S_{D1}	0.579 g

9.2. Surface Fault Rupture

There are no known active faults crossing the subject alignment, and the potential for ground rupture due to faulting is considered low. Surface ground cracking related to shaking from distant events is not considered a significant hazard, although it is a possibility. The site is not located within a State of California Earthquake Fault Zone (formerly known as an Alquist-Priolo Special Studies Zone) (Hart and Bryant, 1997). However, the UCI Campus fault is mapped as crossing through the site (Miller and Tan, 1976). An investigation of the fault conducted in 1992 indicated that terrace deposits aging between 2,000 to 4,000 years had not ruptured due to the fault; however, there was insufficient evidence to state that the Holocene-age deposits had not been faulted (Geobase Inc., 1998). This fault is classified as being pre-Quaternary or having no recognized Quaternary displacement and is not classified as being active or potentially active by the CGS (CGS, 2010).

9.3. Liquefaction

Liquefaction is the phenomenon in which loosely deposited granular soils with silt and clay contents of less than approximately 35 percent and non-plastic silts located below the water table undergo rapid loss of shear strength when subjected to strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid rise in pore water pressure, and causes the soil to behave as a fluid for a short period of time. Liquefaction is known generally to occur in saturated or near-saturated cohesionless soils at depths shallower than 50 feet below the ground surface. Factors known to influence liquefaction potential include composition and thickness of soil layers, grain size, relative density, groundwater level, degree of saturation, and both intensity and duration of ground shaking.

According to the State of California Seismic Hazards Zones map (CGS, 2001), the site is not located within an area mapped as potentially susceptible to liquefaction (Figure 5). The materials encountered in our exploratory borings included clayey marine terrace deposits underlain by predominantly dense to very dense formational deposits. Accordingly, liquefaction is not a design consideration for the project.

9.4. Landsliding

Landslides may be induced by strong vibratory motion produced by earthquakes. Research and historical data indicate that seismically induced landslides tend to occur in weak soil and rock on sloping terrain. The process for zoning earthquake-induced landslides incorporates expected future earthquake shaking, existing landslide features, slope gradient, and strength of earth materials on the slope. The project area is not mapped in an area considered susceptible to seismically induced landslides (CGS, 2001). The subject site is situated on a relatively level terrace. We did not observe indications of landslides during our site reconnaissance and the landslide potential is considered negligible.

9.5. Tsunamis and Seiches

Tsunamis are long wavelength, seismic sea waves (long compared to ocean depth) generated by the sudden movement of the ocean floor during submarine earthquakes, landslides, or volcanic activity. Seiches are waves generated in a large, enclosed body of water. The project area is not located within an area considered susceptible to tsunamis or seiche inundation. Therefore, damage due to tsunamis or seiches is not a design consideration.

10. CORROSIVITY

Laboratory testing was performed on a representative sample of near-surface soil to evaluate pH, electrical resistivity, water-soluble chloride content, and water-soluble sulfate content. The soil pH and electrical resistivity tests were performed in general accordance with California Test Method (CT) 643. Chloride content testing was performed in general accordance with CT 422. Sulfate content testing was performed in general accordance with CT 417. The laboratory test results are presented in Appendix B.

The soil pH was measured at approximately 7.3 and the electrical resistivity was measured to be approximately 370 ohm-centimeters. The chloride content of the sample was measured to be approximately 870 parts per million (ppm). The sulfate content of the tested sample was approximately 0.093 percent (930 ppm). Based on the laboratory test results and Caltrans (2012) criteria, the project site can be classified as a corrosive site, which is defined as having earth materials with more than 500 ppm chlorides, more than 0.20 percent sulfates (i.e., 2,000 ppm), a pH of 5.5 or less, or an electrical resistivity of less than 1,000 ohm-centimeters.

11. CONCLUSIONS

The purpose of this study was to develop preliminary information regarding the soil and geologic conditions at the site for use by the design-build team. Based on our preliminary evaluation, it is our opinion that the project is feasible from a geotechnical perspective. A detailed geotechnical evaluation should be performed during the design phase to develop appropriate design and construction recommendations for the project. A summary of our preliminary conclusions is presented below:

- Based on our exploratory borings, the site is underlain by shallow fill, marine terrace deposits, and bedrock material of the Topanga Formation. The fill generally consisted of moist, stiff to hard, sandy clay and organic silt, and medium dense, clayey sand. The marine terrace deposits generally consisted of moist, stiff to hard, sandy clay and silt, and dense, clayey sand. The Topanga Formation generally consisted of soft, friable to weakly cemented, weathered, interbedded fine to coarse-grained silty sandstone and clayey sandstone.

- Topanga Formation bedrock materials contained gravel and cemented zones. These materials may involve difficult excavating conditions and may generate oversized material.

- Two of the borings encountered refusal in the Topanga Formation sandstone. Rippability should be further evaluated during the design phase of the project, particularly if deep excavations are involved.

- The Topanga Formation exhibits friable zones with a potential for caving.

- Regional bedding in the site vicinity dips to the northwest. Northwest-facing excavations could expose unsupported bedding planes that could result in unstable slopes or temporary excavations. Bedding conditions and excavation stability should be evaluated during the design phase of the project.
- The near-surface deposits have a medium expansion potential. Our laboratory testing indicated an expansion index of 67.
- Groundwater was not encountered at the site to the depth explored of approximately 31½ feet. Historical high groundwater levels are approximately 10 feet below the ground surface.
- Our infiltration testing of the near-surface soils resulted in an infiltration rate of approximately 1.6 inches per hour.
- The site is not located within a mapped Seismic Hazards Zone considered susceptible to liquefaction.
- The subject site is not located within a State of California Earthquake Fault Zone (formerly known as an Alquist-Priolo Special Studies Zone).
- The site is not located within a designated flood inundation zone from failure of a dam or the 100-year and 500-year flood events.
- Based on our laboratory corrosion testing, the on-site soil can be classified as corrosive based on the Caltrans Corrosion Guidelines (Caltrans, 2012).

12. LIMITATIONS

The field evaluation and preliminary geotechnical data presented in this report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the data, conclusions, and opinions presented in this report. There is no evaluation detailed enough to reveal every surface and/or subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

It is suggested that the design-build team's geotechnical consultant perform an independent evaluation of the subsurface conditions at the site. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions and opinions are based on an analysis of the observed site conditions. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client and the design-build teams of the project. Any use or reuse of the findings and conclusions of this report by parties other than the client and its bidders is undertaken at said parties' sole risk.

13. REFERENCES

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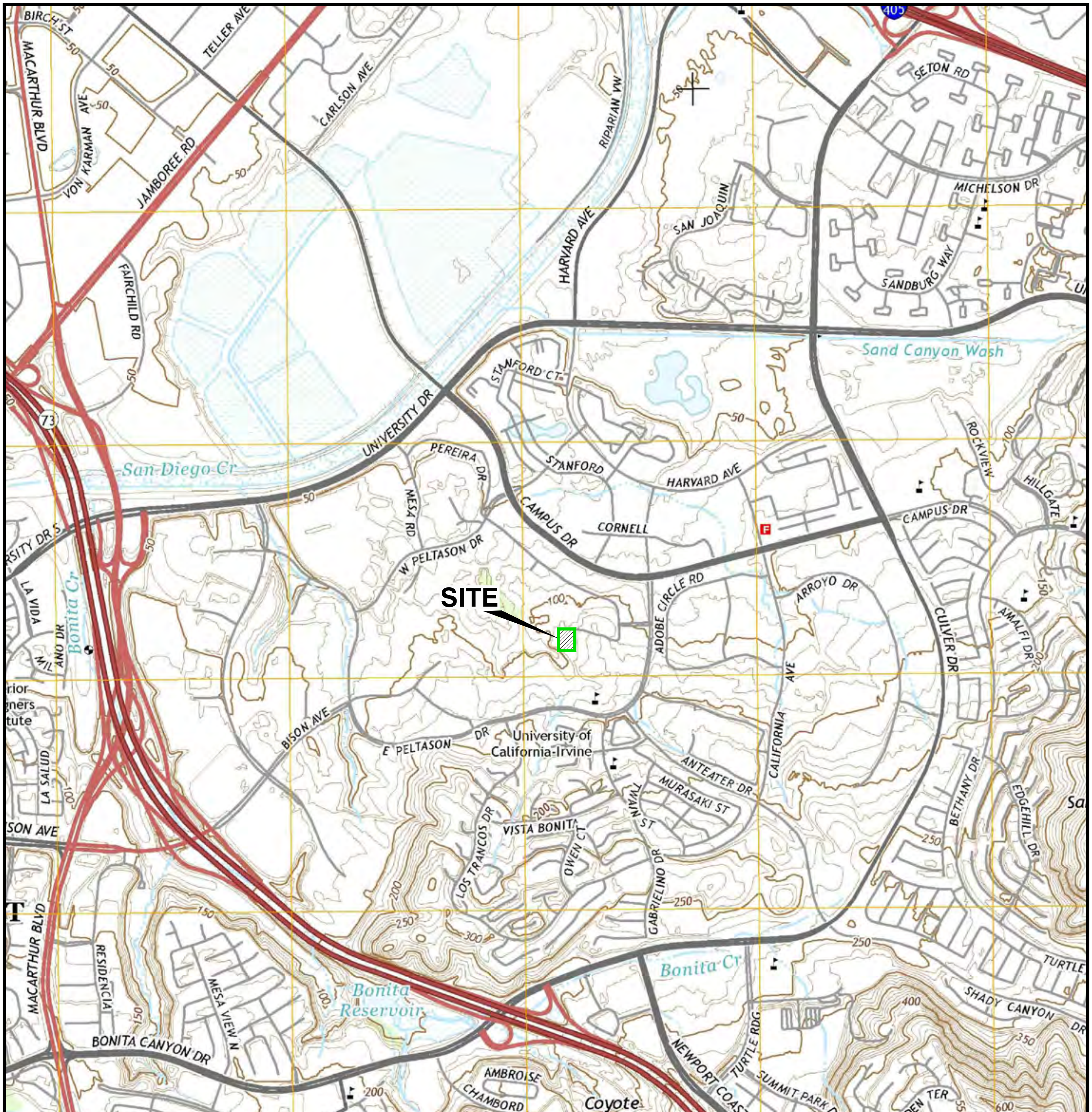
AERIAL PHOTOGRAPHS				
Source	**Date**	**Flight**	**Numbers**	**Scale**
USDA	12-12-52	AXK-2K	47 & 48	1:20,000



REFERENCE: 7.5 MINUTE USGS TOPOGRAPHIC MAP OF TUSTIN, CALIFORNIA QUADRANGLE, DATED 2015, SCALE 1:24000.

N

SCALE IN FEET

0 2,000 4,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore		SITE LOCATION	FIGURE
PROJECT NO.	DATE	MIDDLE EARTH HOUSING EXPANSION UNIVERSITY OF CALIFORNIA, IRVINE IRVINE, CALIFORNIA	1
209570003	10/16		

209570003_SL.dwg 16:32:27 09/27/2016 GK

REFERENCE: UNIVERSITY OF CALIFORNIA, IRVINE, STUDENT HOUSING, 2016, SITE CAPACITY STUDIES - PART 2, DATED JULY 15.

LEGEND

B-5 TD=21.0	⊕	BORING; TD=TOTAL DEPTH IN FEET
P-1	■	INFILTRATION TEST

N

SCALE IN FEET

0 120 240

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore

PROJECT NO.	DATE
209570003	10/16

INFILTRATION BORING AND TESTING LOCATIONS

MIDDLE EARTH HOUSING EXPANSION
UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA

FIGURE

2

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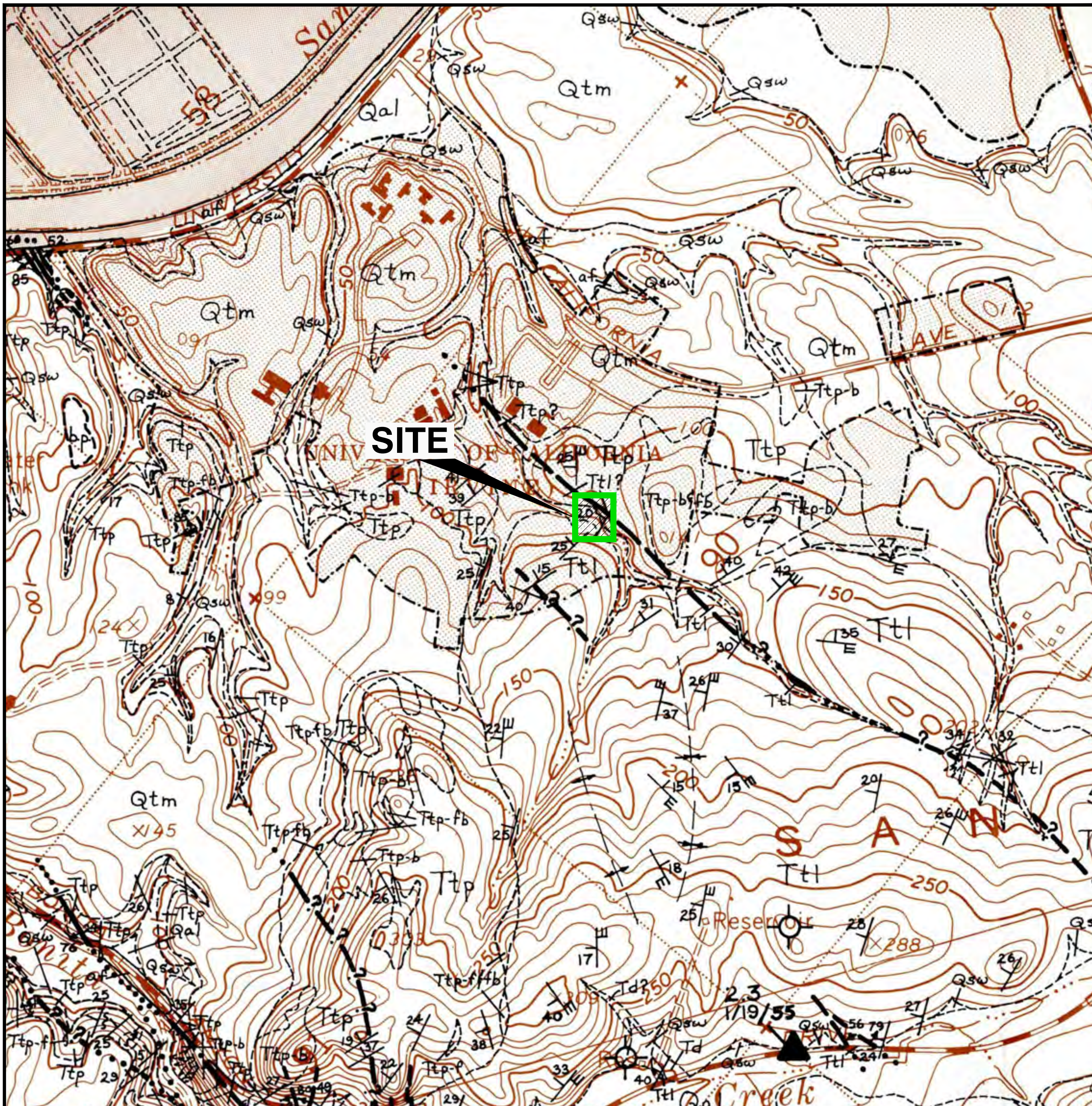

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N

SCALE IN FEET

0 1,000 2,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

Qsw	SLOPEWASH DEPOSITS
Qtm	MARINE TERRACE DEPOSITS
	APPROXIMATE GEOLOGIC CONTACT
	DEVELOPED AREA WITH UNDELINEATED ARTIFICIAL CUTS AND FILLS (1976).

TOPANGA FORMATION

Ttp	PAULARINO MEMBER
Ttl	LOS TRANCOS MEMBER
Ttb	BOMMER MEMBER

Ninyo & Moore

REGIONAL GEOLOGY

MIDDLE EARTH HOUSING EXPANSION
UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
209570003	10/16	3

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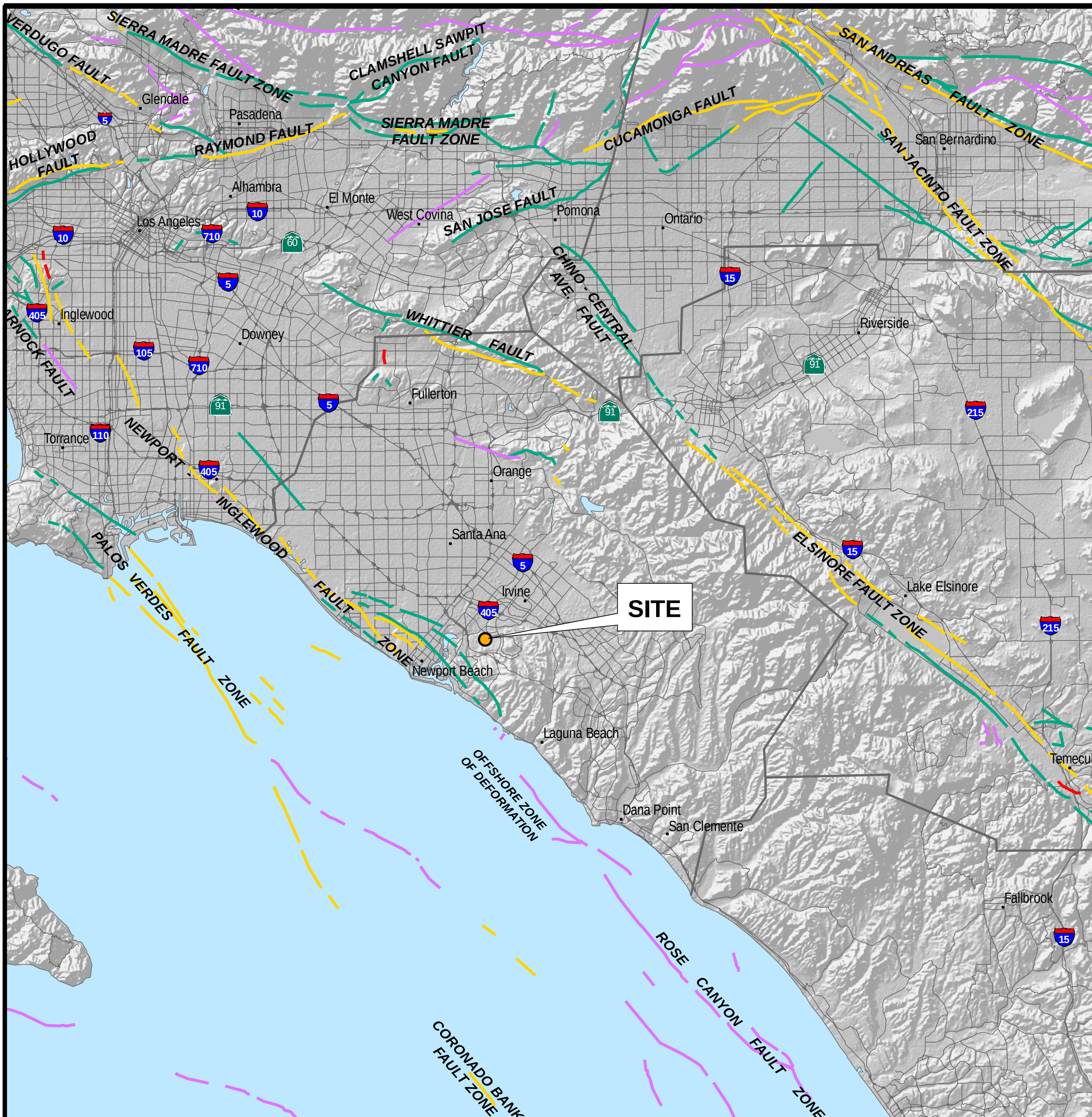

GIS DATA SOURCE: CALIFORNIA GEOLOGICAL SURVEY (CGS); ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE (ESRI)
REFERENCE: JENNINGS, 1994, FAULT ACTIVITY MAP OF CALIFORNIA AND ADJACENT AREAS

LEGEND

FAULT ACTIVITY:

- HISTORICALLY ACTIVE
- HOLOCENE ACTIVE
- LATE QUATERNARY (POTENTIALLY ACTIVE)
- QUATERNARY (POTENTIALLY ACTIVE)
- COUNTY BOUNDARIES

N

10 0 10
Miles

NOTE: DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE

Ninyo & Moore

FAULT LOCATIONS

PROJECT NO.	DATE	MIDDLE EARTH HOUSING EXPANSION UNIVERSITY OF CALIFORNIA, IRVINE IRVINE, CALIFORNIA	FIGURE
209570003	10/16		4

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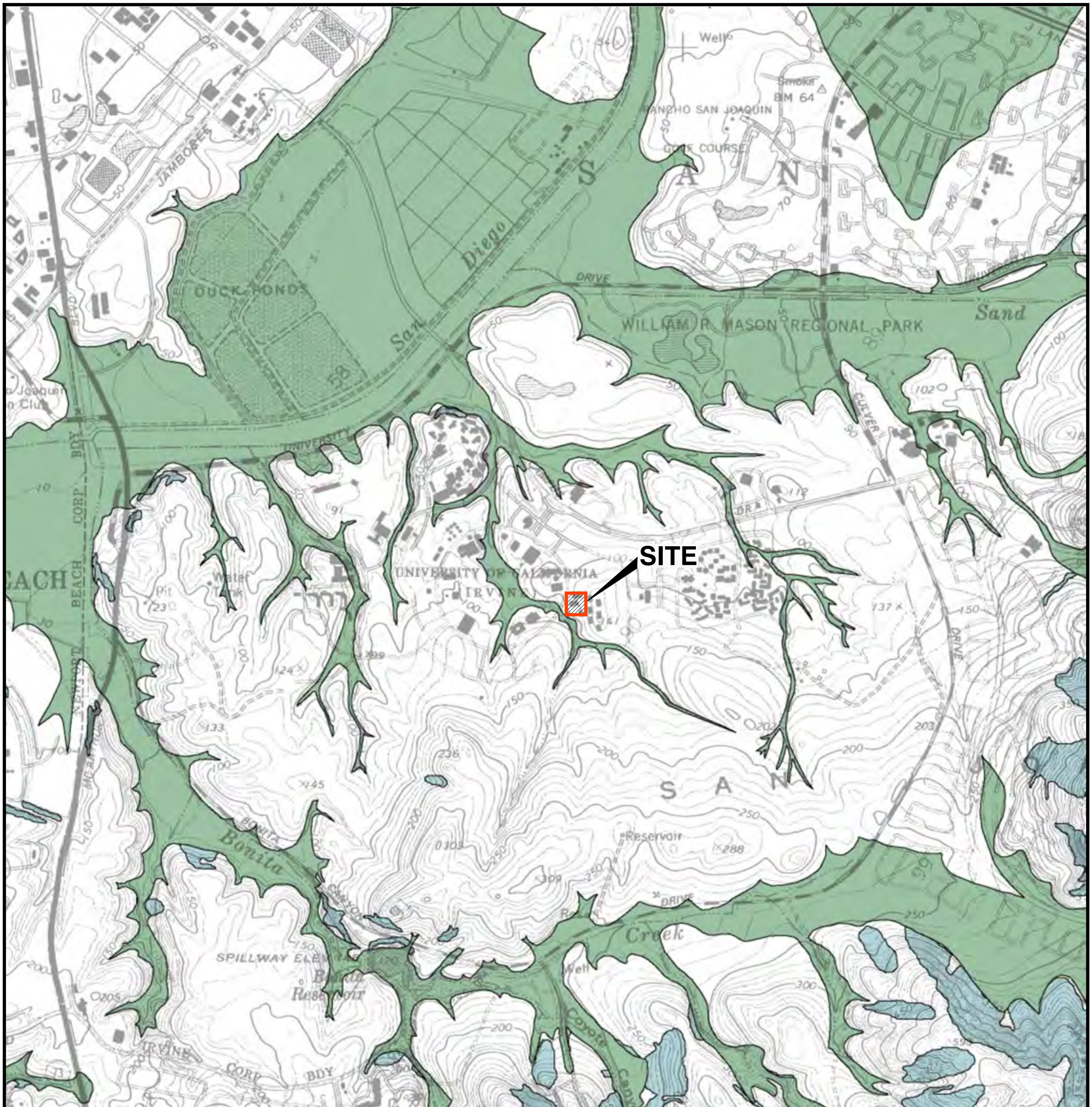

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N

SCALE IN FEET

0 2,000 4,000

Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslides

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

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Ninyo & Moore

SEISMIC HAZARD ZONES

FIGURE 5

PROJECT NO.	DATE
209570003	10/16

MIDDLE EARTH HOUSING EXPANSION
UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA

APPENDIX A

BORING LOGS

Field Procedure for the Collection of Disturbed Samples
Disturbed soil samples were obtained in the field using the following methods.

Bulk Samples
Bulk samples of representative earth materials were obtained from the exploratory borings. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test (SPT) Spoon Samples
Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test spoon sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of $1^{3}/_{8}$ inches. The sampler was driven into the ground 12 to 18 inches with a 140-pound hammer falling freely from a height of 30 inches in general accordance with ASTM D 1586. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the sampler, bagged, sealed and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples
Relatively undisturbed soil samples were obtained in the field using the following methods.

The Modified Split-Barrel Drive Sampler
The sampler, with an external diameter of 3.0 inches, was lined with 1-inch-long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a hammer or the Kelly bar of the drill rig in general accordance with ASTM D 3550. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer or bar, and the number of blows per foot of driving are presented on the boring logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

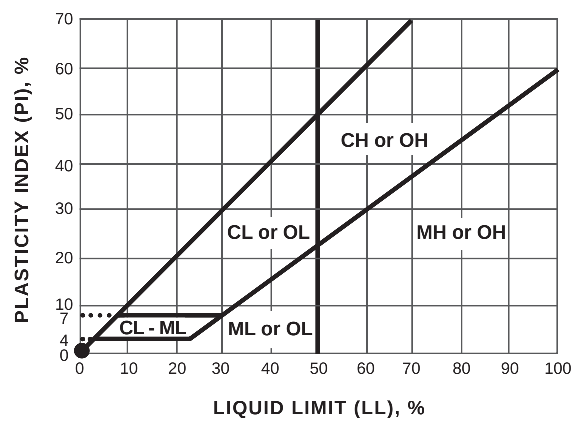
SOIL CLASSIFICATION CHART PER ASTM D 2488

PRIMARY DIVISIONS			SECONDARY DIVISIONS: GROUP SYMBOL	SECONDARY DIVISIONS: GROUP NAME
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	**GRAVEL** more than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVEL less than 5% fines	GW	well-graded GRAVEL
			GP	poorly graded GRAVEL
		GRAVEL with DUAL CLASSIFICATIONS 5% to 12% fines	GW-GM	well-graded GRAVEL with silt
			GP-GM	poorly graded GRAVEL with silt
			GW-GC	well-graded GRAVEL with clay
			GP-GC	poorly graded GRAVEL with clay
		GRAVEL with FINES more than 12% fines	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND 50% or more of coarse fraction passes No. 4 sieve	CLEAN SAND less than 5% fines	SW	well-graded SAND
			SP	poorly graded SAND
		SAND with DUAL CLASSIFICATIONS 5% to 12% fines	SW-SM	well-graded SAND with silt
			SP-SM	poorly graded SAND with silt
			SW-SC	well-graded SAND with clay
			SP-SC	poorly graded SAND with clay
		SAND with FINES more than 12% fines	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS 50% or more passes No. 200 sieve	**SILT and CLAY** liquid limit less than 50%	INORGANIC	CL	lean CLAY
			ML	SILT
			CL-ML	silty CLAY
		ORGANIC	OL (PI > 4)	organic CLAY
			OL (PI < 4)	organic SILT
	SILT and CLAY liquid limit 50% or more	INORGANIC	CH	fat CLAY
			MH	elastic SILT
		ORGANIC	OH (plots on or above "A"-line)	organic CLAY
			OH (plots below "A"-line)	organic SILT
	Highly Organic Soils		PT	Peat

GRAIN SIZE

DESCRIPTION		SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders		> 12"	> 12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	Coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	Fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	Coarse	#10 - #4	0.079 - 0.19"	Rock-salt-sized to pea-sized
	Medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock-salt-sized
	Fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized
Fines		Passing #200	< 0.0029"	Flour-sized and smaller

PLASTICITY CHART



APPARENT DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPOOLING CABLE OR CATHEAD: SPT (blows/foot)	SPOOLING CABLE OR CATHEAD: MODIFIED SPLIT BARREL (blows/foot)	AUTOMATIC TRIP HAMMER: SPT (blows/foot)	AUTOMATIC TRIP HAMMER: MODIFIED SPLIT BARREL (blows/foot)
Very Loose	≤ 4	≤ 8	≤ 3	≤ 5
Loose	5 - 10	9 - 21	4 - 7	6 - 14
Medium Dense	11 - 30	22 - 63	8 - 20	15 - 42
Dense	31 - 50	64 - 105	21 - 33	43 - 70
Very Dense	> 50	> 105	> 33	> 70

CONSISTENCY - FINE-GRAINED SOIL

CONSIS-TENCY	SPOOLING CABLE OR CATHEAD: SPT (blows/foot)	SPOOLING CABLE OR CATHEAD: MODIFIED SPLIT BARREL (blows/foot)	AUTOMATIC TRIP HAMMER: SPT (blows/foot)	AUTOMATIC TRIP HAMMER: MODIFIED SPLIT BARREL (blows/foot)
Very Soft	< 2	< 3	< 1	< 2
Soft	2 - 4	3 - 5	1 - 3	2 - 3
Firm	5 - 8	6 - 10	4 - 5	4 - 6
Stiff	9 - 15	11 - 20	6 - 10	7 - 13
Very Stiff	16 - 30	21 - 39	11 - 20	14 - 26
Hard	> 30	> 39	> 20	> 26

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USCS METHOD OF SOIL CLASSIFICATION

Explanation of USCS Method of Soil Classification

PROJECT NO.	DATE	FIGURE

BORING LOG EXPLANATION SHEET

DEPTH (meters)	SAMPLES Bulk	SAMPLES Driven	BLOWS/0.3 m	MOISTURE (%)	DRY DENSITY (kN/m)	SYMBOL	CLASSIFICATION U.S.C.S.	
0								Bulk sample.
								Modified split-barrel drive sampler.
								No recovery with modified split-barrel drive sampler.
								Sample retained by others.
								Standard Penetration Test (SPT).
5								No recovery with a SPT.
			XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
								No recovery with Shelby tube sampler.
								Continuous Push Sample.
								Seepage.
10								Groundwater encountered during drilling.
								Groundwater measured after drilling.
							SM	MAJOR MATERIAL TYPE (SOIL): Solid line denotes unit change.
							CL	Dashed line denotes material change.
15								Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Shear Bedding Surface
20								The total depth line is a solid line that is drawn at the bottom of the boring.

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BORING LOG

Explanation of Boring Log Symbols

PROJECT NO.	DATE	FIGURE

DATE DRILLED 8/26/16 BORING NO. B-1

GROUND ELEVATION 113' ± (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" Hollow-Stem Auger (2R Drilling)

DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30"

SAMPLED BY SCM LOGGED BY SCM REVIEWED BY RDH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							OL	FILL: Dark brown, moist, very stiff, organic SILT with sand; tree roots; few gravel.
							CL	MARINE TERRACE DEPOSITS: Grayish brown, moist, very stiff, sandy CLAY; few gravel; few organics; oxidation staining.
			46	16.2	116.4			Hard; trace gravel.
10			20					Reddish brown; very stiff.
			56	15.5	107.9			Brown; hard; increasing clay content; trace porosity.
							SC	Brown, moist, dense, clayey SAND; fine to medium sand; few gravel.
20			29					
							CL	Tannish brown, moist, hard, sandy CLAY; trace gravel.
			76	15.6	112.5			
30			23					Contains pockets of silt.
								Total Depth = 31.5 feet. Groundwater was not encountered during drilling. Backfilled with on-site soil on 8/26/16.
								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
40								

Ninyo & Moore

BORING LOG

MIDDLE EARTH HOUSING EXPANSION, UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
209570003	10/16	A-1

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 8/26/16 BORING NO. B-1 GROUND ELEVATION 113' ± (MSL) SHEET 2 OF 2 METHOD OF DRILLING 8" Hollow-Stem Auger (2R Drilling) DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30" SAMPLED BY SCM LOGGED BY SCM REVIEWED BY RDH **DESCRIPTION/INTERPRETATION**
40								The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

DATE DRILLED	8/26/16	BORING NO.	B-2
GROUND ELEVATION	115' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	8" Hollow-Stem Auger (2R Drilling)		
DRIVE WEIGHT	140 lbs. (Auto. Trip Hammer)	DROP	30"
SAMPLED BY SCM	LOGGED BY SCM	REVIEWED BY	RDH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							CL	MARINE TERRACE DEPOSITS: Dark brown, moist, stiff, sandy CLAY; few gravel; few organics; oxidation staining.
								TOPANGA FORMATION: Reddish yellow, dry, weakly cemented, fine to medium-grained, silty SANDSTONE; weathered; oxidation staining.
			50/4"					Brown.
10			50/4"					Reddish brown; fine to coarse-grained; gravel and cobble layers.
								Total Depth = 11 feet (Refusal). Groundwater was not encountered during drilling. Backfilled with on-site soil on 8/26/16.
20								
30								
40								

Notes:
Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

Ninyo & Moore

BORING LOG

MIDDLE EARTH HOUSING EXPANSION, UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
209570003	10/16	A-3

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 8/26/16 BORING NO. B-3
								GROUND ELEVATION 113' ± (MSL) SHEET 1 OF 2
								METHOD OF DRILLING 8" Hollow-Stem Auger (2R Drilling)
								DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30"
								SAMPLED BY SCM LOGGED BY SCM REVIEWED BY RDH
								DESCRIPTION/INTERPRETATION
0							CL	FILL: Dark brown, moist, hard, sandy CLAY; few gravel; few organics.
							SC	MARINE TERRACE DEPOSITS: Light grayish brown, moist, dense, clayey SAND; fine to medium sand; few gravel.
			48	10.6	121.7			
							CL	Reddish gray, moist, very stiff, sandy CLAY; oxidation staining.
10			16					
			56					Brown; hard; contains pockets of clayey sand.
							ML	Brown, moist, very stiff, SILT; caliche deposits.
20			20					
								TOPANGA FORMATION: Reddish gray, moist, weakly cemented, fine to medium-grained, clayey SANDSTONE; highly weathered.
			69/11"	12.7	105.6			
30			50/5"					Yellowish brown; fine to coarse-grained; silty sandstone; gravel layers.
								Total Depth = 31.5 feet. Groundwater not encountered during drilling. Backfilled with on-site soil on 8/26/16. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
40								

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BORING LOG

MIDDLE EARTH HOUSING EXPANSION, UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
209570003	10/16	A-4

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40								The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

DATE DRILLED 8/26/16 BORING NO. B-3

GROUND ELEVATION 113' ± (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" Hollow-Stem Auger (2R Drilling)

DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30"

SAMPLED BY SCM LOGGED BY SCM REVIEWED BY RDH

Ninyo & Moore

BORING LOG

MIDDLE EARTH HOUSING EXPANSION, UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
209570003	10/16	A-5

DATE DRILLED 8/26/16 BORING NO. B-4

GROUND ELEVATION 112' ± (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" Hollow-Stem Auger (2R Drilling)

DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30"

SAMPLED BY SCM LOGGED BY SCM REVIEWED BY RDH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SC	FILL: Brown, dry to moist, medium dense, clayey SAND; few gravel; few organics.
							CL	Dark brown, moist, hard, sandy CLAY; few gravel; few organics; concrete and metal debris.
								Reddish gray.
			44				CL	MARINE TERRACE DEPOSITS: Dark brown, moist, hard, sandy CLAY; oxidation staining.
								Interbedded gravel and cobbles.
10			50/6"	15.8	95.7			
			33					Brown.
20								Few gravel; caliche stringers.
			67					
			19					Very stiff.
							SC	Brown, moist, dense, clayey SAND; medium sand; trace gravel.
30			63	15.5	108.8			
								Total Depth = 31.5 feet. Groundwater was not encountered during drilling. Backfilled with on-site soil on 8/26/16.
								Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
40								

Ninyo & Moore

BORING LOG

MIDDLE EARTH HOUSING EXPANSION, UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
209570003	10/16	A-6

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED 8/26/16 BORING NO. B-4 GROUND ELEVATION 112' ± (MSL) SHEET 2 OF 2 METHOD OF DRILLING 8" Hollow-Stem Auger (2R Drilling) DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30" SAMPLED BY SCM LOGGED BY SCM REVIEWED BY RDH DESCRIPTION/INTERPRETATION
40								The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
50								
60								
70								
80								

Ninyo & Moore

BORING LOG

MIDDLE EARTH HOUSING EXPANSION, UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
209570003	10/16	A-7

DATE DRILLED 8/26/16 BORING NO. B-5

GROUND ELEVATION 114' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Hollow-Stem Auger (2R Drilling)

DRIVE WEIGHT 140 lbs. (Auto. Trip Hammer) DROP 30"

SAMPLED BY SCM LOGGED BY SCM REVIEWED BY RDH

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							CL	MARINE TERRACE DEPOSITS: Dark brown, moist, stiff, sandy CLAY; few gravel; few cobbles; few organics; pinhole voids.
								TOPANGA FORMATION: Light bluish brown, dry to moist, weakly cemented, fine to coarse grained, silty SANDSTONE; weakly cemented; weathered; oxidation staining.
			50/5"	9.3	89.2			
10			50/5"					Fine to medium-grained; contains interbedded siltstone layers.
			50/4"					Light reddish brown; fine to coarse-grained; friable.
20			50/2"	4.0				
								Total Depth = 21 feet (Refusal). Groundwater was not encountered during drilling. Backfilled with on-site soil on 8/26/16.
30								
40								

Notes:
Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.

The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.

Ninyo & Moore

BORING LOG

MIDDLE EARTH HOUSING EXPANSION, UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA

PROJECT NO.	DATE	FIGURE
209570003	10/16	A-8

APPENDIX B

LABORATORY TESTING

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the logs of the exploratory borings in Appendix A.

In-Place Moisture and Density Tests

The moisture content and dry density of relatively undisturbed samples obtained from the exploratory borings were evaluated in general accordance with ASTM D 2937. The test results are presented on the logs of the exploratory borings in Appendix A.

Gradation Analysis

A gradation analysis test was performed on a selected representative soil sample in general accordance with ASTM D 422. The grain-size distribution curve is shown on Figure B-1. The test results were utilized in evaluating the soil classifications in accordance with the USCS.

200 Wash

An evaluation of the percentage of particles finer than the No. 200 sieve in selected soil samples was performed in general accordance with ASTM D 1140. The results of the test are presented on Figure B-2.

Atterberg Limits

Tests were performed on a selected representative fine-grained soil sample to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the USCS. The test results and classification are shown on Figure B-3.

Consolidation Test

A consolidation test was performed on a selected relatively undisturbed soil sample in general accordance with ASTM D 2435. The sample was inundated during testing to represent adverse field conditions. The percent of consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the test are summarized on Figure B-4.

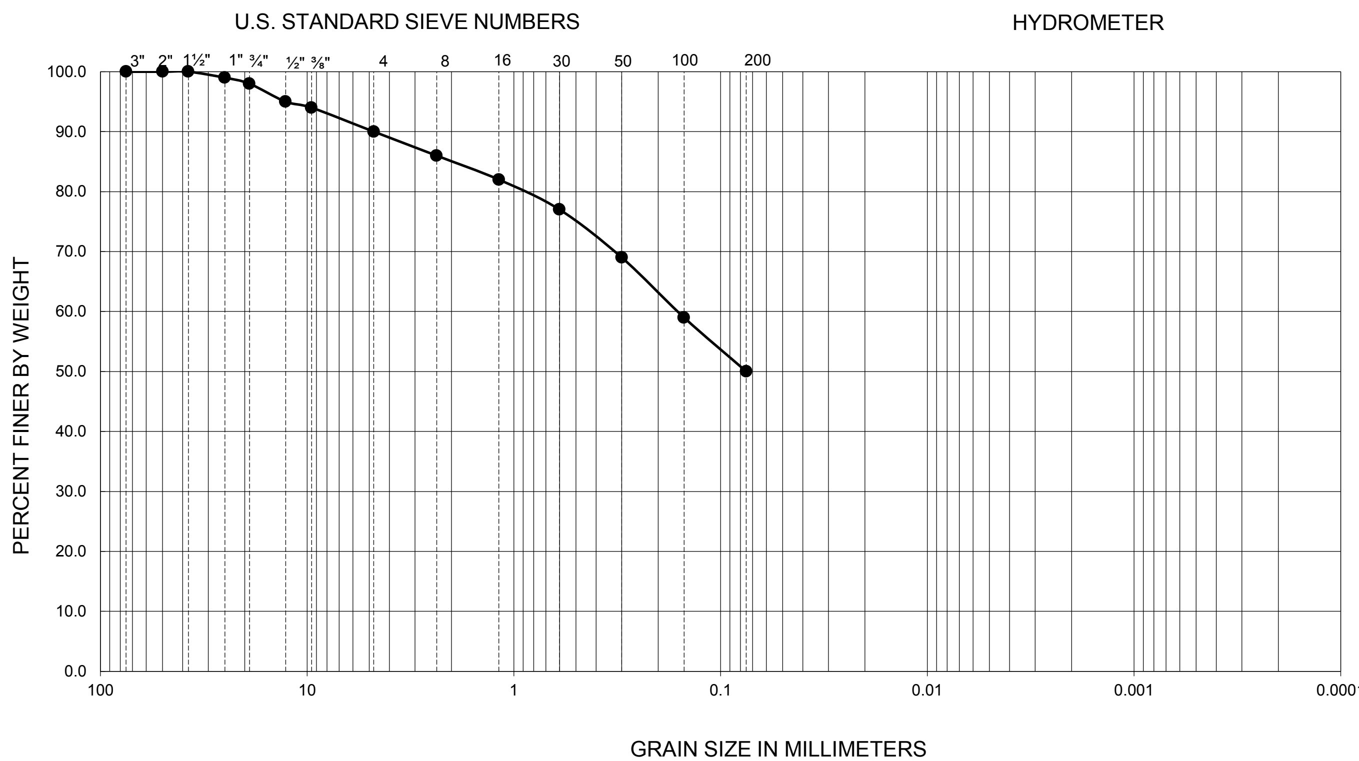
Direct Shear Tests

Direct shear tests were performed on relatively undisturbed samples in general accordance with ASTM D 3080 to evaluate the shear strength characteristics of selected materials. The samples were inundated during shearing to represent adverse field conditions. The results are shown on Figures B-5 and B-6.

Expansion Index Test
The expansion index of a selected representative soil sample was evaluated in general accordance with ASTM D 4829. A specimen was molded under a specified compactive energy at approximately 50 percent saturation (plus or minus 1 percent). The prepared 1-inch thick by 4-inch diameter specimen was loaded with a surcharge of 144 pounds per square foot and was inundated with tap water. Readings of volumetric swell were made for a period of 24 hours. The results of this test are presented on Figure B-7.

Soil Corrosivity Tests
Soil pH, and resistivity tests were performed on a representative soil sample in general accordance with California Test (CT) 643. The soluble sulfate and chloride content of a selected sample were evaluated in general accordance with CT 417 and CT 422, respectively. The test results are presented on Figure B-8.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	USCS
●	B-4	0.0-5.0	44	20	24	--	--	--	--	--	50	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

Ninyo & Moore		GRADATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	MIDDLE EARTH HOUSING EXPANSION UNIVERSITY OF CALIFORNIA, IRVINE IRVINE, CALIFORNIA	B-1
209570003	10/16		

209570003 Fig B-01_SIEVE w No 81 B-4 0-5

SAMPLE LOCATION	SAMPLE DEPTH (FT)	DESCRIPTION	PERCENT PASSING NO. 4	PERCENT PASSING NO. 200	USCS (TOTAL SAMPLE)
B-1	5.0-6.5	SANDY CLAY	97	54	CL
B-1	25.0-26.5	SANDY CLAY	99	67	CL
B-2	5.0-6.5	SANDSTONE	96	14	-
B-3	5.0-6.5	CLAYEY SAND	93	41	SC
B-3	15.0-16.5	SANDY CLAY	100	59	CL
B-4	30.0-31.5	CLAYEY SAND	96	45	SC
B-5	5.0-6.5	SANDSTONE	92	36	-

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1140

Ninyo & Moore

NO. 200 SIEVE ANALYSIS

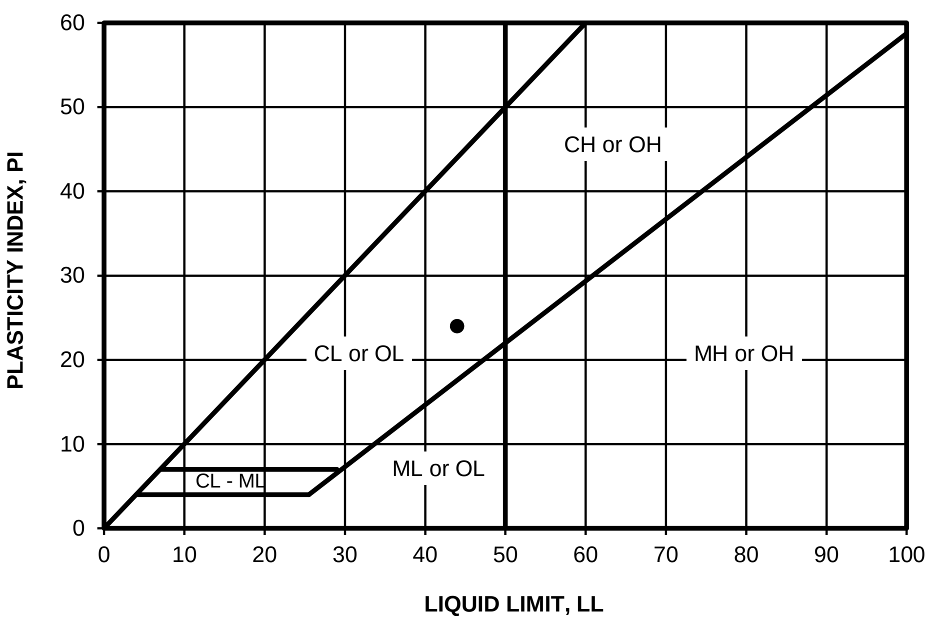
FIGURE

B-2

PROJECT NO.	DATE
209570003	10/16

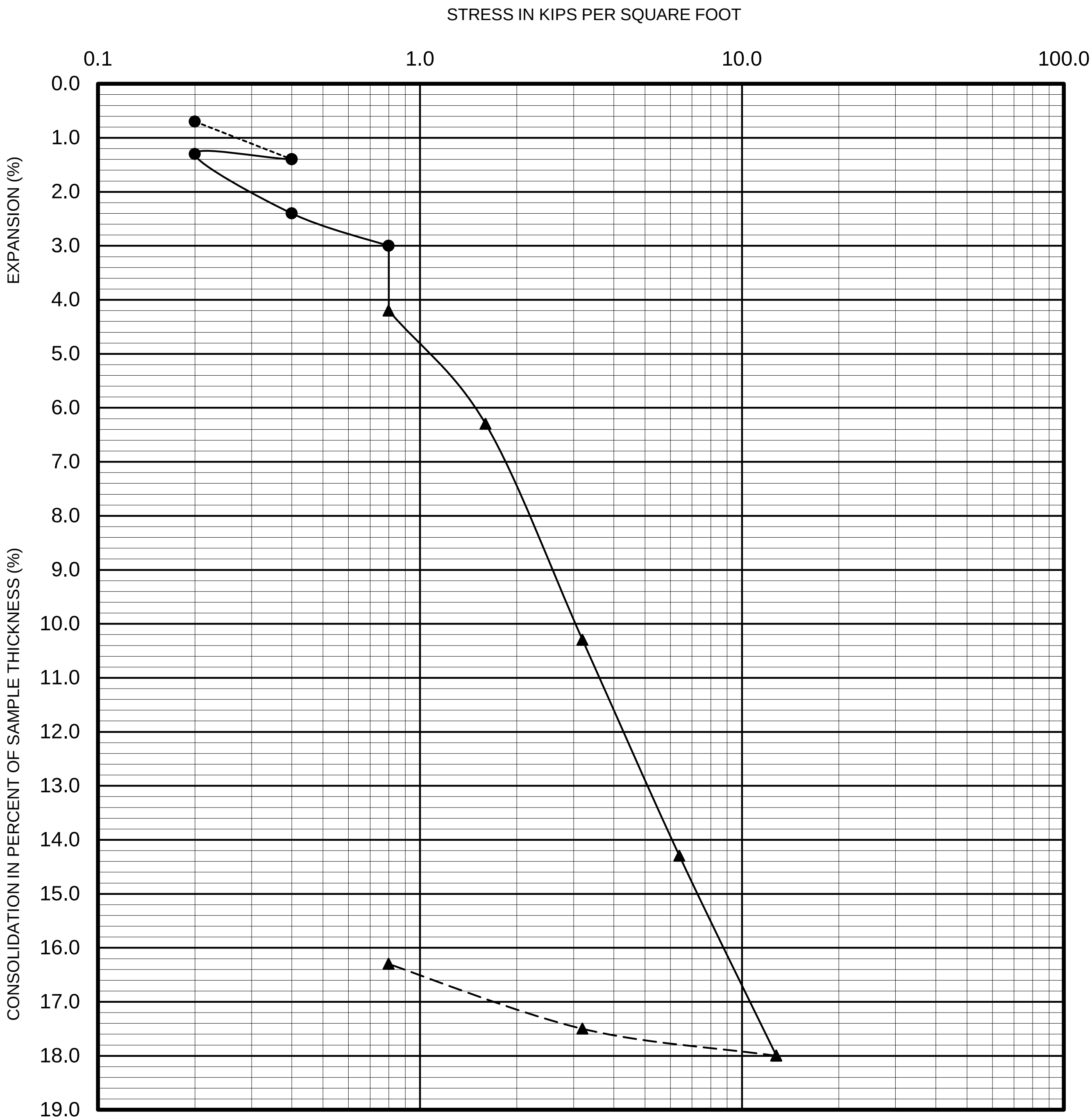
MIDDLE EARTH HOUSING EXPANSION
UNIVERSITY OF CALIFORNIA, IRVINE
IRVINE, CALIFORNIA

SYMBOL	LOCATION	DEPTH (FT)	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS (Entire Sample)
●	B-4	0.0-5.0	44	20	24	CL	CL



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

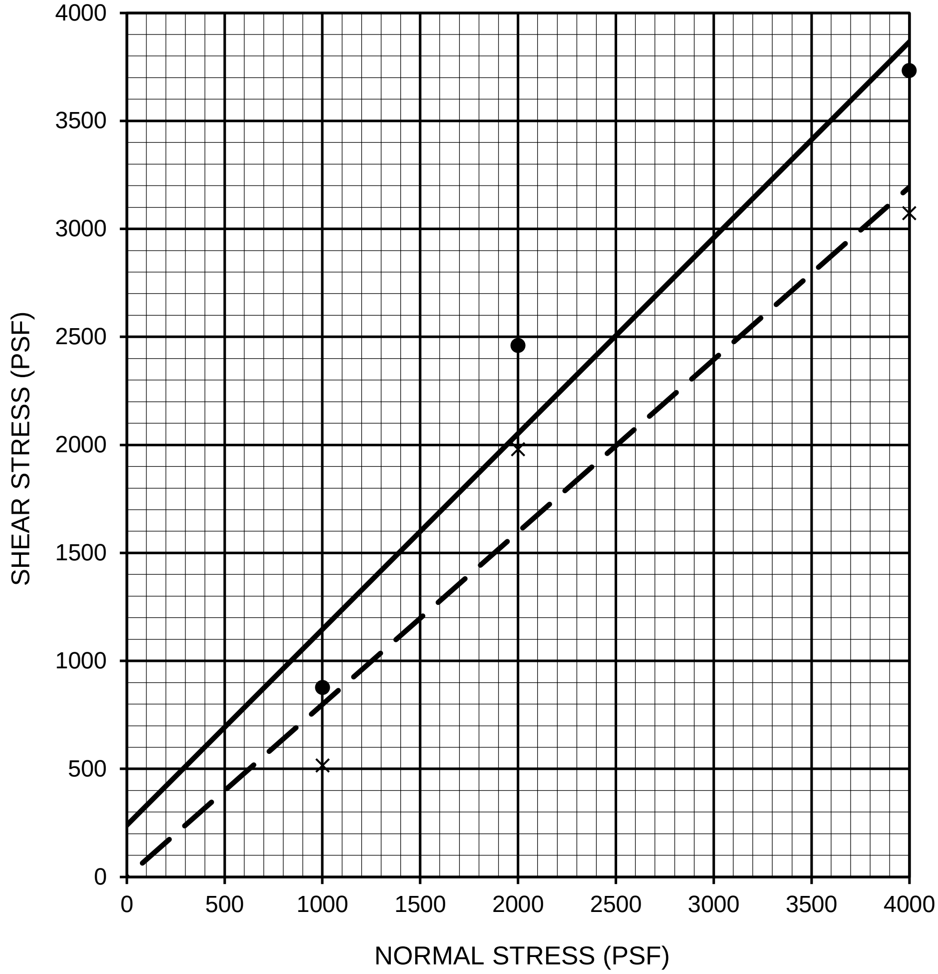
Ninyo & Moore	ATTERBERG LIMITS TEST RESULTS	FIGURE
PROJECT NO. 209570003 / DATE 10/16	MIDDLE EARTH HOUSING EXPANSION UNIVERSITY OF CALIFORNIA, IRVINE IRVINE, CALIFORNIA	B-3



Seating Cycle		Sample Location	B-4
Loading Prior to Inundation		Depth (ft.)	10.0-11.5
Loading After Inundation		Soil Type	CL
Rebound Cycle			

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435

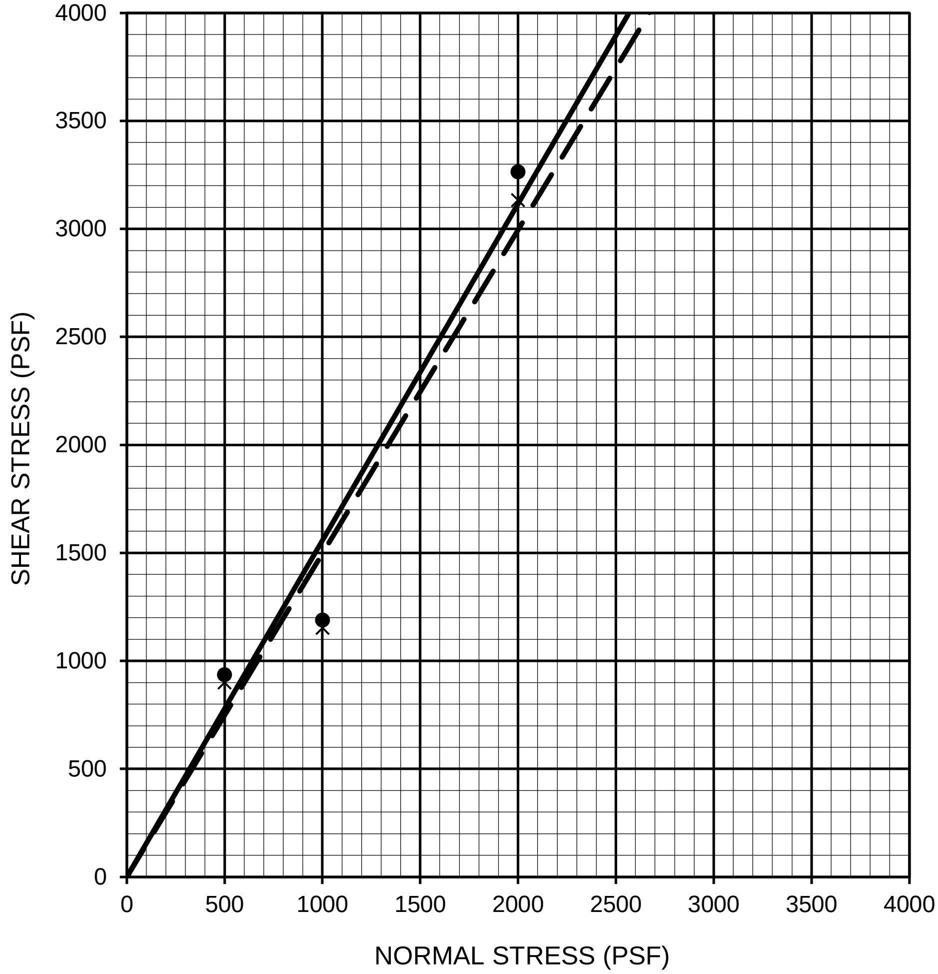
Ninyo & Moore		CONSOLIDATION TEST RESULTS	FIGURE
PROJECT NO.	DATE	MIDDLE EARTH HOUSING EXPANSION UNIVERSITY OF CALIFORNIA, IRVINE IRVINE, CALIFORNIA	B-4
209570003	10/16		



Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
SANDY CLAY	—●—	B-3	15.0-16.5	Peak	240	42	CL
SANDY CLAY	- - x - -	B-3	15.0-16.5	Ultimate	0	39	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

Ninyo & Moore		DIRECT SHEAR TEST RESULTS	FIGURE
PROJECT NO.	DATE	MIDDLE EARTH HOUSING EXPANSION UNIVERSITY OF CALIFORNIA, IRVINE IRVINE, CALIFORNA	B-5
209570003	10/16		



Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
SANDSTONE	—●—	B-5	5.0-6.5	Peak	0	57	-
SANDSTONE	- - x - -	B-5	5.0-6.5	Ultimate	0	56	-

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080

Ninyo & Moore		DIRECT SHEAR TEST RESULTS	FIGURE
PROJECT NO.	DATE	MIDDLE EARTH HOUSING EXPANSION UNIVERSITY OF CALIFORNIA, IRVINE IRVINE, CALIFORNIA	B-6
209570003	10/16		

SAMPLE LOCATION	SAMPLE DEPTH (FT)	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (PCF)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (IN)	EXPANSION INDEX	POTENTIAL EXPANSION
B-4	0.0-5.0	13.5	96.3	28.6	0.067	67	Medium

PERFORMED IN GENERAL ACCORDANCE WITH ☑ UBC STANDARD 18-2 ☐ ASTM D 4829

Ninyo & Moore		EXPANSION INDEX TEST RESULTS	FIGURE
PROJECT NO.	DATE	MIDDLE EARTH HOUSING EXPANSION UNIVERSITY OF CALIFORNIA, IRVINE IRVINE, CALIFORNIA	B-7
209570003	10/16		

SAMPLE LOCATION	SAMPLE DEPTH (FT)	pH [1]	RESISTIVITY [1] (Ohm-cm)	SULFATE CONTENT [2]		CHLORIDE CONTENT [3] (ppm)
				(ppm)	(%)	
B-4	0.0-5.0	7.3	370	930	0.093	870

[1] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643
[2] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417
[3] PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

Ninyo & Moore		CORROSIVITY TEST RESULTS	FIGURE
PROJECT NO.	DATE	MIDDLE EARTH HOUSING EXPANSION UNIVERSITY OF CALIFORNIA, IRVINE IRVINE, CALIFORNIA	B-8
209870003	10/16		

209570003 Fig B-08_CORROSIVITY B-4-0-5

APPENDIX C

Greenhouse Gas Assessment

Greenhouse Gas Assessment
Middle Earth Expansion

CONSULTANT:

Michael Baker International
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Irvine, California 92618

Michael Baker
INTERNATIONAL

GREENHOUSE GAS ASSESSMENT

for the

Middle Earth Expansion Project

University of California, Irvine

Consultant:

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November 22, 2016

JN 156259

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TABLE OF CONTENTS

LIST OF EXHIBITS

LIST OF TABLES

SYMBOLS, ABBREVIATIONS, AND ACRONYMS

AB	Assembly Bill
AQMP	Air Quality Management Plan
Basin	South Coast Air Basin
BAU	business as usual
CAAQS	California Ambient Air Quality Standards
CAFE	corporate average fleet fuel economy
CalGreen	California Green Building Standards
CARB	California Air Resources Board
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH_4	Methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2eq	carbon dioxide equivalent
EAP	Energy Action Plan
EECAP	energy efficiency climate action plans
EPA	U.S. Environmental Protection Agency
FCAA	Federal Clean Air Act
GHG	greenhouse gas
GWP	Global Warming Potential
H_2O	water vapor
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
hp	horsepower
HPLV	high-pressure-low-volume
HVAC	heating, ventilation, and air conditioning
I-4	Environmental Justice Enhancement Initiative
IPCC	International Panel for Climate Change
lbs	pounds
LEED	Leadership in Engineering and Environmental Design
LOS	level of service
LSTs	Localized Significance Thresholds
Metro	Los Angeles County Metropolitan Transportation Authority
MMT	million metric tons
mpg	miles per gallon
MPO	metropolitan planning organization
$MTCO_2eq$	metric tons of carbon dioxide equivalents
MU-T	Mixed-Use Transit
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards

NO_2	nitrogen dioxide
NO_x	nitrogen oxides
OAL	Office of Administrative Law
O_3	ozone
OPR	Office of Planning and Research
PFCs	Perfluorocarbons
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
PST	Pacific Standard Time
RCP	Regional Comprehensive Plan
RH	relative humidity
ROG	Reactive Organic Gasses
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCS	Sustainable Community Strategy
SF_6	Sulfur hexafluoride
SGVCOG	San Gabriel Valley Council of Governments
SGVEWP	San Gabriel Valley Energy Wise Partnership
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
SRA	Source receptor Area
UNFCCC	United Nations Framework Convention on Climate Change
$\mu g/m^3$	micrograms per cubic meter
UV-B	ultraviolet B rays
VMT	vehicle miles traveled
VOC	Volatile Organic Compound

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EXECUTIVE SUMMARY

The purpose of this Greenhouse Gas Assessment is to evaluate potential short- and long-term greenhouse gas (GHG) impacts resulting from implementation of the proposed Middle Earth Expansion Project ("project" or "proposed project") on the University of California, Irvine (UCI) campus.

Regionally, the project site is located 1.92 miles south of Interstate 405 (I-405), and one mile north of State Route 73 (SR-73). Locally, the project is located on the UCI campus, within the existing Middle Earth student housing complex, approximately 115 feet northeast of the intersection of Ring Road and Engineering Services Road.

The proposed project would expand the existing Middle Earth student housing with the addition of an approximately 240,000 square-foot, seven-story structure. The first two floors of the structure would include a 40,000 square-foot dining facility, 14,000 square feet of community facilities to be shared by the rest of the Middle Earth complex, and 12,000 square feet of support and ancillary space. The top five floors would include 500 beds and associated dormitory facilities, such as lounges, laundry, kitchenettes, and bathrooms, totaling approximately 82,000 square feet. The proposed residence tower would replace the existing dining facility and student community center. In addition to the new residence tower, the project includes the demolition of Brandywine Commons, and interior remodeling of the existing 10,000 square foot Pippin Commons. The proposed residence tower and renovated Pippin Commons is estimated to increase staff by 10.

Greenhouse Gas Impacts. The proposed project would result in less than significant GHG impacts. Additionally, the project would not conflict with a plan, policy, or regulation adopted for the purposes of reducing GHG emissions.

1.0 INTRODUCTION

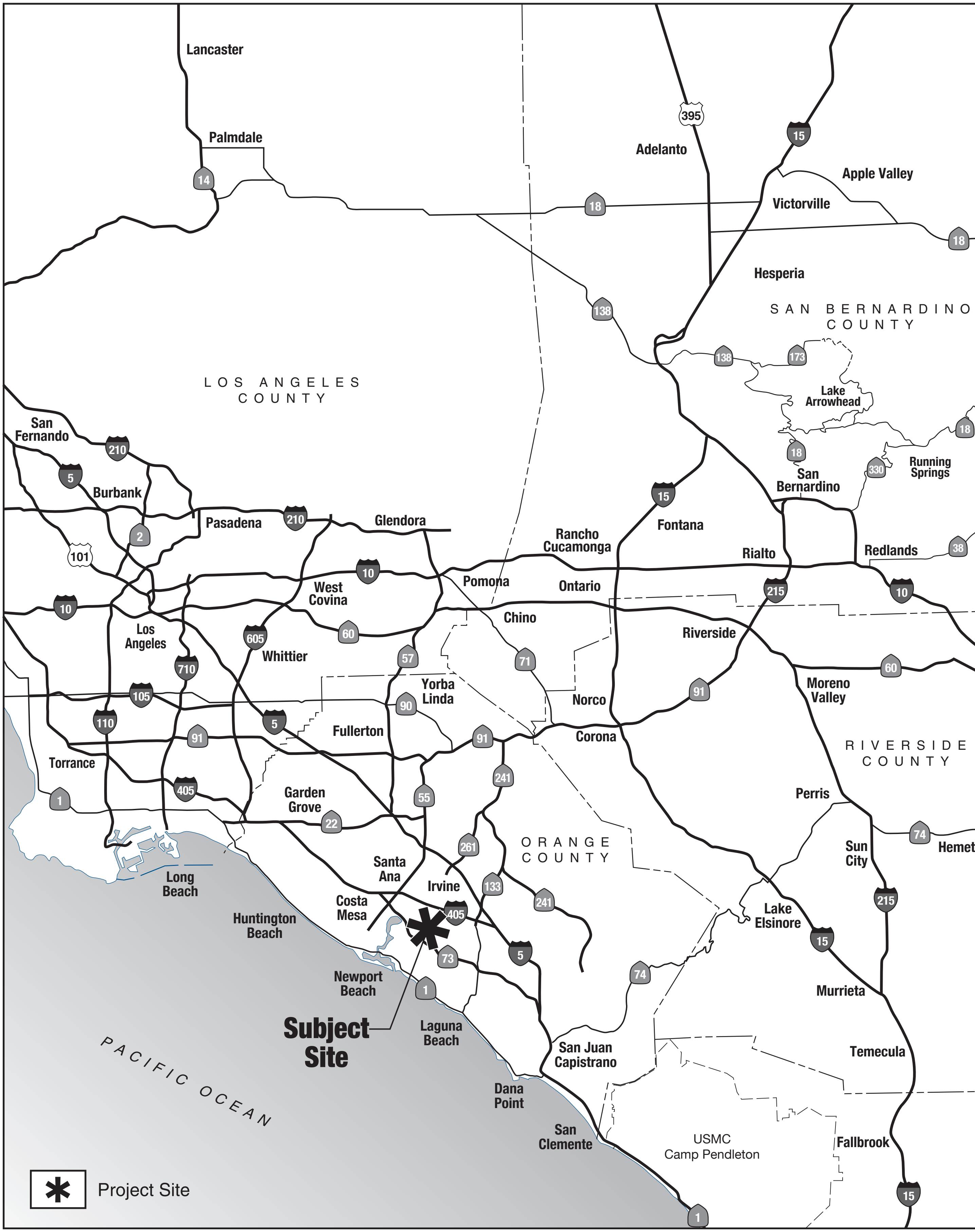
The purpose of this Greenhouse Gas Assessment is to evaluate potential short- and long-term air quality impacts resulting from implementation of the proposed Middle Earth Expansion Project ("project" or "proposed project") on the University of California, Irvine (UCI) campus.

1.1 PROJECT LOCATION

The project site is located 1.92 miles south of Interstate 405 (I-405), and one mile north of State Route 73 (SR-73); refer to Exhibit 1, *Regional Vicinity*. Locally, the project is located on the UCI campus, within the existing Middle Earth student housing complex, approximately 115 feet northeast of the intersection of Ring Road and Engineering Services Road; refer to Exhibit 2, *Site Vicinity*.

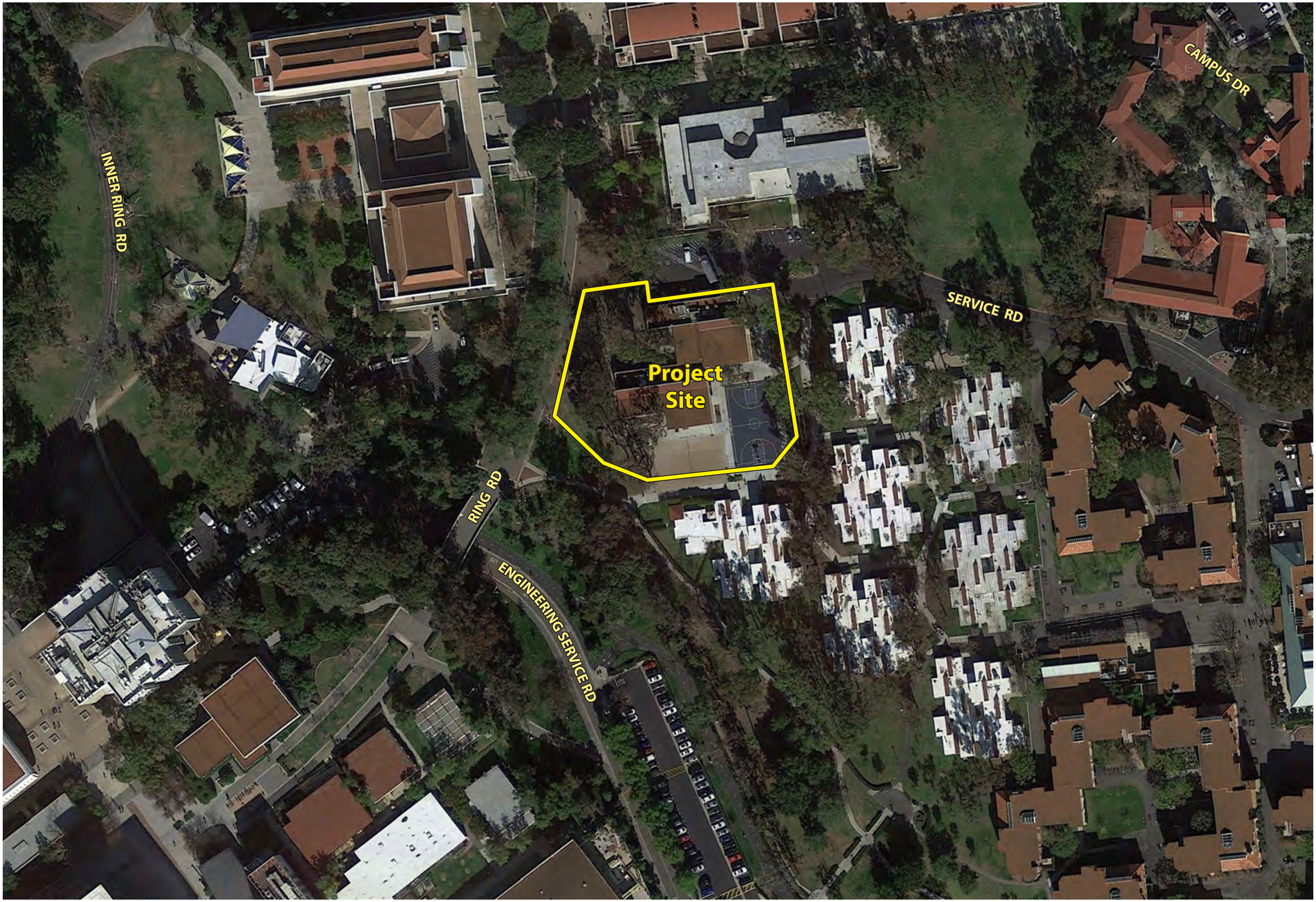
1.2 PROJECT DESCRIPTION

The proposed project would expand the existing Middle Earth student housing with the addition of an approximately 240,000 square-foot, seven-story structure; refer to Exhibit 3, *Conceptual Site Plan*. The first two floors of the structure would include a 40,000 square-foot dining facility, 14,000 square feet of community facilities to be shared by the rest of the Middle Earth complex, and 12,000 square feet of support and ancillary space. The top five floors would include 500 beds and associated dormitory facilities, such as lounges, laundry, kitchenettes, and bathrooms, totaling approximately 82,000 square feet. The proposed residence tower would replace the existing dining facility and student community center. In addition to the new residence tower, the project includes the demolition of Brandywine Commons, and interior remodeling of the existing 10,000 square foot Pippin Commons. The proposed residence tower and renovated Pippin Commons is estimated to increase staff by 10.



Regional Vicinity

Exhibit 1



Source: Aerial - Google Earth Pro, November 2016

Michael Baker INTERNATIONAL

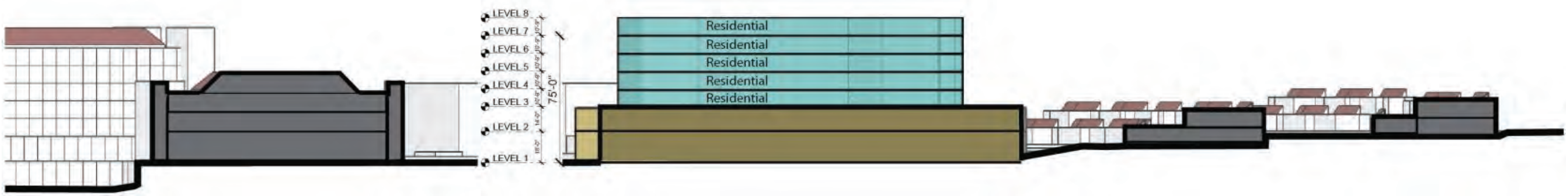
not to scale

11/04/16 JN156259-21946 mas

MIDDLE EARTH EXPANSION • GREENHOUSE GAS ASSESSMENT

Site Vicinity

Exhibit 2



Michael Baker INTERNATIONAL

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MIDDLE EARTH EXPANSION • GREENHOUSE GAS ASSESSMENT

Conceptual Site Plan

Exhibit 3

2.0 ENVIRONMENTAL SETTING

The California Air Resources Board (CARB) divides the State into 15 air basins that share similar meteorological and topographical features. The project site lies within the northwestern portion of the South Coast Air Basin (Basin). The Basin is a 6,600-square mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. The Basin's terrain and geographical location (i.e., a coastal plain with connecting broad valleys and low hills) determine its distinctive climate.

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. The climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

CLIMATE

The average annual temperature varies little throughout the Basin, averaging 75 degrees Fahrenheit (°F). However, with a less-pronounced oceanic influence, the eastern inland portions of the Basin show greater variability in annual minimum and maximum temperatures. All portions of the Basin have had recorded temperatures over 100°F in recent years.

Although the Basin has a semi-arid climate, the air near the surface is moist due to the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the Basin by offshore winds, the ocean effect is dominant. Periods with heavy fog are frequent, and low stratus clouds, occasionally referred to as "high fog," are a characteristic climate feature. Annual average relative humidity is 70 percent at the coast and 57 percent in the eastern part of the Basin. Precipitation in the Basin is typically nine to 14 inches annually and is rarely in the form of snow or hail due to typically warm weather. The frequency and amount of rainfall is greater in the coastal areas of the Basin.

The height of the inversion is important in determining pollutant concentration. When the inversion is approximately 2,500 feet above sea level, the sea breezes carry the pollutants inland to escape over the mountain slopes or through the passes. At a height of 1,200 feet, the terrain prevents the pollutants from entering the upper atmosphere, resulting in a settlement in the foothill communities. Below 1,200 feet, the inversion puts a tight lid on pollutants, concentrating them in a shallow layer over the entire coastal basin. Usually, inversions are lower before sunrise than during the day. Mixing heights for inversions are lower in the summer and more persistent, being partly responsible for the high levels of ozone (O_3) observed during summer months in the

Basin. Smog in southern California is generally the result of these temperature inversions combining with coastal day winds and local mountains to contain the pollutants for long periods of time, allowing them to form secondary pollutants by reacting with sunlight. The Basin has a limited ability to disperse these pollutants due to typically low wind speeds.

The area in which the project is located offers clear skies and sunshine, yet is still susceptible to air inversions. These inversions trap a layer of stagnant air near the ground, where it is then further loaded with pollutants. These inversions cause haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, furnaces, and other sources.

3.0 STATE AND FEDERAL GREENHOUSE GAS STANDARDS

3.1 GLOBAL CLIMATE CHANGE GASES

The natural process through which heat is retained in the troposphere is called the "greenhouse effect."[1] The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and GHGs in the upper atmosphere absorb this long wave radiation and emit this long wave radiation into space and toward the Earth. This "trapping" of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

The most abundant GHGs are water vapor and carbon dioxide (CO_2). Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-radiate long wave radiation.

GHGs include, but are not limited to, the following:[2]

- *Water Vapor (H_2O)*. Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively.

  The primary human related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IPCC) has not determined a GWP for water vapor.

- *Carbon Dioxide (CO_2)*. Carbon Dioxide is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, CO_2 emissions from fossil fuel combustion increased by a total of 7.4 percent between 1990 and 2014.[3] Carbon dioxide is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.

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[1] The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

[2] All Global Warming Potentials are given as 100-year Global Warming Potential. Unless noted otherwise, all Global Warming Potentials were obtained from the IPCC. (Intergovernmental Panel on Climate Change, *Climate Change, Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007*).

[3] U.S. Environmental Protection Agency, *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2014*, April 2016.

- *Methane (CH_4).* Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane are landfills, natural gas systems, and enteric fermentation (the digestive process in animals with a rumen, typically cattle, causing methane gas). Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of methane is 25.

- *Nitrous Oxide (N_2O).* Nitrous oxide is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production (for the industrial production of nylon), and nitric acid production (for rocket fuel, woodworking, and as a chemical reagent). The GWP of nitrous oxide is 298.

- *Hydrofluorocarbons (HFCs).* HFCs are typically used as refrigerants, aerosol propellants, solvents and fire retardants. The major emissions source of HFCs is from their use as refrigerants in air conditioning systems in both vehicles and buildings. The use of HFCs for cooling and foam blowing is increasing, as the continued phase out of chlorofluorocarbons (CFCs) and HCFCs gains momentum. The 100-year GWP of HFCs range from 12 for HFC-161 to 14,800 for HFC-23.[4]

- *Perfluorocarbons (PFCs).* PFCs are compounds consisting of carbon and fluorine, and are primarily created as a byproduct of aluminum production and semiconductor manufacturing. Perfluorocarbons are potent GHGs with a GWP several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years). [5] The GWP of PFCs range from 7,390 to 12,200.[6]

- *Sulfur hexafluoride (SF_6).* SF_6 is a colorless, odorless, nontoxic, nonflammable gas. Sulfur hexafluoride is the most potent GHG that has been evaluated by the IPCC with a Global Warming Potential of 22,800.[7] However, its global warming contribution is not as high as the Global Warming Potential would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm], respectively).[8]

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[4] Ibid.

[5] U.S. Environmental Protection Agency, *Overview of Greenhouse Gas Emissions*, August 9, 2016, https://www.epa.gov/ghgemissions/overview-greenhouse-gases#f-gases, accessed on October 31, 2016.

[6] Ibid.

[7] Ibid.

[8] Ibid.

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric ozone (O_3) depletors; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

- *Hydrochlorofluorocarbons (HCFCs)*. HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The 100-year GWP of HCFCs range from 90 for HCFC-123 to 1,800 for HCFC-142b.[9]

- *1,1,1 trichloroethane*. 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The GWP of methyl chloroform is 146 times that of CO_2 (CO_2 has a GWP of 1).[10]

- *Chlorofluorocarbons (CFCs)*. CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the EPA's Final Rule (57 FR 3374) for the phase out of O_3 depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with 100-year GWPs ranging from 3,800 for CFC 11 to 14,400 for CFC 13.[11]

[9] Intergovernmental Panel on Climate Change, *Climate Change 2007: Working Group I: The Physical Science Basis, 2.10.2, Direct Global Warming Potentials*, 2007, https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html, accessed October 31, 2016.

[10] Ibid.

[11] Ibid.

4.0 REGULATORY SETTING

4.1 GLOBAL CLIMATE CHANGE REGULATORY PROGRAMS

FEDERAL

The Federal government is extensively engaged in international climate change activities in areas such as science, mitigation, and environmental monitoring. The EPA actively participates in multilateral and bilateral activities by establishing partnerships and providing leadership and technical expertise. Multilaterally, the United States is a strong supporter of activities under the United Nations Framework Convention on Climate Change (UNFCCC) and the IPCC.

In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical, and socioeconomic information relevant to understanding the scientific basis of human-induced climate change, its potential impacts, and options for adaptation and mitigation. The most recent reports of the IPCC have emphasized the scientific consensus around the evidence that real and measurable changes to the climate are occurring, that they are caused by human activity, and that significant adverse impacts on the environment, the economy, and human health and welfare are unavoidable.

In December 2007, Congress passed the first increase in corporate average fleet fuel economy (CAFE) standards. The new CAFE standards represent an increase to 35 miles per gallon (mpg) by 2020. In March 2009, the Obama Administration announced that for the 2011 model year, the standard for cars and light trucks will be 27.3 mpg, the standard for cars will be 30.2 mpg; and standard for trucks would be 24.1 mpg. Additionally, in May 2009 President Barack Obama announced plans for a national fuel-economy and GHG emissions standard that would significantly increase mileage requirements for cars and trucks by 2016. The new requirements represent an average standard of 39 mpg for cars and 30 mpg for trucks by 2016.

Currently, the EPA is moving forward with two key climate change regulatory proposals, one to establish a mandatory GHG reporting system. Under the Federal Clean Air Act (FCAA), the EPA is now obligated to issue rules regulating global warming pollution from all major sources. In April 2009, the EPA concluded that GHGs are a danger to public health and welfare, establishing the basis for GHG regulation. However, as of the date of this study there are no Federal regulations or policies regarding GHG emissions applicable to the proposed project.

STATE

Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is occurring, and that there is a real potential for severe adverse environmental, social, and economic effects in the long term. Every nation emits GHGs and as a result makes an incremental cumulative contribution to global climate change; therefore, global cooperation will be required to reduce the rate of GHG emissions enough to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

Executive Order S-1-07. Executive Order S-1-07 proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least ten percent by 2020. This order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

Executive Order S-3-05. Executive Order S-3-05 set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The Executive Order directed the secretary of the California Environmental Protection Agency (Cal/EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the executive order, the secretary of Cal/EPA created the California Climate Action Team (CAT), made up of members from various State agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through State incentive and regulatory programs.

Executive Order B-30-15. Executive Order B-30-15 added the interim target to reduce statewide GHG emissions 40 percent below 1990 levels by 2030.

Executive Order S-13-08. Executive Order S-13-08 seeks to enhance the State's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of State's first climate adaptation strategy. This will result in consistent guidance from experts on how to address climate change impacts in the State of California.

Executive Order S-14-08. Executive Order S-14-08 expands the State's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, Executive Order S-21-09 (signed on September 15, 2009) directs CARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. CARB adopted the "Renewable Electricity

Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers.

Executive Order S-20-04. Executive Order S-20-04, the California Green Building Initiative, (signed into law on December 14, 2004), establishes a goal of reducing energy use in State-owned buildings by 20 percent from a 2003 baseline by 2015. It also encourages the private commercial sector to set the same goal. The initiative places the California Energy Commission (CEC) in charge of developing a building efficiency benchmarking system, commissioning and retro-commissioning (commissioning for existing commercial buildings) guidelines, and developing and refining building energy efficiency standards under Title 24 to meet this goal.

Executive Order S-21-09. Executive Order S-21-09, 33 percent Renewable Energy for California, directs CARB to adopt regulations to increase California's Renewable Portfolio Standard (RPS) to 33 percent by 2020. This builds upon SB 1078 (2002) which established the California RPS program, requiring 20 percent renewable energy by 2017, and SB 107 (2006) which advanced the 20 percent deadline to 2010, a goal which was expanded to 33 percent by 2020 in the 2005 Energy Action Plan II.

Assembly Bill 32 (California Global Warming Solutions Act of 2006). California passed the California Global Warming Solutions Act of 2006 (AB 32; *California Health and Safety Code* Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

Assembly Bill 1493. AB 1493 (also known as the Pavley Bill) requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHG emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State."

To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) in 2004 by adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 and adoption of 13 CCR Section 1961.1 require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty weight classes for passenger vehicles (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily to transport people), beginning with the 2009 model year. Emissions limits are reduced further in each model year through 2016. When fully phased in, the near-term standards will result in a reduction of about 22 percent in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term standards will result in a reduction of about 30 percent.

Assembly Bill 3018. AB 3018 established the Green Collar Jobs Council (GCJC) under the California Workforce Investment Board (CWIB). The GCJC will develop a comprehensive approach to address California's emerging workforce needs associated with the emerging green economy. This bill will ignite the development of job training programs in the clean and green technology sectors.

Senate Bill 97. SB 97, signed in August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the Governor's Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions (or the effects of GHG emissions), as required by CEQA.

OPR published a technical advisory recommending that CEQA lead agencies make a good-faith effort to estimate the quantity of GHG emissions that would be generated by a proposed project. Specifically, based on available information, CEQA lead agencies should estimate the emissions associated with project-related vehicular traffic, energy consumption, water usage, and construction activities to determine whether project-level or cumulative impacts could occur, and should mitigate the impacts where feasible. OPR requested CARB technical staff to recommend a method for setting CEQA thresholds of significance as described in CEQA Guidelines Section 15064.7 that will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the State.

The Natural Resources Agency adopted the CEQA Guidelines Amendments prepared by OPR, as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the CEQA Guidelines Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The CEQA Guidelines Amendments became effective on March 18, 2010.

Senate Bill 375. SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will prescribe land use allocation in that MPOs regional transportation plan. CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects may not be eligible for funding programmed after January 1, 2012.

Senate Bills 1078 and 107. SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

Senate Bill 1368. SB 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed into law in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007. SB 1368 also required the California Energy Commission (CEC) to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas fired plant. Furthermore, the legislation states that all electricity provided to California, including imported electricity, must be generated by plants that meet the standards set by CPUC and CEC.

Senate Bill 32 (SB 32). Signed into law in September 2016, SB 32 codifies the 2030 GHG reduction target in Executive Order B-30-15 (40 percent below 1990 levels by 2030). The bill authorizes CARB to adopt an interim GHG emissions level target to be achieved by 2030. CARB also must adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective GHG reductions.

CARB Scoping Plan

On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. CARB's Scoping Plan contains the main strategies California will implement to reduce CO_2eq[12] emissions by 174 million metric tons (MT), or approximately 30 percent, from the State's projected 2020 emissions level of 596 million MT CO_2eq under a business as usual (BAU)[13] scenario. This is a reduction of 42 million MT CO_2eq, or almost ten percent, from 2002 to 2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.

CARB's Scoping Plan calculates 2020 BAU emissions as the emissions that would be expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors (e.g., transportation, electrical power, commercial and residential, industrial, etc.). CARB used three-year average emissions, by sector, for 2002 to 2004 to forecast emissions to 2020. At the time CARB's Scoping Plan process was initiated, 2004 was the most

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[12] Carbon Dioxide Equivalent (CO_2eq) - A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

[13] "Business as Usual" refers to emissions that would be expected to occur in the absence of GHG reductions. See http://www.arb.ca.gov/cc/inventory/data/forecast.htm. Note that there is significant controversy as to what BAU means. In determining the GHG 2020 limit, CARB used the above as the "definition." It is broad enough to allow for design features to be counted as reductions.

recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.

AB 32 requires CARB to update the Scoping Plan at least once every five years. CARB adopted the first major update to the Scoping Plan on May 22, 2014. The updated Scoping Plan summarizes the most recent science related to climate change, including anticipated impacts to California and the levels of GHG reduction necessary to likely avoid risking irreparable damage. It identifies the actions California has already taken to reduce GHG emissions and focuses on areas where further reductions could be achieved to help meet the 2020 target established by AB 32. The Scoping Plan update also looks beyond 2020 toward the 2050 goal established in Executive Order S-3-05, though not yet adopted as state law, and observes that "a mid-term statewide emission limit will ensure that the State stays on course to meet our long-term goal." The Scoping Plan update does not establish or propose any specific post-2020 goals, but identifies such goals adopted by other governments or recommended by various scientific and policy organizations.

University of California, Irvine

UC Irvine Climate Action Plan

The UCI Climate Action Plan (CAP) was initially adopted in 2007 (updated in 2013) and has guided an array of climate action protection strategies and projects to reduce UCI GHG emissions. The CAP provides a roadmap for UCI to achieve its institutional climate protection commitments in support of University of California sustainability policy and campus sustainability goals. These commitments include reduction of GHG emissions to 1990 levels by the year 2020 (a reduction of approximately 40 percent from emissions levels or a total of 79,000 annual metric tons), and achieve climate neutrality (zero net emissions) by 2050. In 2013 the University of California adopted a target year of 2025 for climate neutrality for all UC campus operations.

University of California Sustainable Practices Policy

The University of California Sustainable Practices Policy (Sustainable Practices Policy) establishes goals in nine areas of sustainable practices: green building, clean energy, transportation, climate protection, sustainable operations, waste reduction and recycling, environmentally preferable purchasing, sustainable foodservice, sustainable water systems.

5.0 POTENTIAL GREENHOUSE GAS IMPACTS

CEQA THRESHOLDS

The environmental analysis in this section is patterned after the Initial Study Checklist recommended by the State *CEQA Guidelines*, as amended. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this section. Accordingly, a project may create a significant environmental impact if it causes one or more of the following to occur:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment (refer to Impact Statement GHG-1); and

- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases (refer to Impact Statement GHG-2).

Based on these standards and thresholds, the effects of the proposed project have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts.

SCAQMD Greenhouse Gas Emissions Thresholds

At this time, there is no absolute consensus in the State of California among CEQA lead agencies regarding the analysis of global climate change and the selection of significance criteria. In fact, numerous organizations, both public and private, have released advisories and guidance with recommendations designed to assist decision-makers in the evaluation of GHG emissions given the current uncertainty regarding when emissions reach the point of significance. Lead agencies may elect to rely on thresholds of significance recommended or adopted by State or regional agencies with expertise in the field of global climate change. (See C*EQA Guidelines* Section 15064.7[c].)

The SCAQMD has formed a GHG CEQA Significance Threshold Working Group (Working Group) to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. As of the last Working Group meeting (Meeting No. 15) held in September 2010, the SCAQMD is proposing to adopt a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency.[14]

With the tiered approach, the project is compared with the requirements of each tier sequentially and would not result in a significant impact if it complies with any tier. Tier 1 excludes projects that are specifically exempt from SB 97 from resulting in a significant impact. Tier 2 excludes

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14 The most recent SCAQMD GHG CEQA Significance Threshold Working Group meeting was held on September 2010.

projects that are consistent with a GHG reduction plan that has a certified final CEQA document and complies with AB 32 GHG reduction goals. Tier 3 excludes projects with annual emissions lower than a screening threshold. For all non-industrial projects, the SCAQMD is proposing a screening threshold of 3,000 $MTCO_2eq$ per year. SCAQMD concluded that projects with emissions less than the screening threshold would not result in a significant cumulative impact.

Tier 4 consists of three options. Under the Tier 4 first option, the project would be excluded if design features and/or mitigation measures resulted in emissions 30 percent lower than business as usual emissions. Under the Tier 4 second option the project would be excluded if it had early compliance with AB 32 through early implementation of CARB's Scoping Plan measures. Under the Tier 4 third option, the project would be excluded if it was below an efficiency-based threshold of 4.8 $MTCO_2eq$ per service population (SP) per year.[15] Tier 5 would exclude projects that implement offsite mitigation (GHG reduction projects) or purchase offsets to reduce GHG emission impacts to less than the proposed screening level.

As the project involves a student housing infill development for UCI students and staff, SCAQMD's 3,000 $MTCO_2eq$ per year screening threshold has been selected as the significance threshold, as it is most applicable to the proposed project. The 3,000 $MTCO_2eq$ threshold is used in addition to the qualitative thresholds of significance set forth below from section VII of Appendix G to the CEQA Guidelines.

PROJECT RELATED SOURCES OF GREENHOUSE GASES

GHG-1 GENERATE GREENHOUSE GAS EMISSIONS, EITHER DIRECTLY OR INDIRECTLY, THAT MAY HAVE A SIGNIFICANT IMPACT ON THE ENVIRONMENT?

Level of Significance Before Mitigation: *Less Than Significant Impact.*

Project-related GHG emissions would include emissions from direct and indirect sources. The proposed project would result in direct and indirect emissions of CO_2, N_2O, and CH_4, and would not result in other GHGs that would facilitate a meaningful analysis. Therefore, this analysis focuses on these three forms of GHG emissions. Direct project-related GHG emissions include emissions from construction activities, area sources, and mobile sources, while indirect sources include emissions from electricity consumption, water demand, and solid waste generation. Operational GHG estimations are based on energy emissions from natural gas usage and automobile emissions. Project GHG emissions were calculated using the California Emissions estimator Model (CalEEMod) version 2016.3.1, which relies on trip generation data, and specific

[15] The project-level efficiency-based threshold of 4.8 $MTCO_2eq$ per SP per year is relative to the 2020 target date. The SCAQMD has also proposed efficiency-based thresholds relative to the 2035 target date to be consistent with the GHG reduction target date of SB 375. GHG reductions by the SB 375 target date of 2035 would be approximately 40 percent. Applying this 40 percent reduction to the 2020 targets results in an efficiency threshold for plans of 4.1 $MTCO_2eq$ per SP per year and an efficiency threshold at the project level of 3.0 $MTCO_2eq$/year.

land use information to calculate emissions. As indicated in the *Middle Earth Housing Expansion Traffic Study* (Traffic Study) for the proposed project, prepared by Stantec Consulting Services (dated October 2016), the proposed project would result in approximately 112 new daily trips. Table 1, *Greenhouse Gas Emissions*, presents the estimated CO_2, N_2O, and CH_4 emissions of the proposed project without GHG-reducing design features and mitigation measures. The CalEEMod outputs are contained within the Appendix A, *Greenhouse Gas Emissions Data*.

Table 1
Greenhouse Gas Emissions

Source	CO_2	CH_4		N_2O		Total Metric Tons of CO_2eq
	Metric Tons/yr[1]	Metric Tons/yr[1]	Metric Tons of CO_2eq[2]	Metric Tons/yr[1]	Metric Tons of CO_2eq[2]	
Direct Emissions						
• Construction (amortized over 30 years)	10.96	0.00	0.00	0.00	0.00	10.96
• Area Source	0.01	0.00	0.00	0.00	0.00	0.01
• Mobile Source	136.31	0.01	0.25	0.00	0.00	136.57
Total Mitigated Direct Emissions[3]	*147.28*	*0.01*	*0.25*	*0.00*	*0.00*	*147.54*
Indirect Emissions						
• Energy	1,394.46	0.04	1.00	0.02	6.00	1,401.52
• Water Demand	47.20	0.35	8.80	0.01	3.00	59.36
• Solid Waste Generation	56.03	3.31	82.80	0.00	0.00	142.14
Total Mitigated Indirect Emissions[3]	*1,497.69*	*3.70*	*92.60*	*0.03*	*9.00*	*1,603.02*
Total Mitigated Project-Related Emissions[3]	*1,750.56 $MTCO_2eq/yr$*					
Mitigated GHG Emissions Exceed Threshold?	*No*					

Notes:
1. Emissions calculated using CalEEMod.
2. CO_2 Equivalent values calculated using the EPA Website, *Greenhouse Gas Equivalencies Calculator*, http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator, accessed November 2016.
3. Totals may be slightly off due to rounding.

Refer to Appendix A, *Greenhouse Gas Emissions Data*, for detailed model input/output data.

As shown in Table 1, the project's GHG emissions would be approximately 1,750.56 $MTCO_2eq/yr$, and would not exceed SCAQMD's 3,000 $MTCO_2eq$ per GHG threshold. A less than significant impact would occur in this regard.

Project Design Features

It is noted that Table 1 includes reduced emissions from the project's design features in compliance with the Sustainable Practices Policy. Such features include the use of water conservation measures, such as low-flow faucets, showers, toilets, water-efficient landscaping and irrigation systems, and use of reclaimed water and grey water. In addition, the project would meet or exceed the Leadership in Energy and Environmental Design (LEED) Silver rating (or an equivalent rating such as the Build it Green GreenPoint Rated program), utilize high-efficiency lighting and energy efficient appliances (i.e., Energy Star dishwashers), and exceed Title 24 standards by 20 percent.

Direct Project-Related Sources of Greenhouse Gases

- Construction Emissions. Construction GHG emissions are typically summed and amortized over the lifetime of the project (assumed to be 30 years), then added to the operational emissions.[16] As seen in Table 1, the proposed project would result in 328.80 $MTCO_2eq$/yr, which represents 10.96 $MTCO_2eq$/yr when amortized over 30 years.

- Area Source. Area source emissions were calculated using CalEEMod and project-specific land use data. As noted in Table 1, the proposed project would not result in a nominal amount of area source GHG emissions.

- Mobile Source. The CalEEMod model relies upon ITE trip generation data within and project specific land use data to calculate mobile source emissions. The project would directly result in 136.57 $MTCO_2eq$/yr of mobile source-generated GHG emissions.

Indirect Project-Related Sources of Greenhouse Gases

- Energy Consumption. Energy consumption emissions were calculated using CalEEMod and project-specific land use data. Electricity would be provided to the project site via Southern California Edison (SCE). The project would indirectly result in 1.401.52 $MTCO_2eq$/year due to energy consumption.

- Water Demand. The project operations would result in a demand of approximately 10.57 million gallons of water per year. Emissions from indirect energy impacts due to water supply would result in 59.36 $MTCO_2eq$/year.

- Solid Waste. Solid waste associated with operations of the proposed project would result in 142.14 $MTCO_2eq$/year.

Total Project-Related Sources of Greenhouse Gases

As depicted in Table 1, the project's GHG emissions would be 1.750.56 $MTCO_2eq$/yr, which would not exceed the 3,000 $MTCO_2eq$ per year GHG threshold. Impacts in this regard would be less than significant.

Level of Significance After Mitigation: *Less Than Significant Impact.*

[16] The project lifetime is based on the standard 30 year assumption of the South Coast Air Quality Management District, *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold*, October 2008.

GHG PLAN CONSISTENCY

GHG-2 CONFLICT WITH AN APPLICABLE PLAN, POLICY, OR REGULATION ADOPTED FOR THE PURPOSE OF REDUCING THE EMISSIONS OF GREENHOUSE GASES?

Level of Significance Before Mitigation: *Less Than Significant Impact.*

As discussed above, UCI's Sustainable Practices Policy establishes goals and policies to reduce GHG emissions from various sources at the UCI campus. In addition, UCI adopted a Climate Action Plan (CAP) in 2007 (updated in 2013) in cooperation with AB 32, and has guided an array of climate action protection strategies and projects to reduce UCI GHG emissions. The purpose of this CAP is to identify UCI's long-term vision and commitment to reduce its GHG emissions in support of University of California Sustainability Practices Policy and campus sustainability goals. These commitments include reduction of GHG emissions to 1990 levels by the year 2020 (a reduction of approximately 40 percent from emissions levels or a total of 79,000 annual metric tons), and ultimately achieve climate neutrality (zero net emissions) by 2050. The CAP does not contain GHG thresholds.

As noted above, the project's GHG emissions would not exceed the SCAQMD's 3,000 $MTCO_2eq$ per year threshold (in compliance with AB 32). In addition, the project would incorporate various sustainable project design features (e.g., water conservation measures, exceed LEED Silver rating, exceed Title 24 by 20 percent, and use energy efficient lighting, etc.) in compliance with the Sustainable Practices Policy. Therefore, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Thus, a less than significant impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: *Less Than Significant Impact.*

6.0 REFERENCES

6.1 LIST OF PREPARERS

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6.2 DOCUMENTS

1. California Air Resources Board, *Climate Change Proposed Scoping Plan: A Framework for Change*, adopted December 2008.

2. California Office of the Attorney General, *Addressing Global Warming Impacts at the Project Level*, updated January 6, 2008.

3. California Environmental Protection Agency, *Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature (Executive Summary)*, March, 2006.

4. California Environmental Protection Agency, *AB 1493 Briefing Package*, 2008.

5. Intergovernmental Panel on Climate Change, *Climate Change, Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007.*

6. Irvine Campus Housing Authority, *Facts and History*, http://icha.uci.edu/, accessed October 31, 2016.

7. Stantec Consulting Services, *Middle Earth Housing Expansion Traffic Study*, November 14, 2016.

8. United States Environmental Protection Agency, *Class I Ozone Depleting Substances*, August 19, 2010, http://www.epa.gov/ozone/science/ods/classone.html, accessed on October 31, 2016.

9. United States Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990 to 2014*, April 2016.

10. EPA Website, *Greenhouse Gas Equivalencies Calculator*, http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator, accessed November 2016.

11. U.S. Environmental Protection Agency, *Overview of Greenhouse Gas Emissions*, August 9, 2016, https://www.epa.gov/ghgemissions/overview-greenhouse-gases#f-gases, accessed on October 31, 2016.

12. U.S. Environmental Protection Agency, *Stratospheric Ozone Protection and Climate Change,* http://www.epa.gov/ozone/climate.html, accessed on October 31, 2016.

13. University of California, Irvine, *Climate Action Plan, 2013 Update*, http://sustainability.uci.edu/wp-content/uploads/sites/5/2014/12/ClimateActionPlanUpdate20132.pdf, accessed October 2016.

6.3 WEB SITES/PROGRAMS

Environ International Corporation and the South Coast Air Quality Management District, *California Emissions Estimator Model (CalEEMod) Version 2016.3.1*, 2016.

Google Earth, 2016.

APPENDIX A: GREENHOUSE GAS EMISSIONS DATA

UCI - Middle Earth Housing Expansion
Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	500.00	Student	1.10	108,000.00	0
Fast Food Restaurant w/o Drive Thru	40.00	1000sqft	1.10	40,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project characteristics

Land Use - Per Project Characteristics: 495 students, 10 staff. Dorms, community facilities, and ancillary space grouped together. Lot acreage is approxiamtely 2.2 acres

Construction Phase - Per AQ Construction Questionnaire

Off-road Equipment -

Off-road Equipment - Per AQ Construction Questionnaire

Off-road Equipment - Per AQ Construction Questionnaire

Off-road Equipment - Per AQ Construction Questionnaire

Demolition - Per AQ Construction Questionnaire

Grading - Approximately 1 acre of grading.

Vehicle Trips - Per Trip Gen Memo

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Energy Use -

Construction Off-road Equipment Mitigation - per SCAQMD Rule 403

Mobile Land Use Mitigation -

Mobile Commute Mitigation -

Area Mitigation -

Energy Mitigation - Energy efficiency mitigation measures include 20% over Title 24 (LEED building).

Water Mitigation -

Waste Mitigation -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	26
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstructionPhase	NumDays	10.00	65.00
tblConstructionPhase	NumDays	220.00	544.00
tblConstructionPhase	NumDays	20.00	43.00
tblConstructionPhase	NumDays	6.00	43.00
tblGrading	AcresOfGrading	16.13	1.00
tblGrading	MaterialExported	0.00	1,500.00
tblLandUse	BuildingSpaceSquareFeet	91,898.73	108,000.00
tblLandUse	LandUseSquareFeet	91,898.73	108,000.00
tblLandUse	LotAcreage	2.11	1.10
tblLandUse	LotAcreage	0.92	1.10
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00

tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblVehicleTrips	ST_TR	696.00	0.00
tblVehicleTrips	ST_TR	1.30	0.22
tblVehicleTrips	SU_TR	500.00	0.00
tblVehicleTrips	SU_TR	0.00	0.22
tblVehicleTrips	WD_TR	716.00	0.00
tblVehicleTrips	WD_TR	1.71	0.22

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.2079	2.0694	1.2864	2.6100e-003	0.1616	0.1082	0.2698	0.0694	0.1009	0.1703	0.0000	241.5951	241.5951	0.0484	0.0000	242.8048
2018	0.2136	2.0432	1.5754	3.5700e-003	0.1085	0.0986	0.2071	0.0293	0.0924	0.1217	0.0000	328.6932	328.6932	0.0548	0.0000	330.0631
2019	0.8242	1.2983	1.0798	2.5000e-003	0.0766	0.0609	0.1375	0.0207	0.0573	0.0779	0.0000	228.0790	228.0790	0.0368	0.0000	228.9989
Maximum	**0.8242**	**2.0694**	**1.5754**	**3.5700e-003**	**0.1616**	**0.1082**	**0.2698**	**0.0694**	**0.1009**	**0.1703**	**0.0000**	**328.6932**	**328.6932**	**0.0548**	**0.0000**	**330.0631**

Mitigated Construction

Year	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
2017	0.2079	2.0694	1.2864	2.6100e-003	0.0934	0.1082	0.2016	0.0347	0.1009	0.1356	0.0000	241.5949	241.5949	0.0484	0.0000	242.8046
2018	0.2136	2.0432	1.5754	3.5700e-003	0.1085	0.0986	0.2071	0.0293	0.0924	0.1217	0.0000	328.6929	328.6929	0.0548	0.0000	330.0629
2019	0.8242	1.2983	1.0798	2.5000e-003	0.0766	0.0609	0.1375	0.0207	0.0573	0.0779	0.0000	228.0789	228.0789	0.0368	0.0000	228.9988
Maximum	**0.8242**	**2.0694**	**1.5754**	**3.5700e-003**	**0.1085**	**0.1082**	**0.2071**	**0.0347**	**0.1009**	**0.1356**	**0.0000**	**328.6929**	**328.6929**	**0.0548**	**0.0000**	**330.0629**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**19.68**	**0.00**	**11.11**	**29.05**	**0.00**	**9.37**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
1	**4-1-2017**	**6-30-2017**	0.9868	0.9868
2	**7-1-2017**	**9-30-2017**	0.6621	0.6621
3	**10-1-2017**	**12-31-2017**	0.6421	0.6421
4	**1-1-2018**	**3-31-2018**	0.5550	0.5550
5	**4-1-2018**	**6-30-2018**	0.5592	0.5592
6	**7-1-2018**	**9-30-2018**	0.5653	0.5653
7	**10-1-2018**	**12-31-2018**	0.5674	0.5674
8	**1-1-2019**	**3-31-2019**	0.5037	0.5037
9	**4-1-2019**	**6-30-2019**	0.5075	0.5075
10	**7-1-2019**	**9-30-2019**	0.5980	0.5980
		Highest	0.9868	0.9868

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6041	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143
Energy	0.0650	0.5907	0.4962	3.5400e-003		0.0449	0.0449		0.0449	0.0449	0.0000	1,552.9868	1,552.9868	0.0499	0.0196	1,560.0633
Mobile	0.0345	0.1510	0.4520	1.5100e-003	0.1276	1.7300e-003	0.1293	0.0342	1.6300e-003	0.0358	0.0000	138.9739	138.9739	6.2800e-003	0.0000	139.1309
Waste						0.0000	0.0000		0.0000	0.0000	112.0530	0.0000	112.0530	6.6222	0.0000	277.6067
Water						0.0000	0.0000		0.0000	0.0000	4.1915	63.4838	67.6754	0.4331	0.0107	81.6945
Total	**0.7035**	**0.7417**	**0.9551**	**5.0500e-003**	**0.1276**	**0.0466**	**0.1742**	**0.0342**	**0.0465**	**0.0807**	**116.2446**	**1,755.4580**	**1,871.7025**	**7.1115**	**0.0303**	**2,058.5097**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6041	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143
Energy	0.0604	0.5489	0.4611	3.2900e-003		0.0417	0.0417		0.0417	0.0417	0.0000	1,394.4586	1,394.4586	0.0444	0.0178	1,400.8606
Mobile	0.0342	0.1490	0.4448	1.4800e-003	0.1250	1.7000e-003	0.1267	0.0335	1.6000e-003	0.0351	0.0000	136.3105	136.3105	6.1700e-003	0.0000	136.4648
Waste						0.0000	0.0000		0.0000	0.0000	56.0265	0.0000	56.0265	3.3111	0.0000	138.8033
Water						0.0000	0.0000		0.0000	0.0000	3.3532	43.8505	47.2037	0.3462	8.5100e-003	58.3942
Total	**0.6986**	**0.6980**	**0.9129**	**4.7700e-003**	**0.1250**	**0.0434**	**0.1685**	**0.0335**	**0.0433**	**0.0768**	**59.3797**	**1,574.6330**	**1,634.0127**	**3.7079**	**0.0263**	**1,734.5372**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.69	5.89	4.42	5.54	2.00	6.86	3.30	2.02	6.88	4.82	48.92	10.30	12.70	47.86	13.21	15.74

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/1/2017	5/31/2017	5	43	
2	Grading	Grading	6/1/2017	7/31/2017	5	43	
3	Building Construction	Building Construction	8/1/2017	8/30/2019	5	544	
4	Architectural Coating	Architectural Coating	8/31/2019	11/29/2019	5	65	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 222,000; Non-Residential Outdoor: 74,000; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	1	8.00	158	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Aerial Lifts	2	6.00	63	0.31
Building Construction	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20

Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	99.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	188.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	62.00	24.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	12.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0107	0.0000	0.0107	1.6200e-003	0.0000	1.6200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0670	0.6596	0.4062	6.3000e-004		0.0396	0.0396		0.0369	0.0369	0.0000	57.5249	57.5249	0.0151	0.0000	57.9025
Total	**0.0670**	**0.6596**	**0.4062**	**6.3000e-004**	**0.0107**	**0.0396**	**0.0503**	**1.6200e-003**	**0.0369**	**0.0386**	**0.0000**	**57.5249**	**57.5249**	**0.0151**	**0.0000**	**57.9025**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.1000e-004	0.0174	3.8400e-003	4.0000e-005	8.5000e-004	1.0000e-004	9.4000e-004	2.3000e-004	9.0000e-005	3.2000e-004	0.0000	3.9240	3.9240	4.2000e-004	0.0000	3.9345
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6200e-003	1.2600e-003	0.0136	4.0000e-005	3.5400e-003	2.0000e-005	3.5600e-003	9.4000e-004	2.0000e-005	9.6000e-004	0.0000	3.3495	3.3495	1.0000e-004	0.0000	3.3520
Total	**2.1300e-003**	**0.0187**	**0.0174**	**8.0000e-005**	**4.3900e-003**	**1.2000e-004**	**4.5000e-003**	**1.1700e-003**	**1.1000e-004**	**1.2800e-003**	**0.0000**	**7.2735**	**7.2735**	**5.2000e-004**	**0.0000**	**7.2864**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.9600e-003	0.0000	3.9600e-003	6.0000e-004	0.0000	6.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0670	0.6596	0.4062	6.3000e-004		0.0396	0.0396		0.0369	0.0369	0.0000	57.5249	57.5249	0.0151	0.0000	57.9024
Total	**0.0670**	**0.6596**	**0.4062**	**6.3000e-004**	**3.9600e-003**	**0.0396**	**0.0435**	**6.0000e-004**	**0.0369**	**0.0375**	**0.0000**	**57.5249**	**57.5249**	**0.0151**	**0.0000**	**57.9024**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.1000e-004	0.0174	3.8400e-003	4.0000e-005	8.5000e-004	1.0000e-004	9.4000e-004	2.3000e-004	9.0000e-005	3.2000e-004	0.0000	3.9240	3.9240	4.2000e-004	0.0000	3.9345
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6200e-003	1.2600e-003	0.0136	4.0000e-005	3.5400e-003	2.0000e-005	3.5600e-003	9.4000e-004	2.0000e-005	9.6000e-004	0.0000	3.3495	3.3495	1.0000e-004	0.0000	3.3520
Total	**2.1300e-003**	**0.0187**	**0.0174**	**8.0000e-005**	**4.3900e-003**	**1.2000e-004**	**4.5000e-003**	**1.1700e-003**	**1.1000e-004**	**1.2800e-003**	**0.0000**	**7.2735**	**7.2735**	**5.2000e-004**	**0.0000**	**7.2864**

3.3 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0977	0.0000	0.0977	0.0535	0.0000	0.0535	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0345	0.3933	0.1512	3.0000e-004		0.0188	0.0188		0.0173	0.0173	0.0000	28.1819	28.1819	8.6300e-003	0.0000	28.3978
Total	**0.0345**	**0.3933**	**0.1512**	**3.0000e-004**	**0.0977**	**0.0188**	**0.1165**	**0.0535**	**0.0173**	**0.0707**	**0.0000**	**28.1819**	**28.1819**	**8.6300e-003**	**0.0000**	**28.3978**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.6000e-004	0.0331	7.3000e-003	7.0000e-005	1.6100e-003	1.8000e-004	1.7900e-003	4.4000e-004	1.7000e-004	6.2000e-004	0.0000	7.4516	7.4516	8.0000e-004	0.0000	7.4715
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.7000e-004	6.7000e-004	7.2300e-003	2.0000e-005	1.8900e-003	1.0000e-005	1.9000e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.7864	1.7864	5.0000e-005	0.0000	1.7877
Total	**1.8300e-003**	**0.0338**	**0.0145**	**9.0000e-005**	**3.5000e-003**	**1.9000e-004**	**3.6900e-003**	**9.4000e-004**	**1.8000e-004**	**1.1300e-003**	**0.0000**	**9.2380**	**9.2380**	**8.5000e-004**	**0.0000**	**9.2592**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0362	0.0000	0.0362	0.0198	0.0000	0.0198	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0345	0.3933	0.1512	3.0000e-004		0.0188	0.0188		0.0173	0.0173	0.0000	28.1819	28.1819	8.6300e-003	0.0000	28.3978
Total	**0.0345**	**0.3933**	**0.1512**	**3.0000e-004**	**0.0362**	**0.0188**	**0.0550**	**0.0198**	**0.0173**	**0.0371**	**0.0000**	**28.1819**	**28.1819**	**8.6300e-003**	**0.0000**	**28.3978**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.6000e-004	0.0331	7.3000e-003	7.0000e-005	1.6100e-003	1.8000e-004	1.7900e-003	4.4000e-004	1.7000e-004	6.2000e-004	0.0000	7.4516	7.4516	8.0000e-004	0.0000	7.4715
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.7000e-004	6.7000e-004	7.2300e-003	2.0000e-005	1.8900e-003	1.0000e-005	1.9000e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.7864	1.7864	5.0000e-005	0.0000	1.7877
Total	**1.8300e-003**	**0.0338**	**0.0145**	**9.0000e-005**	**3.5000e-003**	**1.9000e-004**	**3.6900e-003**	**9.4000e-004**	**1.8000e-004**	**1.1300e-003**	**0.0000**	**9.2380**	**9.2380**	**8.5000e-004**	**0.0000**	**9.2592**

3.4 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0794	0.7808	0.5066	7.9000e-004		0.0478	0.0478		0.0447	0.0447	0.0000	71.9136	71.9136	0.0192	0.0000	72.3946
Total	**0.0794**	**0.7808**	**0.5066**	**7.9000e-004**		**0.0478**	**0.0478**		**0.0447**	**0.0447**	**0.0000**	**71.9136**	**71.9136**	**0.0192**	**0.0000**	**72.3946**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.1600e-003	0.1701	0.0483	3.3000e-004	8.2400e-003	1.4600e-003	9.7000e-003	2.3800e-003	1.4000e-003	3.7700e-003	0.0000	32.3684	32.3684	3.0200e-003	0.0000	32.4439
Worker	0.0170	0.0132	0.1421	3.9000e-004	0.0371	2.5000e-004	0.0374	9.8500e-003	2.3000e-004	0.0101	0.0000	35.0947	35.0947	1.0300e-003	0.0000	35.1204
Total	**0.0232**	**0.1833**	**0.1904**	**7.2000e-004**	**0.0453**	**1.7100e-003**	**0.0471**	**0.0122**	**1.6300e-003**	**0.0139**	**0.0000**	**67.4631**	**67.4631**	**4.0500e-003**	**0.0000**	**67.5642**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0794	0.7808	0.5066	7.9000e-004		0.0478	0.0478		0.0447	0.0447	0.0000	71.9135	71.9135	0.0192	0.0000	72.3945
Total	**0.0794**	**0.7808**	**0.5066**	**7.9000e-004**		**0.0478**	**0.0478**		**0.0447**	**0.0447**	**0.0000**	**71.9135**	**71.9135**	**0.0192**	**0.0000**	**72.3945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.1600e-003	0.1701	0.0483	3.3000e-004	8.2400e-003	1.4600e-003	9.7000e-003	2.3800e-003	1.4000e-003	3.7700e-003	0.0000	32.3684	32.3684	3.0200e-003	0.0000	32.4439
Worker	0.0170	0.0132	0.1421	3.9000e-004	0.0371	2.5000e-004	0.0374	9.8500e-003	2.3000e-004	0.0101	0.0000	35.0947	35.0947	1.0300e-003	0.0000	35.1204
Total	**0.0232**	**0.1833**	**0.1904**	**7.2000e-004**	**0.0453**	**1.7100e-003**	**0.0471**	**0.0122**	**1.6300e-003**	**0.0139**	**0.0000**	**67.4631**	**67.4631**	**4.0500e-003**	**0.0000**	**67.5642**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1640	1.6341	1.1681	1.8800e-003		0.0952	0.0952		0.0892	0.0892	0.0000	169.9544	169.9544	0.0457	0.0000	171.0970
Total	**0.1640**	**1.6341**	**1.1681**	**1.8800e-003**		**0.0952**	**0.0952**		**0.0892**	**0.0892**	**0.0000**	**169.9544**	**169.9544**	**0.0457**	**0.0000**	**171.0970**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0129	0.3814	0.1052	7.8000e-004	0.0197	2.7900e-003	0.0225	5.6900e-003	2.6600e-003	8.3500e-003	0.0000	77.1558	77.1558	6.9300e-003	0.0000	77.3290
Worker	0.0367	0.0278	0.3020	9.0000e-004	0.0888	6.0000e-004	0.0894	0.0236	5.5000e-004	0.0241	0.0000	81.5829	81.5829	2.1700e-003	0.0000	81.6371
Total	**0.0497**	**0.4091**	**0.4073**	**1.6800e-003**	**0.1085**	**3.3900e-003**	**0.1119**	**0.0293**	**3.2100e-003**	**0.0325**	**0.0000**	**158.7387**	**158.7387**	**9.1000e-003**	**0.0000**	**158.9661**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1640	1.6341	1.1681	1.8800e-003		0.0952	0.0952		0.0892	0.0892	0.0000	169.9542	169.9542	0.0457	0.0000	171.0968
Total	**0.1640**	**1.6341**	**1.1681**	**1.8800e-003**		**0.0952**	**0.0952**		**0.0892**	**0.0892**	**0.0000**	**169.9542**	**169.9542**	**0.0457**	**0.0000**	**171.0968**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0129	0.3814	0.1052	7.8000e-004	0.0197	2.7900e-003	0.0225	5.6900e-003	2.6600e-003	8.3500e-003	0.0000	77.1558	77.1558	6.9300e-003	0.0000	77.3290
Worker	0.0367	0.0278	0.3020	9.0000e-004	0.0888	6.0000e-004	0.0894	0.0236	5.5000e-004	0.0241	0.0000	81.5829	81.5829	2.1700e-003	0.0000	81.6371
Total	**0.0497**	**0.4091**	**0.4073**	**1.6800e-003**	**0.1085**	**3.3900e-003**	**0.1119**	**0.0293**	**3.2100e-003**	**0.0325**	**0.0000**	**158.7387**	**158.7387**	**9.1000e-003**	**0.0000**	**158.9661**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0975	0.9794	0.7585	1.2600e-003		0.0546	0.0546		0.0512	0.0512	0.0000	111.8245	111.8245	0.0302	0.0000	112.5802
Total	**0.0975**	**0.9794**	**0.7585**	**1.2600e-003**		**0.0546**	**0.0546**		**0.0512**	**0.0512**	**0.0000**	**111.8245**	**111.8245**	**0.0302**	**0.0000**	**112.5802**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.9800e-003	0.2417	0.0658	5.2000e-004	0.0132	1.6100e-003	0.0148	3.7900e-003	1.5400e-003	5.3300e-003	0.0000	51.1797	51.1797	4.4700e-003	0.0000	51.2914
Worker	0.0225	0.0164	0.1825	5.9000e-004	0.0592	4.0000e-004	0.0596	0.0157	3.7000e-004	0.0161	0.0000	52.9485	52.9485	1.3000e-003	0.0000	52.9811
Total	**0.0305**	**0.2581**	**0.2482**	**1.1100e-003**	**0.0724**	**2.0100e-003**	**0.0744**	**0.0195**	**1.9100e-003**	**0.0214**	**0.0000**	**104.1282**	**104.1282**	**5.7700e-003**	**0.0000**	**104.2725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0975	0.9794	0.7585	1.2600e-003		0.0546	0.0546		0.0512	0.0512	0.0000	111.8243	111.8243	0.0302	0.0000	112.5800
Total	**0.0975**	**0.9794**	**0.7585**	**1.2600e-003**		**0.0546**	**0.0546**		**0.0512**	**0.0512**	**0.0000**	**111.8243**	**111.8243**	**0.0302**	**0.0000**	**112.5800**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.9800e-003	0.2417	0.0658	5.2000e-004	0.0132	1.6100e-003	0.0148	3.7900e-003	1.5400e-003	5.3300e-003	0.0000	51.1797	51.1797	4.4700e-003	0.0000	51.2914
Worker	0.0225	0.0164	0.1825	5.9000e-004	0.0592	4.0000e-004	0.0596	0.0157	3.7000e-004	0.0161	0.0000	52.9485	52.9485	1.3000e-003	0.0000	52.9811
Total	**0.0305**	**0.2581**	**0.2482**	**1.1100e-003**	**0.0724**	**2.0100e-003**	**0.0744**	**0.0195**	**1.9100e-003**	**0.0214**	**0.0000**	**104.1282**	**104.1282**	**5.7700e-003**	**0.0000**	**104.2725**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6860					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.6600e-003	0.0597	0.0598	1.0000e-004		4.1800e-003	4.1800e-003		4.1800e-003	4.1800e-003	0.0000	8.2981	8.2981	7.0000e-004	0.0000	8.3156
Total	**0.6946**	**0.0597**	**0.0598**	**1.0000e-004**		**4.1800e-003**	**4.1800e-003**		**4.1800e-003**	**4.1800e-003**	**0.0000**	**8.2981**	**8.2981**	**7.0000e-004**	**0.0000**	**8.3156**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6300e-003	1.1900e-003	0.0132	4.0000e-005	4.2800e-003	3.0000e-005	4.3100e-003	1.1400e-003	3.0000e-005	1.1600e-003	0.0000	3.8283	3.8283	9.0000e-005	0.0000	3.8307
Total	**1.6300e-003**	**1.1900e-003**	**0.0132**	**4.0000e-005**	**4.2800e-003**	**3.0000e-005**	**4.3100e-003**	**1.1400e-003**	**3.0000e-005**	**1.1600e-003**	**0.0000**	**3.8283**	**3.8283**	**9.0000e-005**	**0.0000**	**3.8307**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6860					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.6600e-003	0.0597	0.0598	1.0000e-004		4.1800e-003	4.1800e-003		4.1800e-003	4.1800e-003	0.0000	8.2981	8.2981	7.0000e-004	0.0000	8.3156
Total	**0.6946**	**0.0597**	**0.0598**	**1.0000e-004**		**4.1800e-003**	**4.1800e-003**		**4.1800e-003**	**4.1800e-003**	**0.0000**	**8.2981**	**8.2981**	**7.0000e-004**	**0.0000**	**8.3156**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6300e-003	1.1900e-003	0.0132	4.0000e-005	4.2800e-003	3.0000e-005	4.3100e-003	1.1400e-003	3.0000e-005	1.1600e-003	0.0000	3.8283	3.8283	9.0000e-005	0.0000	3.8307
Total	**1.6300e-003**	**1.1900e-003**	**0.0132**	**4.0000e-005**	**4.2800e-003**	**3.0000e-005**	**4.3100e-003**	**1.1400e-003**	**3.0000e-005**	**1.1600e-003**	**0.0000**	**3.8283**	**3.8283**	**9.0000e-005**	**0.0000**	**3.8307**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0342	0.1490	0.4448	1.4800e-003	0.1250	1.7000e-003	0.1267	0.0335	1.6000e-003	0.0351	0.0000	136.3105	136.3105	6.1700e-003	0.0000	136.4648
Unmitigated	0.0345	0.1510	0.4520	1.5100e-003	0.1276	1.7300e-003	0.1293	0.0342	1.6300e-003	0.0358	0.0000	138.9739	138.9739	6.2800e-003	0.0000	139.1309

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Fast Food Restaurant w/o Drive Thru	0.00	0.00	0.00		
University/College (4Yr)	112.00	112.00	112.00	336,435	329,707
Total	112.00	112.00	112.00	336,435	329,707

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Fast Food Restaurant w/o Drive Thru	16.60	8.40	6.90	1.50	79.50	19.00	51	37	12
University/College (4Yr)	16.60	8.40	6.90	6.40	88.60	5.00	91	9	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4Yr)	0.552373	0.044229	0.211123	0.119112	0.017503	0.005797	0.024455	0.015685	0.001637	0.001633	0.004830	0.000583	0.001041
Fast Food Restaurant w/o Drive Thru	0.552373	0.044229	0.211123	0.119112	0.017503	0.005797	0.024455	0.015685	0.001637	0.001633	0.004830	0.000583	0.001041

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	796.8817	796.8817	0.0329	6.8100e-003	799.7326
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	909.9828	909.9828	0.0376	7.7700e-003	913.2383
NaturalGas Mitigated	0.0604	0.5489	0.4611	3.2900e-003		0.0417	0.0417		0.0417	0.0417	0.0000	597.5769	597.5769	0.0115	0.0110	601.1280
NaturalGas Unmitigated	0.0650	0.5907	0.4962	3.5400e-003		0.0449	0.0449		0.0449	0.0449	0.0000	643.0040	643.0040	0.0123	0.0118	646.8251

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Fast Food Restaurant w/o Drive Thru	1.03884e+007	0.0560	0.5092	0.4278	3.0600e-003		0.0387	0.0387		0.0387	0.0387	0.0000	554.3646	554.3646	0.0106	0.0102	557.6589
University/College (4Yr)	1.66104e+006	8.9600e-003	0.0814	0.0684	4.9000e-004		6.1900e-003	6.1900e-003		6.1900e-003	6.1900e-003	0.0000	88.6394	88.6394	1.7000e-003	1.6300e-003	89.1662
Total		**0.0650**	**0.5907**	**0.4962**	**3.5500e-003**		**0.0449**	**0.0449**		**0.0449**	**0.0449**	**0.0000**	**643.0040**	**643.0040**	**0.0123**	**0.0118**	**646.8251**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Fast Food Restaurant w/o Drive Thru	9.7568e+006	0.0526	0.4783	0.4018	2.8700e-003		0.0364	0.0364		0.0364	0.0364	0.0000	520.6600	520.6600	9.9800e-003	9.5500e-003	523.7540
University/College (4Yr)	1.44137e+006	7.7700e-003	0.0707	0.0594	4.2000e-004		5.3700e-003	5.3700e-003		5.3700e-003	5.3700e-003	0.0000	76.9169	76.9169	1.4700e-003	1.4100e-003	77.3740
Total		**0.0604**	**0.5489**	**0.4611**	**3.2900e-003**		**0.0417**	**0.0417**		**0.0417**	**0.0417**	**0.0000**	**597.5769**	**597.5769**	**0.0115**	**0.0110**	**601.1280**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Fast Food Restaurant w/o Drive Thru	1.4844e+006	472.9616	0.0195	4.0400e-003	474.6537
University/College (4Yr)	1.3716e+006	437.0212	0.0180	3.7300e-003	438.5846
Total		**909.9828**	**0.0376**	**7.7700e-003**	**913.2383**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Fast Food Restaurant w/o Drive Thru	1.3484e+006	429.6291	0.0177	3.6700e-003	431.1661
University/College (4Yr)	1.15263e+006	367.2526	0.0152	3.1400e-003	368.5665
Total		**796.8817**	**0.0329**	**6.8100e-003**	**799.7326**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6041	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143
Unmitigated	0.6041	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0686					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5348					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	6.6000e-004	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143
Total	**0.6041**	**6.0000e-005**	**6.9600e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0134**	**0.0134**	**4.0000e-005**	**0.0000**	**0.0143**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0686					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5348					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	6.6000e-004	6.0000e-005	6.9600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0134	0.0134	4.0000e-005	0.0000	0.0143
Total	**0.6041**	**6.0000e-005**	**6.9600e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0134**	**0.0134**	**4.0000e-005**	**0.0000**	**0.0143**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Use Grey Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	47.2037	0.3462	8.5100e-003	58.3942
Unmitigated	67.6754	0.4331	0.0107	81.6945

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO_2	CH_4	N_2O	CO_2e
Land Use	Mgal	MT/yr			
Fast Food Restaurant w/o Drive Thru	12.1413 / 0.77498	56.9669	0.3978	9.8000e-003	69.8314
University/College (4Yr)	1.07055 / 1.67445	10.7085	0.0353	9.1000e-004	11.8631
Total		**67.6754**	**0.4331**	**0.0107**	**81.6945**

Mitigated

	Indoor/Outdoor Use	Total CO_2	CH_4	N_2O	CO_2e
Land Use	Mgal	MT/yr			
Fast Food Restaurant w/o Drive Thru	9.71308 / 0	43.3788	0.3182	7.8200e-003	53.6626
University/College (4Yr)	0.85644 / 0	3.8249	0.0281	6.9000e-004	4.7316
Total		**47.2037**	**0.3462**	**8.5100e-003**	**58.3942**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	56.0265	3.3111	0.0000	138.8033
Unmitigated	112.0530	6.6222	0.0000	277.6067

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Fast Food Restaurant w/o Drive Thru	460.76	93.5301	5.5275	0.0000	231.7169
University/College (4Yr)	91.25	18.5229	1.0947	0.0000	45.8898
Total		**112.0531**	**6.6221**	**0.0000**	**277.6067**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Fast Food Restaurant w/o Drive Thru	230.38	46.7651	2.7637	0.0000	115.8585
University/College (4Yr)	45.625	9.2615	0.5473	0.0000	22.9449
Total		**56.0265**	**3.3111**	**0.0000**	**138.8033**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX D

Traffic Study

Middle Earth Housing Expansion Traffic Study

UC Irvine

Prepared for:
UC Irvine Environmental Planning
and Sustainability

Prepared by:
Stantec Consulting Services Inc.

November 23, 2016

Sign-off Sheet

This document entitled Middle Earth Housing Expansion Traffic Study was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of UC Irvine Environmental Planning and Sustainability (the "Client").

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Glossary

ADT	**Average Daily Traffic.** Generally used to measure the total two-directional traffic volumes passing a given point on a roadway.
DU	**Dwelling Unit.** Used in quantifying residential land use.
ICU	**Intersection Capacity Utilization.** A measure of the volume-to-capacity ratio for an intersection. Typically used to determine the peak hour level of service for a given set of intersection volumes.
LOS	**Level of Service.** A scale used to evaluate circulation system performance based on ICU values at intersections or volume-to-capacity ratios of arterial segments.
Peak Hour	This refers to the hour during the AM peak period (typically 7 AM to 9 AM) or the PM peak period (typically 4 PM to 6 PM) in which the greatest number of vehicle trips are generated by a given land use or are travelling on a given roadway.
V/C	**Volume-to-Capacity Ratio.** This is typically used to describe the percentage of capacity utilized by existing or projected traffic on a segment of an arterial or intersection.

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has performed a traffic impact analysis for a proposed undergraduate student housing project in the Middle Earth area of the UC Irvine main campus. The purpose of this study is to determine the amount of traffic generated by the proposed project and to analyze the impacts of the project on the affected portions of the circulation system.

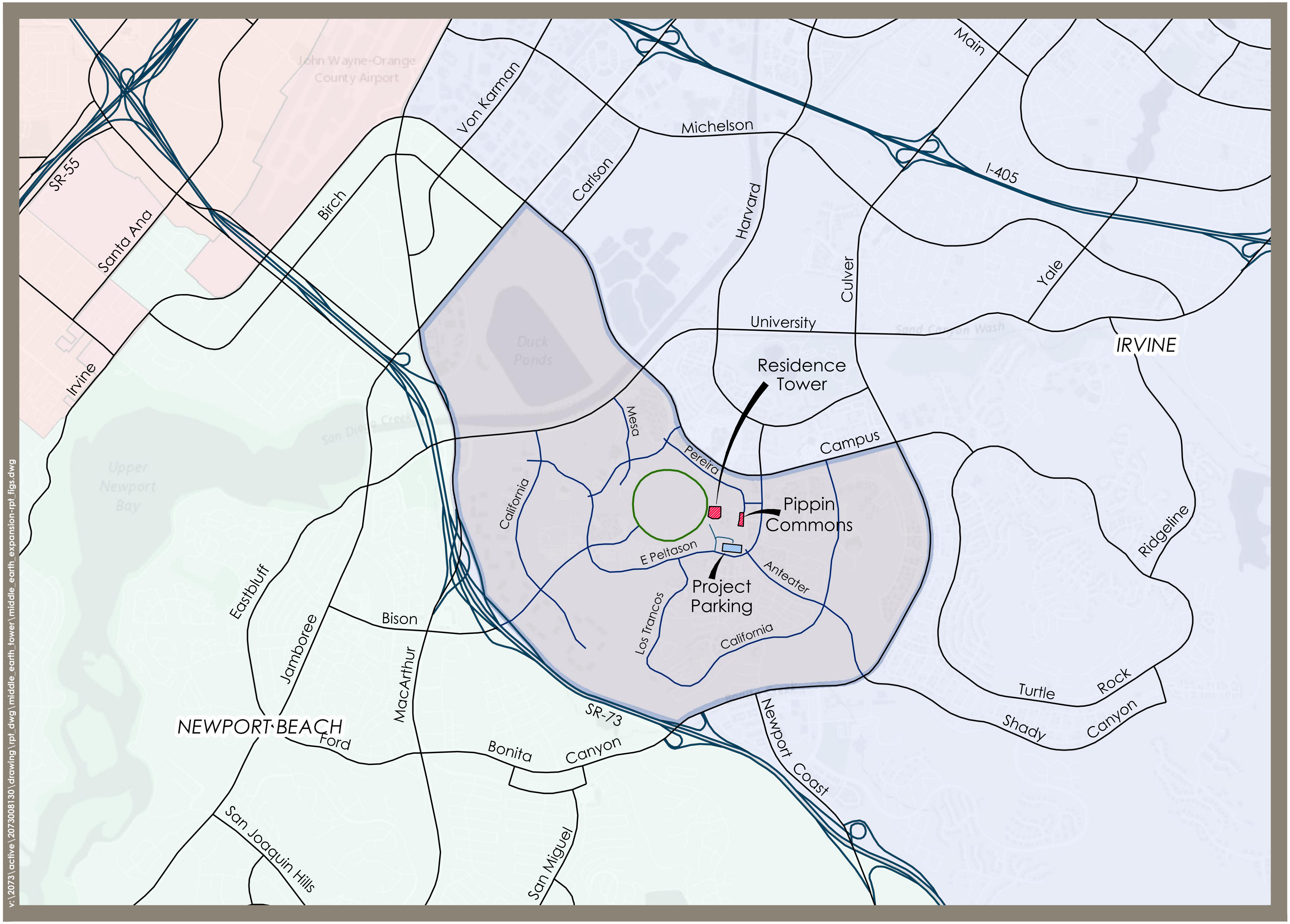
1.1 BACKGROUND AND SCOPE

The project site is located between Ring Road and E. Peltason Drive among the existing Middle Earth residence halls on the eastern portion of the campus. The location of the project site is shown in **Figure 1-1**. The proposed seven-story tower consists of 500 beds and associated dormitory facilities in five floors above two floors consisting of a 40,000 square foot dining facility, 14,000 square feet of community facilities, and 12,000 square feet of support and ancillary space. The proposed residence tower will replace the existing dining facility and student community center. In addition to the new residence tower, the project includes interior remodeling of the existing 10,000 square foot Pippin Commons. The proposed residence tower and renovated Pippin Commons is estimated to increase staff by 10.

The current UCI Long Range Development Plan (LRDP) was adopted in 2007, and established a land use plan and physical planning framework to accommodate projected enrollment levels, additional academic facilities and housing, and the on-campus circulation system through the 2025-2026 horizon year. The site is included in the LRDP land use and is designated Student Housing.

There are currently 1,825 beds in Middle Earth, and this project will increase the number by 500 beds to a total of 2,325 beds. With this project, the total number of beds exceeds the 1,583 beds analyzed for Traffic Analysis Zone 49 (Middle Earth) in the 2007 LRDP Environmental Impact Report (EIR) Traffic Study by 742 beds. However, with this project, the UCI campus is still under the total number of beds analyzed in the LRDP EIR overall. Therefore, the project is consistent with the overall LRDP student bed count, but with this project the number of beds analyzed in the LRDP EIR Traffic Study is shifted from the East Campus into the Academic Core.

This traffic study provides near term and long-range conditions as required by the California Environmental Quality Act (CEQA). These scenarios include existing conditions and long-range cumulative conditions (2035 and beyond). The long-range analysis examines the project in a LRDP buildout context. The study area includes intersections located in the City of Irvine, as well as intersections and mid-block segments on the UCI main campus.



Stantec

N

Figure 1-1

Project Location

1.2

Chapter 2.0 of this report provides the transportation setting for the impact analysis, and Chapter 3.0 provides a detailed project description. Chapter 4.0 focuses on the potential traffic impacts of the project.

1.2 METHODOLOGY

The traffic forecasts for the study area circulation system were generated using a combination of data from the UCI Main Campus Traffic Model (MCTM) and the City of Irvine Traffic Analysis Model (ITAM) for the long-range analysis. Project-generated traffic volumes are estimated using the MCTM and the overall distribution of project traffic is based on the project trip distribution derived from the ITAM. The ITAM can provide off-campus trip distribution patterns whereas the UCI MCTM is limited to on-campus traffic patterns. The project volumes were then added to the no-project volumes, resulting in with-project volumes.

1.3 PERFORMANCE CRITERIA

The traffic analysis uses a set of performance criteria for evaluating intersection capacity to determine potential project impacts. In traffic impact studies, impact criteria are based on two primary measures. The first is "capacity," which establishes the vehicle carrying ability of a road segment, and the second is "volume." The volume-to-capacity (V/C) ratio corresponds with a level of service (LOS). Traffic LOS is designated A through F, with LOS A representing free flow conditions, and LOS F representing severe traffic congestion. Traffic flow quality for the different LOS is described in **Table 1-1**.

Average daily traffic (ADT) volumes are presented for roadway links in the study area. The traffic analysis also analyzes the AM and PM peak hour volumes for study area intersections. Peak hour volumes and capacities are compared by means of intersection capacity utilization (ICU) values for signalized intersections.

For the stop-controlled study intersection, the Highway Capacity Manual (HCM) methodology for estimating intersection delay is used to determine the intersection peak hour LOS. The ICU values and vehicle delay ranges that correspond to LOS A through F are summarized in **Table 1-2**.

Both the V/C and LOS are used in identifying impacts. Certain LOS values are deemed acceptable by the various governing jurisdictions within the traffic analysis study area, and increases in the V/C ratio which cause or contribute to the LOS being unacceptable are defined as an adverse impact. LOS D is the performance standard applied in this study for the intersections in the study area.

Table 1-1 Level of Service Descriptions – Arterial Streets and Intersections

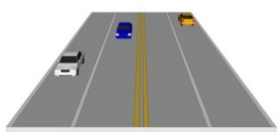
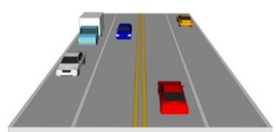
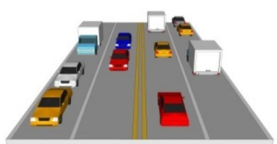
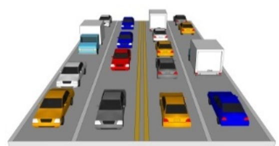
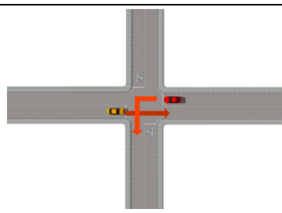
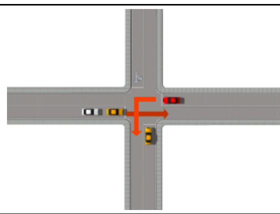
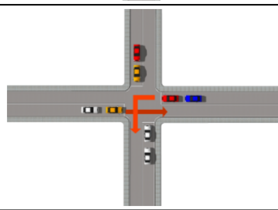
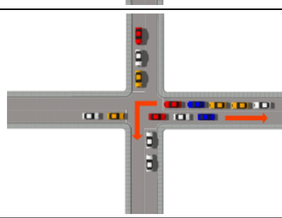
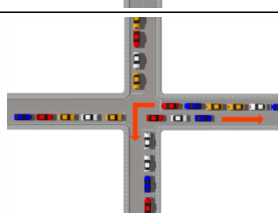
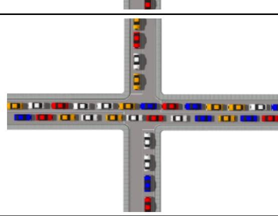
Level of Service (LOS)		Description
A		LOS A describes primarily free-flow operations. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at the intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.
B		LOS B describes reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted, and control delay at the intersections is not significant. The travel speed is between 67% and 85% of the base free-flow speed.
C		LOS C describes stable operation. The ability to maneuver and change lanes at midsegment locations may be more restricted than at LOS B. Longer queues at the intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.
D		LOS D indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the intersections. The travel speed is between 40% and 50% of the base free-flow speed.
E		LOS E is characterized by unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the intersections. The travel speed is between 30% and 40% of the base free-flow speed.
F		LOS F is characterized by flow at extremely low speed. Congestion is likely occurring at the intersections, as indicated by high delay and extensive queuing. The travel speed is 30% or less of the base free-flow speed.
Source: Highway Capacity Manual 2010, Transportation Research Board, National Research Council		

Table 1-2 Intersection Level of Service Ranges (ICU and HCM Delay)

Level of Service (LOS)		Intersection Capacity Utilization (ICU)	Highway Capacity Manual (HCM) Average Delay
			Stop-Controlled Intersection
A		0.00 – 0.60	0.00 – 10.0 seconds
B		0.61 – 0.70	10.1 – 15.0 seconds
C		0.71 – 0.80	15.1 – 25.0 seconds
D		0.81 – 0.90	25.1 – 35.0 seconds
E		0.91 – 1.00	35.1 – 50.0 seconds
F		Above 1.00	Above 50.0 seconds

Sources: Highway Capacity Manual 2010, Transportation Research Board, National Research Council
Orange County Congestion Management Program

Significant impacts are defined for this analysis as an increase of .02 or more in the ICU value per the City of Irvine Traffic Impact Analysis Guidelines. This increase at a signalized intersection operating at LOS D or better is not considered a significant impact. Since UCI does not have an adopted performance criteria for intersections, the City of Irvine's performance criteria were used in the analysis to identify project impacts at on-campus signalized intersection locations. For the stop-controlled study intersections, if the LOS reaches E or F, the intersection is evaluated further for possible improvement with a traffic signal.

The performance criteria adopted by the City of Irvine, and applied for this analysis, are summarized in **Table 1-3**.

1.4 STUDY AREA

The study area encompasses five intersections in and around the UCI campus. The study area was defined by identifying how project trips would distribute to the adjacent roads and determining the limits of where project peak hour impacts become insignificant. Key intersections within the study area were selected for peak hour analysis. Three of the intersections are located within the UCI campus, and two are located in the City of Irvine. There are no Orange County Congestion Management Program (CMP) monitoring intersections within the study area. **Figure 1-2** illustrates the study area for the project.

1.5 REFERENCES

1. *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

2. *University of California Irvine Long Range Development Plan 2007 Update Traffic Study*, Austin-Foust Associates, Inc., May 2007.

3. *Mesa Court Expansion Project Traffic Study,* Stantec Consulting Services Inc., October 2013.

Table 1-3 Performance Criteria for Locations Analyzed within the Study Area

Intersections

V/C Calculation Methodology

Level of service based on peak hour intersection capacity utilization (ICU) values and calculated using the following assumptions:

City of Irvine & UCI
Saturation Flow Rate: 1,700 vehicles/hour/lane
Clearance Interval: .05
Right-Turn-On-Red Utilization Factor*: .75
* "De-facto" right-turn lane is assumed in the ICU calculation if 19 feet from edge to outside of through-lane exists and parking is prohibited during peak periods.

HCM Delay Methodology

Level of service based on peak hour average intersection delay and calculated using the following assumptions:

Ideal Flow Rate: 1,900 vehicles/hour/lane
Peak Hour Factor: measured PHF at stop-controlled intersections
Percent Heavy Vehicles: 2%

Performance Standard

Level of service D

Mitigation Requirement

For stop-controlled intersections operating greater than the performance standard, the intersection is evaluated further for possible improvement with a traffic signal, or geometric improvements to improve operations.

For signalized intersections operating greater than the performance standard, the intersection is evaluated further for possible improvements to improve operations.

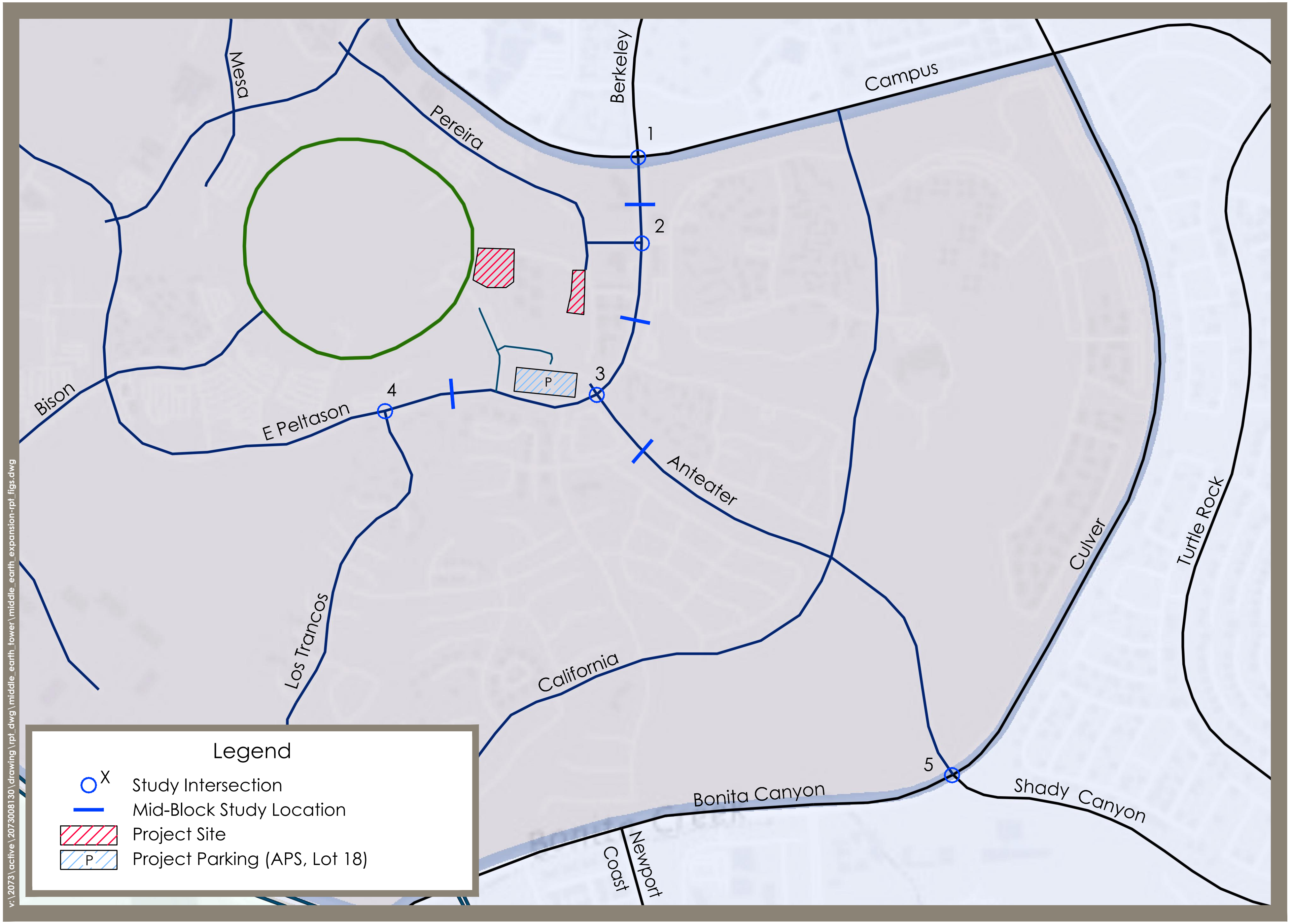


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Figure 1-2

Study Intersection Locations

2.0 TRANSPORTATION SETTING

This chapter describes the transportation setting for the proposed project. Existing and opening year traffic conditions in the traffic analysis study area are summarized, and the future circulation system planned for the UCI LRDP buildout is described.

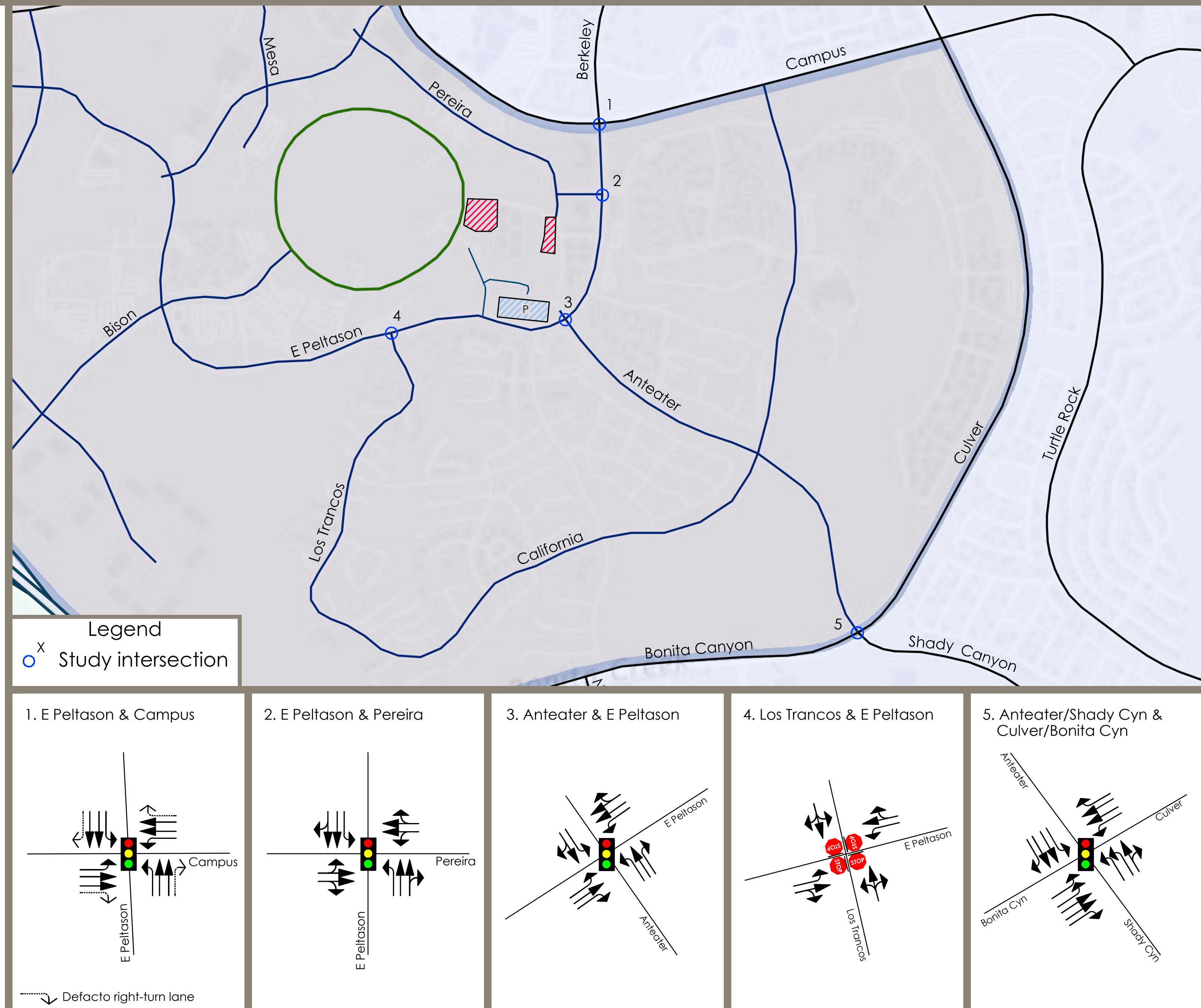
2.1 EXISTING ROADWAY SYSTEM

The study area encompasses three intersections within the UCI campus and two intersections along the perimeter of the UCI campus and in the surrounding City of Irvine. One of the on-campus study intersections is stop-controlled, and the remaining study intersections are signalized. The off-campus study intersections are located along Campus Drive and Culver Drive/Bonita Canyon Drive and are both signalized. Intersection lane configurations and intersection controls are illustrated in **Figure 2-1**.

Campus Drive is designated as a Primary Arterial on the City of Irvine and the Orange County Master Plan of Arterial Highways (MPAH). Campus Drive begins at Bristol Street and runs in a generally northwest direction until reaching Macarthur Boulevard where it continues in a southeast direction to east of Culver Drive. Campus Drive provides four travel lanes with a raised median through the study area. Campus Drive provides the northeast boundary of the UCI main campus. The speed limit is 45 mph in the vicinity. On-street parking is not allowed, and a striped bike lane is provided.

Culver Drive runs generally northeast to southwest from Portola Parkway in northeast Irvine to Michelson Drive where it curves toward the south between Michelson Drive and University Drive. South of University Drive, it curves southeast and then west around the eastern and southern boundary of the UCI campus, where Culver Drive turns into Bonita Canyon Drive west of Shady Canyon Drive/Anteater Drive. Bonita Canyon Drive continues west into the City of Newport Beach and becomes Ford Road west of MacArthur Boulevard. Bonita Canyon Drive provides full access to SR-73 just west of the project site. Culver Drive is a Major Arterial north of Campus Drive and a Primary Arterial south of Campus Drive through the study area. Bonita Canyon Drive is designated as a Primary Arterial. Culver Drive/Bonita Canyon Drive provides four lanes with a raised median through the study area, except for a short section near the SR-73 Toll Road where the roadway varies from five to six lanes. On-street parking is prohibited and a striped bike lane is provided. The speed limit on Culver Drive is 50 mph north of Campus Drive and 55 mph south of Campus Drive, and the speed limit on Bonita Canyon Drive is 50 mph.

Peltason Drive begins opposite Bridge Road at Campus Drive and loops through the UCI campus to opposite Berkeley Avenue at Campus Drive. Peltason Drive is a two-lane local street through



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Stantec

N

Figure 2-1

Existing Intersection Lane Configurations and Traffic Control

most of the campus with a raised median east of Bison Avenue, and a four-lane local street with a raised median from Pereira Drive to Berkeley Avenue. The speed limit is 30 mph. On-street parking is not allowed. An on-street bike lane is provided.

Los Trancos Drive begins on-campus just north of E. Peltason Drive and continues south as a two-lane local street where it becomes California Avenue. On-street parking is prohibited, a striped bike lane is provided, and the speed limit is 25 mph. California Avenue continues in a generally northeast direction past Anteater Drive where it turns toward the north and terminates north of the UCI campus at Harvard Avenue. California Avenue is designated as a Primary Arterial. It is a two-lane road between Los Trancos Drive and Adobe Circle, and a four-lane road north of Adobe Circle.

Anteater Drive is a Secondary Arterial located on-campus between E. Peltason Drive and Culver Drive/Bonita Canyon Drive and has a speed limit of 40 mph. Anteater Drive is a two lane roadway with a raised median and turn pockets at intersections. Parking is prohibited, and a bike lane is provided. A four-way stop is provided at California Avenue, and signals are provided at E. Peltason Drive and at Culver Drive/Bonita Canyon Drive. Shady Canyon Drive begins opposite Anteater Drive at Culver Drive/Bonita Canyon Drive which provides access to the gated community of Shady Canyon east of the campus.

2.2 EXISTING VOLUMES

Existing ADT and peak hour volumes were counted in September 2016 while classes were in session. ADT volumes were counted for key roadway segments on campus, and existing peak hour turning movement volumes were collected at the study intersections. **Figure 2-2** illustrates the existing study area volumes. Actual count data is included in **Appendix A**.

2.3 EXISTING INTERSECTION LEVELS OF SERVICE

Existing ICU values were calculated for the signalized study intersections based on the AM and PM peak hour turning movement counts presented above and existing lane configurations. The intersection of Los Trancos Drive and E. Peltason Drive is an all-way stop-controlled intersection. For the stop-controlled study intersection, the HCM delay methodology was used. The average delay is rounded to the nearest second to allow for minor fluctuations in daily traffic volumes, which is appropriate for planning purposes. Existing AM and PM peak hour ICU and delay values are summarized in **Table 2-1** (actual ICU calculation worksheets are included in **Appendix B,** and delay calculations are included in **Appendix C**). As this table shows, the signalized study intersections currently operate at LOS A during the AM and PM peak hours based on the ICU methodology. The stop-controlled study intersection is currently operating at LOS F during the AM and PM peak hour. This intersection is identified as the location of a signal under long-range conditions.

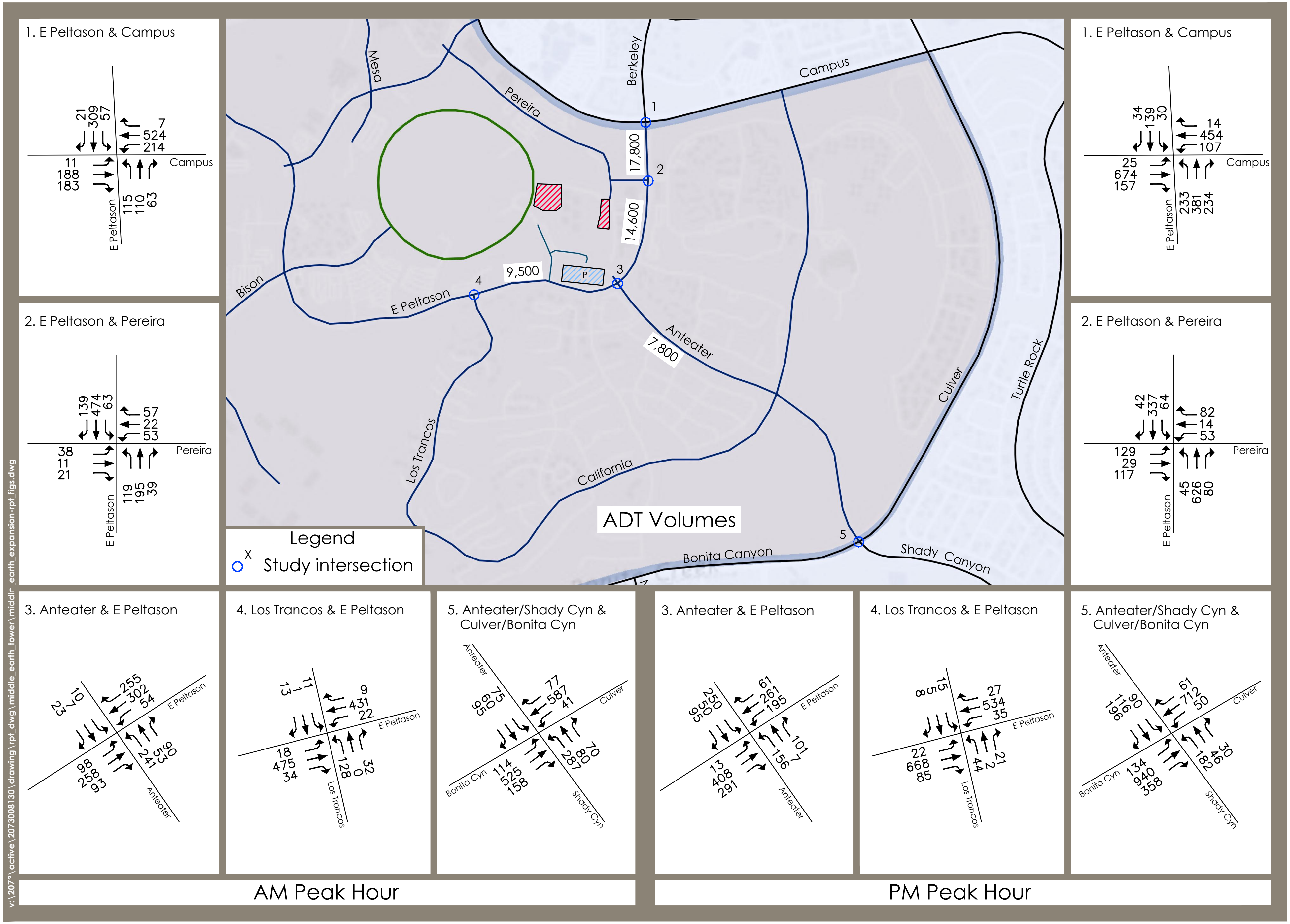

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Figure 2-2

Existing Volumes

Table 2-1 Existing Intersection LOS Summary

Intersection	Jurisdiction	AM Peak Hour		PM Peak Hour	
		ICU/Delay	LOS	ICU/Delay	LOS
ICU Methodology – Signalized Intersections					
1. E. Peltason/Berkeley & Campus	Irvine	.40	A	.49	A
2. E. Peltason & Pereira	UCI	.35	A	.40	A
3. Anteater & E. Peltason	UCI	.43	A	.58	A
5. Anteater/Shady Cyn & Culver/Bonita Cyn	Irvine	.38	A	.45	A
HCM Delay Methodology – Stop-Controlled Intersections					
4. Los Trancos & E Peltason	UCI	57 sec	F	130 sec	F

2.4 BUILDOUT TRAFFIC FORECAST VOLUMES

Although the project does not increase the overall number of student beds within the UCI campus identified in the LRDP, the proposed project represents an increase in beds within the Middle Earth traffic analysis zone (TAZ 49) as analyzed in the 2007 LRDP EIR and LRDP EIR Traffic Study. Localized impacts from shifting student beds from the East Campus to the Academic Core are examined under buildout conditions. This would represent the buildout of the area, assumed to be 2035 and beyond.

The long-range volumes were obtained from the UCI MCTM and ITAM. Buildout volumes for on-campus intersections came from the recently prepared University Hills PA10 traffic study, and volumes for off-campus intersections were obtained from ITAM 12.4 Post-2035 Cumulative Condition (February 2015) with UCI North Campus and Main Campus zones factored to 2007 LRDP trips.

Figure 2-3 illustrates 2035 ADT volumes on mid-block links in the study area and 2035 AM and PM peak hour intersection volumes based on the LRDP EIR Traffic Study land use assumptions.

Table 2-2 summarizes the 2035 ICU values at the study intersections. The intersection of Los Trancos Drive and E. Peltason Drive is identified as signalized in the LRDP. The LRDP also assumes that E. Peltason Drive has two lanes eastbound east of Anteater Drive (it currently has one lane eastbound). Under 2035 conditions, with the above assumptions, all study intersections will operate at acceptable LOS D or better during the AM and PM peak hours based on the LRDP EIR Traffic Study.

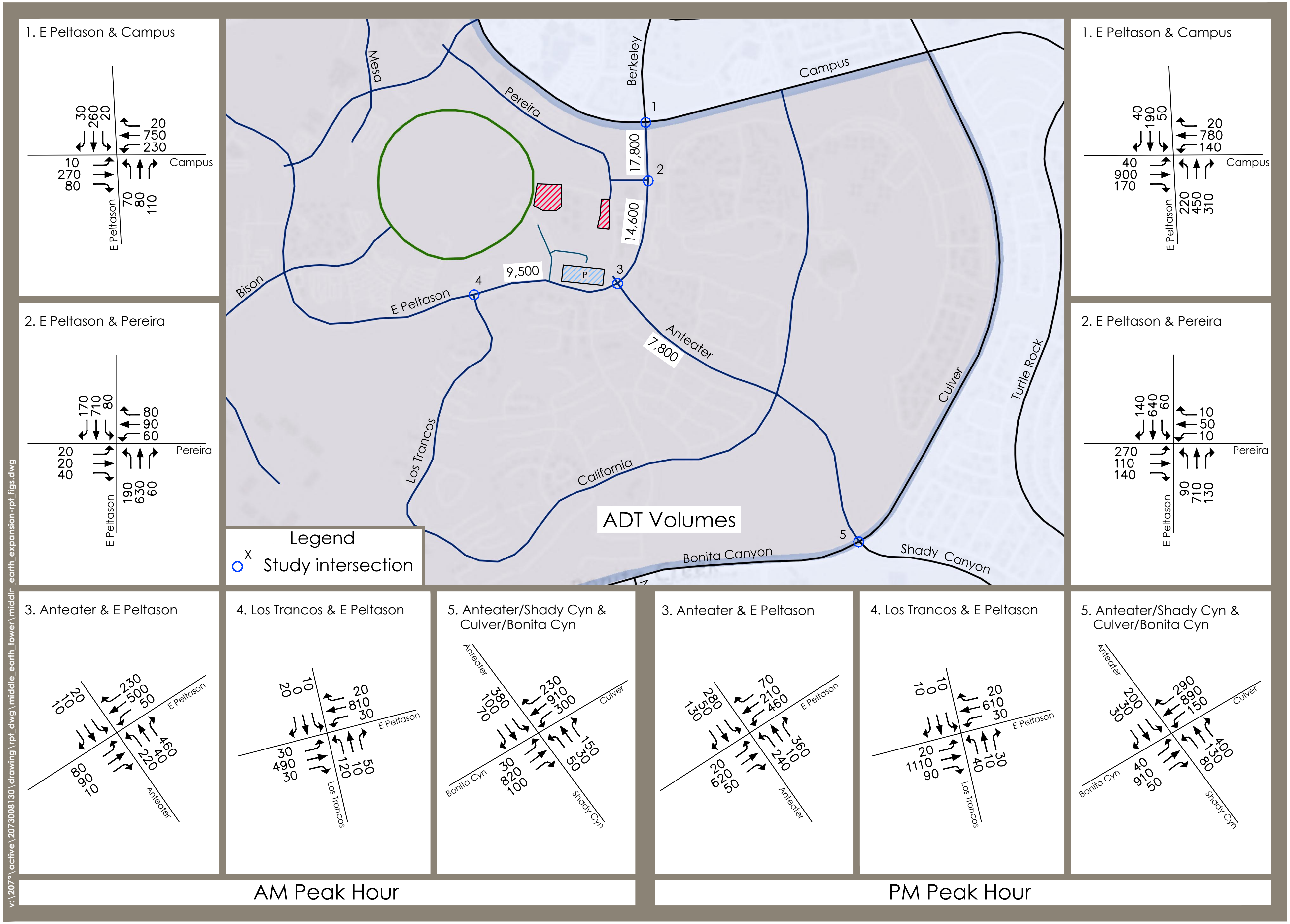

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Figure 2-3

2035 No-Project Volumes

Table 2-2 2035 No-Project Intersection LOS Summary

Intersection	Jurisdiction	AM Peak Hour		PM Peak Hour	
		ICU/Delay	LOS	ICU/Delay	LOS
ICU Methodology – Signalized Intersections					
1. E. Peltason/Berkeley & Campus	Irvine	.40	A	.58	A
2. E. Peltason & Pereira	UCI	.50	A	.52	A
3. Anteater & E. Peltason	UCI	.45	A	.77	C
4. Los Trancos & E Peltason	UCI	.68	B	.84	D
5. Anteater/Shady Cyn & Culver/Bonita Cyn	Irvine	.80	C	.84	D

3.0 PROJECT DESCRIPTION

This chapter describes the traffic characteristics of the proposed project. Trip generation for the project is summarized, and the distribution of project trips on the study area circulation system is presented.

3.1 PROJECT DESCRIPTION

The proposed project is located in the eastern portion of the UCI main campus in the Middle Earth student housing area. The project consists of a residential tower which includes 500 undergraduate student beds, 40,000 square feet of dining facilities, 14,000 square feet of community facilities, and 12,000 square feet of support and ancillary space. The residential tower will replace the existing Middle Earth dining facility and student community center. The proposed project also includes the interior remodeling of the existing 10,000 square foot Pippin Commons. An increase of approximately 10 staff is expected with the proposed project. Parking for residents and staff of the proposed facility is expected to be provided in the Anteater Parking Structure (APS) and Parking Lot 18 northwest of the Anteater Drive/E. Peltason Drive intersection. Middle Earth housing is for freshman students, and it is estimated that approximately 12 percent of student residents of the proposed project would own a vehicle on campus (i.e. 60 vehicles).

The site is located within the heart of the main campus and is served by an extensive trail of pedestrian paths and sidewalks through this area of the campus, and bike trails are provided on each roadway in the area. It is expected that residents of the proposed project would take advantage of the opportunities to walk or bike to their destination on campus, even those students that own a vehicle.

The proposed concept plan is illustrated in **Figure 3-1**.

The 2007 LRDP EIR Traffic Study contains a total of 1,583 student beds in the Middle Earth TAZ (TAZ 49). As of 2016, there are 1,825 beds in Middle Earth. The development of the proposed project would bring the total number of Middle Earth beds to 2,325, exceeding the housing total in the Middle Earth TAZ analyzed in the LRDP EIR Traffic Study by 742 beds. However, as noted previously, UCI campus is still under the total number of beds analyzed in the LRDP EIR overall. Therefore, the project is consistent with the overall LRDP student bed count, but with this project the number of beds analyzed in the LRDP EIR Traffic Study is shifted from the East Campus into the Academic Core.

3.2 TRIP GENERATION

Trip generation rates for the 500-bed project were derived from the Mesa Court Expansion Project Traffic Study trip rates, assuming a 12 percent vehicle ownership factor by first-year students (derivation of the trip rates is included in **Appendix D**). **Table 3-1** summarizes the trip

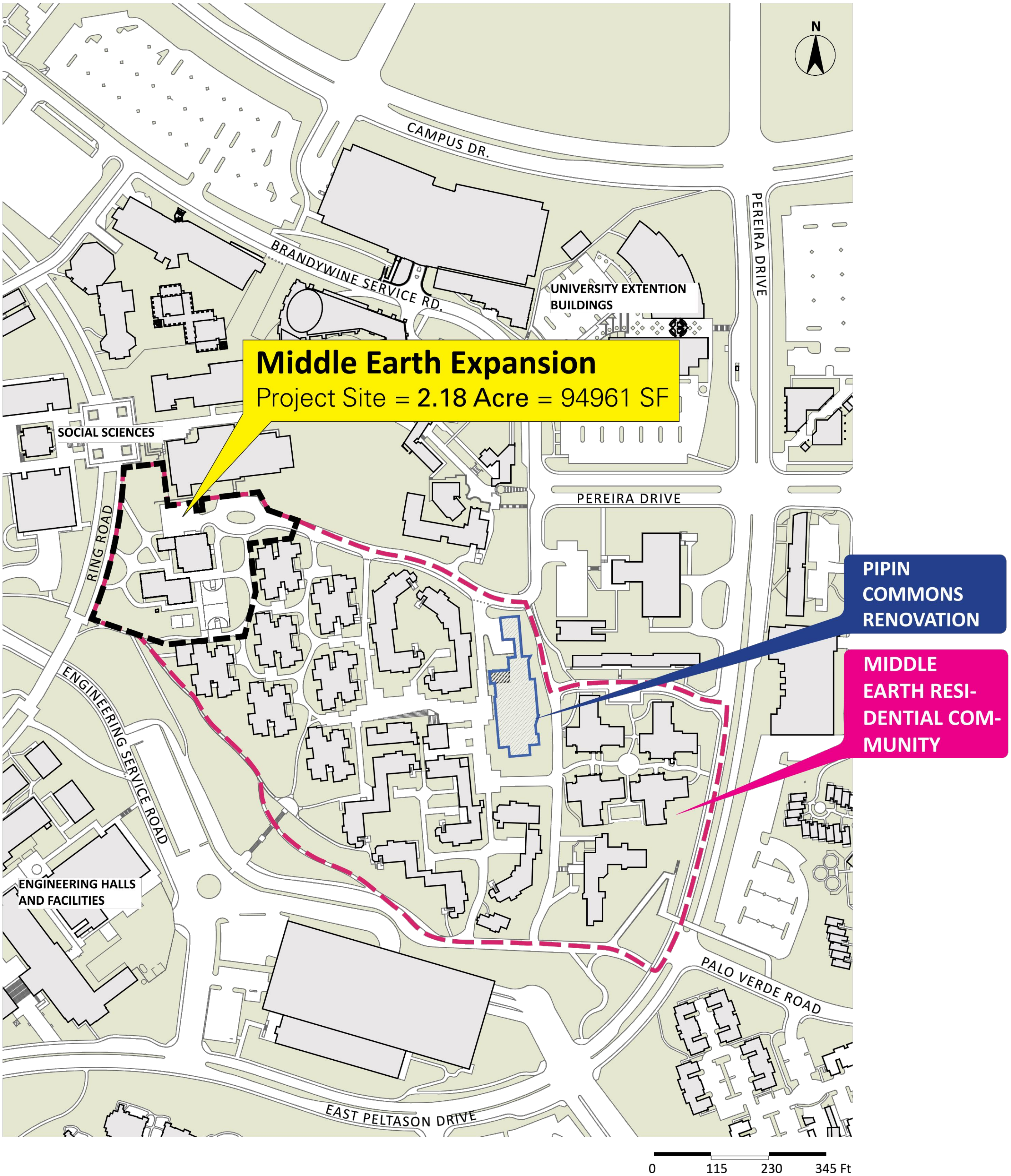

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Figure 3-1

Project Vicinity Plan

3.2

generation rates per bed and the resulting total trip generation for the proposed residential project. The 10 full-time staff would generate approximately 10 ADT trips which is negligible and would generate a minimal number of trips during the AM (7 AM – 9 AM) and PM (4 PM – 6 PM) peak hours.[1] The interior remodeling of Pippin Commons will not generate any additional peak hour or daily trips. As this table shows, the project would generate a total of 112 daily vehicle trips, of which 7 would occur during the AM peak hour and 9 would occur during the PM peak hour.

Table 3-1 Proposed Project Trip Generation Summary

Land Use	Amount	AM Peak Hour			PM Peak Hour			ADT
		In	Out	Total	In	Out	Total	
Trip Generation								
Student Housing	500 Bed	1	5	6	5	3	8	102
Staff	10	1	Negl.	1	Negl.	1	1	10
Total		2	5	7	5	4	9	112
Trip Rates (MCTM)								
Single Undergrad Housing	Bed	0.001	0.011	0.012	0.009	0.006	0.015	0.204
Staff	Person	Negl.	Negl.	Negl.	Negl.	Negl.	Negl.	1.00
LRDP Adjustment								
Change to LRDP	742 Bed	1	8	9	7	4	11	151
Staff	10	1	Negl.	1	Negl.	1	1	10
Total LRDP Adjustment		2	8	10	7	5	12	161

Source: *UCI Main Campus Traffic Model (MCTM)*

ADT = average daily trips
LRDP = Long-Range Development Plan
Negl. = Negligible

The proposed project would add 742 beds above the level of student housing analyzed in the Middle Earth TAZ in the 2007 LRDP EIR Traffic Study. These beds increase the trips analyzed in the Middle Earth TAZ in the LRDP EIR Traffic Study by 161 daily trips, 10 AM peak hour trips, and 12 PM peak hour trips.

3.3 TRIP DISTRIBUTION

The trips generated by the project will use E. Peltason Drive and Anteater Drive to access the surrounding circulation system.

[1] The ADT trip rate for UCI staff category in the LRDP is 1.0 per person.

Project trip distribution was determined based on ADT volumes from ITAM. Approximately 56 percent of project trips are oriented toward Campus Drive, Berkeley Avenue, and Culver Drive via E. Peltason Drive, 8 percent of project trips are oriented west on E. Peltason Drive towards Bison Avenue, and 36 percent of project trips are oriented toward Bonita Canyon Drive via Anteater Drive. From there, project trips will disperse along Campus Drive, Culver Drive, Bonita Canyon Drive, Newport Coast Drive, Shady Canyon Drive, and SR-73.

Figure 3-2 illustrates the general distribution for the proposed project. **Figure 3-3** illustrates the project ADT volumes on the study area roadways and the AM and PM peak hour project-generated trips based on the distribution.

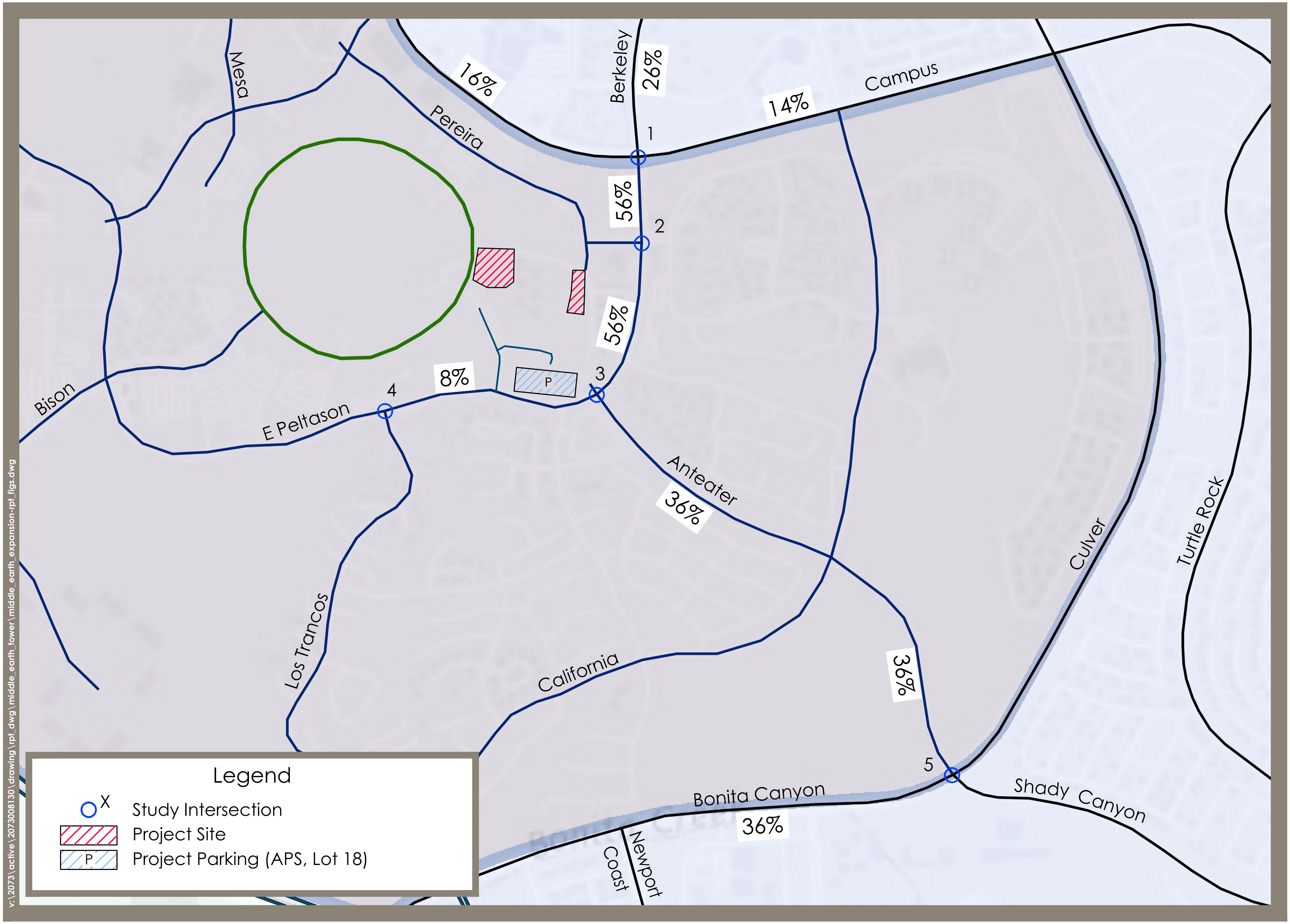

Figure 3-2

General Project Distribution

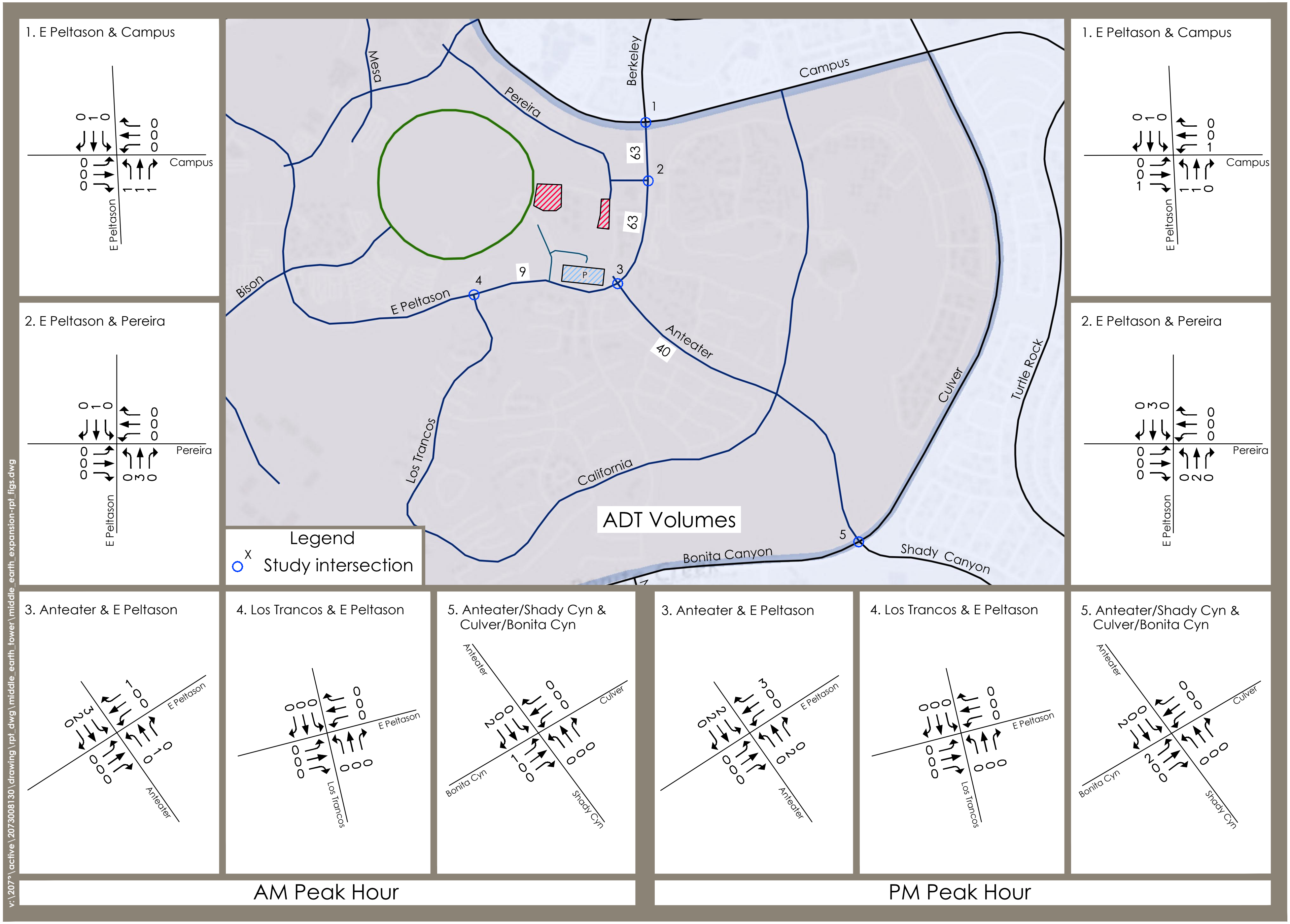

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Figure 3-3

Project-Generated Trips

4.0 IMPACT ANALYSIS

This chapter presents the with-project intersection volumes, and evaluates the project impacts on the study intersections. Project increases resulting in significant impacts, if any, are discussed and mitigation measures are identified if necessary.

4.1 EXISTING PLUS PROJECT CONDITIONS

Impacts from the full project are analyzed under existing conditions. Existing-plus-project peak hour volumes were obtained by adding the project-generated peak hour trips, presented in Section 3.3, to the existing intersection turning movement volumes at the study intersections.

Figure 4-1 illustrates the existing-plus-project ADT volumes on the mid-block links in the study area and the peak hour volumes at the study intersections. The existing and existing-plus-project LOS based on existing lane configurations are summarized in **Table 4-1** (the ICU calculation worksheets are included in **Appendix B**, and HCM delay calculation worksheets are included in **Appendix C**).

Table 4-1 Existing-Plus-Project Intersection LOS Summary

	Existing				Existing + Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Intersection	**ICU/Delay**	**LOS**	**ICU/Delay**	**LOS**	**ICU/Delay**	**LOS**	**ICU/Delay**	**LOS**
ICU Methodology – Signalized Intersections								
1. E. Peltason/Berkeley & Campus	.40	A	.49	A	.40	A	.49	A
2. E. Peltason & Pereira	.35	A	.40	A	.35	A	.40	A
3. Anteater & E. Peltason	.43	A	.58	A	.43	A	.58	A
5. Anteater/Shady Cyn & Culver/Bonita Cyn	.38	A	.45	A	.38	A	.45	A
HCM Delay Methodology – Stop-Controlled Intersections								
4. Los Trancos & E. Peltason	57 sec	F	130 sec	F	57 sec	F	130 sec	F

The signalized intersections operate at LOS A during the AM and PM peak hours with the addition of the proposed project traffic based on the ICU methodology. The project would add less than 0.01 to the ICU value at the intersections, and the project has no significant impact.

The stop-controlled study intersection of Los Trancos Drive and E. Peltason Drive operates at LOS F during the AM and PM peak hour; however, the addition of project-generated traffic would add no measurable increase to the average delay during the AM and PM peak hours. Therefore, the project has no significant impact on the stop-controlled intersection of Los Trancos Drive and E. Peltason Drive. Although the intersection operates at LOS F as a stop-controlled

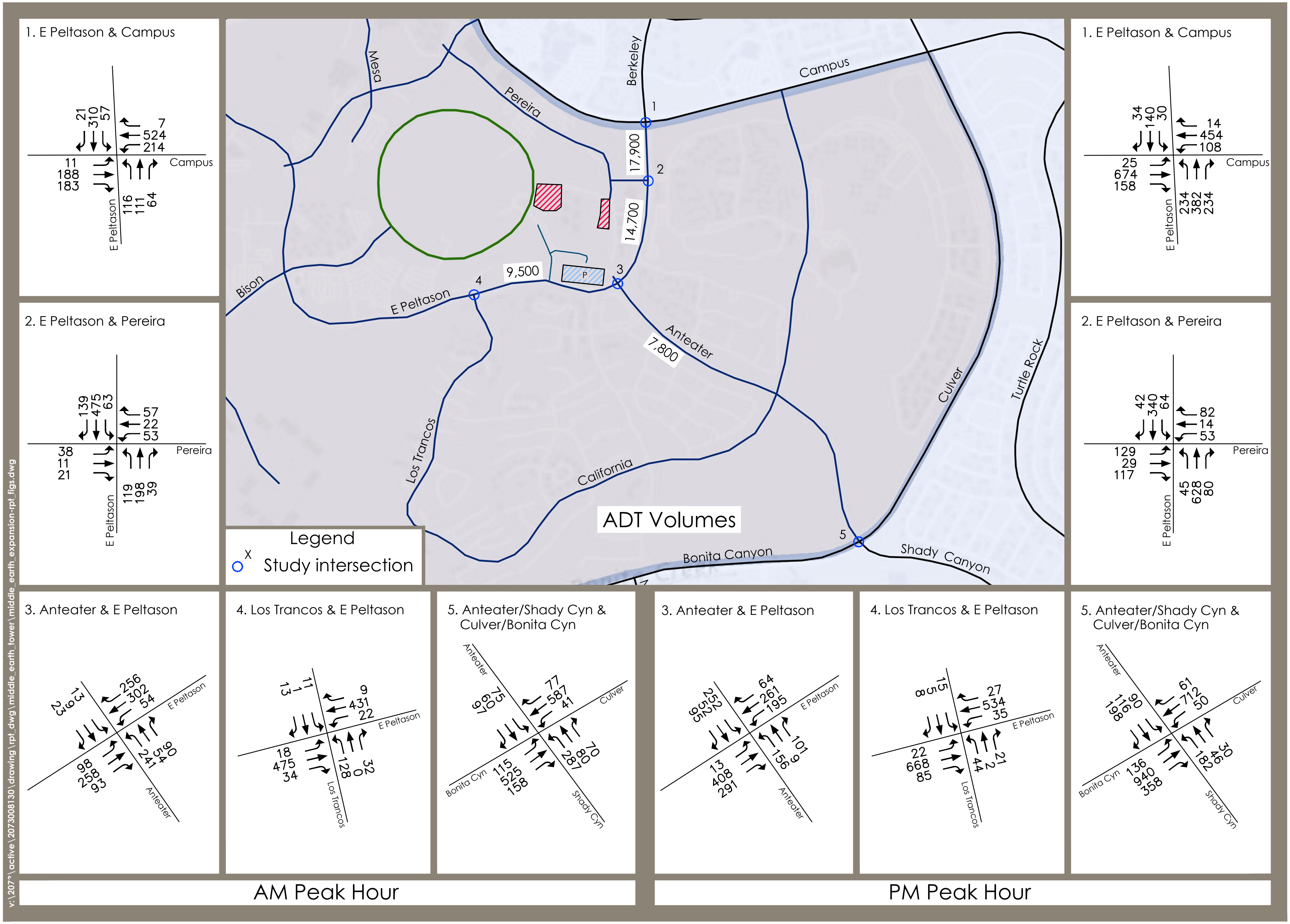

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Figure 4-1

Existing-Plus-Project Volumes

intersection, the existing peak hour volumes do not satisfy the minimum warrant for signalization of the intersection (Appendix E), which in this case is a minimum side street volume of 205 vehicles during the AM peak hour and 105 vehicles during the PM peak hour. The project has no significant impact on the stop-controlled intersection, and therefore no mitigation is required.

4.2 LONG-RANGE ANALYSIS

As discussed in Section 3.3, the proposed project would add 742 beds above the level of undergraduate student housing analyzed in Middle Earth (TAZ 49) in the 2007 LRDP EIR Traffic Study. However, based on the number of vehicles owned by the first-year student residents (12 percent), the peak hour trips generated by the project would be only slightly higher than that assumed in the LRDP Traffic Study (10 additional AM peak hour trips, 12 additional PM peak hour trips). **Figure 4-2** illustrates the 2035 with-Project ADT and peak hour volumes, and **Table 4-2** summarizes the ICU values at the study intersections. The project would result in a negligible impact on the study intersections under LRDP buildout conditions and no mitigation is required.

Table 4-2 2035 with-Project Intersection LOS Summary

	2035 No-Project				2035 with-Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Intersection	**ICU/Delay**	**LOS**	**ICU/Delay**	**LOS**	**ICU/Delay**	**LOS**	**ICU/Delay**	**LOS**
ICU Methodology – Signalized Intersections								
1. E. Peltason/Berkeley & Campus	.40	A	.58	A	.40	A	.58	A
2. E. Peltason & Pereira	.50	A	.52	A	.50	A	.52	A
3. Anteater & E. Peltason	.45	A	.77	C	.46	A	.77	C
4. Los Trancos & E. Peltason	.68	B	.84	D	.68	B	.84	D
5. Anteater/Shady Cyn & Culver/Bonita Cyn	.80	C	.84	D	.80	C	.84	D

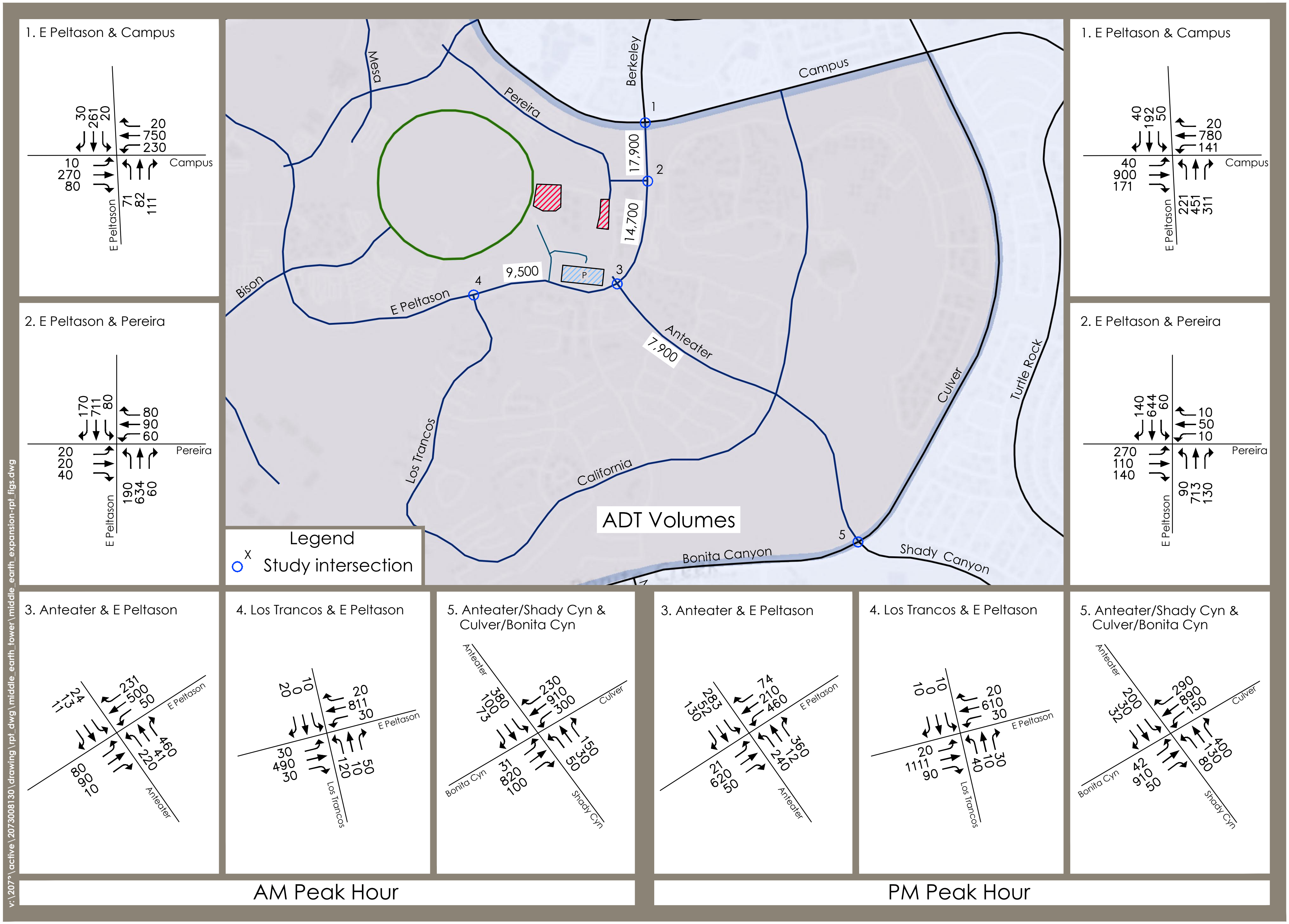

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Figure 4-2

2035 with-Project Volumes

5.0 CONCLUSIONS

The proposed project would add 500 undergraduate student beds in the Middle Earth Housing area on-campus, remodel the existing Pippin Commons, and add approximately 10 staff. The project would generate approximately 112 trips daily, of which 7 would occur during the AM peak hour and 9 would occur during the PM peak hour. These peak hour trips were assigned to the surrounding street system and added to existing traffic volumes to determine the project impacts.

Under existing conditions, all signalized study intersections operate at LOS A or better during the AM and PM peak hours based on the ICU values. The project increases the ICU values by less than .01. The stop-controlled study intersection of Los Trancos Drive and E. Peltason Drive currently operates at LOS F during the AM and PM peak hour. The project adds a negligible amount of traffic during the peak hours and increases the average intersection delay at the stop-controlled study intersection by less than 1 second; therefore, the project has no significant impact. The existing peak hour volumes do not satisfy the minimum signal warrant for Los Trancos Drive and E. Peltason Drive, which is 205 vehicles during the AM peak hour and 105 vehicles during the PM peak hour. This intersection is identified as being signalized under long-range buildout conditions, but the existing volumes do not warrant the installation of a signal at this time. Therefore, the project has no significant impact on the study intersections under existing conditions.

All study intersections would operate at LOS D or better under long-range buildout (2035) conditions, assuming the intersection improvements identified in the LRDP. The project would add 742 beds above the level of undergraduate student housing analyzed for Middle Earth (TAZ 49) in the 2007 LRDP EIR and 2007 LRDP EIR Traffic Study. The project generates very few additional peak hour trips than previously studied in the LRDP EIR Traffic Study (10 AM peak hour trips and 12 PM peak hour trips) and, therefore, has no significant impact on the study intersections under 2035 conditions.

In conclusion, the project has no significant impact on the surrounding circulation system under existing or 2035 conditions, and no mitigation is required.

APPENDICES

Appendix A COUNT DATA

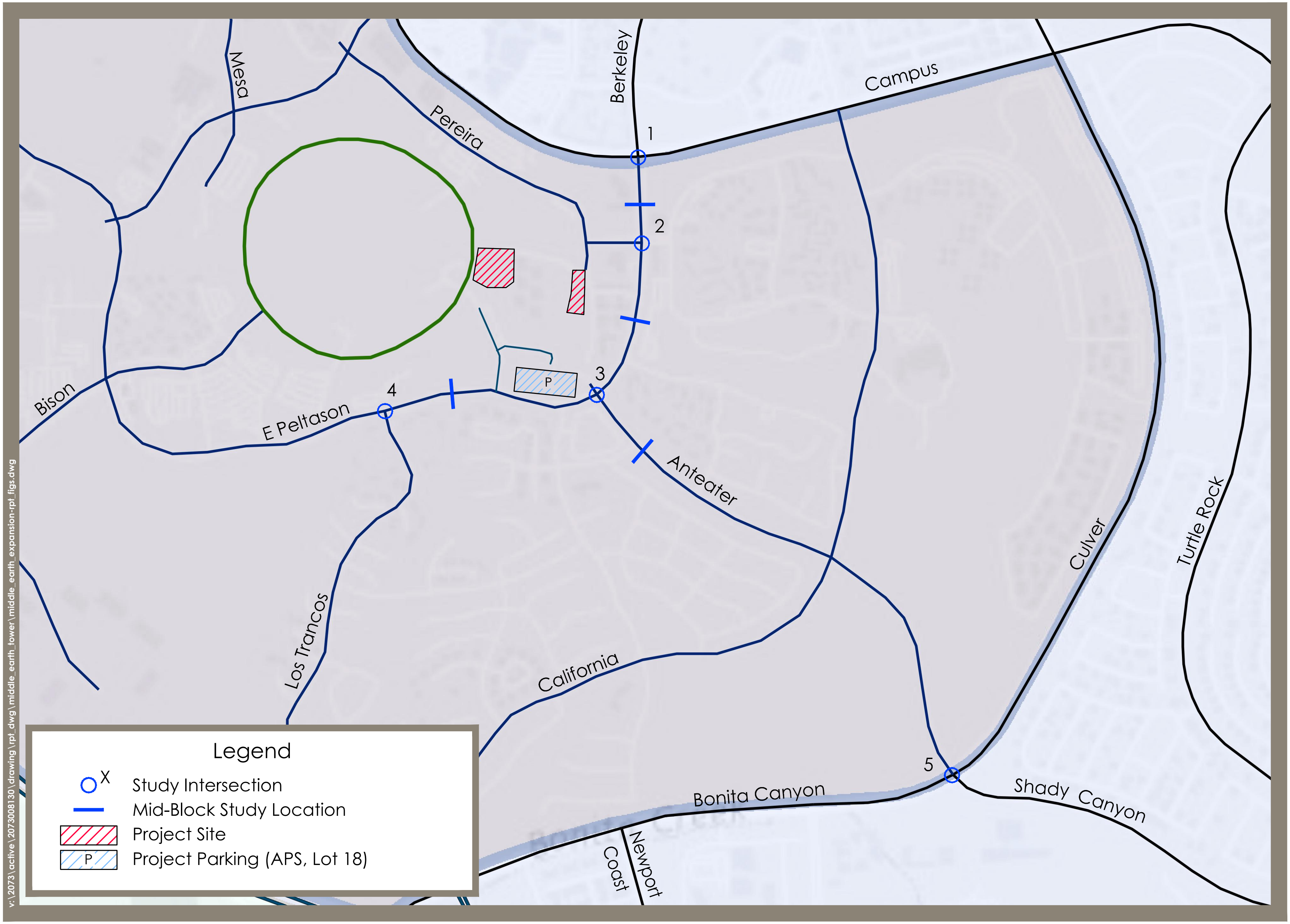

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Figure A-1

Study Intersection Location Map

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: PELTASON DR /BERKELEY AV
E-W Direction: CAMPUS DRIVE

File Name : h1610015
Site Code : 00005701
Start Date : 10/4/2016
Page No : 1

Groups Printed- Turning Movements

	BERKELEY AVENUE Southbound			CAMPUS DRIVE Westbound			PELTASON DRIVE Northbound			CAMPUS DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00	1	19	0	2	45	23	4	9	7	14	31	2	157
07:15	9	41	0	1	49	16	7	8	7	25	31	3	197
07:30	2	72	2	1	62	23	11	12	17	45	33	0	280
07:45	5	92	1	0	140	69	24	23	27	62	47	2	492
Total	17	224	3	4	296	131	46	52	58	146	142	7	1126
08:00	9	128	6	2	156	60	14	32	32	59	57	3	558
08:15	3	45	16	2	122	54	13	25	28	28	34	4	374
08:30	4	44	34	3	106	31	12	30	28	34	50	2	378
08:45	4	48	30	4	98	48	11	26	19	61	51	1	401
Total	20	265	86	11	482	193	50	113	107	182	192	10	1711
16:00	8	36	3	4	104	21	37	53	38	31	96	5	436
16:15	2	26	0	2	109	29	36	43	33	34	119	6	439
16:30	6	29	4	5	109	28	30	50	36	46	118	7	468
16:45	5	60	5	1	114	29	48	73	41	61	112	4	553
Total	21	151	12	12	436	107	151	219	148	172	445	22	1896
17:00	9	36	6	2	112	27	74	109	57	28	192	10	662
17:15	8	25	12	4	111	30	61	131	79	41	178	6	686
17:30	10	33	4	3	120	21	47	81	54	36	146	4	559
17:45	7	45	8	5	111	29	52	60	43	52	158	5	575
Total	34	139	30	14	454	107	234	381	233	157	674	25	2482
Grand Total	92	779	131	41	1668	538	481	765	546	657	1453	64	7215
Apprch %	9.2	77.7	13.1	1.8	74.2	23.9	26.8	42.7	30.5	30.2	66.8	2.9	
Total %	1.3	10.8	1.8	0.6	23.1	7.5	6.7	10.6	7.6	9.1	20.1	0.9	

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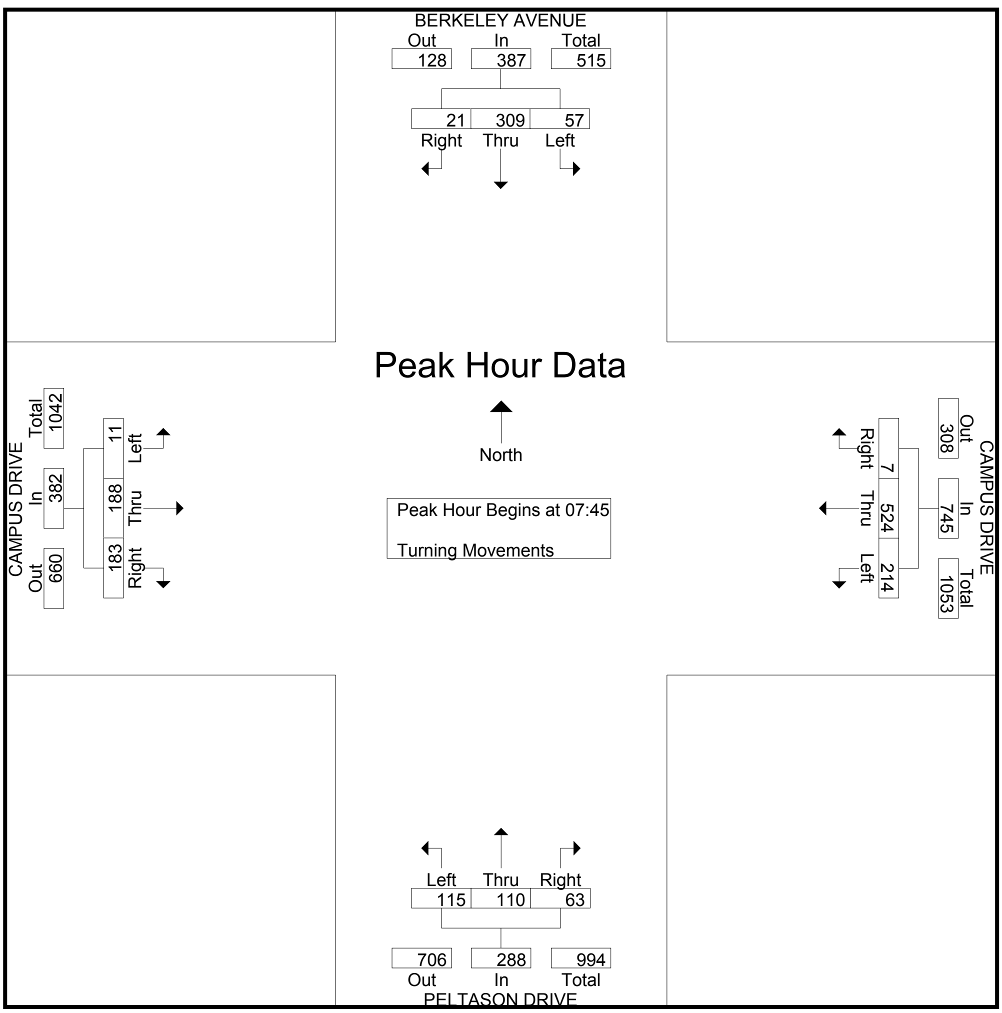
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

	BERKELEY AVENUE Southbound				CAMPUS DRIVE Westbound				PELTASON DRIVE Northbound				CAMPUS DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	5	92	1	98	0	140	**69**	209	**24**	23	27	74	**62**	47	2	111	492
08:00	**9**	**128**	**6**	**143**	2	**156**	60	**218**	14	**32**	**32**	**78**	59	**57**	3	**119**	**558**
08:15	3	45	16	64	2	122	54	178	13	25	28	66	28	34	**4**	66	374
08:30	4	44	**34**	**82**	**3**	106	31	140	12	30	28	70	34	50	2	86	378
Total Volume	21	309	57	387	7	524	214	745	63	110	115	288	183	188	11	382	1802
% App. Total	5.4	79.8	14.7		0.9	70.3	28.7		21.9	38.2	39.9		47.9	49.2	2.9		
PHF	.583	.604	.419	.677	.583	.840	.775	.854	.656	.859	.898	.923	.738	.825	.688	.803	.807



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

File Name : h1610015
Site Code : 00005701
Start Date : 10/4/2016
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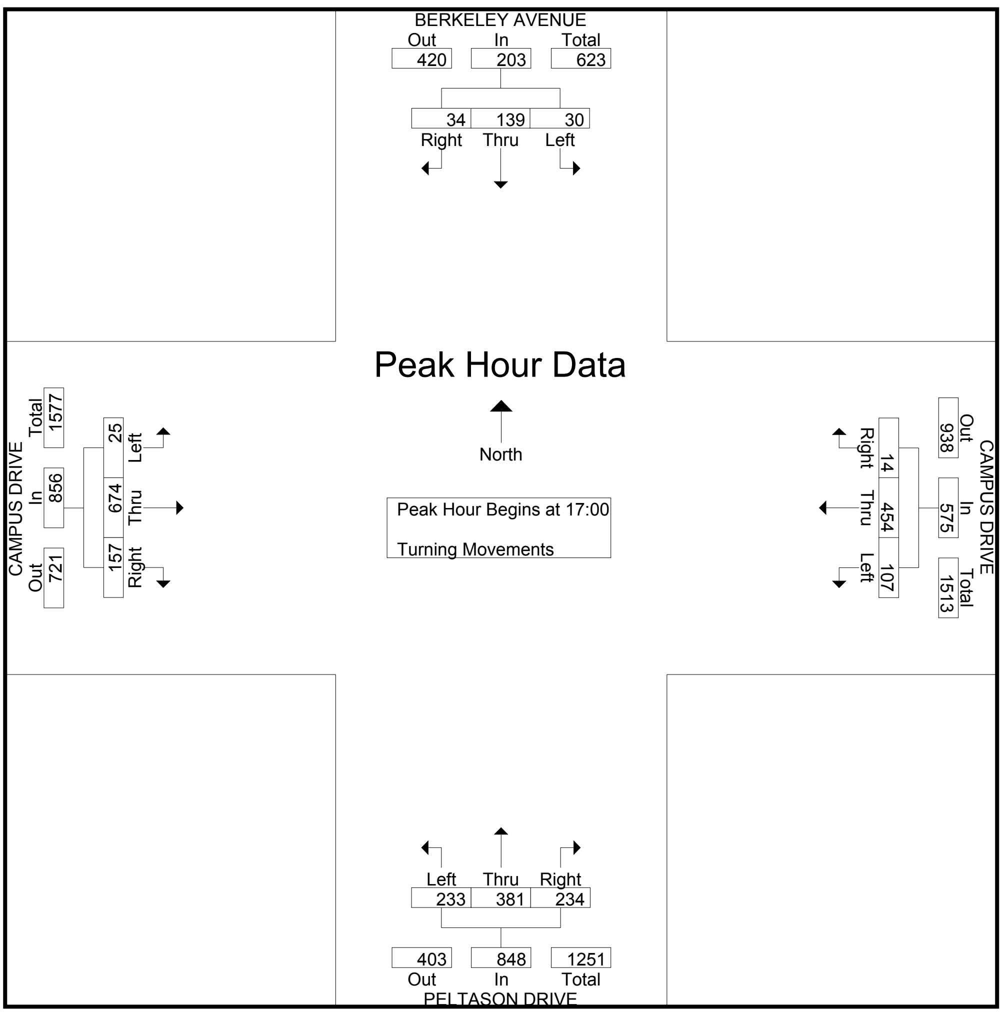
	BERKELEY AVENUE Southbound				CAMPUS DRIVE Westbound				PELTASON DRIVE Northbound				CAMPUS DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	9	36	6	51	2	112	27	141	**74**	109	57	240	28	**192**	**10**	**230**	662
17:15	8	25	**12**	45	**4**	**111**	**30**	**145**	61	**131**	**79**	**271**	41	178	6	225	**686**
17:30	**10**	33	4	47	3	**120**	21	144	47	81	54	182	36	146	4	186	559
17:45	7	**45**	**8**	**60**	**5**	111	29	145	52	60	43	155	**52**	158	5	215	575
Total Volume	34	139	30	203	14	454	107	575	234	381	233	848	157	674	25	856	2482
% App. Total	16.7	68.5	14.8		2.4	79	18.6		27.6	44.9	27.5		18.3	78.7	2.9		
PHF	.850	.772	.625	.846	.700	.946	.892	.991	.791	.727	.737	.782	.755	.878	.625	.930	.905



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: PELTASON DRIVE
E-W Direction: PEREIRA DRIVE

File Name : H1610016
Site Code : 00005701
Start Date : 10/5/2016
Page No : 1

Groups Printed- Turning Movements

	PELTASON DRIVE Southbound			PEREIRA DRIVE Westbound			PELTASON DRIVE Northbound			PEREIRA DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00	2	62	11	6	1	4	15	17	7	1	0	0	126
07:15	9	71	6	3	2	5	9	21	7	2	1	0	136
07:30	22	106	13	6	4	9	11	32	14	5	3	5	230
07:45	22	122	17	20	11	19	9	54	20	1	2	3	300
Total	55	361	47	35	18	37	44	124	48	9	6	8	792
08:00	50	140	31	21	5	13	13	42	36	6	5	18	380
08:15	29	82	10	12	7	9	4	50	28	4	0	6	241
08:30	32	89	8	10	6	13	5	31	27	4	3	6	234
08:45	28	163	14	14	4	18	17	72	28	7	3	8	376
Total	139	474	63	57	22	53	39	195	119	21	11	38	1231
16:00	18	70	6	12	5	17	18	80	12	22	6	28	294
16:15	19	57	16	24	6	15	19	108	14	16	12	38	344
16:30	10	66	10	17	8	12	9	85	7	23	4	28	279
16:45	11	104	20	20	6	15	13	96	2	18	6	24	335
Total	58	297	52	73	25	59	59	369	35	79	28	118	1252
17:00	12	76	17	21	5	14	20	154	13	24	11	36	403
17:15	8	104	21	17	3	13	15	208	5	39	6	38	477
17:30	9	74	8	23	3	9	21	146	15	28	6	28	370
17:45	13	83	18	21	3	17	24	118	12	26	6	27	368
Total	42	337	64	82	14	53	80	626	45	117	29	129	1618
Grand Total	294	1469	226	247	79	202	222	1314	247	226	74	293	4893
Apprch %	14.8	73.9	11.4	46.8	15	38.3	12.5	73.7	13.9	38.1	12.5	49.4	
Total %	6	30	4.6	5	1.6	4.1	4.5	26.9	5	4.6	1.5	6	

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Tustin, CA. 92780

File Name : H1610016
Site Code : 00005701
Start Date : 10/5/2016
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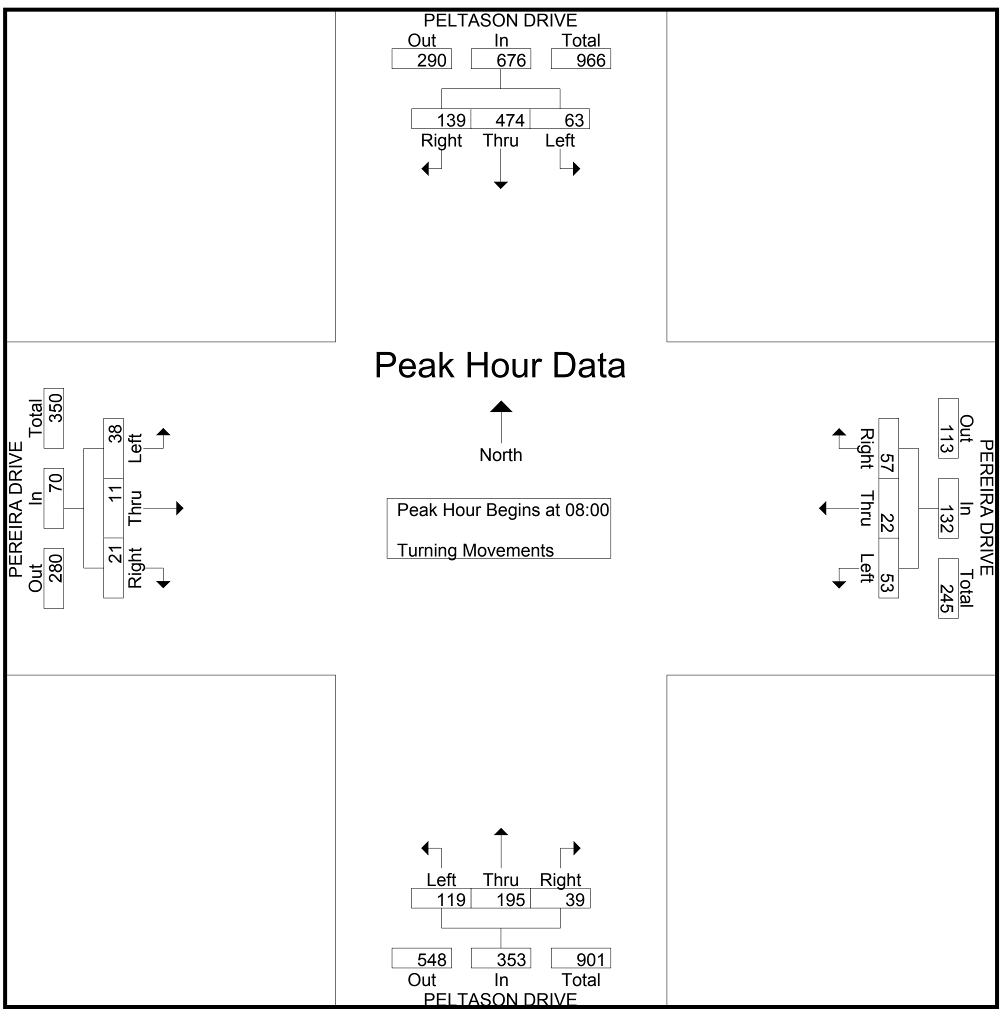
	PELTASON DRIVE Southbound				PEREIRA DRIVE Westbound				PELTASON DRIVE Northbound				PEREIRA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	**50**	140	**31**	**221**	**21**	5	13	**39**	13	42	**36**	**91**	**6**	**5**	**18**	**29**	**380**
08:15	29	82	10	121	12	**7**	9	28	4	50	28	82	4	0	6	10	241
08:30	32	89	8	129	10	6	13	29	5	31	27	63	4	3	6	13	234
08:45	28	**163**	**14**	**205**	**14**	**4**	**18**	36	**17**	**72**	**28**	**117**	**7**	3	8	18	376
Total Volume	139	474	63	676	57	22	53	132	39	195	119	353	21	11	38	70	1231
% App. Total	20.6	70.1	9.3		43.2	16.7	40.2		11	55.2	33.7		30	15.7	54.3		
PHF	.695	.727	.508	.765	.679	.786	.736	.846	.574	.677	.826	.754	.750	.550	.528	.603	.810



File Name : H1610016
Site Code : 00005701
Start Date : 10/5/2016
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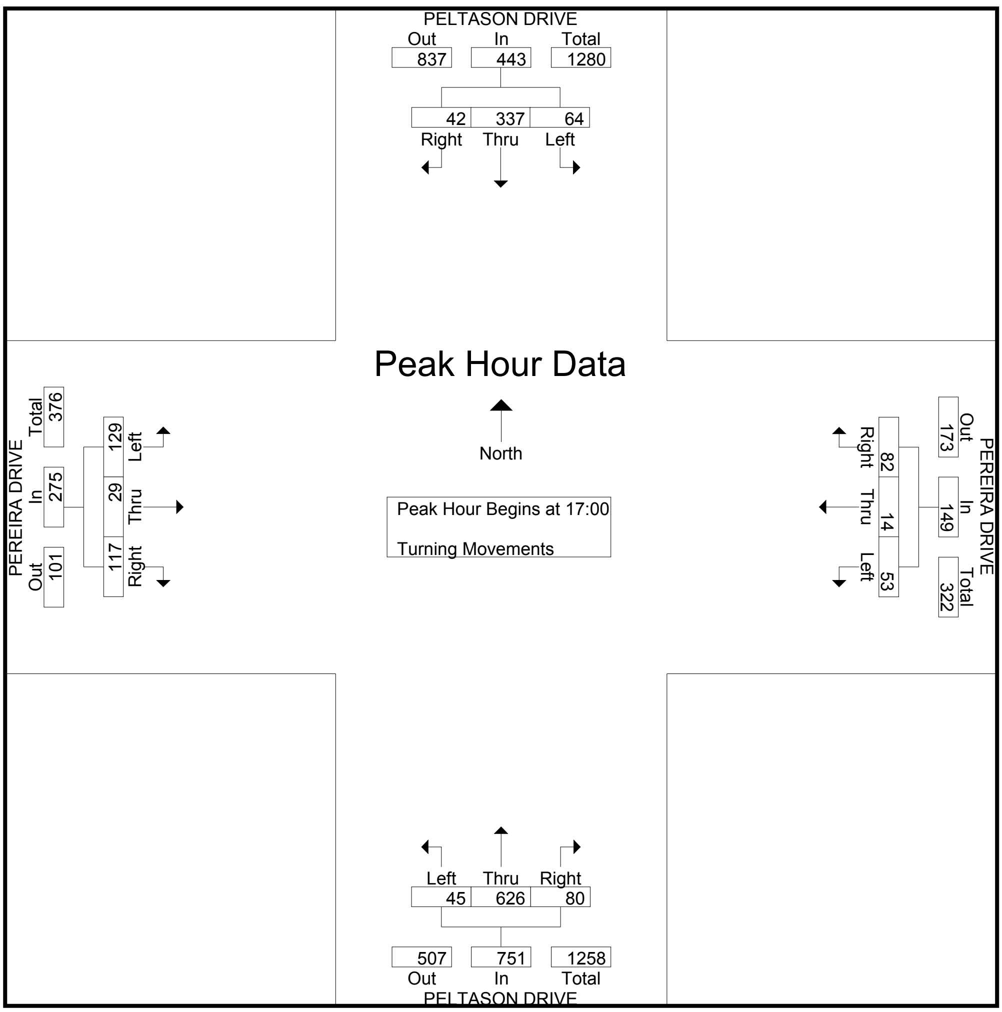
	PELTASON DRIVE Southbound				PEREIRA DRIVE Westbound				PELTASON DRIVE Northbound				PEREIRA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	12	76	17	105	21	**5**	14	40	20	154	13	187	24	**11**	36	71	403
17:15	8	**104**	**21**	**133**	17	3	13	33	15	**208**	**5**	**228**	**39**	6	**38**	**83**	**477**
17:30	9	74	8	91	**23**	3	9	35	21	146	**15**	**182**	**28**	**6**	**28**	**62**	**370**
17:45	**13**						**17**	**41**	**24**								
Total Volume	42	337	64	443	82	14	53	149	80	626	45	751	117	29	129	275	1618
% App. Total	9.5	76.1	14.4		55	9.4	35.6		10.7	83.4	6		42.5	10.5	46.9		
PHF	.808	.810	.762	.833	.891	.700	.779	.909	.833	.752	.750	.823	.750	.659	.849	.828	.848



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: PELTASON DRIVE
E-W Direction: ANTEATER DRIVE

File Name : H1610017
Site Code : 00005701
Start Date : 10/6/2016
Page No : 1

Groups Printed- Turning Movements

	PELTASON DRIVE Southbound			ANTEATER DRIVE Westbound			PELTASON DRIVE Northbound			ANTEATER DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00	8	31	5	7	3	16	11	34	9	0	0	0	124
07:15	19	31	0	10	1	29	15	25	16	3	0	1	150
07:30	65	36	10	11	5	39	13	38	21	5	0	0	243
07:45	98	81	9	19	20	56	17	63	37	5	1	1	407
Total	190	179	24	47	29	140	56	160	83	13	1	2	924
08:00	91	104	12	24	18	85	31	65	28	5	1	2	466
08:15	38	67	12	20	7	42	24	74	19	5	2	6	316
08:30	28	50	21	27	8	58	21	56	14	8	3	1	295
08:45	53	74	21	26	10	59	19	66	19	6	3	3	359
Total	210	295	66	97	43	244	95	261	80	24	9	12	1436
16:00	15	68	31	21	1	39	39	50	6	19	8	30	327
16:15	21	58	41	23	3	27	43	53	3	11	12	24	319
16:30	17	47	26	26	2	28	40	62	8	10	5	36	307
16:45	44	73	41	22	4	34	36	74	10	16	1	36	391
Total	97	246	139	92	10	128	158	239	27	56	26	126	1344
17:00	28	71	42	24	2	50	57	93	6	23	16	68	480
17:15	10	86	42	23	2	39	84	119	4	38	14	74	535
17:30	10	58	56	24	1	36	83	105	1	25	12	65	476
17:45	13	46	55	30	2	31	67	91	2	9	8	43	397
Total	61	261	195	101	7	156	291	408	13	95	50	250	1888
Grand Total	558	981	424	337	89	668	600	1068	203	188	86	390	5592
Apprch %	28.4	50	21.6	30.8	8.1	61.1	32.1	57.1	10.8	28.3	13	58.7	
Total %	10	17.5	7.6	6	1.6	11.9	10.7	19.1	3.6	3.4	1.5	7	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

File Name : H1610017
Site Code : 00005701
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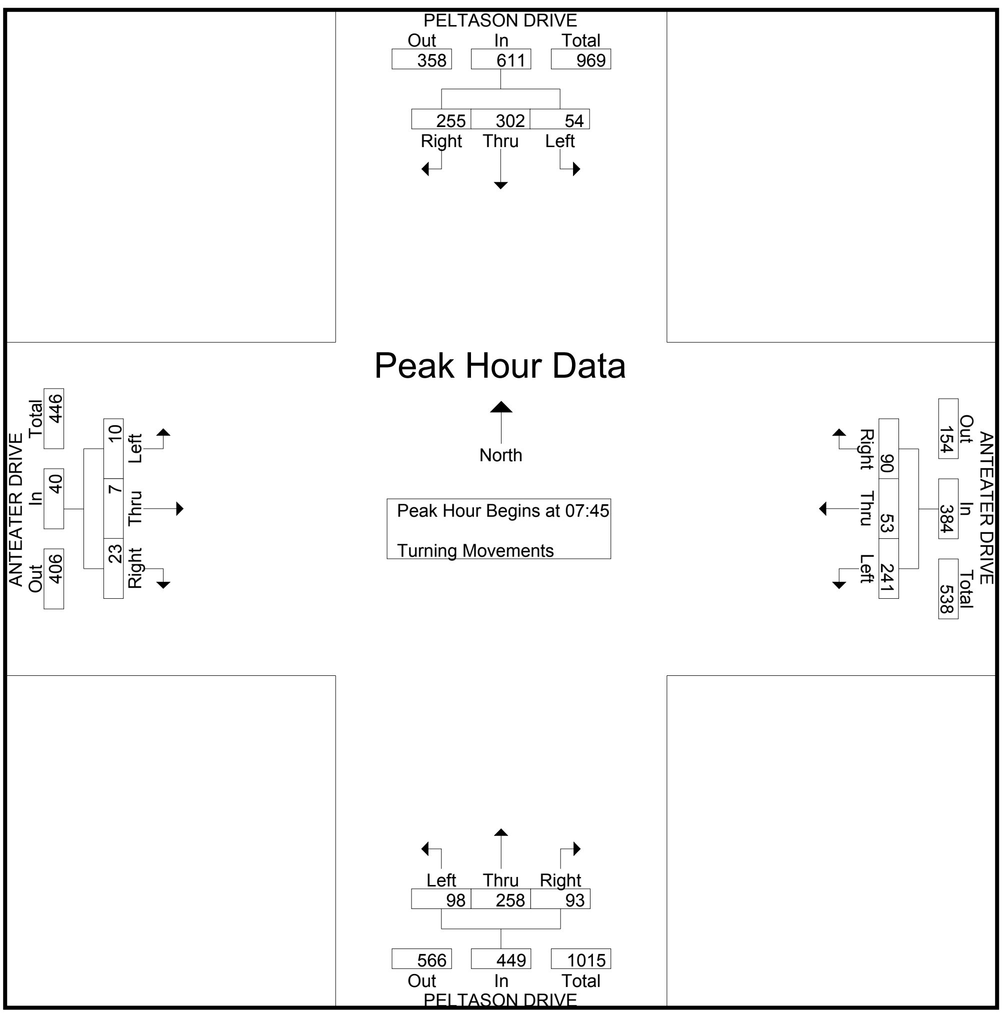
	PELTASON DRIVE Southbound				ANTEATER DRIVE Westbound				PELTASON DRIVE Northbound				ANTEATER DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	**98**	81	9	188	19	**20**	56	95	17	63	**37**	**117**	**5**	**1**	**1**	**7**	**407**
08:00	**91**	**104**	**12**	**207**			**85**	**127**	**31**			**124**					**466**
08:15	38	67	12	117	20	7	42	69	24	**74**	**19**	**117**	**5**	**2**	**6**	**13**	316
08:30	28	50	**21**	**99**	**27**	8	58	93	21	56	14	91	**8**	**3**	1	12	295
Total Volume	255	302	54	611	90	53	241	384	93	258	98	449	23	7	10	40	1484
% App. Total	41.7	49.4	8.8		23.4	13.8	62.8		20.7	57.5	21.8		57.5	17.5	25		
PHF	.651	.726	.643	.738	.833	.663	.709	.756	.750	.872	.662	.905	.719	.583	.417	.769	.796



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

File Name : H1610017
Site Code : 00005701
Start Date : 10/6/2016
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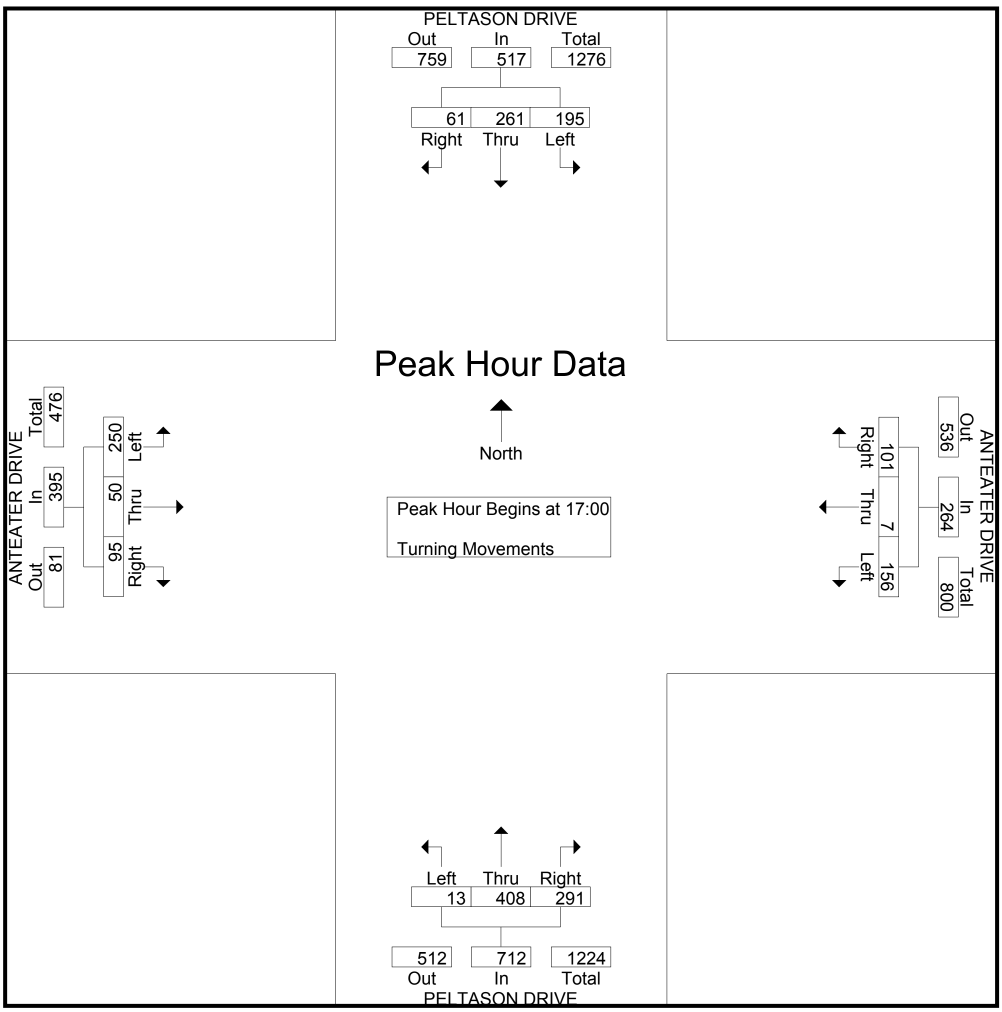
	PELTASON DRIVE Southbound				ANTEATER DRIVE Westbound				PELTASON DRIVE Northbound				ANTEATER DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	**28**	71	42	**141**	24	**2**	**50**	**76**	57	93	**6**	**156**	**23**	**16**	68	107	480
17:15	10	**86**	42	**138**	**23**	**2**	39	64	**84**	**119**	4	**207**	**38**	14	**74**	**126**	**535**
17:30	10	58	**56**	124	**24**	1	36	61	83	105	1	189	25	12	65	102	476
17:45	**13**	**46**	**55**	**114**	**30**												
Total Volume	61	261	195	517	101	7	156	264	291	408	13	712	95	50	250	395	1888
% App. Total	11.8	50.5	37.7		38.3	2.7	59.1		40.9	57.3	1.8		24.1	12.7	63.3		
PHF	.545	.759	.871	.917	.842	.875	.780	.868	.866	.857	.542	.860	.625	.781	.845	.784	.882



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: LOS TRANCOS
E-W Direction: PELTASON DRIVE

File Name : H1610018
Site Code : 00000000
Start Date : 10/4/2016
Page No : 1

Groups Printed- Turning Movements

	TRANCOS DRIVE Southbound			PELTASON DRIVE Westbound			TRANCOS DRIVE Northbound			PELTASON DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00	2	0	0	3	49	3	1	0	21	2	47	2	130
07:15	1	0	1	1	68	3	11	0	31	11	88	1	216
07:30	1	1	3	3	88	2	12	0	27	2	140	4	283
07:45	6	0	4	2	142	5	6	0	36	12	138	9	360
Total	10	1	8	9	347	13	30	0	115	27	413	16	989
08:00	2	0	1	1	106	10	9	0	36	8	111	4	288
08:15	4	0	3	3	95	5	5	0	29	12	86	1	243
08:30	0	0	3	3	109	4	8	0	39	8	102	5	281
08:45	1	1	2	4	149	6	7	0	42	8	106	2	328
Total	7	1	9	11	459	25	29	0	146	36	405	12	1140
16:00	1	0	3	3	81	7	4	0	20	12	84	3	218
16:15	1	1	5	7	75	5	3	0	18	14	86	1	216
16:30	3	0	3	0	93	4	2	1	15	17	130	6	274
16:45	2	1	3	12	125	4	5	0	10	20	164	10	356
Total	7	2	14	22	374	20	14	1	63	63	464	20	1064
17:00	5	2	9	11	177	10	5	1	9	22	179	6	436
17:15	1	2	0	3	131	7	9	1	11	24	168	5	362
17:30	0	0	3	1	101	14	2	0	14	19	157	1	312
17:45	1	0	1	1	70	16	9	0	14	19	190	2	323
Total	7	4	13	16	479	47	25	2	48	84	694	14	1433
Grand Total	31	8	44	58	1659	105	98	3	372	210	1976	62	4626
Apprch %	37.3	9.6	53	3.2	91.1	5.8	20.7	0.6	78.6	9.3	87.9	2.8	
Total %	0.7	0.2	1	1.3	35.9	2.3	2.1	0.1	8	4.5	42.7	1.3	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

File Name : H1610018
Site Code : 00000000
Start Date : 10/4/2016
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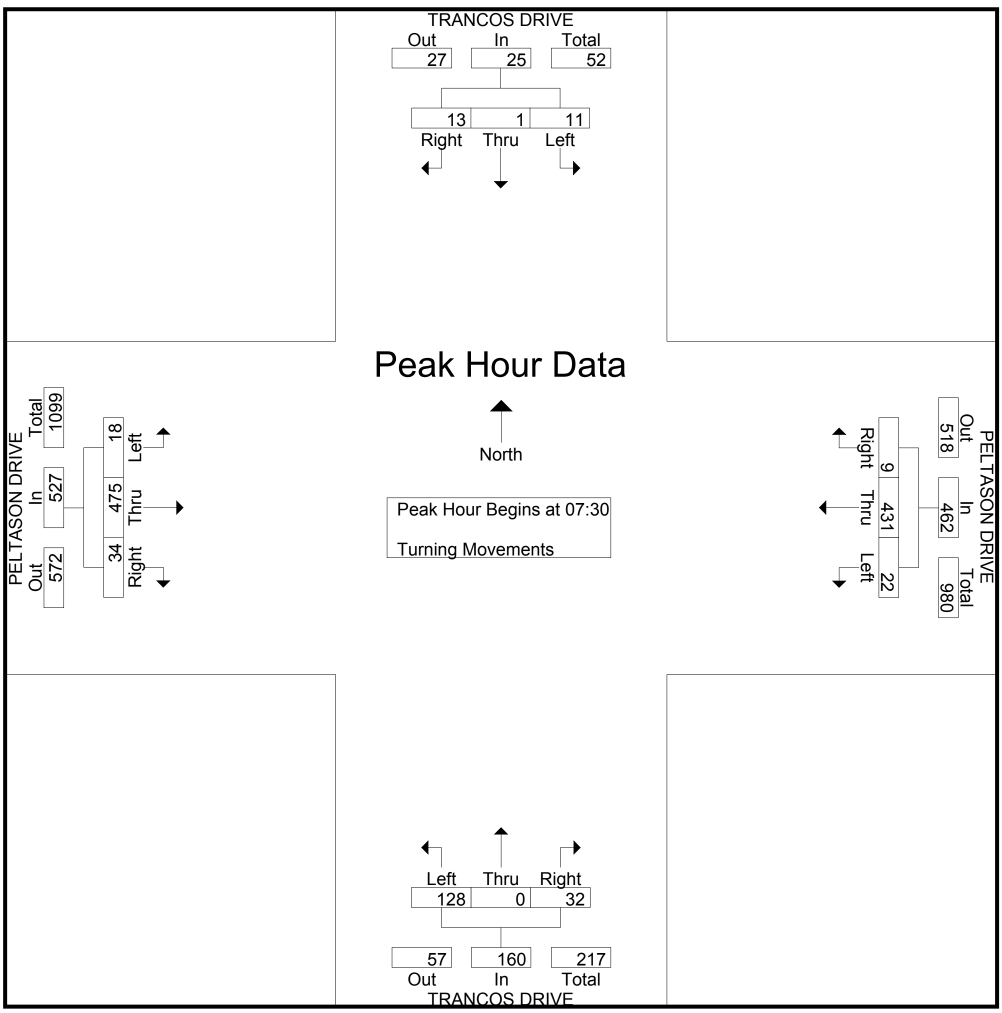
	TRANCOS DRIVE Southbound				PELTASON DRIVE Westbound				TRANCOS DRIVE Northbound				PELTASON DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	1	**1**	3	5	**3**	88	2	93	**12**	0	27	39	2	**140**	4	146	283
07:45	**6**	0	**4**	**10**	2	**142**	5	**149**	6	0	**36**	42	**12**	138	**9**	**159**	**360**
08:00	2	0	1	3	1	106	**10**	117	9	0	36	**45**	8	111	4	123	288
08:15	4	0	3	7	3	95	5	103	5	0	29	34	12	86	1	99	243
Total Volume	13	1	11	25	9	431	22	462	32	0	128	160	34	475	18	527	1174
% App. Total	52	4	44		1.9	93.3	4.8		20	0	80		6.5	90.1	3.4		
PHF	.542	.250	.688	.625	.750	.759	.550	.775	.667	.000	.889	.889	.708	.848	.500	.829	.815



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

File Name : H1610018
Site Code : 00000000
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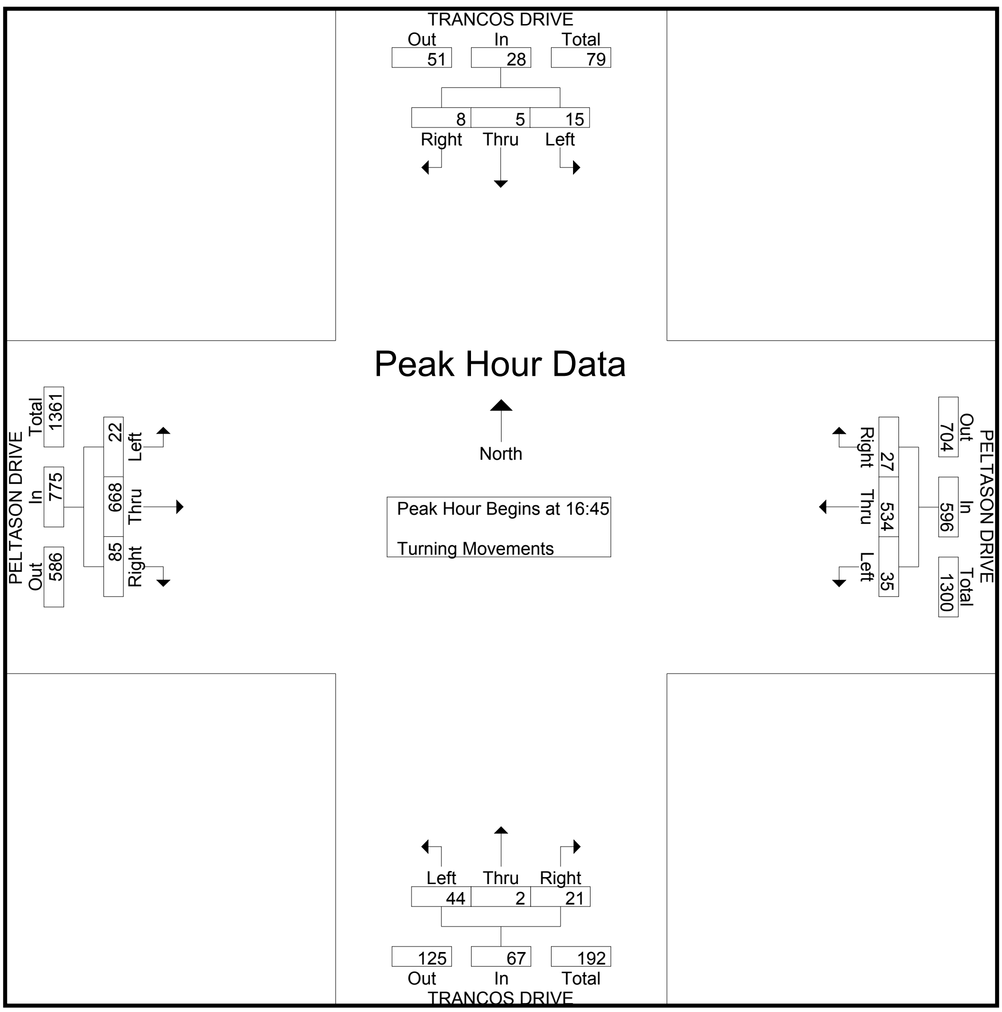
Page No : 3

	TRANCOS DRIVE Southbound				PELTASON DRIVE Westbound				TRANCOS DRIVE Northbound				PELTASON DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	2	1	3	6	**12**	125	4	141	5	0	10	15	20	164	**10**	194	356
17:00	**5**	**2**	**9**	**16**	11	**177**	10	**198**	5	**1**	9	15	22	**179**	6	**207**	**436**
17:15	1	2	0	3	3	131	7	141	**9**	1	11	**21**	**24**	168	5	197	362
17:30	0	0	3	3	1	101	**14**	116	2	0	**14**	16	19	157	1	177	312
Total Volume	8	5	15	28	27	534	35	596	21	2	44	67	85	668	22	775	1466
% App. Total	28.6	17.9	53.6		4.5	89.6	5.9		31.3	3	65.7		11	86.2	2.8		
PHF	.400	.625	.417	.438	.563	.754	.625	.753	.583	.500	.786	.798	.885	.933	.550	.936	.841



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: BONITA CYN/CULVER DR
E-W Direction: SHADY CYN / ANTEATER DR

File Name : H1610019
Site Code : 00000000
Start Date : 10/4/2016
Page No : 1

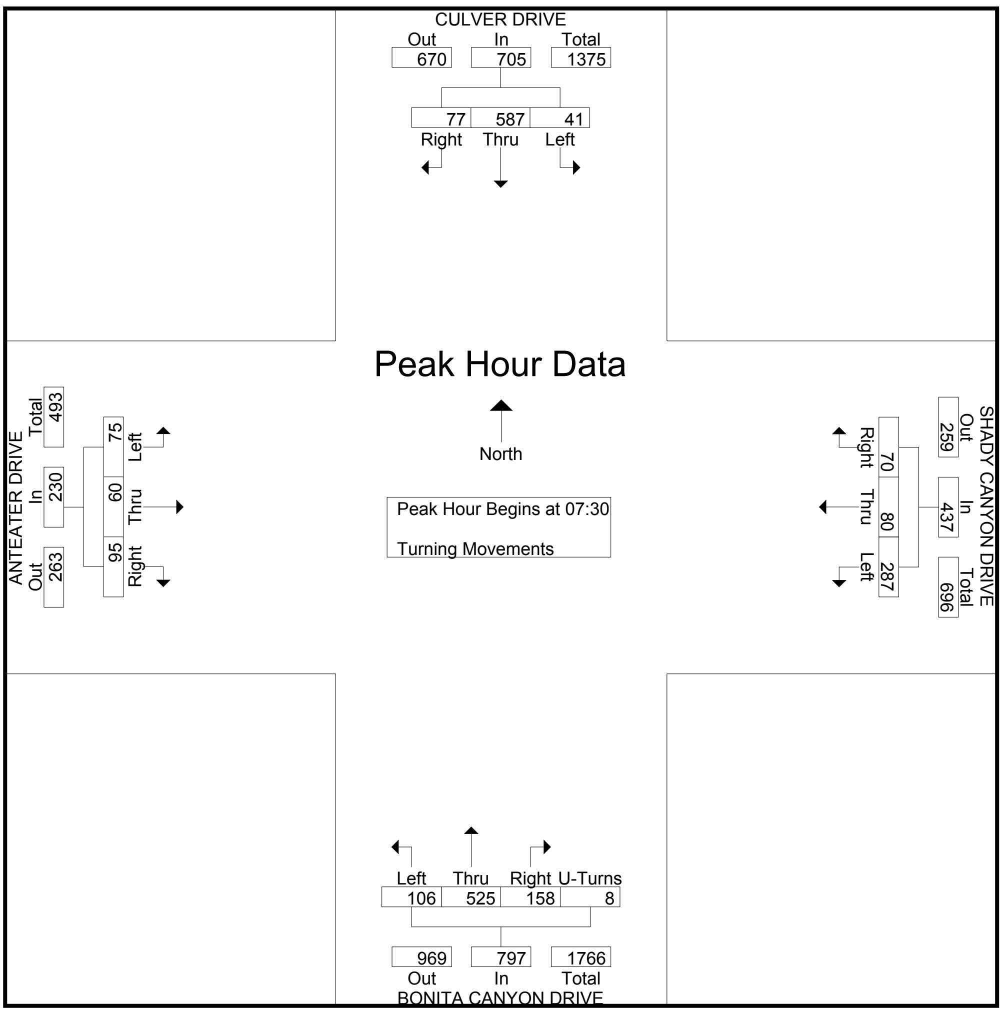
Groups Printed- Turning Movements

	CULVER DRIVE Southbound			SHADY CANYON DRIVE Westbound			BONITA CANYON DRIVE Northbound				ANTEATER DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	U-Turns	Right	Thru	Left	Int. Total
07:00	3	91	13	6	7	29	23	85	5	1	14	2	3	282
07:15	8	118	2	8	5	43	32	115	16	0	16	5	11	379
07:30	15	143	6	18	9	72	36	123	22	1	13	28	36	522
07:45	30	139	17	36	32	84	41	148	37	1	31	8	16	620
Total	56	491	38	68	53	228	132	471	80	3	74	43	66	1803
08:00	15	156	11	6	15	64	49	107	21	4	24	15	12	499
08:15	17	149	7	10	24	67	32	147	26	2	27	9	11	528
08:30	17	152	6	14	20	56	38	143	34	3	24	7	7	521
08:45	23	158	5	6	19	57	43	146	28	0	27	9	10	531
Total	72	615	29	36	78	244	162	543	109	9	102	40	40	2079
16:00	8	142	15	7	6	51	46	166	21	1	22	15	8	508
16:15	18	137	5	8	7	45	55	200	19	2	36	10	10	552
16:30	13	138	11	6	8	54	69	167	15	1	36	23	13	554
16:45	25	154	15	10	5	37	75	234	32	3	55	21	12	678
Total	64	571	46	31	26	187	245	767	87	7	149	69	43	2292
17:00	20	158	14	9	10	52	85	215	34	1	48	19	31	696
17:15	12	180	7	10	16	49	80	256	31	0	56	33	20	750
17:30	18	175	16	5	11	45	98	208	30	1	45	38	20	710
17:45	11	199	13	6	9	36	95	261	32	5	47	26	19	759
Total	61	712	50	30	46	182	358	940	127	7	196	116	90	2915
Grand Total	253	2389	163	165	203	841	897	2721	403	26	521	268	239	9089
Apprch %	9	85.2	5.8	13.6	16.8	69.6	22.2	67.2	10	0.6	50.7	26.1	23.2	
Total %	2.8	26.3	1.8	1.8	2.2	9.3	9.9	29.9	4.4	0.3	5.7	2.9	2.6	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

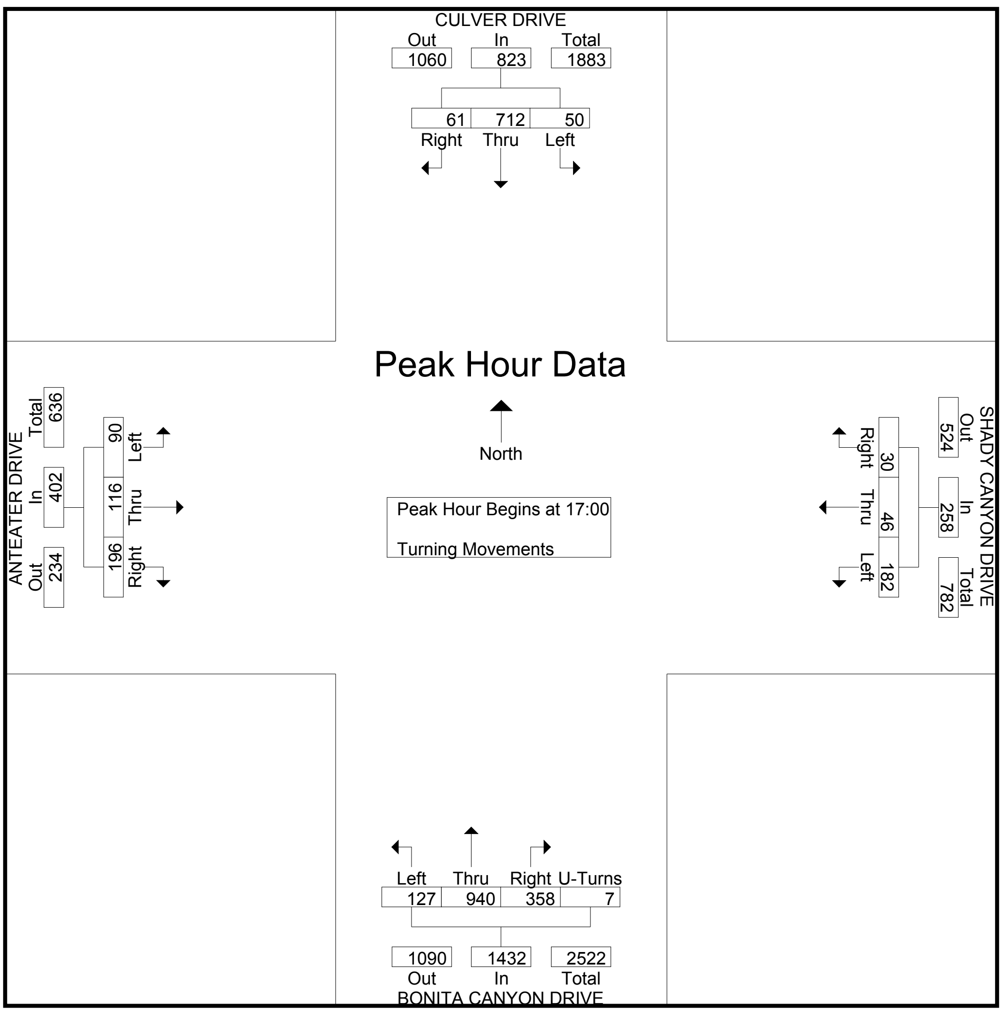
File Name : H1610019
Site Code : 00000000
Start Date : 10/4/2016
Page No : 2

	CULVER DRIVE Southbound				SHADY CANYON DRIVE Westbound				BONITA CANYON DRIVE Northbound					ANTEATER DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turns	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:30																		
07:30	15	143	6	164	18	9	72	99	36	123	22	1	182	13	28	36	77	522
07:45	30	139	**17**	**186**	**36**	**32**	**84**	**152**		**148**	**37**	1	**227**	**31**	8	16	55	**620**
08:00	**15**	**156**	11	182	6	15	64	85	**49**	107	21	**4**	181	24	15	12	51	499
08:15	17	149	7	173	10	24	67	101	32	147	26	2	207	27	9	11	47	528
Total Volume	77	587	41	705	70	80	287	437	158	525	106	8	797	95	60	75	230	2169
% App. Total	10.9	83.3	5.8		16	18.3	65.7		19.8	65.9	13.3	1		41.3	26.1	32.6		
PHF	.642	.941	.603	.948	.486	.625	.854	.719	.806	.887	.716	.500	.878	.766	.536	.521	.747	.875



File Name : H1610019
Site Code : 00000000
Start Date : 10/4/2016
Page No : 3

	CULVER DRIVE Southbound				SHADY CANYON DRIVE Westbound				BONITA CANYON DRIVE Northbound					ANTEATER DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turns	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 17:00																		
17:00	20	158	14	192	9	10	52	71	85	215	34	1	335	48	19	31	98	696
17:15	12	180	7	199	**10**	**16**	49	**75**						**56**	33	20	**109**	750
17:30	18	175	**16**	209	5	11	45	61	**98**	208	30	1	337	45	**38**	20	103	710
17:45	11	**199**	13	**223**						**261**	32	**5**	**393**					**759**
Total Volume	61	712	50	823	30	46	182	258	358	940	127	7	1432	196	116	90	402	2915
% App. Total	7.4	86.5	6.1		11.6	17.8	70.5		25	65.6	8.9	0.5		48.8	28.9	22.4		
PHF	.763	.894	.781	.923	.750	.719	.875	.860	.913	.900	.934	.350	.911	.875	.763	.726	.922	.960



Transportation Studies, Inc.

2640 Walnut Avenue, Suite L
Tustin, CA. 92780

Location	: E. PELTASON DRIVE	Site:	IRVINE
Segment	: S/O CAMPUS DRIVE	Date:	10/04/16
Client	: STANTEC	Day:	Tuesday

Interval	NB				SB				Combined			
Begin	AM		PM		AM		PM		AM		PM	
12:00	16	65	239	736	11	42	144	536	27	107	383	1,272
12:15	18		148		14		138		32		286	
12:30	14		230		8		121		22		351	
12:45	17		119		9		133		26		252	
01:00	7	29	161	563	15	36	108	543	22	65	269	1.106
01:15	13		112		8		122		21		234	
01:30	5		106		8		150		13		256	
01:45	4		184		5		163		9		347	
02:00	3	15	327	721	3	12	87	382	6	27	414	1.103
02:15	6		137		2		83		8		220	
02:30	3		108		4		96		7		204	
02:45	3		149		3		116		6		265	
03:00	1	12	158	701	3	6	132	452	4	18	290	1.153
03:15	6		141		1		150		7		291	
03:30	2		257		1		88		3		345	
03:45	3		145		1		82		4		227	
04:00	1	5	184	711	2	10	84	432	3	15	268	1,143
04:15	1		123		1		100		2		223	
04:30	1		181		1		122		2		303	
04:45	2		223		6		126		8		349	
05:00	8	44	374	1,224	4	34	88	402	12	78	462	1,626
05:15	12		346		8		94		20		440	
05:30	12		218		9		108		21		326	
05:45	12		286		13		112		25		398	
06:00	16	69	296	1,132	17	128	142	541	33	197	438	1,673
06:15	14		240		20		126		34		366	
06:30	15		334		35		135		50		469	
06:45	24		262		56		138		80		400	
07:00	28	264	204	631	59	613	89	341	87	877	293	972
07:15	36		145		106		78		142		223	
07:30	81		158		188		80		269		238	
07:45	119		124		260		94		379		218	
08:00	104	381	200	562	176	571	62	263	280	952	262	825
08:15	84		164		98		74		182		238	
08:30	77		131		120		76		197		207	
08:45	116		67		177		51		293		118	
09:00	88	466	88	537	210	690	52	220	298	1,156	140	757
09:15	112		156		234		62		346		218	
09:30	150		200		138		60		288		260	
09:45	116		93		108		46		224		139	
10:00	94	431	107	245	96	563	42	173	190	994	149	418
10:15	104		52		121		60		225		112	
10:30	87		58		176		44		263		102	
10:45	146		28		170		27		316		55	
11:00	210	650	22	95	96	455	32	101	306	1.105	54	196
11:15	113		28		98		18		211		46	
11:30	163		23		88		37		251		60	
11:45	164		22		173		14		337		36	
Totals	2.431		7.858		3.160		4.386		5.591		12.244	
Split%	43.5		64.2		56.5		35.8					
Day Totals		10.289				7.546				17.835		
Day Splits		57.7				42.3						
Peak Hour	11:00		05:00		08:45		01:00		08:45		06:00	
Volume	650		1.224		759		543		1.225		1.673	
Factor	0.77		0.82		0.81		0.83		0.89		0.89	

Data File : D1610017

Transportation Studies, Inc.

2640 Walnut Avenue, Suite L
Tustin, CA. 92780

Location : E. PELTASON DRIVE — Site: IRVINE
Segment : S/O PEREIRA DRIVE — Date: 10/04/16
Client : STANTEC — Day: Tuesday

Interval Begin	NB AM		NB PM		SB AM		SB PM		Combined AM		Combined PM	
12:00	15	51	135	489	9	37	140	508	24	88	275	997
12:15	15		100		11		124		26		224	
12:30	10		154		11		123		21		277	
12:45	11		100		6		121		17		221	
01:00	3	18	110	400	13	28	108	492	16	46	218	892
01:15	7		86		6		106		13		192	
01:30	2		84		6		142		8		226	
01:45	6		120		3		136		9		256	
02:00	5	12	168	423	3	12	102	366	8	24	270	789
02:15	5		86		3		70		8		156	
02:30	0		85		4		96		4		181	
02:45	2		84		2		98		4		182	
03:00	1	11	110	482	2	6	143	509	3	17	253	991
03:15	4		104		1		162		5		266	
03:30	2		157		1		116		3		273	
03:45	4		111		2		88		6		199	
04:00	2	9	113	478	1	14	96	460	3	23	209	938
04:15	2		100		3		102		5		202	
04:30	1		127		1		128		2		255	
04:45	4		138		9		134		13		272	
05:00	5	34	242	776	12	45	132	479	17	79	374	1,255
05:15	9		210		11		102		20		312	
05:30	9		146		11		121		20		267	
05:45	11		178		11		124		22		302	
06:00	10	74	182	768	18	116	126	499	28	190	308	1,267
06:15	13		172		22		106		35		278	
06:30	21		230		28		142		49		372	
06:45	30		184		48		125		78		309	
07:00	40	264	143	438	54	513	104	375	94	777	247	813
07:15	38		100		92		86		130		186	
07:30	82		104		161		92		243		196	
07:45	104		91		206		93		310		184	
08:00	103	370	132	385	142	500	70	254	245	870	202	639
08:15	89		112		91		70		180		182	
08:30	78		83		113		66		191		149	
08:45	100		58		154		48		254		106	
09:00	96	460	65	356	206	671	48	229	302	1,131	113	585
09:15	118		106		210		67		328		173	
09:30	154		129		149		60		303		189	
09:45	92		56		106		54		198		110	
10:00	86	330	66	177	91	538	37	147	177	868	103	324
10:15	61		49		115		49		176		98	
10:30	78		43		169		39		247		82	
10:45	105		19		163		22		268		41	
11:00	146	425	22	95	82	398	32	90	228	823	54	185
11:15	88		23		82		15		170		38	
11:30	103		28		92		29		195		57	
11:45	88		22		142		14		230		36	
Totals	2,058		5,267		2,878		4,408		4,936		9,675	
Split%	41.7		54.4		58.3		45.6					
Day Totals		7,325				7,286				14,611		
Day Splits		50.1				49.9						
Peak Hour	08:45		05:00		08:45		02:45		08:45		06:00	
Volume	468		776		719		519		1,187		1,267	
Factor	0.76		0.80		0.86		0.80		0.90		0.85	

Data File : D1610018

Transportation Studies, Inc.

2640 Walnut Avenue, Suite L
Tustin, CA. 92780

Location	: PELTASON DRIVE	Site:	IRVINE
Segment	: W/O ANTEATER DRIVE	Date:	10/04/16
Client	: STANTEC		

Interval	EB				WB				Combined				Day:	Tuesday
Begin	AM		PM		AM		PM		AM		PM			
12:00	7	23	52	223	8	27	80	233	15	50	132	456		
12:15	2		48		7		59		9		107			
12:30	9		53		6		43		15		96			
12:45	5		70		6		51		11		121			
01:00	0	7	46	214	2	12	68	203	2	19	114	417		
01:15	3		50		6		42		9		92			
01:30	2		58		1		43		3		101			
01:45	2		60		3		50		5		110			
02:00	1	2	45	214	1	6	59	191	2	8	104	405		
02:15	0		52		1		32		1		84			
02:30	0		61		2		47		2		108			
02:45	1		56		2		53		3		109			
03:00	0	3	39	197	3	7	56	203	3	10	95	400		
03:15	0		35		1		41		1		76			
03:30	2		66		0		50		2		116			
03:45	1		57		3		56		4		113			
04:00	1	6	170	690	1	3	112	398	2	9	282	1,088		
04:15	0		183		0		93		0		276			
04:30	2		167		2		79		4		246			
04:45	3		170		0		114		3		284			
05:00	1	20	154	662	4	22	142	509	5	42	296	1,171		
05:15	8		168		3		126		11		294			
05:30	3		172		4		126		7		298			
05:45	8		168		11		115		19		283			
06:00	8	56	104	341	15	60	128	395	23	116	232	736		
06:15	15		105		11		98		26		203			
06:30	10		68		11		85		21		153			
06:45	23		64		23		84		46		148			
07:00	80	464	44	146	64	319	75	249	144	783	119	395		
07:15	104		31		78		61		182		92			
07:30	120		34		75		64		195		98			
07:45	160		37		102		49		262		86			
08:00	100	439	46	147	132	551	53	199	232	990	99	346		
08:15	84		28		132		50		216		78			
08:30	115		39		138		52		253		91			
08:45	140		34		149		44		289		78			
09:00	107	407	30	96	89	347	35	135	196	754	65	231		
09:15	96		27		85		37		181		64			
09:30	96		12		91		38		187		50			
09:45	108		27		82		25		190		52			
10:00	64	262	18	94	40	163	24	87	104	425	42	181		
10:15	61		26		49		22		110		48			
10:30	69		19		32		20		101		39			
10:45	68		31		42		21		110		52			
11:00	34	184	20	63	46	178	17	62	80	362	37	125		
11:15	42		17		30		23		72		40			
11:30	55		12		44		11		99		23			
11:45	53		14		58		11		111		25			
Totals	1,873		3,087		1,695		2,864		3,568		5,951			
Split%	52.5		51.9		47.5		48.1							
Day Totals		4,960				4,559				9,519				
Day Splits		52.1				47.9								
Peak Hour	07:15		04:00		08:00		05:00		08:00		04:45			
Volume	484		690		551		509		990		1,172			
Factor	0.76		0.94		0.92		0.90		0.86		0.98			

* Data File : D1610019

Transportation Studies, Inc.

2640 Walnut Avenue, Suite L
Tustin, CA. 92780

Location : ANTEATER DRIVE
Segment : S/O E. PELTASON DRIVE
Client : STANTEC

Site: IRVINE
Date: 10/04/16
Day: Tuesday

Interval	NB				SB				Combined			
Begin	AM		PM		AM		PM		AM		PM	
12:00	9	34	63	229	8	37	64	246	17	71	127	475
12:15	6		63		11		67		17		130	
12:30	9		44		8		59		17		103	
12:45	10		59		10		56		20		115	
01:00	3	15	45	214	4	18	58	187	7	33	103	401
01:15	7		66		9		42		16		108	
01:30	0		48		2		41		2		89	
01:45	5		55		3		46		8		101	
02:00	2	8	58	187	4	8	62	191	6	16	120	378
02:15	4		37		1		33		5		70	
02:30	0		37		1		44		1		81	
02:45	2		55		2		52		4		107	
03:00	0	5	51	195	2	6	58	273	2	11	109	468
03:15	0		44		0		62		0		106	
03:30	0		63		2		87		2		150	
03:45	5		37		2		66		7		103	
04:00	0	4	32	218	2	8	70	319	2	12	102	537
04:15	1		54		3		77		4		131	
04:30	0		54		2		84		2		138	
04:45	3		78		1		88		4		166	
05:00	2	24	56	257	1	18	120	515	3	42	176	772
05:15	6		76		3		162		9		238	
05:30	7		64		6		111		13		175	
05:45	9		61		8		122		17		183	
06:00	8	66	61	274	15	52	121	453	23	118	182	727
06:15	19		73		12		118		31		191	
06:30	11		60		14		110		25		170	
06:45	28		80		11		104		39		184	
07:00	30	302	51	191	14	112	102	284	44	414	153	475
07:15	54		51		26		57		80		108	
07:30	74		38		28		59		102		97	
07:45	144		51		44		66		188		117	
08:00	80	369	38	149	56	164	56	226	136	533	94	375
08:15	82		43		28		60		110		103	
08:30	95		35		43		64		138		99	
08:45	112		33		37		46		149		79	
09:00	132	417	37	113	43	161	40	178	175	578	77	291
09:15	132		29		46		46		178		75	
09:30	82		24		52		56		134		80	
09:45	71		23		20		36		91		59	
10:00	69	232	34	74	39	140	41	119	108	372	75	193
10:15	45		17		34		33		79		50	
10:30	56		14		29		25		85		39	
10:45	62		9		38		20		100		29	
11:00	46	205	7	38	56	207	18	62	102	412	25	100
11:15	41		7		46		22		87		29	
11:30	64		15		44		15		108		30	
11:45	54		9		61		7		115		16	
Totals	1,681		2,139		931		3,053		2,612		5,192	
Split%	64.4		41.2		35.6		58.8					
Day Totals		3,820				3,984				7,804		
Day Splits		48.9				51.1						
Peak Hour	08:30		04:45		11:00		05:15		08:30		05:15	
Volume	471		274		207		516		640		778	
Factor	0.89		0.88		0.85		0.80		0.90		0.82	

Data File : D1610020

Appendix B ICU CALCULATION WORKSHEETS

INTERSECTION CAPACITY UTILIZATION

Peak hour intersection volume/capacity ratios are calculated by means of intersection capacity utilization (ICU) values.

The procedure is based on the critical movement methodology, and shows the amount of capacity utilized by each critical move. A capacity of 1,700 vehicles per hour (VPH) per lane is assumed together with a .05 clearance interval for City of Irvine intersections, and a capacity of 1,600 VPH is assumed for the City of Newport Beach intersection. A "de-facto" right-turn lane is used in the ICU calculation for cases where a curb lane is wide enough to separately serve both through and right-turn traffic (i.e., with a width of 19 feet from curb to outside of through-lane with parking prohibited during peak periods). Such lanes are treated the same as striped right-turn lanes during the ICU calculations, but they are denoted on the ICU calculation worksheets using the letter "d" in place of a numerical entry for right-turn lanes.

The methodology also incorporates a check for right-turn capacity utilization. Both right-turn-on-green (RTOG) and right-turn-on-red (RTOR) capacity availability are calculated and checked against the total right-turn capacity need. If insufficient capacity is available, then an adjustment is made to the total capacity utilization value. The following example shows how this adjustment is made.

Example for Northbound Right

<u>1. Right-Turn-On-Green (RTOG)</u>

If NBT is critical move, then:

RTOG = V/C (NBT)

Otherwise,

RTOG = V/C (NBL) + V/C (SBT) - V/C (SBL)

<u>2. Right-Turn-On-Red (RTOR)</u>

If WBL is critical move, then:

RTOR = V/C (WBL)

Otherwise,

RTOR = V/C (EBL) + V/C (WBT) - V/C (EBT)

3. Right-Turn Overlap Adjustment

If the northbound right is assumed to overlap with the adjacent westbound left, adjustments to the RTOG and RTOR values are made as follows:

RTOG = RTOG + V/C (WBL)

RTOR = RTOR - V/C (WBL)

4. Total Right-Turn Capacity (RTC) Availability for NBR

RTC = RTOG + factor x RTOR

Where factor = RTOR saturation flow factor (75%)

Right-turn adjustment is then as follows:

Additional ICU = V/C (NBR) - RTC

A zero or negative value indicates that adequate capacity is available and no adjustment is necessary. A positive value indicates that the available RTOR and RTOG capacity does not adequately accommodate the right-turn V/C; therefore, the right-turn is essentially considered to be a critical movement. In such cases, the right-turn adjustment is noted on the ICU worksheet and it is included in the total capacity utilization value. When it is determined that a right-turn adjustment is required for more than one right-turn movement, the word "multi" is printed on the worksheet instead of an actual right-turn movement reference, and the right-turn adjustments are cumulatively added to the total capacity utilization value. In such cases, further operational evaluation is typically carried out to determine if under actual operational conditions, the critical right-turns would operate simultaneously, and therefore a right-turn adjustment credit should be applied.

Shared Lane V/C Methodology

For intersection approaches where shared usage of a lane is permitted by more than one turn movement (e.g., left/through, through/right, left/through/right), the individual turn volumes are evaluated to determine whether dedication of the shared lane is warranted to any one given turn movement. The following example demonstrates how this evaluation is carried out:

Example for Shared Left/Through Lane

1. Average Lane Volume (ALV)

$$\text{ALV} = \frac{\text{Left-Turn Volume + Through Volume}}{\text{Total Left + Through Approach Lanes (including shared lane)}}$$

2. ALV for Each Approach

$$\text{ALV (Left)} = \frac{\text{Left-Turn Volume}}{\text{Left Approach Lanes (including shared lane)}}$$

$$\text{ALV (Through)} = \frac{\text{Through Volume}}{\text{Through Approach Lanes (including shared lane)}}$$

3. Lane Dedication is Warranted

If ALV (Left) is greater than ALV, then full dedication of the shared lane to the left-turn approach is warranted. Left-turn and through V/C ratios for this case are calculated as follows:

$$\text{V/C (Left)} = \frac{\text{Left-Turn Volume}}{\text{Left Approach Capacity (including shared lane)}}$$

$$\text{V/C (Through)} = \frac{\text{Through Volume}}{\text{Through Approach Capacity (excluding shared lane)}}$$

Similarly, if ALV (Through) is greater than ALV then full dedication to the through approach is warranted, and left-turn and through V/C ratios are calculated as follows:

$$\text{V/C (Left)} = \frac{\text{Left-Turn Volume}}{\text{Left Approach Capacity (excluding shared lane)}}$$

$$\text{V/C (Through)} = \frac{\text{Through Volume}}{\text{Through Approach Capacity (including shared lane)}}$$

4. Lane Dedication is not Warranted

If ALV (Left) and ALV (Through) are both less than ALV, the left/through lane is assumed to be truly shared and each left, left/through or through approach lane carries an evenly distributed volume of traffic equal to ALV. A combined left/through V/C ratio is calculated as follows:

$$\text{V/C (Left/Through)} = \frac{\text{Left-Turn Volume + Through Volume}}{\text{Total Left + Through Approach Capacity (including shared lane)}}$$

This V/C (Left/Through) ratio is assigned as the V/C (Through) ratio for the critical movement analysis and ICU summary listing.

If split phasing has not been designated for this approach, the relative proportion of V/C (Through) that is attributed to the left-turn volume is estimated as follows:

If approach has more than one left-turn lane (including shared lane), then:

V/C (Left) = V/C (Through)

If approach has only one left-turn lane (shared lane), then:

$$\text{V/C (Left)} = \frac{\text{Left-Turn Volume}}{\text{Single Approach Lane Capacity}}$$

If this left-turn movement is determined to be a critical movement, the V/C (Left) value is posted in brackets on the ICU summary printout.

These same steps are carried out for shared through/right lanes. If full dedication of a shared through/right lane to the right-turn movement is warranted, the right-turn V/C value calculated in step three is checked against the RTOR and RTOG capacity availability if the option to include right-turns in the V/C ratio calculations is selected. If the V/C value that is determined using the shared lane methodology described here is reduced due to RTOR and RTOG capacity availability, the V/C value for the through/right lanes is posted in brackets.

When an approach contains more than one shared lane (e.g., left/through and through/right), steps one and two listed above are carried out for the three turn movements combined. Step four is carried out if dedication is not warranted for either of the shared lanes. If dedication of one of the shared lanes is warranted to one movement or another, step three is carried out for the two movements involved, and then steps one through four are repeated for the two movements involved in the other shared lane.

1. E Peltason/Berkeley & Campus

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	115	.07*	233	.14*
NBT	2	3400	110	.03	381	.11
NBR	d	1700	63	.04	234	.14
SBL	1	1700	57	.03	30	.02
SBT	2	3400	309	.09*	139	.04*
SBR	d	1700	21	.01	34	.02
EBL	1	1700	11	.01	25	.01
EBT	2	3400	188	.06*	674	.20*
EBR	d	1700	183	.11	157	.09
WBL	1	1700	214	.13*	107	.06*
WBT	2	3400	524	.15	454	.13
WBR	d	1700	7	.00	14	.01
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.40**		**.49**

Existing + Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	116	.07*	234	.14*
NBT	2	3400	111	.03	382	.11
NBR	d	1700	64	.04	234	.14
SBL	1	1700	57	.03	30	.02
SBT	2	3400	310	.09*	140	.04*
SBR	d	1700	21	.01	34	.02
EBL	1	1700	11	.01	25	.01
EBT	2	3400	188	.06*	674	.20*
EBR	d	1700	183	.11	158	.09
WBL	1	1700	214	.13*	108	.06*
WBT	2	3400	524	.15	454	.13
WBR	d	1700	7	.00	14	.01
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.40**		**.49**

2035 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	70	.04*	220	.13*
NBT	2	3400	80	.02	450	.13
NBR	d	1700	110	.06	310	.18
SBL	1	1700	20	.01	50	.03
SBT	2	3400	260	.08*	190	.06*
SBR	d	1700	30	.02	40	.02
EBL	1	1700	10	.01*	40	.02
EBT	2	3400	270	.08	900	.26*
EBR	d	1700	80	.05	170	.10
WBL	1	1700	230	.14	140	.08*
WBT	2	3400	750	.22*	780	.23
WBR	d	1700	20	.01	20	.01
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.40**		**.58**

2035 with-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	71	.04*	221	.13*
NBT	2	3400	82	.02	451	.13
NBR	d	1700	111	.07	311	.18
SBL	1	1700	20	.01	50	.03
SBT	2	3400	261	.08*	192	.06*
SBR	d	1700	30	.02	40	.02
EBL	1	1700	10	.01*	40	.02
EBT	2	3400	270	.08	900	.26*
EBR	d	1700	80	.05	171	.10
WBL	1	1700	230	.14	141	.08*
WBT	2	3400	750	.22*	780	.23
WBR	d	1700	20	.01	20	.01
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.40**		**.58**

2. E Peltason & Pereira

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	119	.07*	45	.03
NBT	2	3400	195	.07	626	.21*
NBR	0	0	39		80	
SBL	1	1700	63	.04	64	.04*
SBT	2	3400	474	.18*	337	.11
SBR	0	0	139		42	
EBL	0	0	38	{.02}*	129	{.08}*
EBT	2	3400	11	.02	29	.06
EBR	0	0	21	.01	117	.07
WBL	0	0	53		53	
WBT	2	3400	22	.03*	14	.02*
WBR	0	0	57	.03	82	.05
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.35**		**.40**

Existing + Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	119	.07*	45	.03
NBT	2	3400	198	.07	628	.21*
NBR	0	0	39		80	
SBL	1	1700	63	.04	64	.04*
SBT	2	3400	475	.18*	340	.11
SBR	0	0	139		42	
EBL	0	0	38	{.02}*	129	{.08}*
EBT	2	3400	11	.02	29	.06
EBR	0	0	21	.01	117	.07
WBL	0	0	53		53	
WBT	2	3400	22	.03*	14	.02*
WBR	0	0	57	.03	82	.05
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.35**		**.40**

2035 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	190	.11*	90	.05
NBT	2	3400	630	.20	710	.25*
NBR	0	0	60		130	
SBL	1	1700	80	.05	60	.04*
SBT	2	3400	710	.26*	640	.23
SBR	0	0	170		140	
EBL	0	0	20	{.01}*	270	{.16}*
EBT	2	3400	20	.02	110	.14
EBR	0	0	40	.02	140	.08
WBL	0	0	60		10	
WBT	2	3400	90	.07*	50	.02*
WBR	0	0	80		10	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.50**		**.52**

2035 with-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	190	.11*	90	.05
NBT	2	3400	634	.20	713	.25*
NBR	0	0	60		130	
SBL	1	1700	80	.05	60	.04*
SBT	2	3400	711	.26*	644	.23
SBR	0	0	170		140	
EBL	0	0	20	{.01}*	270	{.16}*
EBT	2	3400	20	.02	110	.14
EBR	0	0	40	.02	140	.08
WBL	0	0	60		10	
WBT	2	3400	90	.07*	50	.02*
WBR	0	0	80		10	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.50**		**.52**

3. Anteater & E Peltason

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	241	.14*	156	.09*
NBT	1	1700	53	.03	7	.00
NBR	1	1700	90	.05	101	.06
SBL	1	1700	10	.01	250	.15
SBT	1	1700	7	.02*	50	.09*
SBR	0	0	23		95	
EBL	1	1700	98	.06*	13	.01
EBT	1	1700	258	.15	408	.24*
EBR	1	1700	93	.05	291	.17
WBL	1	1700	54	.03	195	.11*
WBT	2	3400	302	.16*	261	.09
WBR	0	0	255		61	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.43**		**.58**

Existing + Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	241	.14*	156	.09*
NBT	1	1700	54	.03	9	.01
NBR	1	1700	90	.05	101	.06
SBL	1	1700	13	.01	252	.15
SBT	1	1700	9	.02*	52	.09*
SBR	0	0	23		95	
EBL	1	1700	98	.06*	13	.01
EBT	1	1700	258	.15	408	.24*
EBR	1	1700	93	.05	291	.17
WBL	1	1700	54	.03	195	.11*
WBT	2	3400	302	.16*	261	.10
WBR	0	0	256		64	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.43**		**.58**

2035 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	220	.13*	240	.14*
NBT	1	1700	40	.02	10	.01
NBR	1	1700	460	.27	360	.21
SBL	1	1700	20	.01	280	.16
SBT	1	1700	10	.01*	50	.11*
SBR	0	0	10		130	
EBL	1	1700	80	.05*	20	.01
EBT	2	3400	90	.03	620	.20*
EBR	0	0	10		50	
WBL	1	1700	50	.03	460	.27*
WBT	2	3400	500	.21*	210	.08
WBR	0	0	230		70	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.45**		**.77**

2035 with-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	220	.13*	240	.14*
NBT	1	1700	41	.02	12	.01
NBR	1	1700	460	.27	360	.21
SBL	1	1700	24	.01	283	.17
SBT	1	1700	13	.01*	52	.11*
SBR	0	0	11		130	
EBL	1	1700	80	.05*	21	.01
EBT	2	3400	90	.03	620	.20*
EBR	0	0	10		50	
WBL	1	1700	50	.03	460	.27*
WBT	2	3400	500	.22*	210	.08
WBR	0	0	231		74	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.46**		**.77**

4. Los Trancos & E Peltason

2035 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	120		40	
NBT	1	1700	10	.11*	10	.05*
NBR	0	0	50		30	
SBL	0	0	10	{.01}*	10	{.01}*
SBT	1	1700	0	.02	0	.01
SBR	0	0	20		10	
EBL	1	1700	30	.02*	20	.01
EBT	1	1700	490	.31	1110	.71*
EBR	0	0	30		90	
WBL	1	1700	30	.02	30	.02*
WBT	1	1700	810	.49*	610	.37
WBR	0	0	20		20	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.68**		**.84**

2035 with-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	120		40	
NBT	1	1700	10	.11*	10	.05*
NBR	0	0	50		30	
SBL	0	0	10	{.01}*	10	{.01}*
SBT	1	1700	0	.02	0	.01
SBR	0	0	20		10	
EBL	1	1700	30	.02*	20	.01
EBT	1	1700	490	.31	1111	.71*
EBR	0	0	30		90	
WBL	1	1700	30	.02	30	.02*
WBT	1	1700	811	.49*	610	.37
WBR	0	0	20		20	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.68**		**.84**

5. **Anteater/Shady Canyon & Culver/Bonita Canyon_(s**

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	287	.08	182	.05
NBT	1	1700	80	.09*	46	.04*
NBR	0	0	70		30	
SBL	1	1700	75	.04*	90	.05*
SBT	2	3400	60	.02	116	.03
SBR	1	1700	95	.06	196	.12
EBL	2	3400	114	.03*	134	.04
EBT	2	3400	525	.15	940	.28*
EBR	1	1700	158	.09	358	.21
WBL	1	1700	41	.02	50	.03*
WBT	2	3400	587	.17*	712	.21
WBR	1	1700	77	.05	61	.04
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.38**		**.45**

Existing + Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	287	.08	182	.05
NBT	1	1700	80	.09*	46	.04*
NBR	0	0	70		30	
SBL	1	1700	75	.04*	90	.05*
SBT	2	3400	60	.02	116	.03
SBR	1	1700	97	.06	198	.12
EBL	2	3400	115	.03*	136	.04
EBT	2	3400	525	.15	940	.28*
EBR	1	1700	158	.09	358	.21
WBL	1	1700	41	.02	50	.03*
WBT	2	3400	587	.17*	712	.21
WBR	1	1700	77	.05	61	.04
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.38**		**.45**

2035 No-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	50	.01	80	.02
NBT	1	1700	30	.11*	130	.31*
NBR	0	0	150		400	
SBL	1	1700	380	.22*	200	.12*
SBT	2	3400	100	.03	30	.01
SBR	1	1700	70	.04	30	.02
EBL	2	3400	30	.01	40	.01
EBT	2	3400	820	.24*	910	.27*
EBR	1	1700	100	.06	50	.03
WBL	1	1700	300	.18*	150	.09*
WBT	2	3400	910	.27	890	.26
WBR	1	1700	230	.14	290	.17
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.80**		**.84**

2035 with-Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	50	.01	80	.02
NBT	1	1700	30	.11*	130	.31*
NBR	0	0	150		400	
SBL	1	1700	380	.22*	200	.12*
SBT	2	3400	100	.03	30	.01
SBR	1	1700	73	.04	32	.02
EBL	2	3400	31	.01	42	.01
EBT	2	3400	820	.24*	910	.27*
EBR	1	1700	100	.06	50	.03
WBL	1	1700	300	.18*	150	.09*
WBT	2	3400	910	.27	890	.26
WBR	1	1700	230	.14	290	.17
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.80**		**.84**

Appendix C HCM DELAY CALCULATION WORKSHEETS

Intersection	
Intersection Delay, s/veh	57.2
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	18	475	34	0	22	431	9	0	128	0	32
Future Vol, veh/h	0	18	475	34	0	22	431	9	0	128	0	32
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	22	586	42	0	27	532	11	0	158	0	40
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	81.7	46.3	15
HCM LOS	F	E	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	80%	100%	0%	100%	0%	44%
Vol Thru, %	0%	0%	93%	0%	98%	4%
Vol Right, %	20%	0%	7%	0%	2%	52%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	160	18	509	22	440	25
LT Vol	128	18	0	22	0	11
Through Vol	0	0	475	0	431	1
RT Vol	32	0	34	0	9	13
Lane Flow Rate	198	22	628	27	543	31
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.39	0.042	1.078	0.051	0.934	0.066
Departure Headway (Hd)	7.386	6.731	6.174	6.905	6.38	7.99
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	490	531	584	522	570	451
Service Time	5.386	4.486	3.929	4.605	4.08	5.99
HCM Lane V/C Ratio	0.404	0.041	1.075	0.052	0.953	0.069
HCM Control Delay	15	9.8	84.2	10	48.1	11.6
HCM Lane LOS	B	A	F	A	E	B
HCM 95th-tile Q	1.8	0.1	18.4	0.2	11.9	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	11	1	13
Future Vol, veh/h	0	11	1	13
Peak Hour Factor	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	14	1	16
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	11.6
HCM LOS	B

Intersection	
Intersection Delay, s/veh	129.8
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	22	668	85	0	35	534	27	0	44	2	21
Future Vol, veh/h	0	22	668	85	0	35	534	27	0	44	2	21
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	26	795	101	0	42	636	32	0	52	2	25
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	194.3	64.7	12.3
HCM LOS	F	F	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	66%	100%	0%	100%	0%	54%
Vol Thru, %	3%	0%	89%	0%	95%	18%
Vol Right, %	31%	0%	11%	0%	5%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	67	22	753	35	561	28
LT Vol	44	22	0	35	0	15
Through Vol	2	0	668	0	534	5
RT Vol	21	0	85	0	27	8
Lane Flow Rate	80	26	896	42	668	33
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.157	0.045	1.384	0.07	1.029	0.067
Departure Headway (Hd)	7.813	6.262	5.675	6.489	5.947	8.098
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	462	575	645	555	614	445
Service Time	5.813	3.962	3.375	4.189	3.647	6.098
HCM Lane V/C Ratio	0.173	0.045	1.389	0.076	1.088	0.074
HCM Control Delay	12.3	9.3	199.7	9.7	68.1	11.7
HCM Lane LOS	B	A	F	A	F	B
HCM 95th-tile Q	0.6	0.1	38.9	0.2	16.4	0.2

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Lane Configurations			✥	
Traffic Vol, veh/h	0	15	5	8
Future Vol, veh/h	0	15	5	8
Peak Hour Factor	0.84	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	18	6	10
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	11.7
HCM LOS	B

Intersection	
Intersection Delay, s/veh	57.2
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	18	475	34	0	22	431	9	0	128	0	32
Future Vol, veh/h	0	18	475	34	0	22	431	9	0	128	0	32
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Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	22	586	42	0	27	532	11	0	158	0	40
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	81.7	46.3	15
HCM LOS	F	E	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	80%	100%	0%	100%	0%	44%
Vol Thru, %	0%	0%	93%	0%	98%	4%
Vol Right, %	20%	0%	7%	0%	2%	52%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	160	18	509	22	440	25
LT Vol	128	18	0	22	0	11
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Degree of Util (X)	0.39	0.042	1.078	0.051	0.934	0.066
Departure Headway (Hd)	7.386	6.731	6.174	6.905	6.38	7.99
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	490	531	584	522	570	451
Service Time	5.386	4.486	3.929	4.605	4.08	5.99
HCM Lane V/C Ratio	0.404	0.041	1.075	0.052	0.953	0.069
HCM Control Delay	15	9.8	84.2	10	48.1	11.6
HCM Lane LOS	B	A	F	A	E	B
HCM 95th-tile Q	1.8	0.1	18.4	0.2	11.9	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	11	1	13
Future Vol, veh/h	0	11	1	13
Peak Hour Factor	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	14	1	16
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	11.6
HCM LOS	B

Intersection	
Intersection Delay, s/veh	129.8
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	22	668	85	0	35	534	27	0	44	2	21
Future Vol, veh/h	0	22	668	85	0	35	534	27	0	44	2	21
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	26	795	101	0	42	636	32	0	52	2	25
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	194.3	64.7	12.3
HCM LOS	F	F	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	66%	100%	0%	100%	0%	54%
Vol Thru, %	3%	0%	89%	0%	95%	18%
Vol Right, %	31%	0%	11%	0%	5%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	67	22	753	35	561	28
LT Vol	44	22	0	35	0	15
Through Vol	2	0	668	0	534	5
RT Vol	21	0	85	0	27	8
Lane Flow Rate	80	26	896	42	668	33
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.157	0.045	1.384	0.07	1.029	0.067
Departure Headway (Hd)	7.813	6.262	5.675	6.489	5.947	8.098
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	462	575	645	555	614	445
Service Time	5.813	3.962	3.375	4.189	3.647	6.098
HCM Lane V/C Ratio	0.173	0.045	1.389	0.076	1.088	0.074
HCM Control Delay	12.3	9.3	199.7	9.7	68.1	11.7
HCM Lane LOS	B	A	F	A	F	B
HCM 95th-tile Q	0.6	0.1	38.9	0.2	16.4	0.2

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	15	5	8
Future Vol, veh/h	0	15	5	8
Peak Hour Factor	0.84	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	18	6	10
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	11.7
HCM LOS	B

Appendix D STUDENT HOUSING TRIP RATES DERIVATION

Table D- 1 Student Housing Trip Rates and Trip Generation Derivation

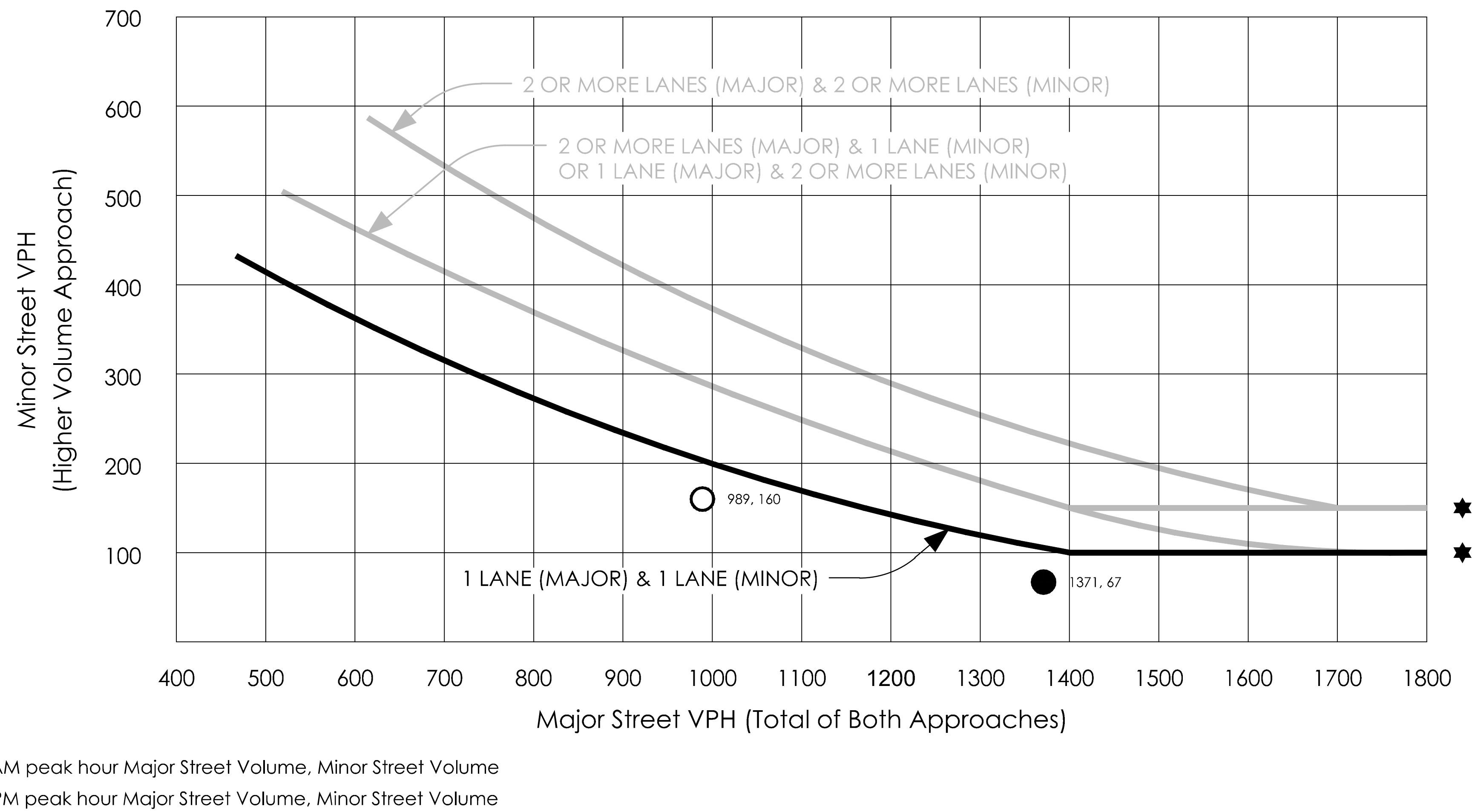
ADT Trip Rate for Undergraduate Dormitory					
Land Use	**Unit**	**Rate 1**	**Rate 2**	**Rate 1 Description**	**Rate 2 Description**
Undergrad Dorm	Bed	.192	.012	Non-academic vehicle trips (Off-Campus)	Internal academic vehicle trips (On-Campus)
Source: UCI Main Campus Traffic Model Note: the ADT trip rate for Single Undergraduate Housing category in the Long Range Development Plan (LRDP) is 1.6 per Bed with a car for Rate 1 and .10 for Rate 2. A vehicle ownership factor of .12 was applied to 1.6 (Rate 1) and .10 (Rate 2) to derive the trip rates shown above.					

Peak Hour Trip Rates (Percent of ADT)				
	AM Peak Hour		**PM Peak Hour**	
Description	**Inbound**	**Outbound**	**Inbound**	**Outbound**
Residence	0.5%	5.3%	4.6%	2.8%
Note: The trip distribution derived is for average weekday vehicle trips.				

Project ADT Trip Generation				
Land Use	**Amount**	**Unit**	**Rate 1 Vehicle Trips (Off-Campus)**	**Rate 2 Vehicle Trips (On-Campus)**
Undergrad Dorm	500	Bed	96	6

Project Peak Hour Trip Generation				
	AM Peak Hour		**PM Peak Hour**	
Description	**Inbound**	**Outbound**	**Inbound**	**Outbound**
Off-Campus				
Residence	0.5	5	5	3
On-Campus				
Residence	0.0	0.3	0.3	0.2
Total	**1**	**5**	**5**	**3**

Appendix E PEAK HOUR SIGNAL WARRANT



★ Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes, and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: MUTCD - Figure 4C-3

Stantec

Figure E-1

Peak Hour Signal Warrant - Los Trancos Drive & E Peltason Drive

APPENDIX E

CEQA Notices

UCI University of California, Irvine

Environmental Planning & Sustainability (949) 824-6316
4199 Campus Drive, Suite 380
Irvine, CA 92697-2325 www.eps.uci.edu

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

Project Title: Middle Earth Expansion
Project Location: University of California, Irvine
Lead Agency: University of California
County: Orange

In accordance with the California Environmental Quality Act (CEQA) Guidelines and University of California Guidelines for Implementation of CEQA, an Initial Study for the Middle Earth Expansion project (proposed project) was prepared by the University of California, Irvine (University), and was determined that a Mitigated Negative Declaration is the appropriate level of analysis.

Phase 1 would demolish the existing 11,200-gross-square-foot (GSF) Brandywine Dining Commons and Student Center located in the existing Middle Earth student housing complex. A seven-story, approximately 240,000 GSF structure with 143,000 assignable square feet (ASF) would be constructed on the 2.2-acre site. The lower two floors of the structure would include a dining hall, community facilities, and support and ancillary space. The top five floors would include 500 student beds within double and triple occupancy rooms and associated dormitory facilities, such as lounges, laundry, kitchenettes, and bathrooms. Approximately 10,000 ASF of outdoor space would be constructed for 230 seats of dining and a loading dock. The existing Brandywine Service Road would be lengthened to connect to Ring Road, and widened adjacent to the proposed loading dock to allow for a 65-foot truck turn-around. Phase 2 would remodel the existing 10,500 GSF Pippin Commons from a dining facility to a recreation center.

The project has been analyzed in the Draft Initial Study/Mitigated Negative Declaration (Draft IS/MND) and determined that, with the incorporation of mitigation, it will not have a significant effect on the environment. The document is available for viewing on the UCI website at: http://www.eps.uci.edu/EnvironmentalPlanning/index.html. Hard copies of the Draft IS/MND and referenced documents are available for review during business hours at the University of California, Irvine's Office of Environmental Planning and Sustainability. Comments will be received December 2, 2016 through January 1, 2017, and can be emailed to hashimol@uci.edu or mailed to:

Lindsey Hashimoto, Senior Planner
Office of Environmental Planning and Sustainability
University of California, Irvine
4199 Campus Drive, Suite 380
Irvine, CA 92697

The Draft IS/MND, along with comments received during the public review period, will be considered by the Regents in conjunction with project approval. If adopted by the University, the Draft IS/MND will be finalized.

Richard Demerjian, Assistant Vice Chancellor

THE UNIVERSITY OF CALIFORNIA · IRVINE · LET THERE BE LIGHT

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Middle Earth Expansion

Lead Agency: University of California, Irvine — Contact Person: Richard Demerjian
Mailing Address: 4199 Campus Drive, Suite 380, Irvine, CA 92697 — Phone: (949) 824-7058
City: Irvine — Zip: 92697 — County: Orange

Project Location: County: Orange — City/Nearest Community: Irvine
Cross Streets: East Peltason Drive and Anteater Drive — Zip Code: 92697
Longitude/Latitude (degrees, minutes and seconds): 33 ° 38 ′ 43.4 ″ N / -117 ° 50 ′ 20.6 ″ W — Total Acres: 2.2
Assessor's Parcel No.: ____ Section: ____ Twp.: ____ Range: ____ Base: ____
Within 2 Miles: State Hwy #: SR-73 and I-405 — Waterways: San Diego Creek
Airports: ____ Railways: ____ Schools: IUSD (4); Tarbut V'Torah

---

Document Type:

CEQA: ☐ NOP ☐ Early Cons ☐ Neg Dec ☒ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ____ Other: ____

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI

Other: ☐ Joint Document ☐ Final Document ☐ Other: ____

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other: Design Approval

---

Development Type:

☒ Residential: Units 500bed Acres 2.2
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☐ Educational: ____
☐ Recreational: ____
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type ____
☐ Mining: Mineral ____
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type ____
☐ Other: ____

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☐ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☒ Drainage/Absorption
☐ Economic/Jobs
☐ Fiscal
☒ Flood Plain/Flooding
☒ Forest Land/Fire Hazard
☒ Geologic/Seismic
☐ Minerals
☒ Noise
☒ Population/Housing Balance
☒ Public Services/Facilities
☒ Recreation/Parks
☒ Schools/Universities
☒ Septic Systems
☒ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☒ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation
☒ Vegetation
☒ Water Quality
☒ Water Supply/Groundwater
☒ Wetland/Riparian
☒ Growth Inducement
☒ Land Use
☒ Cumulative Effects
☒ Other: Greenhouse Gas

Present Land Use/Zoning/General Plan Designation:
UC Irvine is not subject to local zoning regulations. Permitted uses in the 2007 UCI LRDP allow residential facilities.

Project Description: *(please use a separate page if necessary)*
Phase 1 would demolish the existing Brandywine Dining Commons and Student Center in the existing Middle Earth student housing complex. A seven-story, approximately 240,000 GSF structure with 143,000 ASF would be constructed on the 2.2-acre site. The lower two floors of the structure would include a dining hall, community facilities, and support and ancillary space. The top five floors would include 500 student beds within double and triple occupancy rooms and associated dormitory facilities. Approximately 10,000 ASF of outdoor space would be constructed for dining seating and a loading dock, and the adjacent existing Brandywine Service Road would be widened and lengthened to connect to Ring Road. Phase 2 would remodel the existing Pippin Commons from a dining facility to a recreation center.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

_____ Air Resources Board
_____ Boating & Waterways, Department of
_____ California Emergency Management Agency
_____ California Highway Patrol
S Caltrans District #12
_____ Caltrans Division of Aeronautics
_____ Caltrans Planning
_____ Central Valley Flood Protection Board
_____ Coachella Valley Mtns. Conservancy
_____ Coastal Commission
_____ Colorado River Board
_____ Conservation, Department of
_____ Corrections, Department of
_____ Delta Protection Commission
_____ Education, Department of
_____ Energy Commission
S Fish & Game Region #5
_____ Food & Agriculture, Department of
_____ Forestry and Fire Protection, Department of
_____ General Services, Department of
_____ Health Services, Department of
_____ Housing & Community Development
S Native American Heritage Commission
_____ Office of Historic Preservation
_____ Office of Public School Construction
_____ Parks & Recreation, Department of
_____ Pesticide Regulation, Department of
_____ Public Utilities Commission
S Regional WQCB #8
_____ Resources Agency
_____ Resources Recycling and Recovery, Department of
_____ S.F. Bay Conservation & Development Comm.
_____ San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
_____ San Joaquin River Conservancy
_____ Santa Monica Mtns. Conservancy
_____ State Lands Commission
_____ SWRCB: Clean Water Grants
_____ SWRCB: Water Quality
_____ SWRCB: Water Rights
_____ Tahoe Regional Planning Agency
S Toxic Substances Control, Department of
S Water Resources, Department of

_____ Other: _______________
_____ Other: _______________

Local Public Review Period (to be filled in by lead agency)

Starting Date December 2, 2016 Ending Date January 1, 2017

Lead Agency (Complete if applicable):

Consulting Firm:
Address:
City/State/Zip:
Contact:
Phone:

Applicant: University of California, Irvine
Address: 4199 Campus Drive, Suite 380
City/State/Zip: Irvine, CA 92697-2325
Phone: (949) 824-7058

Signature of Lead Agency Representative: ____________ **Date:** 12·1·16

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

AFFIDAVIT OF PUBLICATION

STATE OF CALIFORNIA,)
) ss.
County of Orange)

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of **The Orange County Register**, a newspaper of general circulation, published in the city of Santa Ana, County of Orange, and which newspaper has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, under the date of November 19, 1905, Case No. A-21046, that the notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

December 2, 2016

"I certify (or declare) under the penalty of perjury under the laws of the State of California that the foregoing is true and correct":

Executed at Santa Ana, Orange County, California, on

Date: December 2, 2016

Signature

The Orange County Register
625 N. Grand Ave.
Santa Ana, CA 92701
(714) 796-2209

PROOF OF PUBLICATION

NOTICE OF INTENT
TO ADOPT A MITIGATED NEGATIVE DECLARATION

MIDDLE EARTH EXPANSION

UNIVERSITY OF CALIFORNIA, IRVINE

In accordance with the California Environmental Quality Act (CEQA) Guidelines and University of California Procedures for Implementation of CEQA, an Initial Study for the Middle Earth Expansion project (proposed project) was prepared by the University of California, Irvine (University), and was determined that a Mitigated Negative Declaration is the appropriate level of analysis.

Phase 1 would demolish the existing 11,200-gross-square-foot (GSF) Brandywine Dining Commons and Student Center located in the existing Middle Earth student housing complex. A seven-story, approximately 240,000 GSF structure with 143,000 assignable square feet (ASF) would be constructed on the 2.2-acre site. The lower two floors of the structure would include a dining hall, community facilities, and support and ancillary space. The top five floors would include 500 student beds within double and triple occupancy rooms and associated dormitory facilities, such as lounges, laundry, kitchenettes, and bathrooms. Approximately 10,000 ASF of outdoor space would be constructed for 230 seats of dining and a loading dock. The existing Brandywine Service Road would be lengthened to connect to Ring Road, and widened adjacent to the proposed loading dock to allow for a 65-foot truck turn-around.

Phase 2 would remodel the existing 10,500 GSF Rippin Commons from a dining facility to a recreation center, which would house part of the displaced uses from the Brandywine Commons and Student Center demolition. The remaining displaced uses would be housed in the seven-story structure after completion of Phase 1.

The project has been analyzed in the Draft Initial Study/Mitigated Negative Declaration (Draft IS/MND) and determined that, with the incorporation of mitigation, it will not have a significant effect on the environment. The document is available at: http://www.eps.uci.edu/EnvironmentalPlanning/index.html. The 30-day public review period will begin December 2, 2016 through January 1, 2017. Comments may be sent to Lindsey Hashimoto, Associate Planner, at hashimol@uci.edu or mailed to University of California, Irvine, Office of Environmental Planning and Sustainability, 4199 Campus Drive, Suite 380, Irvine, CA 92697. If you have any questions regarding the project, please call (949) 824-8692.

Published: Orange County Register December 2, 2016 R-1870 10219848

Print Form

Notice of Determination

Appendix D

To:

☒ Office of Planning and Research

U.S. Mail: P.O. Box 3044, Sacramento, CA 95812-3044

Street Address: 1400 Tenth St., Rm 113, Sacramento, CA 95814

☐ County Clerk
County of: ______________________
Address: ______________________

From:

Public Agency: University of California, Irvine
Address: 4199 Campus Drive, Suite 380
Irvine, CA 92697
Contact: Richard Demerjian, Asst. Vice Chancellor
Phone: (949) 824-7058

Lead Agency (if different from above):
____
Address: ______________________
Contact: ______________________
Phone: ______________________

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2016121006

Project Title: Middle Earth Expansion

Project Applicant: University of California, Irvine

Project Location (include county): Irvine, Orange County

Project Description:

Phase 1 would demolish the existing Brandywine Dining Commons and Student Center. A seven-story, approximately 240,000 GSF structure would be constructed on the 2.2-acre site. The lower two floors would include a dining hall, community facilities, and support and ancillary space, and the top five floors would include 500 student beds. The existing Brandywine Service Road would be lengthened and widened. Phase 2 would remodel the existing 10,500 GSF Pippin Commons from a dining facility to a recreation center.

This is to advise that the University of California, Irvine (☒ Lead Agency or ☐ Responsible Agency) has approved the above described project on ______________ (date) and has made the following determinations regarding the above described project.

1. The project [☐ will ☒ will not] have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☒ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☐ was ☒ was not] adopted for this project.
6. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:

4199 Campus Drive, Suite 380, Irvine, CA 92697

Signature (Public Agency): ______________________ Title: Assistant Vice Chancellor

Date: ______________________ Date Received for filing at OPR: ______________________

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

Revised 2011

APPENDIX F

Response to Comments

MIDDLE EARTH EXPANSION
MAILING LIST

Orange County Public Library
University Park Branch
4512 Sandburg Way
Irvine, CA 92612

City of Irvine
Community Development Dept.
P.O. Box 19575
Irvine, CA 92623-9575
Attn: Mr. Bill Jacobs

County of Orange
Planning & Development Services
300 N. Flower Street

Orange County Transportation Authority
550 South Main Street
Orange, CA 92868

California Department of Fish & Wildlife
3883 Ruffin Road
San Diego, CA 92123

U.S. Fish & Wildlife Service
Division of Ecological Services
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

Regional Water Quality Control Board - Santa Ana
Region
3737 Main Street, Suite 500
Riverside, CA 92501-3348

U.S. Army Corps of Engineers
Los Angeles District
911 Wilshire Boulevard
Los Angeles, CA 90017

CA Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630

South Coast Air Quality Management District
21865 East Copley Drive
Diamond Bar, CA 91765-4182

Southern California Association of Governments
818 West 7th Street, 12th Floor
Los Angeles, CA 90017

California Department of Transportation
District 12
3337 Michelson Drive, Suite 380
Irvine, CA 92612-1699

Orange County Fire Authority
P.O. Box 57115
Irvine, CA 92619-7115

Irvine Ranch Water District
15600 Sand Canyon Ave.
Irvine, CA 92618

Public Utilities Commission
320 W. 4th Street, Suite 500
Los Angeles, CA 90013

Transportation Corridor Agencies
125 Pacifica
Irvine, CA 92618-3304

Irvine Unified School District
5050 Barranca Parkway
Irvine, CA 92604-4698

Metropolitan Water District
P.O. Box 54153
Los Angeles, CA 90054

Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691

Department of Water Resources
1416 9th Street
Sacramento, CA 95814

Middle Earth Expansion

Draft Initial Study
Public Review/Response to Comments

Public Review

The Draft Initial Study/Mitigated Negative Declaration (IS/MND), along with a Notice of Completion (NOC) and Notice of Intent to Adopt a Mitigated Negative Declaration (NOI), were circulated for public review and comment from December 2, 2016 through January 1, 2017. Copies of the document were submitted to the State Clearinghouse; local agencies; UCI faculty, staff, and other members of the campus community; and additional interested groups and persons. On December 2, 2016, a notice regarding the availability of the Draft IS/MND was published in the Orange County Register. Copies of the distribution list and notices are provided in this appendix.

Comments and Responses

Written comments were submitted by the agencies listed below. The letters and the responses to comments are presented on the pages following the Draft IS/MND distribution list.

Commenting Agency	Date
Department of Toxic Substances Control	December 15, 2016
City of Irvine	December 27, 2016

Matthew Rodriquez
Secretary for
Environmental Protection

Department of Toxic Substances Control

Barbara A. Lee, Director
5796 Corporate Avenue
Cypress, California 90630

Edmund G. Brown Jr.
Governor

December 15, 2016

Mr. Richard Demerjian
Assistant Vice Chancellor
University of California, Irvine
Office of Environmental Planning and Sustainability
4199 Campus Drive, Suite 380
Irvine, California 92697-2325

INITIAL STUDY AND PROPOSED MITIGATED NEGATIVE DECLARATION (ND) FOR MIDDLE EARTH EXPANSION PROJECT (SCH# 2016121006)

Dear Mr. Demerjian:

The Department of Toxic Substances Control (DTSC) has reviewed the subject ND. The following project description is stated in the ND: "Phases 1 and 2 of the proposed project are located in the existing Middle Earth student housing complex located in the Academic Core on the University of California, Irvine (UCI) campus. Phase 1 would demolish the existing 11,200-gross-square-foot (GSF) Brandywine Dining Commons and Student Center located in the existing Middle Earth student housing complex. A seven-story, approximately 240,000 GSF structure with 143,000 assignable square feet (ASF) would be constructed on the 2.2-acre site. The lower two floors of the structure would include an approximately 35,000 ASF dining facility, 14,000 ASF of community facilities, and 12,000 ASF of support and ancillary space. The top five floors would include 500 student beds within double and triple occupancy rooms and associated dormitory facilities, such as lounges, laundry, kitchenettes, and bathrooms totaling approximately 82,000 ASF. Approximately 10,000 ASF of outdoor space, including 230 seats for dining and a loading dock, would also be constructed. The existing Brandywine Service Road would be modified to connect to Ring Road to increase fire access usability, and widened adjacent to the proposed loading dock to allow for a 65-foot truck turn-around for on-site deliveries. Phase 2 would remodel the existing 10,500 GSF Pippin Commons from a dining facility to a recreation center, which would house part of the displaced uses from the Brandywine Commons and Student Center demolition. The remaining displaced uses would be housed in the seven-story structure after completion of Phase 1."

Based on the review of the submitted document DTSC has the following comments:

1. The ND should identify and determine whether current or historic uses at the project site may have resulted in any release of hazardous wastes/substances. A Phase I Environmental Site Assessment is necessary to identify any recognized environmental conditions.

2. If there are any recognized environmental conditions in the project area, then proper investigation, sampling and remedial actions overseen by the appropriate regulatory agencies should be conducted prior to the new development or any construction.

3. If the project plans include discharging wastewater to a storm drain, you may be required to obtain an NPDES permit from the overseeing Regional Water Quality Control Board (RWQCB).

4. If during construction/demolition of the project, soil and/or groundwater contamination is suspected, construction/demolition in the area should cease and appropriate health and safety procedures should be implemented. If it is determined that contaminated soil and/or groundwater exist, the ND should identify how any required investigation and/or remediation will be conducted, and the appropriate government agency to provide regulatory oversight.

If you have any questions regarding this letter, please contact me at (714) 484-5476 or email at Johnson.Abraham@dtsc.ca.gov.

Sincerely,

Johnson P. Abraham

Johnson P. Abraham
Project Manager
Brownfields Restoration and School Evaluation Branch
Brownfields and Environmental Restoration Program - Cypress

kl/sh/ja

cc: See next page.

cc: Ms. Lindsey Hashimoto
Senior Planner
Office of Environmental Planning and Sustainability
University of California, Irvine
Hashimol@uci.edu

Governor's Office of Planning and Research (via e-mail)
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044
State.clearinghouse@opr.ca.gov

Mr. Guenther W. Moskat, Chief (via e-mail)
Planning and Environmental Analysis Section
CEQA Tracking Center
Department of Toxic Substances Control
Guenther.Moskat@dtsc.ca.gov

Mr. Dave Kereazis (via e-mail)
Office of Planning & Environmental Analysis
Department of Toxic Substances Control
Dave.Kereazis@dtsc.ca.gov

Mr. Shahir Haddad, Chief (via e-mail)
Schools Evaluation and Brownfields Cleanup
Brownfields and Environmental Restoration Program - Cypress
Shahir.Haddad@dtsc.ca.gov

CEQA# 2016121006

Response to Department of Toxic Substances Control

Comment 1: The proposed project would demolish the existing Brandywine Commons and Student Center and remodel Pippin Commons constructed in 1974 and 1990, respectively. Prior to 1974 the land was undeveloped and has operated as residential uses since construction of Middle Earth. Due to the date of construction, Brandywine Commons may contain hazardous substances such as lead based paint and/or asbestos. However, UCI performs lead and asbestos surveying in all buildings constructed prior to 1978 and as a routine control, prior to any demolition on campus, the Office of Environmental Health and Safety (EH&S) and the project manager coordinate assessment of potentially contaminated buildings. Furthermore, the standard UCI construction contract, which would be implemented as part of the project, specifies that all contractors who disturb or potentially disturb asbestos or lead must comply with all federal, State, and local regulations regarding hazardous materials.

In accordance with EH&S, who monitors on-campus hazardous sites, there are no currently active recognized environmental conditions (RECs) on or adjacent to the project site. This issue is discussed on page 4.7-3, Hazards and Hazardous Materials.

Comment 2: As discussed above in the response to Comment 1, there are no RECs located on or adjacent to the project site.

Comment 3: As discussed on page 4.8-2, Hydrology and Water Quality, the proposed project would comply with the National Pollutant Discharge Elimination System (NPDES). The project would obtain a Construction General Permit as required by the State Water Quality Control Board (SWQCB), which requires the preparation of a Storm Water Pollution Prevention Plan (SWPPP). A Water Quality Management Plan would also be prepared that would install and maintain post-construction best management practices (BMPs) that would reduce any potential runoff in compliance with State water quality standards. Furthermore, LRDP EIR mitigation measure Hyd-2B that has been incorporated as part of the project, would further ensure compliance with water quality standards.

Comment 4: The site has been previously developed and, as discussed above in response to Comment 1, no RECs are located anywhere on the main campus. Furthermore, in the event that contaminated soil or groundwater is discovered during construction, the contractor is required under contract to comply with all federal, State, and local regulations regarding hazardous materials. Construction would be halted and appropriate remediation, including notification of DTSC, would occur.

Community Development
cityofirvine.org
1 Civic Center Plaza, Irvine, CA 92606-5208
949-724-6000

December 27, 2016

Ms. Lindsey Hashimoto
Office of Environmental Planning and Sustainability
4199 Campus Drive, Suite 750
Irvine, CA 92612

Subject: Middle Earth Expansion

Dear Ms. Hashimoto:

Thank you for the opportunity to review the Initial Study (IS) and Mitigated Negative Declaration (MND) for the Middle Earth Expansion at UC Irvine. The proposed project is a seven-story, 240,000 square feet, structure that will be used for the purposes of a new dormitory consisting of 500 beds. The new dormitory will also include a dining hall, community facilities and ancillary spaces. Staff offers the following comment:

> Confirm what the total on-campus bed count will be with the Middle Earth expansion. The document indicates that while the project will increase the number of beds beyond what was previously analyzed in Middle Earth, it will not exceed the overall number (which was previously projected to be 17,637) that was identified in the 2007 LRDP.

If you have any questions, please contact me at 949-724-6364 or by email at jequina@cityofirvine.org.

Sincerely,

for

Justin Equina
Associate Planner

cc: Bill Jacobs, Principal Planner

Response to the City of Irvine

Comment 1: The total on-campus bed count, including the 500 beds from the Middle Earth Expansion project, is 14,514.

APPENDIX G

Mitigation Monitoring and Reporting Program

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
Aes-2A	Prior to project design approval for future projects that implement the 2007 LRDP, UCI shall ensure that the projects include design features to minimize glare impacts. These design features shall include use of non-reflective exterior surfaces and low-reflectance glass (e.g., double or triple glazing glass, high technology glass, low-E glass, or equivalent materials with low reflectivity) on all project surfaces that could produce glare.	D&CS/EPS	D&CS to review during design EPS to confirm
Aes-2B	Prior to approval of construction documents for future projects that implement the 2007 LRDP, UCI shall approve an exterior lighting plan for each project. In accordance with UCI's Campus Standards and Design Criteria for outdoor lighting, the plan shall include, but not be limited to, the following design features: • Full-cutoff lighting fixtures to direct lighting to the specific location intended for illumination (e.g., roads, walkways, or recreation fields) and to minimize stray light spillover into adjacent residential areas, sensitive biological habitat, and other light-sensitive receptors; • Appropriate intensity of lighting to provide campus safety and security while minimizing light pollution and energy consumption; and • Shielding direct lighting within parking areas, parking structures, or roadways away from adjacent residential areas, sensitive biological habitat, and other light-sensitive receptors through site configuration, grading, lighting design, or barriers such as earthen berms, walls, or landscaping.	D&CS/EPS	D&CS to review during design EPS to confirm
AQ-1	Prior to initiating construction, UCI shall ensure that the project construction contract includes a construction emissions mitigation plan, including measures compliant with SCAQMD Rule 403 (Fugitive Dust), to be implemented and supervised by the on-site construction supervisor, which	D&CS/EPS	D&CS to confirm and monitor contractor EPS to confirm

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	shall include, but not be limited to, the following BMPs: • During grading and site preparation activities, exposed soil areas shall be stabilized via frequent watering, on-toxic chemical stabilization, or equivalent measures at a rate to be determined by the on-site construction supervisor. • During windy days when fugitive dust can be observed leaving the construction site, additional applications of water shall be required at a rate to be determined by the onsite construction supervisor. • Disturbed areas designated for landscaping shall be prepared as soon as possible after completion of construction activities. • Areas of the construction site that will remain inactive for three months or longer following clearing, grubbing and/or grading shall receive appropriate BMP treatments (e.g., revegetation, mulching, covering with tarps, etc.) to prevent fugitive dust generation. • All exposed soil or material stockpiles that will not be used within 3 days shall be enclosed, covered, or watered twice daily, or shall be stabilized with approved nontoxic chemical soil binders at a rate to be determined by the on-site construction supervisor. • Unpaved access roads shall be stabilized via frequent watering, non-toxic chemical stabilization, temporary paving, or equivalent measures at a rate to be determined by the on-site construction supervisor. • Trucks transporting materials to and from the site shall allow for at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer). Alternatively, trucks transporting materials shall be covered.		

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	• Speed limit signs at 15 mph or less shall be installed on all unpaved roads within construction sites. • Where visible soil material is tracked onto adjacent public paved roads, the paved roads shall be swept and debris shall be returned to the construction site or transported off site for disposal. • Wheel washers, dirt knock-off grates/mats, or equivalent measures shall be installed within the construction site where vehicles exit unpaved roads onto paved roads. • Diesel powered construction equipment shall be maintained in accordance with manufacturer's requirements, and shall be retrofitted with diesel particulate filters where available and practicable. • Heavy duty diesel trucks and gasoline powered equipment shall be turned off if idling is anticipated to last for more than 5 minutes. • Where feasible, the construction contractor shall use alternatively fueled construction equipment, such as electric or natural gas-powered equipment or biofuel. • Heavy construction equipment shall use low NOx diesel fuel to the extent that it is readily available at the time of construction. • To the extent feasible, construction activities shall rely on the campus's existing electricity infrastructure rather than electrical generators powered by internal combustion engines. • The construction contractor shall develop a construction traffic management plan that includes the following: • Scheduling heavy-duty truck deliveries to avoid peak traffic periods		

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	Consolidating truck deliveries. • Where possible, the construction contractor shall provide a lunch shuttle or on-site lunch service for construction workers. • The construction contractor shall, to the extent possible, use pre-coated architectural materials that do not require painting. Water-based or low VOC coatings shall be used that are compliant with SCAQMD Rule 1113. Spray equipment with high transfer efficiency, such as the high volume-low pressure spray method, or manual coatings application shall be used to reduce VOC emissions to the extent possible. • Project constructions plans and specifications will include a requirement to define and implement a work program that would limit the emissions of reactive organic gases (ROG's) during the application of architectural coatings to the extent necessary to keep total daily ROG's for each project to below 75 pounds per day, or the current SCAQMD threshold, throughout that period of construction activity to the extent feasible. The specific program may include any combination of restrictions on the types of paints and coatings, application methods, and the amount of surface area coated as determined by the contractor. • The construction contractor shall maintain signage along the construction perimeter with the name and telephone number of the individual in charge of implementing the construction emissions mitigation plan, and with the telephone number of the SCAQMD's complaint line. The contractor's representative shall maintain a log of any public complaints and corrective actions taken to resolve complaints.		

Mitigation Measure		Responsible Party	Monitoring and Reporting Procedure
BR-1	If construction occurs during the nesting season (February 1 through August 31), pre-constructing surveys for active nests shall be performed within 30 days prior to the commencement of any clearing or grading activities at locations within 500 feet of the approved limits of disturbance where suitable nesting habitat exists. Construction activities within 300 feet of active nests shall be monitored by a qualified biologist until the biologist determines that the nest is no longer active. Construction may encroach within the 300-foot buffer only at the discretion of the biologist.	D&CS/EPS	D&CS to coordinate surveys and incorporate into construction documents EPS to confirm
Cul-1C	Prior to land clearing, grading, or similar land development activities for future projects that implement the 2007 LRDP in areas of identified archaeological sensitivity, UCI shall retain a qualified archaeologist (and, if necessary, a culturally affiliated Native American) to monitor these activities. In the event of an unexpected archaeological discovery during grading, the on-site construction supervisor shall redirect work away from the location of the archaeological find. A qualified archaeologist shall oversee the evaluation and recovery of archaeological resources, in accordance with the procedures listed below, after which the on-site construction supervisor shall be notified and shall direct work to continue in the location of the archaeological find. A record of monitoring activity shall be submitted to UCI each month and at the end of monitoring. If an archaeological discovery is determined to be significant, the archaeologist shall prepare and implement a data recovery plan. The plan shall include, but not be limited to, the following measures: a. Perform appropriate technical analyses; b. File an resulting reports with South Coast Information Center; and c. Provide the recovered materials to an appropriate repository for	D&CS/EPS	On-site construction supervisor to notify D&CS and EPS who will stop/direct work Submit final report to EPS

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	curation, in consultation with a culturally-affiliated Native American.		
Cul-4A	Prior to grading or excavation for future project that implement the 2007 LRDP and would excavate sedimentary rock material other than topsoil, UCI shall retain a qualified paleontology to monitor these activities. In the event fossils are discovered during grading, the on-site construction supervisor shall be notified and shall redirect work away from the location of the discovery. The recommendations of the paleontologist shall be implemented with respect to the evaluation and recovery of fossils, in accordance with mitigation measures Cul-4B and Cul-4C, after which the on-site construction supervisor shall be notified and shall direct work to continue in the location of the fossil discovery. A record of monitoring activity shall be submitted to UCI each month and ay the end of monitoring.	D&CS/EPS	On-site construction supervisor to notify D&CS and EPS who will stop/direct work Submit final report to EPS
Cul-4B	If the fossils are determined to be significant, then mitigation measure Cul-4C shall be implemented.	D&CS/EPS	Submit documentation to EPS to report procedures were followed
Cul-4C	For significant fossils as determined by mitigation measure Cul-4B, the paleontologist shall prepare and implement a data recovery plan. The plan shall include, but not be limited to, the following measures: a. The paleontologist shall ensure that all significant fossils collected are cleaned, identified, catalogued, and permanently curated with an appropriate institution with a research interest in the materials (which may include UCI); b. The paleontologist shall ensure that specialty studies are completed, as appropriate, for any significant fossil collected; and c. The paleontologist shall ensure that curation of fossils are completed in consultation with UCI. A letter of acceptance from the curation	D&CS/EPS	Submit documentation to EPS to report procedures were followed and an attempt to house found fossils occurred

Mitigation Measure		Responsible Party	Monitoring and Reporting Procedure
	institution shall be submitted to UCI.		
GS-1	A project-specific geotechnical investigation that includes trenching shall be prepared during the design phase to identify the location of the UCI Campus Fault in relation to the project site. No structure shall fall within the Restricted Use Zone (RUZ), 50 feet on either side of the UCI Campus Fault, in the final design.	D&CS/EPS	D&CS to coordinate survey EPS to confirm
Haz-6A	Prior to initiating on-site construction for future projects that implement the 2007 LRDP and would involve a land or roadway closure, the construction contractor and/or UCI Design and Construction Services shall notify the UCI Fire Marshal. If determined necessary by the UCI Fire Marshal, local emergency services shall be notified of the lane or roadway closure by the Fire Marshal.	D&CS/EPS	D&CS to record notification to the Fire Marshall EPS to confirm
Hyd-1A	As early as possible in the planning process of future projects that implement the 2007 LRDP and would result in land disturbance of 1 acre or greater, and for all development projects occurring on the North Campus in the watershed of the San Joaquin Freshwater Marsh, a qualified engineer shall complete a drainage study. Design features and other recommendations from the drainage study shall be incorporated into project development plans and construction documents. Design features shall be consistent with UCI's Storm Water Management Program, shall be operational at the time of project occupancy, and shall be maintained by UCI. At a minimum, all drainage studies required by this mitigation measure shall include, but not be limited to, the following design features: Site design that controls runoff discharge volumes and durations shall be utilized, where applicable and feasible, to maintain or reduce the peak runoff for the 10-year, 6-hour storm event in the post-development condition compared to the pre-development condition, or as defined by current water	D&CS/EPS	D&CS to incorporate findings into project design EPS to confirm

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	quality regulatory requirements. Measures that control runoff discharge volumes and durations shall be utilized, where applicable and feasible, on manufactured slopes and newly-graded drainage channels, such as energy dissipaters, revegetation (e.g., hydroseeding and/or plantings), and slope/channel stabilizers.		
Hyd-2A	Prior to initiating on-site construction for future projects that implement the 2007 LRDP, UCI shall approve an erosion control plan for project construction. The plan shall include, but not be limited to, the following applicable measures to protect downstream areas from sediment and other pollutants during site grading and construction: • Proper storage, use, and disposal of construction materials. • Removal of sediment from surface runoff before it leaves the site through the use of silt fences, gravel bags, fiber rolls or other similar measures around the site perimeter. • Protection of storm drain inlets on-site or downstream of the construction site through the use of gravel bags, fiber rolls, filtration inserts, or other similar measures. • Stabilization of cleared or graded slopes through the use of plastic sheeting, geotextile fabric, jute matting, tackifiers, hydro-mulching, revegetation (e.g., hydroseeding and/or plantings), or other similar measures. • Protection or stabilization of stockpiled soils through the use of tarping, plastic sheeting, tackifiers, or other similar measures. • Prevention of sediment tracked or otherwise transported onto adjacent roadways through use of gravel strips or wash facilities at exit areas (or	D&CS/EPS	D&CS to prepare erosion control plan and incorporate into construction documents EPS to confirm

Mitigation Measure		Responsible Party	Monitoring and Reporting Procedure
	equivalent measures). • Removal of sediment tracked or otherwise transported onto adjacent roadways through periodic street sweeping. • Maintenance of the above-listed sediment control, storm drain inlet protection, slope/stockpile stabilization measures.		
Hyd-2B	Prior to project design approval for future projects that implement the 2007 LRDP and would result in land disturbance of 1 acre or more, the UCI shall ensure that the projects include the design features listed below, or their equivalent, in addition to those listed in mitigation measure Hyd-1A. Equivalent design features may be applied consistent with applicable MS4 permits (UCI's Storm Water Management Plan) at that time. All applicable design features shall be incorporated into project development plans and construction documents; shall be operational at the time of project occupancy; and shall be maintained by UCI. • All new storm drain inlets and catch basins within the project site shall be marked with prohibitive language and/or graphical icons to discourage illegal dumping per UCI standards. • Outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system shall be covered and protected by secondary containment. • Permanent trash container areas shall be enclosed to prevent off-site transport of trash, or drainage from open trash container areas shall be directed to the sanitary sewer system. • At least one treatment control is required for new parking areas or structures, or for any other new uses identified by UCI as having the	D&CS/EPS	D&CS to incorporate into construction documents EPS to confirm

Mitigation Measure		Responsible Party	Monitoring and Reporting Procedure
	potential to generate substantial pollutants. Treatment controls include, but are not limited to, detention basins, infiltration basins, wet ponds or wetlands, bio-swales, filtration devices/inserts at storm drain inlets, hydrodynamic separator systems, increased use of street sweepers, pervious pavement, native California plants and vegetation to minimize water usage, and climate controlled irrigation systems to minimize overflow. Treatment controls shall incorporate volumetric or flow-based design standards to mitigate (infiltrate, filter, or treat) storm water runoff, as appropriate.		
Noi-2A	Prior to initiating on-site construction for future projects that implement the 2007 LRDP, UCI shall approve contractor specifications that include measures to reduce construction/demolition noise to the maximum extent feasible. These measures shall include, but are not limited to, the following: • Noise-generating construction activities occurring Monday through Friday shall be limited to the hours of 7:00 am to 7:00 pm, except during summer, winter, or spring break at which construction may occur at the times approved by UCI. • Noise-generating construction activities occurring on weekends in the vicinity of (can be heard from) off-campus land uses shall be limited to the hours of 9:00 am to 6:00 pm on Saturdays, with no construction occurring on Sundays or holidays. • Noise-generating construction activities occurring on weekends in the vicinity of (can be heard from) on-campus residential housing shall be limited to the hours of 9:00 amto 6:00 pm on Saturdays, with no construction on Sundays or holidays. However, as determined by UCI, if on-campus residential housing is unoccupied (during summer, winter, or spring break, for example), or would otherwise be unaffected	D&CS/EPS	D&CS to confirm with contractor and incorporate into construction documents EPS to confirm

Mitigation Measure		Responsible Party	Monitoring and Reporting Procedure
	by construction noise, construction may occur at any time. • Construction equipment shall be properly outfitted and maintained with manufacturer recommended noise-reduction devices to minimize construction-generated noise. • Stationary construction noise sources such as generators, pumps or compressors shall be located at least 100 feet from noise-sensitive land uses (i.e., campus housing, classrooms, libraries, and clinical facilities), as feasible. • Laydown and construction vehicle staging areas shall be located at least 100 feet from noise-sensitive land uses (i.e., campus housing, classrooms, libraries, and clinical facilities), as feasible. • All neighboring land uses that would be subject to construction noise shall be informed at least two weeks prior to the start of each construction project, except in an emergency situation. • Loud construction activity such as jackhammering, concrete sawing, asphalt removal, pile driving, and large-scale grading operations occurring within 600 feet of a residence or an academic building shall not be scheduled during any finals week of classes. A finals schedule shall be provided to the construction contractor.		